A U S T R A L I A N

Brachyscomes

AUSTRALIAN DAISY STUDY GROUP

AUSTRALIAN

Brachyscomes

Dedicated to Betty Campbell

AUSTRALIAN
Brachyscomes

Esma Salkin

Gloria Thomlinson

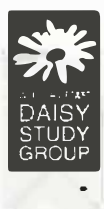
Beth Armstrong

Bev Courtney

Maureen Schaumann

for the

Australian Daisy Study Group



First published 1995 by
The Australian Daisy Study Group

National Library of Australia
Cataloguing-in-Publication data:

Australian Brachyscomes

Bibliography.
Includes index.
ISBN 0 646 25079 5.

1. Brachyscomes. 2. Brachyscomes — varieties — cultivars.
3. Brachyscomes — propagation. 4. Brachyscomes — illustrations.
I. Salkin, Esma *et al.* II. Australian Brachyscomes.

This edition limited to 1000 copies

Cover picture: *Brachyscome iberidifolia* (Judy Barker)

Editor: Judy Barker
Book design: Gloria Thomlinson
Bev Courtney

Printed by: Brown Prior Anderson Pty. Ltd.
5 Evans Street, Burwood Vic, 3125

Contents

Acknowledgements		vi
Introduction		vii
1	The Name *Brachyscome*	1
2	What is a Brachyscome?	3
3	Propagation	7
4	Growing Brachyscomes	12
5	Brachyscomes for Gardens	14
6	Brachyscomes for Containers and Other Uses	27
7	Reproduction and Hybridization	29
Brachyscome Species		33
Comparison of *Brachyscome* Species: Tables		248
Comparison of *Brachyscome* Species: Illustrations of fruits within complexes		252
Brachyscome Cultivars		255
Glossary		258
References and Further Reading		263
The Australian Daisy Study Group		265
Index		266

Insert: Chart of *Brachyscome* Fruits

Acknowledgements

In the writing of this book the Australian Daisy Study Group gratefully acknowledges the help provided by a great number of people. It was written at the suggestion of our Leader, Esma Salkin, and her generous donation of royalties gained from *Rhodanthe* 'Paper Cascade', together with royalties from *Australian Daisies for gardens and floral art,* have paid for publishing it. Her leadership has been of inestimable value.

The book could not have been written without the invaluable assistance of Dr Philip Short, a senior botanist at the National Herbarium of Victoria, who is revising the genus *Brachyscome.* Dr Short donated seed of some species the Group was unable to collect, arranged for members to examine herbarium specimens, presented us with valuable articles and references of special interest and patiently answered our many questions. We thank Philip particularly for checking the manuscript. We also thank Dr Jim Ross, Dr Don Foreman, Dr Tim Entwisle, Neville Walsh, and David Albrecht for arranging visits to the Herbarium in Dr Short's absence.

The Study Group has received assistance from Dr Jim Willis on the habitat of *B. eyrensis* and on the characters of several other species, from Dr Manfred Jusaitis of the Black Hill Flora Centre at Athelstone in South Australia on a description of *B. muelleri* in cultivation, and from Mark Richardson of the Australian Network for Plant Conservation on the status of *B. radicata*. We also thank the Department of Conservation and Natural Resources in all states for their willing assistance.

The Study Group is grateful to all those members and non-members who donated seed and cuttings of species for trialling. In particular we thank Hilary Coulson of the Arid Zone Institute at Alice Springs for seed of *B. blackii,* Dr Beth Gott for seed of *B. diversifolia* var. *maritima* from Erith Island and Peg McAllister for cutting material of her cultivars. Rodger Elliot has given major assistance; we are most grateful for his slides, background information on species, guidance on matters editorial and on spelling conventions.

All the members of the Group participated in this book in some way. Collection of new species and forms for trialling was of the highest importance. In this endeavour none has surpassed our leader, Esma, who has made countless expeditions with Alf. Many of the new species are directly attributable to her. Esma's ability to spot a brachyscome at moderately high speeds and her determination to track down the most insignificant species are legendary. Other collectors or providers of note are Beth Armstrong, John Barrie, Barbara Buchanan, Joy Greig, Colin Jones, Val McConchie, Bob Magnus, Jenny Rejske, Maureen Schaumann, Pat Shaw, Julie Strudwick, Gloria Thomlinson and Pat Tratt.

In writing the section titled Brachyscomes in Gardens the Group sought help in a number of geographical areas where there were few members. We were delighted to receive articles on growing daisies at the Australian National Botanic Gardens in Canberra and at Kings Park and Botanic Garden in Perth. We thank Geoff Butler and Dr Stephen Hopper respectively for these contributions and we thank Irene Cullen of Algester (Qld), David Hockings of Maleny (Qld), Mary McEvoy of Murdunna (Tas) and Ruth Moir of Albany (WA) for their valuable information on daisy growing in their districts. The response of members who were invited to write of their experiences was magnificent. These members include Judy Barker, John Barrie, Bev Courtney, Joy Greig, Jan Hall, Colin Jones, Val McConchie, Mary McKay, Bill Owen, Jenny Rejske, June Rogers, Esma Salkin, Pat Shaw, Colleen Simpson, Doll Stanley, Julie Strudwick, Margery Stutchbury, Pat Tratt, Brian Walker and Bruce Wallace. The recommendations for species to suit various conditions are of great interest and will prove extremely useful.

We have been extremely fortunate to number such a talented artist as Gloria Thomlinson on the Editorial Committee and among our members. Her drawings combine botanical accuracy with the essence of the plant's character. The Group has asked her to perform many difficult tasks and she has been more than equal to them all. Her drawings have taken five years and several thousand hours to complete. They have added immeasurably to the value of this book. The Group also is grateful to John Armstrong for the excellent illustrations appearing in the preliminary chapters and for the diagrams explaining the terms in the glossary.

The Editorial Committee has done a sterling job. Maureen Schaumann, founder of the Study Group, has converted a scrawl to a neat computer print-out with her usual practical competence. Bev Courtney has translated the computer disc to another language, formatted and indexed it with flair, thus revealing an insatiable taste for challenge. Esma and Alf Salkin have checked and rechecked the information presented and have acted as consultants on many esoteric matters. Beth Armstrong and Natalie Peate undertook the task of preliminary proof-reading and glossary writing. They have corrected mistakes, altered syntax and unearthed split infinitives with zeal and humour. We thank our husbands for their editorial and other assistance, encouragement and forbearance (and in some cases for their culinary skills).

Introduction

The genus *Brachyscome* is restricted to Australasia. At least 3 species occur in New Zealand and two species, *B. papuana* and *B. elegans*, have been described from New Guinea. At present approximately 75 Australian species have been described. Future revision will see this number change; some species are still awaiting description, other species now included in the genus may belong to related or new genera.

Brachyscome species comprise annuals, perennials, subshrubs and one shrub. They grow naturally in a wide range of habitats including coastal, arid inland and alpine environments. The annuals are showy when massed and the perennials are attractive in general garden planting and for containers. Most species appear to best advantage when grouped together. Brachyscomes are low growing, non-invasive and extremely colourful. The perennials generally flower for long periods and many annuals produce masses of flower-heads for at least three months, sometimes more than six months. Gardeners prize these attributes highly, but the genus has been largely neglected by horticulturalists.

This book sets out to describe brachyscomes in light of the experience gained by the Study Group in growing them and evaluating their horticultural potential. Identification of species has involved detailed study using microscopes, and experimental growing techniques have been tested for some of the more difficult species. The knowledge accumulated from all these activities has been included.

The aims of this book are:

- to give a comprehensive account of every *Brachyscome* species known to be in cultivation
- to extend the range of *Brachyscome* species available to gardeners
- to provide sufficient information for accurate identification by amateur naturalists
- to assist conservationists in regeneration projects.

When the Study Group was formed in 1981 very few brachyscomes were available to gardeners. Species in nurseries were limited to *B. angustifolia* and *B. multifida*, and seed suppliers stocked *B. iberidifolia*. A few specialist alpine plant growers offered *B. decipiens, B. nivalis, B. rigidula* and *B. scapigera*. A glittering array of relatively unknown species remained for members to investigate. It has been a fascinating and most enjoyable project for us all.

With few exceptions all *Brachyscome* species described in the book have been collected by the Study Group as either seed or cutting material. These were propagated and cultivated to form the basis of our study. Herbarium specimens of field collections are housed in the ADSG herbarium, and where possible duplicate specimens were also collected and housed at the National Herbarium of Victoria.

Layout of the book

The emphasis is on performance of species in cultivation. The Study Group has not been able to acquire material for propagation of some species. In those cases we have combined all the accounts we have been able to find in the literature, and have presented the descriptions of species in their natural habitats.

The salient characters of each species in cultivation may be gathered from the box and from the short description in bold print positioned near the top of the first page of each species' description. The dimensions in the box are derived from cultivated plants unless otherwise stated.

The names of the botanical regions in New South Wales and Western Australia have been in use for many years. They have been applied to the distribution of species in those two States.

Hard won experience in propagation, cultivation and uses, and brief mention of the various forms grown by members have been included. Flowering period is merely a guide. It is subject to change depending on many variables such as soil type, climate, aspect and provision of water and nutrients.

'Similar species' provides distinguishing features about species, or undescribed entities of uncertain status, which may be confusingly alike, as an aid to correct identification.

Some distinctive entities collected during the course of our studies have not been readily referable to formally recognized species. At least some of these may prove to be distinct species or may be deserving of formal recognition as varieties or subspecies. Furthermore, in various cytological papers authors have made reference to possibly distinct species or unusual forms in various fashion, e.g. by listing species as 'sp. A' or as 'sp. 1' or '*B.* sp. aff. *goniocarpa*' or, if the status is uncertain, as '*B.* aff. *gracilis*'. Such a method is useful within the context of individual papers but can be confusing.

When the status of an entity is uncertain such taxa are usually listed here under the species to which they belong or are apparently most closely related, e.g. a possibly distinct species with affinities to *B. cuneifolia* is mentioned under that name. On the other hand the Study Group has chosen, for example, to highlight *Brachyscome* sp. (Darling Downs), which although not yet formally named, is clearly specifically distinct from all other taxa.

Under the heading 'Special notes' additional information has been supplied for those requiring more detailed knowledge, such as horticultural students, plant breeders, and readers with an interest in the relationship between species or in the background of name changes.

The illustrations of the majority of the species have been drawn from fresh material, from either garden or bush plants. In each case the origin has been stated and voucher specimens of all illustrations have been retained. Drawings of some species have been made from dried specimens in the ADSG herbarium. All the species drawings are life-size; the illustrations of fruit are magnified by 20, but the small habit drawings are not to scale. The fruits illustrated are typical of the species, although in some cases they have originated from different locations.

A degree of variation was noted in some features. The range of sizes are those encountered in different conditions and at different times.

Species new to cultivation

Since the Study Group was formed many species previously unknown in cultivation have been trialled and have displayed potential for horticulture. These species are listed below:

Perennials

B. aculeata
B. angustifolia — forms
B. ascendens
B. basaltica
B. aff. *cuneifolia*
B. aff. *curvicarpa*
B. dentata — some forms
B. dissectifolia
B. diversifolia
B. formosa
B. aff. *formosa*
B. graminea
B. melanocarpa
B. microcarpa
B. nova-anglica
B. parvula
B. petrophila
B. procumbens
B. ptychocarpa
B. riparia
B. segmentosa
B. sieberi var. *gunnii*
B. spathulata
B. stuartii
B. tadgellii
B. tatei
B. tenuiscapa var. *pubescens*
B. sp. (Darling Downs)

Annuals

B. ciliaris — some forms
B. cillocarpa
B. dichromosomatica
B. exilis
B. gracilis
B. aff. *gracilis*
B. halophila
B. nodosa
B. oncocarpa
B. pusilla
B. readeri
B. smithwhitei

Using this book in species' identifications

Although Davis (1948) provided a comprehensive key for the genus *Brachyscome*, the status of many species has been changed since that time, and many new species have been collected and described. Several new, unnamed species also await description and classification. Keys to the identification of *Brachyscome* species can be found in the floras of most States. A combined key for the whole of Australia is needed, and will appear when the current revision is published.

In the identification of species, *Australian Brachyscomes* should be regarded as an adjunct to the *Brachyscome* key in the flora of each State. Most identifications are based on the appearance of the fruit. If the relevant State flora is not available, the fruit characters depicted in the insert included with this book can be used as a basis for identification. The species description then could be used to confirm the identity.

1

The Name *Brachyscome*

The generic name *Brachyscome* is derived from two Greek words, *brachys* meaning short and *kome* meaning hair. It refers to the short bristles or hairs of the pappus.

Cassini first published the name *Brachyscome* in 1816 and used it again in 1817 in two other publications. He had combined the two Greek words simply by joining them together. The rules of Greek grammar, however, direct that the 's' be omitted if the two words are combined. Examples of the correct combination are seen in *Brachychiton* (*brachys* — short; *chiton* — tunic) and *Brachyloma* (*brachys* and *loma* — edge or border). Where the 's' is included in the combined words it belongs to the second word, for example, *Brachysema* (*brachys* and *sema* — standard). In 1825 Cassini himself corrected the spelling to *Brachycome,* adding a footnote to the effect that this was how the generic name should be spelt.

The spelling of the generic name has been a controversial subject for many years. Some botanists followed Cassini's direction, including Bentham (1867) and Davis (1948, 1949), but others maintained that the first spelling had priority. When Davis revised the genus she noted in her introduction that *Brachyscome* had priority but she felt that in view of his footnote, Cassini had almost certainly considered the original combination to be an orthographic error although he had not stated his exact reason for correcting the spelling. She therefore felt justified in using *Brachycome* as the generic name.

The rules of botanical nomenclature state that the original spelling of a name or epithet is to be retained except for the correction of typographic or orthographic errors. All are agreed that the error is not typographic. The disagreement hinges on the desirability of correcting orthographic errors.

Shortly after Davis published her revision a proposal to conserve *Brachycome* over *Brachyscome* was put to the Special Committee for Pteridophyta and Phanerogamae. The motion was lost, largely because some members of the Committee felt that the spelling *Brachycome* was permissible under the code and that conservation was unnecessary.

In 1965, Eichler, in *Supplement to J.M. Black's Flora of South Australia* (p. 297), reinstated *Brachyscome* by rigidly applying the rules of the International Code of Botanical Nomenclature. A number of botanists agreed with him, but many did not and opinion remained divided.

In 1989 another attempt was made to conserve *Brachycome* and maintain that spelling in preference to *Brachyscome* (Adolphi *et al.* 1989). This proposal, however, failed to get the necessary support, the final vote by the Committee for Spermatophyta being evenly divided. In a report by the Committee the statement was also made that 'it appears now that the spelling *Brachyscome* should be preferred' (Brummitt 1993, p. 693) and it is this spelling that has been adopted by the Study Group.

Background

William Dampier collected the first herbarium specimen of *Brachyscome* in 1699 from the Shark Bay area in north-western Western Australia. By 1867 George Bentham was able to classify 36 species in *Flora Australiensis.* His treatment grouped species in four sections, *Brachystephium, Paquerina, Brachycome* and *Silphiosperma.* This classification was based primarily on the appearance of the fruit.

A major revision was undertaken by Dr Gwenda Davis in 1948. She also used variation in the mature fruit for her classification into species. A number of species were further classified into varieties on the basis of vegetative variation. Dr Davis published additional papers on the genus (1949, 1954, 1959) and her work is still the standard reference. She recognized 72 species and 12 varieties.

Subgenera

The genus is divided into 2 subgenera; *Eubrachycome* possesses a terminal anther appendage and includes 45 species and 8 varieties, and *Metabrachycome* in which the anther appendage is absent

and which includes 17 species and 4 varieties. It has since been noted (Barker in Barker and Greenslade, 1982) that the two subgeneric names are not validly published under the rules of botanical nomenclature and are therefore illegitimate. The names are still used by some botanists.

Superspecies

The two subgenera are divided into 11 superspecies; *Eubrachycome* includes 6 superspecies and there are 5 superspecies in *Metabrachycome.* This classification has a few shortcomings. It does not always group like species together. For instance, although *B. dissectifolia* and *B. stuartii* are very similar species and are included in *Eubrachycome,* the former is in superspecies *leptocarpa* and the latter in superspecies *tenuiscapa. B. gracilis* is close to *B. goniocarpa* but it is grouped under superspecies *leptocarpa,* while *B. goniocarpa* and *B. diversifolia* are in the superspecies *diversifolia.*

From 1968 onwards much work has been done on the cytology of brachyscomes and chromosome number determinations. Professor Smith-White and Professor Watanabe with associates Carter, Kosuge, Kyhos and Stace were responsible for detailed knowledge of the *B. linearifoba* complex and the relationships between the species within it. During this period one of the undescribed species in the complex was discovered (Smith-White, 1968) and was found to have a chromosome number of $n = 2$. Carter (1978b) later recognized this species as *B. dichromosomatica* and simultaneously described another species in the complex with $n = 4$ as *B. breviscapis.*

New species have been recognized; *B. formosa* and *B. halophila* (Short, 1988), and *B. nodosa* and *B. smithwhitei* (Watanabe and Short, 1993). These four species and *B. dichromosomatica* are very attractive species and are expected to increase the number of species with horticultural potential.

Revisionary work on *Brachyscome* is being carried out by Dr Short and Professor Watanabe and will be completed within a few years. This is expected to include major changes.

2

What is a Brachyscome?

Brachyscome is a member of the Compositae (or Asteraceae), a family which contains perhaps 25,000 species. The most recent subfamilial treatment of the family recognizes 3 subfamilies and 17 tribes (Bremer, 1994), with *Brachyscome* belonging to the tribe Astereae. *Brachyscome* is one of about 15 genera in Australia that are placed in the Astereae. Other genera include *Calotis, Celmisia, Lagenifera, Minuria, Olearia* and *Vittadinia.*

Brachyscome is described as follows: an annual or perennial herb or rarely a small shrub. **Leaves** basal and/or cauline, entire to lobed or pinnatisect, alternate. **Flower-heads** usually solitary, terminal, held on a scape or flower stem; **involucral bracts** green, arranged in one or several rows, either glabrous or hairy on the outer surface; **receptacle** hemispherical to conical, naked sometimes pitted; **ray florets** female, strap-shaped and usually with three apical teeth, commonly white or mauve, occasionally yellow or pink; **disc florets** bisexual, tubular, 4- or 5-lobed, yellow; **fruit** a cypsela, i.e. a dry, indehiscent, single-seeded fruit from an inferior ovary. Cypselas (commonly, but incorrectly, called achenes or seeds), may be glabrous to hairy or tuberculate, often with longitudinal folds, sometimes winged; **pappus** a collection of bristles, short or sometimes absent.

Growth habit

Annuals are plants which complete their life cycles within 12 months. Perennials are plants whose lifespans extend over more than two growing seasons. Some *Brachyscome* species, defined as annuals in botanical literature, have lived longer than 12 months, e.g. *B. gracilis* (Upper Namoi). This species would be defined as a long-lived annual. Certain annuals complete their life cycles in 3–6 months, e.g. the members of the *B. iberidifolia* and *B. oncocarpa* complexes. They are more ephemeral in nature.

Many species are rhizomatous, that is they send out horizontal underground shoots from the rootstock, e.g. *B. aculeata* and *B. angustifolia.* A few species are stoloniferous, such as *B. dissectifolia* and *B. stolonifera.* They send out long horizontal stems above the soil surface and are able to form roots at the nodes. In some cases species layer with ease, e.g. *B. multifida* var. *multifida.*

Leaves

Size: In most brachyscomes the leaves progressively diminish in size up the stem. When plants are grown from seed the first leaves are often much larger than those produced at any other time in the plant's development. This is also the case for the first leaves produced from the rootstock after plants have died back, or following hard pruning.

Shape: The cauline leaves change shape as they are produced up the stem. If the margin is lobed the lobes often decrease in number and the uppermost leaves become entire. If the lower leaves are stalked the upper leaves may become sessile.

Arrangement: In some species leaves are produced in basal clusters and flower stems arise from them. The clusters may persist for some time or may be lost as plants develop. Some authors use the word 'rosette' to describe these clusters, but a rosette usually is defined as a group of leaves which lie flat on the ground and radiate from a central point. In our experience only two species possess true rosettes, *B. decipiens* and *B. tenuiscapa* var. *tenuiscapa.* Other species may have a basal tuft of leaves but the leaves are held erect or at an angle and do not lie flat on the ground. In a few species the basal leaves may lie flat only for a short period in their development.

Flower-head

Colour: Colour is subjective. Individuals see and describe colours quite differently. In this book the use of lilac and violet has been avoided and mauve, pink or mauve-pink used instead. The colour of the heads often changes during the growing season. In general the colour fades in the hotter months. A form of *B. angustifolia* is pale pink in spring, white in summer and pale pink again in autumn.

B. trachycarpa and certain forms of *B. ciliaris* have mauve heads in spring and autumn, but are white in summer.

When some species are dried and pressed the heads change colour, usually with the ray florets turning from white to blue-mauve. This change frequently occurs in species with mauve streaks on the undersurface of white ray florets, one example being a form of *B. aculeata*. The true colour of the fresh ray florets should be recorded with other relevant data when a specimen is collected. Descriptions based solely on herbarium specimens lacking this information may not be reliable with respect to colour. In the literature botanists often describe species as blue when collectors usually record them as mauve.

Size: The diameter of the head is generally larger at the beginning of the flowering period. In summer there is a decrease in size, sometimes reducing the diameter by as much as half, and in autumn the heads grow larger again. The dimensions of the flower-heads recorded in the descriptions of species include the ray florets.

Involucral bracts

The flower-head is encircled by modified leaves known as involucral bracts. In *Brachyscome* species these bracts are green and generally soft. They may be glabrous or hairs may be present, usually short glandular hairs. The margins are scarious, entire or torn and are often tinged purple. Involucral bracts are commonly arranged in two rows but there are four rows of bracts in *B. latisquamea*. The appearance of the bracts may be used as an identifying character.

Receptacle

The receptacle is the enlarged top of the flower stem. It varies in shape from hemispherical to steeply conical and the surface may be pitted.

Ray florets

Ray florets are arranged in a radiating ring at the periphery of the receptacle. They are female and have strap-shaped corollas usually with three teeth at the apex denoting the number of petals fused together. These ray florets are generally colourful. The majority are white or mauve, a few species are pink (*B. formosa* and some forms of *B. angustifolia* and *B. procumbens*) and two species are yellow (*B. chrysoglossa* and *B.* aff. *curvicarpa*). Some forms of *B. dentata* have yellow ray florets when they first open, but they quickly turn white.

Disc florets

Disc florets are bisexual and occupy the centre of the receptacle. The petals are fused into a tubular corolla, the number of apical lobes indicating the number of petals (usually five in *Brachyscome*). Disc florets are usually yellow but in some cultivars of *B. iberidifolia* they may be black or purplish.

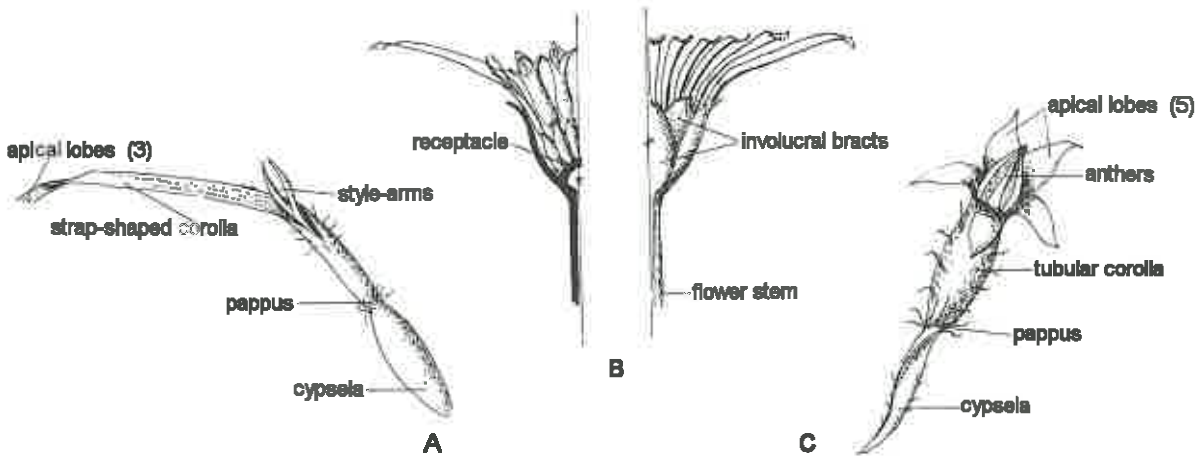


Fig. 1. Flower-head. A, ray floret; B, flower-head (sections); C, disc floret.

Stigmas

Stigmas are not used in identification. They are lanceolate with short glandular papillae on the outer surfaces.

Anthers

Anthers are obtuse at the base, sometimes cut off at the top of the pollen sacs and at other times extended beyond the pollen sacs as a lanceolate appendage. Presence or absence of this appendage has been used by Davis (1948) to classify the species into the subgenera *Eubrachycome* or *Metabrachycome* respectively.

Flower stem

The flower stem has been defined as the stem bearing the flower-head and its length is measured from immediately below the head to the nearest junction with the main stem system. It may be naked or bear a variable number of small leaves. The term 'scape' sometimes is used to define an unbranched flower stem arising from a basal cluster of leaves. The length of the flower stem does not remain constant for any one plant over the duration of a growing season. For instance, the flower stem of *B.* aff. *formosa* (Neville) elongates from 9–10cm in October, to 13–16cm in the following February, and 17–18cm in March.

Fruit

Fruits form the basis for the identification of *Brachyscome* species. They vary in size, shape and colour. The body may be smooth, or covered in hairs or tubercles, and wings may be present or absent. Keys are based on these characters but a microscope or close focus monocular is necessary to discern the fine detail of the fruit.

Maturity: Fruit must be mature to exhibit some of the characters accurately. Although immature wings may be detected, whether fruits will be flattened or swollen will not be apparent until maturity, nor will the development of tubercles, longitudinal folds or the final colour.

Position in the head: The position of the fruit in the head also has an effect on the final appearance. In *B. pusilla* the fruit of the ray florets on the periphery develop more obvious apical swellings and are more hairy than those in the centre. The fruit of the ray florets of *B. smithwhitei* have broader wings than those of the disc florets, and similarly *B. nodosa* develops larger apical projections in the fruit of the ray florets. Short and Watanabe (1993) suggest that this variation may reflect the time the florets opened compared with the time they were pollinated, the outer florets being the first pollinated and the first to develop. The outer ring of florets may also have more room in which to expand. Due to this variation fruits often appear to be heteromorphic, but the only true heteromorphic fruits occur in *B. ciliaris*.

Wings: Wings are structures that develop outwards from the body. They also vary in size and shape; they may be broad or narrow, swollen or thin and papery. In some species it is difficult to see whether a wing is present. It has been suggested by Watanabe *et al.* (1991) that the horseshoe-shaped folds of *B. goniocarpa* may be modified wings. The fruit dimensions recorded in this book exclude the length of the pappus.

Pappus: The pappus is usually a collection of bristles arising from a point on the apex. The bristles may differ in length, be free or fused together at the base. In some cases the pappus is composed of a ring of small papillae rather than bristles, e.g. *B. basaltica* and *B. rara*. The presence or absence of a pappus together with its size are used in identification.

Cotyledons and first seedling leaves

Members have noted that cotyledons of *Brachyscome* species vary in shape. The first two pairs of seedling leaves also vary in shape and in degree of hairiness. This variation may be a useful tool in identification and is one that gardeners would find easy to use. One instance of this variation is that the cotyledons of all the species in the *B. linearifoba* complex are narrow-linear, whereas species in the *B. dentata* complex are oblong and have a small apical mucro.

B. formosa and *B. procumbens* have many vegetative characters in common, but they differ at the seedling stage. The cotyledons of both species have long stalks. *B. formosa* has oblong to obovate cotyledons and the first seedling leaves are similar in shape; *B. procumbens* has more rounded cotyledons and the seedling leaves are almost circular.

When a collection was made in the Upper Namoi (NSW) district it was tentatively identified as either *B. gracilis* or *B. nodosa*, although it seemed a long way out of the range of *B. gracilis*. When seed germinated, however, the first seedling leaves were seen to be identical to those of *B. gracilis* and different from those of *B. nodosa*. Another interesting observation was made when seed of *B.* aff. *gracilis* germinated and the first seedling leaves were larger than those of *B. gracilis* but were the same shape.

The cotyledons of *B.* aff. *multifida* (Hat Head) are rounded whereas those of *B. multifida* var. *dilatata* (Stawell) and of var. *multifida* (Mt Kaputar) are narrow-elliptical.

These are only preliminary observations. It is expected that more work will be done on this aspect of brachyscome diversity.

3

Propagation

Brachyscome species are relatively easy to propagate. The method chosen depends on the species, the material available at the time of collection, and the aim of the propagator. There are four main methods:

- from seed
- from cuttings
- by division
- by layering.

Propagation from seed yields individual plants with variable characters, while vegetative propagation results in plants which are identical to their parents in every respect because they are of exactly the same genetic constitution. To reproduce good horticultural forms or cultivars it is essential to propagate vegetatively. Seedlings usually differ from the parent plant in habit, colour, and constitution. If superior horticultural forms are produced they then may be selected for further propagation by vegetative means.

Propagation from seed

Seed of a few species is produced commercially and is available from seed suppliers. To date the range of *Brachyscome* species stocked by Australian suppliers is limited to *B. ciliaris, B. dentata, B. iberidifolia and B. latisquamea.* Overseas suppliers list selected forms of *B. iberidifolia,* such as the 'Splendour' series. If seed is sown and harvested over a number of years it may be selected for attractive appearance and ease of germination. Over this period the percentage germination increases markedly. For example, commercial seed of *B. iberidifolia* germinated in abundance in 2–3 days, whereas seed of the same species collected from the wild took 25–50 days and percentage germination was low. One of the Study Group's aims is to extend the range of seed available to gardeners. Some very attractive annual species new to gardeners have been trialled, such as *B. dichromosomatica, B. exilis, B. halophila, B. nodosa* and *B. oncocarpa.* From these trials members have collected seed which is available to the public in small quantities, and it is hoped that the descriptions in this book will arouse the interest of commercial growers.

A basic knowledge of propagation methods has been assumed. In this book the subject is treated in detail only when specific information relating to brachyscomes is involved. If more complete information is required refer to the relevant chapters in *Australian Daisies for gardens and floral art* or the *Encyclopaedia of Australian Plants suitable for cultivation* Vol. 1.

Seed may be germinated by sowing direct or by sowing in containers.

Direct sowing

This method is suitable for annuals or when mass planting is desired. It is more wasteful of seed since there can be little control over the depredations of ants, snails, birds and animals or the effect of bad weather, but it is a simple procedure. After the soil has been prepared, humus and nutrients added and weeds removed, a layer of inorganic mulch should be applied to the surface before sowing. This enhances germination and certainly aids natural regeneration in the following season. Coarse sand or small chips of granite or bluestone have proved successful in this regard.

Sowing in containers

Medium: Seed raising mix is available in small quantities from nurseries. It is a simple answer for the germination of one or two species. Other useful mixes are made up of different proportions of

peat moss and perlite. One part of peat moss to 3–7 parts of perlite has been used, 3–5 parts of perlite being the more usual ratio. A higher proportion of perlite increases aeration but containers might need light watering to retain moisture. Sand may be used in place of perlite, and vermiculite in place of peat moss. Coarse sand may be used alone but in that case the bog method of germination should be followed.

Sowing methods: Brachyscome seed is small. It should be sown on the surface of the medium. Some growers claim that a thin layer of granite or blue metal chips (5–7mm) over the seed enhances germination, acts as a mulch and forms a protective layer against birds and heavy rain. Other growers have had more success when a fine layer of vermiculite is sprinkled over the seed.

Siting of pots: Simple outdoor methods of propagation require pots to be placed in open, sunny positions. It has been observed that flushes of germination always follow relatively heavy rainfalls and so the site selected should not be protected from rain. Seed may be germinated successfully in glasshouses. It is advisable to remove containers from the glasshouse once germination has begun. If containers remain too wet, fungal problems are likely to occur.

Sowing times

In general, autumn is the best time to sow. Where heavy frosts occur, sowing should be delayed until late winter or early spring unless the seedlings are to be raised under cover. This advice applies also to certain brachyscomes with soft, hairy stems and foliage that may rot in cold wet weather. The following species are of this persuasion:

B. blackii	*B. dentata*	*B. papillosa*
B. chrysoglossa	*B. latisquamea*	*B. tesquorum*
B. curvicarpa	*B. melanocarpa*	*B. tetrapterocarpa*
B. aff. *curvicarpa*	*B. nova-anglica*	

It should be noted that seedlings of *B. latisquamea* die progressively in cold, wet weather in spite of having glabrous foliage and stems. In some districts red-legged earth mite destroys the foliage of seedlings in autumn. It is preferable to delay sowing in those areas until they have disappeared.

Germination times

Germination times vary from 2–10 days for annual species, such as *B. iberidifolia* and *B. pusilla* purchased from seed companies, to 1–12 months with a very poor percentage germination for *B.* aff. *gracilis* collected from its natural habitat.

Poor germination

Reasons for poor germination of seed include the following:

Seed is not mature. Immature seed is small and fruit characters are not fully developed. If seed is left to soak in water overnight before sowing the mature seed will sink.

Seed has been damaged by insects or fungi. Insect damage may have occurred either before seed was collected or during storage. Seed must be stored dry to prevent fungal damage.

Seed is not viable, i.e. not able to live and develop. When viable seed is cut in half the embryo within the seed coat should be white and healthy-looking.

Conditions for germination are not right for the particular species. Many factors affect germination, the four most important being warmth, moisture, oxygen and light. Much research has been done on factors affecting germination of arid zone annuals, such as *Myriocephalus morrisonianus* (syn. *Helipterum craspedioides*) and *Schoenia cassiniana* (Mott, 1972). It has been proved that there is an optimum temperature for each species at which germination takes place, although seed will germinate over a much wider range. Some species need wide fluctuations of temperature between day and night. Some seeds need light, others need darkness. Moisture and oxygen are essential for the seed to be biochemically activated.

Willis and Groves (1972) explored the effects of temperature and light on Asteraceae species such as *Chrysocephalum apiculatum, C. semipapposum, Leptorhynchos squamatus, Leucochrysum albicans*

and *Vittadinia muelleri.* Little research has been done on factors affecting germination in *Brachyscome* species. Of the species tested by Willis and Groves, *V. muelleri,* another member of the tribe *Astereae,* is the closest relation to *Brachyscome* and so the results for it may be relevant. Optimal germination occurred between 15°C and 25°C, light had a promotory effect, and no after-ripening period was necessary.

Dormancy

If seeds do not germinate they may be dormant. Dormancy is a regulatory mechanism to prevent germination while retaining viability, and is accomplished in many ways. Dormancy may be caused by the presence of chemical inhibitors to germination. An after-ripening period or period of storage may be necessary to break down the inhibitors, thus allowing germination to proceed. If the inhibitors are in the seed coat and are water-soluble, they will be leached out of the coat after heavy precipitation. This may explain the fact that gardeners find species germinating soon after heavy rainfall or after a period of automatic misting. Better germination of *B. curvicarpa* has been achieved by soaking seed overnight in water. Some inhibitors can be neutralized by excising the embryo, either by removing the seed coat or by clipping it to allow penetration of water. For example, germination of *B. dichromosomatica* is increased by excising the embryo after soaking in water.

If seed can be sown before the inhibiting factors are present in high concentration it may be possible to circumvent dormancy. Members found that plump green seed of *B. obovata* germinated within a few days, whereas old mature seed took 5–7 months. The following species have germinated from seed which was collected slightly immature (relatively large and green) and sown soon after collection:

B. ciliaris
B. decipiens
B. dissectifolia
B. exilis
B. graminea
B. obovata
B. procumbens
B. ptychocarpa
B. spathulata
B. stuartii
B. aff. *stuartii*
B. tatei
B. whitei

Seed pretreatment

Germination of recalcitrant species can be increased by certain pretreatments. The Study Group members have tried a number of pretreatments, the results of which are reported below.

Heat treatment: The effect of keeping seed at 60°C for three months has been trialled using three species, *B. cheilocarpa, B. halophila* and *B. latisquamea.* Germination was not enhanced.

Seed primer treatment: *B. breviscapis* is normally difficult to germinate, but when it was soaked in a seed primer impregnated with smoke, germination was improved. Tests are still proceeding. It is possible that increased germination resulted from soaking for 24 hours, not necessarily being the result of the primer. The pretreatment has had no effect on the germination of *B. halophila.* The smoke used to impregnate the primers is produced from burning fynbos material, a South African type of vegetation.

Stratification: It was thought that alpine brachyscomes might need a pretreatment, known as stratification, which involves keeping seed moist at 2–4°C for 6–12 weeks. Study Group members, however, have reported that mature seed germinates readily if sown soon after collection. Stratification has had no discernible effect.

Storage at 4°C: Some species germinate more readily if they are stored dry at 4°C for 4–6 months before sowing, e.g. *B.* aff. *gracilis.*

More experimental work using several of these strategies will lead to greater knowledge of the effectiveness of pretreatment.

Appearance of seedlings

The appearance of seedlings often differs markedly from that of the adult plant. The basal leaves of seedlings are usually much larger and may disappear as plants develop. Seedlings are frequently more hairy than the adult plant, e.g. *B. petrophila.*

Seed collection

There are laws protecting each State's rapidly diminishing flora. All species examined by the Study Group have been collected under licences issued by the relevant state conservation bodies. Annual reports of work in progress are forwarded to these bodies.

Where the conservation status has been mentioned in the text, the reference used has been *Threatened Australian Flora*, June 1993 (Australian Nature Conservation Agency). The conservation status will differ in each State; some species of *Brachyscome* are protected flora and cannot be collected in that State. Collections on private property should be made only with the authority of the owner.

In *Brachyscome* species the shrivelled florets may be mistaken for seed, which is usually small and often of the same colour. The dried florets should fall off and reveal the mature seed clustered on the receptacle. The outer rows of fruit are always the most mature. As the flower-head develops the florets at the periphery are pollinated first and are the first to reach maturity. The central florets are normally sterile; either they are not pollinated, or the circulating nutrients have been appropriated by the earlier developing outer florets.

Seed should be dry when collected as it is prone to fungal attack. Ensure that all pests are killed before storing. One easy method is to place seed in an airtight jar for 24–48 hours with a piece of pest strip attached inside the lid. A small amount of seed should be collected from each of a number of plants in order to obtain a larger gene pool.

Brachyscome species differ from each other in the way seed is retained or dispersed after it has matured. The following species ripen their fruits over a long period. In the case of the hard-headed species, such as those in the *B. lineariloba* complex, the seed remains tightly in the head for some time after it is mature. It is not shed until the head is saturated, at which time the centre of the head elongates and the outer seeds soften and become loose. Some species, however, lose the central fruits quite quickly, but retain the ripe fruits in one or two rows just inside the involucral bracts. These are designated by an asterisk.

B. breviscapis
B. campylocarpa
B. cheilocarpa
B. ciliocarpa
B. dichromosomatica
B. eriogona
B. exilis *
B. goniocarpa
B. halophila
B. iberidifolia *
B. leptocarpa
B. lineariloba
B. nodosa
B. oncocarpa *
B. pusilla *
B. smithwhitei

All the species listed above occur in arid habitats. The manner in which they retain seed may be simply a strategy for survival.

In the following species the seed matures quickly and may be collected when the fruits begin to loosen in the head. If they are left to ripen for too long the lightest touch will disperse them.

B. aculeata
B. angustifolia
B. ascendens
B. basaltica
B. chrysoglossa
B. cuneifolia
B. curvicarpa
B. aff. *curvicarpa*
B. debilis
B. decipiens
B. dentata
B. dissectifolia
B. formosa
B. aff. *formosa*
B. melanocarpa
B. microcarpa
B. multifida
B. nivalis
B. nova-anglica
B. obovata
B. papillosa
B. parvula
B. perpusilla
B. procumbens
B. ptychocarpa
B. rigidula
B. riparia
B. segmentosa
B. sieberi var. *gunnii*
B. spathulata
B. stuartii
B. aff. *stuartii*
B. tatei
B. tetrapterocarpa
B. uliginosa
B. sp. (Darling Downs)

Seed storage

Store seed in small airtight jars or foil packages at 4°C. If refrigerator space is unavailable, seed is best stored in a dry atmosphere at a temperature no higher than 15°C.

Availability of seed

Seed of a few species is offered commercially. Seed of some species may be purchased from the Study Group, but seed of species on the Endangered or Vulnerable Lists is not usually available.

Endangered species: *B. muelleri.*
Vulnerable species: *B. ascendens, B. muelleroides, B. papillosa.*

Propagation from cuttings

Brachyscomes may be propagated from three types of cutting:

- stem cuttings
- root cuttings
- leaf cuttings.

Stem cuttings

Stem cuttings of brachyscomes strike readily as a general rule. Elaborate propagation devices are not necessary, but strike rates are improved and cuttings strike faster if bottom heat and misting are provided, or if cuttings are propagated in glasshouses or polyhouses. The process is also improved if cuttings are dipped in hormone solution or powder. Clean conditions are very important.

Root cuttings

Root cuttings are used when propagating species with naked scapes arising from basal leaf clusters.

Leaf cuttings

B. nivalis, B. spathulata and *B. uliginosa* have been struck from leaf cuttings but the process is slow, bottom heat and misting are necessary, and the rooted leaves seldom grow into plants.

Propagation by division

Most rhizomatous or stoloniferous species are easily propagated by division. Such species include *B. angustifolia, B. dissectifolia, B. formosa, B. graminea, B. multifida* var. *dilatata* and *B. radicans.* A better result is obtained if the sucker is first transferred to a container of potting mix, before planting out in a permanent position. Large plants may be dug up and divided with a knife or spade. *B. diversifolia, B. scapigera* and *B. spathulata* var. *spathulata* may be divided in this manner.

Layering

Many brachyscomes layer naturally, e.g. some forms of *B. multifida* var. *multifida.* It is likely that most herbaceous species could be layered, but this is a slower process and is rarely used.

Natural regeneration

Most species will self-sow in gardens or pots, even some of the more difficult species to germinate, such as *B. breviscapis* and *B. goniocarpa.* Members have observed that most natural regeneration takes place when the ground is bare or the mulch is inorganic. Thick organic mulches seem to reduce regeneration.

4

Growing Brachyscomes

In general it may be said that most brachyscomes prefer an open position in morning sun. Plants grow and flower in sun and dappled shade but root protection is essential. They will also grow in shade but flowers will be few. The majority of brachyscomes benefit from added nutrients. Factors involved in growing *Brachyscome* species will be discussed in broad terms, but where the requirements of individual species are concerned, reference should be made to the species' descriptions.

Soil types

Clay or sandy soils are suitable. Many brachyscomes prefer well-drained soils, but numerous species grow well in boggy situations, e.g. *B. basaltica, B. graminea* and *B. radicans*. The range of pH 6–7 is suitable for the majority of species, but some prefer alkaline soils since their natural habitat is in limestone or other calcareous soil, e.g. *B. cuneifolia* and *B. tatei*.

Nutrients

Brachyscomes that have been grown in cultivation for some time thrive on nutrients. Applications may be made in early spring and again in late summer or early autumn. Alternatively small applications may be made more frequently. Addition of nutrients is not advised for species newly propagated from plants in the wild. Forms of *B. angustifolia* var. *angustifolia* from the natural habitat were killed by generous application of organic fertilizer.

When plants are pruned nutrients should be added at the same time and watered in thoroughly.

Some species, such as *B. angustifolia* varieties, are especially prone to leaf yellowing and may be successfully treated with iron compounds. For soils of pH 5–6 use a soil drench with ferrous sulphate (50g per sq. metre), and for soils of pH 6–7 use ferrous sulphate as a foliar spray (30g per litre). For soils of pH 7 or higher use iron chelates as a soil drench (2–3g per sq. metre) or as a foliar spray at the same concentration.

Brachyscomes usually do not suffer other nutritional deficiencies.

Pruning

Perennials should be pruned at the end of each flush of flowers in order to encourage the development of more flowers. Other reasons for pruning are to maintain a tidy appearance, produce a desired shape and to remove dead or diseased material. Light trimming is beneficial at any stage of a plant's growth but hard pruning should be undertaken only when new shoots are present and sufficiently advanced. Hard pruning may kill *B. basaltica* var. *gracilis* unless the new shoots are at least 15cm high, and untidy top growth of *B. multifida* should not be removed until new growth is firmly established.

Mulching

Mulching of soil discourages weed growth, conserves moisture, protects root systems and keeps fluctuations in soil temperature to a minimum. Organic mulches such as wood chips, pinebark and shredded prunings can be used and will ultimately add humus to the soil as they break down. One disadvantage of this type of mulch is that birds love to forage in it. As a result, small plants soon get lost, pulled out or covered with mulch, and often die. Thick layers of organic mulch seem to inhibit germination of brachyscome seed. A layer of granite chips, small blue metal screenings or coarse sand makes an excellent medium for germination of brachyscomes. Although this kind of mulch may be expensive it has the advantage of reducing the entry of pathogens to the stems of plants.

Pests

Brachyscome species are relatively free from pest attack. It should be remembered that healthy plants combat predators more successfully than weak or diseased plants.

Slugs and snails attack brachyscomes at all stages of growth. Baits are usually effective.

Caterpillars bite and chew foliage and stems. While they do not kill mature plants, young seedlings may not shoot again if the main stem has been bitten off at the base. Caterpillars may be effectively controlled with sprays of low toxicity.

Aphids suck sap from young stems and buds. This retards growth and damages buds. If present in great numbers they may kill plants, but are squashed easily by hand or controlled by spraying. *Brachyscome* species especially susceptible to aphid attack in cool temperate areas are *B. blackii* and *B. tesquorum.*

Root aphids pose the greatest problem to *Brachyscome* species. They attack other genera in the tribe *Astereae,* e.g. *Calotis, Lagenifera* and *Olearia,* but many other members of the Asteraceae family seem to be immune. Root aphids live below ground and suck sap from the roots, gradually causing plants to lose vigour. The only way to see these pests is to dig up plants or knock them out of their pots. If root aphids are present a white, waxy secretion will be observed around the roots. Sprays of high toxicity may be used to control root aphids but every precaution must be taken when using them. A measure of control is gained for container plants by soaking affected pots for 30 minutes in pyrethrum solution to which horticultural clensel has been added. Another method is to sprinkle naphthalene flakes on the soil surface around infested plants. The pests are kept in check if this is done every three or four months. It should be noted, however, that naphthalene has been reported to be a carcinogen.

Red-legged earth mites suck sap by lacerating plant tissue with their mouth parts. They are a problem in rural areas but are seldom seen in cities. Systemic sprays like dimethoate are effective, but toxicity is high. Many growers prefer to wait until the mites have disappeared before they sow or plant.

Diseases

Powdery mildew is caused by a fungus and controlled by a fungicide such as benomyl, which is moderately toxic. Certain arid zone species, such as the species in the *B. iberidifolia* or *B. oncocarpa* complexes, have been affected by powdery mildew in cool temperate climates.

5

Brachyscomes in Gardens

Brachyscome species have been trialled by ADSG members in gardens all over Australia. Such great variations of climate, soil type, aspect and overhead protection exist that a simple designation of conditions, e.g. 'species suitable for subtropical gardens', will not suffice for recommendations of what to plant and where to plant it.

Descriptions of a number of gardens are set out below. The *Brachyscome* species that have proved themselves worthy of cultivation in these specific situations are listed. Details of rainfall, temperature range, soil type, etc., have been included in order that prospective growers may choose species for conditions most closely approximating their own.

The order in which the gardens are presented is the same as that followed in the distribution of species, that is it begins with Queensland gardens and proceeds clockwise around Australia.

Queensland

Algester

Algester is approximately 18km south-west of the GPO in Brisbane. The average summer temperatures are 22–30°C and the winter temperatures are 8–20°C with occasional frosts. The average annual rainfall is 1200mm, falling mainly in summer. South-easterly and north-westerly winds affect the garden. Abnormally hot north-westerlies cause a certain amount of wind burn. The soil is loam with some clay and the pH is 7. The brachyscomes grow better in this soil than they did in a previous garden in which the soil was a light sandy loam. Plants growing in full sun are designated #, in sun for two thirds of the day are designated * and in dappled shade are designated †.

The following species and cultivars are growing well in these conditions and flower throughout the year:

B. aculeata †
B. angustifolia var. *angustifolia* *
B. angustifolia var. *heterophylla* *
B. ascendens †
B. formosa †
B. iberidifolia #*
B. multifida — white, dark mauve #*
B. 'Pink Haze' #*
B. procumbens *
B. segmentosa *
B. 'Sunburst' *

The following brachyscomes are not as satisfactory in this garden:

B. diversifolia
B. graminea
B. microcarpa
B. rigidula
B. 'Strawberry Mousse'

Bundaberg

Bundaberg is situated on the Burnett River, 365km north of Brisbane. The flat, open, volcanic plains were once covered with dense forest and vine scrub, known as the Woongarra scrub, but were cleared completely in the early pioneering days and are now under sugarcane. The elevation is 30 metres, the only hill being the remains of a volcano, a sloping cone 90 metres high known as The Hummock. Average temperatures during the hottest month, January, are a minimum of 21.6°C and a maximum of 30°C. The coldest month is July with a minimum of 10.5°C and a maximum of 21.8°C. The average annual rainfall is 1140mm, falling over about ninety-six wet days per year. Much of it is from short sharp storms during summer and is helped by cyclonic rain, with most rain falling between November and March. The last few years have seen much less than average rainfall.

This garden was established as a daisy garden in 1993, thirty years after the original garden was made. Logs were placed and sandy loam was purchased and spread over the existing lawn. A compost mostly made up of lawn clippings and garden cuttings was mixed through the soil. The garden faces east and is approximately 14 metres long by 1 metre wide. One end is shaded by a large *Liquidambar styraciflua* and at the other end *Eucalyptus ptychocarpa* and *Brachychiton acerifolius* provide some shade. Species doing better in part shade than in full sun in these conditions are designated *.

Brachyscomes growing and flowering well in this garden are as follows:

B. angustifolia
B. iberidifolia
B. multifida — mauve *
B. multifida 'Alba' *
B. multifida 'Breakoday' *
B. parvula (Huntly, Vic)

Macgregor

Macgregor is a suburb 11.5km south-south-east of Brisbane. The elevation is 70 metres. The average annual rainfall is 1150mm, falling mainly in summer. Rainfall averages 160mm a month in mid-summer and 60mm a month in mid-winter. Temperatures average 21–28°C in mid-summer and 10–20°C in mid-winter. Mean relative humidity averages 60–70% over the whole year, with higher maxima in the wet summer season. The soil in this garden is sandy loam.

The following *Brachyscome* species and cultivars have performed best in these conditions:

B. 'Amethyst'
B. angustifolia var. *angustifolia*
B. angustifolia var. *heterophylla*
B. ascendens
B. basaltica var. *basaltica*
B. aff. *curvicarpa* — self-sows
B. formosa
B. 'Just Jayne'
B. microcarpa
B. multifida var. *dilatata*
B. multifida var. *multifida* — lilac, white
B. 'Pink Haze'
B. procumbens
B. rigidula (alpine and subalpine forms)
B. segmentosa
B. 'Strawberry Mousse'
B. stuartii
B. 'Sunburst'
B. 'Valencia'
B. sp. (Darling Downs)

The following species are not satisfactory in this garden:

B. dissectifolia — form
B. diversifolia var. *diversifolia*
B. graminea

Annuals useful for autumn, winter and spring are:

B. halophila
B. iberidifolia
B. pusilla (Kings Park seed)
B. smithwhitei

Maleny

Maleny lies 100km north-west of Brisbane on the Blackall Range at an elevation of 365 metres. The average annual rainfall is 2010mm; the average rainfall in January is 290mm and 95mm in July. In mid-summer the temperature ranges from 25°C to 32°C and in mid-winter from –5°C to 20°C. The soil type is an acidic, light red volcanic soil.

Species recommended for these conditions are:

B. angustifolia var. *heterophylla*
B. ascendens
B. aff. *curvicarpa*
B. microcarpa
B. multifida var. *multifida* — mauve
B. nova-anglica — suckering
B. scapigera
B. tenuiscapa var. *pubescens*
B. sp. (west of Charleville)
B. sp. (Ravensbourne) — white, ferny leaf

New South Wales

Kanwal

Kanwal is 100km north of Sydney on the central coast. It is 10km from the coastline and 1km from Tuggerah Lake, which is a saltwater lake. The average monthly rainfall is 75mm, with December to June the wettest period. August to October is drier. The average summer temperature is 15–24°C with an odd day or two over 37°C. Winter temperatures average 5–15°C with an occasional frost.

There is very little room for a garden, so all of the brachyscomes have been grown in full sun in either 200mm or 250mm plastic pots. The potting mix contains pine bark fines, 10mm weathered pine bark, coarse river sand, rice hulls, sandy loam and old cow manure. Another ingredient is forest fibre which is a waste product from the manufacture of masonite and has similar properties to those of peat moss. All pots are fed regularly with a liquid fertilizer. The plants in the pots have only been grown for two years and have suffered no disease or insect problems apart from root aphids in one or two pots.

The following species are growing well in these conditions:

B. angustifolia
B. basaltica var. gracilis
B. ciliaris
B. aff. *curvicarpa*
B. dissectifolia — form (south-east of Tingha)
B. diversifolia var. *diversifolia*
B. exilis
B. formosa —250mm pot
B. aff. *gracilis* (Kings Billabong)
B. iberidifolia
B. melanocarpa
B. nova-anglica
B. parvula
B. segmentosa — 250mm pot
B. stuartii (Emmaville)
B. 'Sunburst'
B. tadgellii

Note: The leaves of *B. stuartii* often turn yellow, probably due to an iron deficiency.

Other SGAP members in the area are growing the following species successfully:

B. angustifolia
B. formosa
B. multifida — many forms
B. rigidula

Orange

Orange is in the Central Tablelands, 220km west of Sydney as the crow flies. The elevation is approximately 860m rising to 1397m at Mount Canobolas, which is 15km south-west of Orange. Average annual rainfall is 880mm. Rain does fall each month, but the February to April rainfalls average a little lower than the other months. The average temperatures for mid-winter are 0.5–11°C and for mid-summer are 13–28°C. Each winter Orange is subject to severe frosts down to –4°C, sometimes much lower, and occasional falls of snow.

The garden is only four years old and consequently there is relatively little shade to protect plants from the elements. It is not possible to specify the soil type as other than 'estate developer's soil mix'. The species cut back by frost each winter are designated *. Those that die back to ground level or just above are designated #. In both categories regrowth usually starts from the centre of the plant, under the dead foliage.

The following species are reliable in these conditions:

B. aculeata (alpine form) #
B. angustifolia (Tea Gardens, NSW) #
B. angustifolia hybrids #
B. basaltica var. *gracilis* (Narrabri, NSW) #
B. dentata (Sofala & West Wyalong, NSW) #
B. dissectifolia — form (south-east of Tingha)
B. formosa #
B. aff. *formosa* (Barry, NSW) #
B. aff. *formosa* (Bemm River, Vic) hybrid #
B. multifida — many forms *
B. nova-anglica #
B. parvula (Huntly, Vic)
B. ptychocarpa (Central Tablelands, NSW)
B. rigidula (Falls Creek, Vic)
B. scapigera (Northern Tablelands, NSW)
B. stuartii complex
B. tadgellii
B. tenuiscapa var. *pubescens* (Northern Tablelands, NSW)

Canberra; Australian National Botanic Gardens.

The Gardens are located on the lower eastern slopes of Black Mountain overlooking Canberra. Elevations range from 576m at the entrance to 670m at the centre of the western boundary. The mean annual rainfall is 655mm and its distribution is irregular. The effectiveness of summer rain is reduced by high evaporation rates and rapid run-off on the slopes of Black Mountain. The relative humidity in the afternoon ranges from 35% in January to 64% in June. The average temperatures for midwinter are –0.3–11°C and for midsummer are 13–27.4°C. Frosts occur often in winter and may persist throughout the day on the southern slopes of Black Mountain. Fogs and mists sometimes shroud the top of the mountain.

Black Mountain and its surrounds are composed of sandstone deposited under the sea during the Ordovician period (500 million years ago). It is part of the basement rock of the Canberra region and has been exposed as a residual mountain by uplift and differential erosion. During formation of the mountain colluvial material (moved by gravity) and alluvial material (moved by water) eroded from the sides of the mountain has been deposited around the base as detrital fans. It is on this eroded material that the Botanic Gardens are located.

Soils are generally grey clay loams over heavy yellow clays. The loam is bleached and it sets hard on drying. The clay is densely packed and has restricted drainage. There is a distinct boundary between the loam horizon and the clay horizon. Rocks are very common through the profile, reflecting the colluvial nature of the parent material. The soils are of inherently low fertility due to deficiencies in nitrogen, phosphorus, calcium and a range of trace elements. Structure is generally poor to moderate. Erosion can be a problem where the soil is not protected by vegetation. Intensive horticultural use requires some fertilization and protection of soil structure to overcome the above limitations.

The ANBG has a charter to grow a representative sample of the Australian flora. A major effort has been put into establishing a native plant collection from all over Australia. For many years the concentration has been on woody species, as in many respects these are easier to keep alive within the collection due to their long-lived nature. More recently attempts have been made to 'highlight' species and shorter lived species, especially those that are listed on the ANZECC list of rare, threatened and vulnerable species. *Brachyscome* has been one of these groups, and the assistance of the Australian Daisy Study Group is acknowledged in the provision of seed in the recent past.

The genus *Brachyscome* is an important group for providing seasonal colour. They are used in the Rockery, ecological sections, areas where extra colour is required, cultivar beds and the Asteraceae section. Being small plants, they are often lost in larger planting beds due to their short lived nature. They are planted in such areas, especially ecological beds, where the gardening staff have the expertise and interest to monitor them closely.

The commonly grown species (e.g. *B. multifida*) grow well almost anywhere as is to be expected. Most species seem to perform reasonably well on naturally occurring soils. All species and cultivars do well on 'improved' soils, i.e. on artificially prepared media with a high organic content and free draining nature. The ingredients used are primarily coarse sand and decomposed pine fines. A general purpose slow release fertilizer must be applied to this mix. All species, regardless of where they occur naturally, seem to appreciate extra water during the drier seasons of the year.

Collections made in early years were often gained by removing plants from the wild and growing them on for stock material. They are now mostly raised from seeds and cuttings. Cuttings are generally taken as new growth emerges and prior to the initiation of the flower head. Seed is sown when available, with best results from a late winter to early spring sowing.

A few of the hardier species have been used in overseas display work done by the Gardens, notably the International Garden Festival in Liverpool (UK) in 1984 and the Gardening and Greenery Exposition in Osaka in 1990.

Species in cultivation are:

B. aculeata
B. angustifolia var. *angustifolia*
B. angustifolia var. *heterophylla*
B. basaltica var. *gracilis*
B. chrysoglossa
B. ciliaris
B. decipiens
B. diversifolia var. *diversifolia*
B. goniocarpa
B. graminea
B. halophila
B. iberidifolia

B. latisquamea
B. 'Lemon Drops'
B. melanocarpa
B. multifida var. *dilatata*
B. multifida var. *multifida*
B. multifida 'Breakoday'
B. multifida 'Evan'
B. multifida 'Roulette'
B. obovata
B. parvula
B. petrophila
B. procumbens
B. ptychocarpa
B. rigidula
B. scapigera
B. spathulata subsp. *glabra*
B. spathulata subsp. *spathulata*
B. 'Strawberry Mousse'
B. 'Sunburst'
B. tenuiscapa var. *pubescens*
B. tetrapterocarpa
B. 'Valencia'

Victoria

Ballarat

Ballarat is 120km west of Melbourne in the Central Highlands, about 420m above sea level. The climate is invigorating and variable. The average temperature range is 11–25°C in summer and 5–12°C in winter. A recent maximum of 8°C in late September attests to the variability. There are numerous frosts in winter, down as low as –5°C, and sometimes it snows. The brachyscomes have survived these conditions due to the provision of much overhead cover.

The soil is a heavy loam with gravel mixed in to improve the drainage. Weeds are the great problem in this garden. If weeds are not removed promptly the weaker daisies are lost. Many mulches have been used, including wood chips, bush litter and compost. All have been a waste of time because blackbirds move the mulch and plants at the same time. The most successful mulch has proved to be about ten pages of newspaper covered by bluestone screenings (2cm or ¾ inch). When the paper rots the screenings are sprayed with a glyphosate spray such as Zero. Only the weeds immediately around the plants then need to be weeded. The following are the best performers in this garden:

B. angustifolia var. *angustifolia* — suckers
B. basaltica var. *gracilis* — planted in clumps
B. diversifolia (Tasmania and Beaufort, Vic)
B. formosa — slow to grow, but attractive
B. multifida — varieties and forms
B. multifida 'Breakoday' — slow to grow
B. stuartii

Emerald

Emerald is in the Dandenongs, the foothills of the Victorian Eastern Highlands. It is considered to be dry sclerophyll, open forest, where the dominant plants are *Eucalyptus obliqua* and *E. radiata, Acacia myrtifolia* and *Bursaria spinosa.* The elevation is just under 300m. Average annual rainfall is 1300–1400mm, falling mainly in winter and spring, although some winters are relatively dry. The driest months are February to April. The temperature is moderate to cold. The area is frosty, but there are no frosts in this garden because the overhead canopy is too dense. Light snow falls in some years. Where the daisies are growing the soil is clay-loam overlying rock. The garden is lightly to heavily shaded.

An artificial sand area 15cm deep and covering an area of about 20 square metres has been incorporated. Plants growing in this situation are marked with an asterisk (*).

The following species perform well:

B. decipiens *
B. diversifolia
B. formosa
B. 'Maureen'
B. multifida — many forms *
B. nivalis
B. nivalis hybrid
(probably *B. nivalis* x *B. diversifolia*)
B. segmentosa

Fairhaven

Fairhaven is on the coast about 100km south-west of Melbourne at the eastern end of the Otway Ranges. The garden is 200m from Bass Strait on a steep, south-facing slope. The average annual rainfall is 750–900mm falling mostly in winter and spring. The garden is set in a coastal heath area

and the dominant species are wind-blown *Eucalyptus baxteri, Leptospermum continentale* (syn. *Leptospermum juniperinum*) and *L. myrsinoides*. The mean temperature over the year is 9–19°C. Typical winter days are 7–14°C, summer days are 12–25°C. Frosts are rare, but gale force winds are common. The virgin soil is dark grey sand and all parts of the garden are shaded for some time of the day. The garden is organically mulched and rarely watered.

Species growing in clay banks around the house are designated # and those growing in exposed positions are designated ‡.

The following species have proved reliable:

B. angustifolia #‡
B. angustifolia x *B. formosa* hybrids #‡
B. diversifolia var. *diversifolia*
B. formosa
B. aff. *formosa* (Bemm River, Vic) hybrid
B. graminea
B. multifida var. *dilatata* — many forms #‡
B. multifida var. *multifida* — mauve
B. aff. *multifida* (Hat Head) ‡
B. parvula
B. segmentosa
B. smithwhitei #
B. tatei #‡

Frankston

Frankston is on the eastern side of Port Philip Bay, about 40km south of Melbourne. The garden is 5km from the coast on a slight, north-facing slope. Rainfall is 800mm per year, falling mainly in winter and spring. Frosts are rare. Previously existing vegetation was *Eucalyptus cephalocarpa/Eucalyptus radiata* woodland to open forest, on yellow podsolic soil. The garden has areas of open sun as well as light to full shade and is mulched with 7mm granite chips. Brachyscomes grow best in full sun or dappled shade. Plants are watered at planting out stage and once per week through their first summer.

The following species perform well:

B. angustifolia (Tea Gardens)
B. decipiens
B. formosa
B. aff. *formosa* (Bemm River, Vic) hybrid
B. linearifoba
B. multifida var. *dilatata* — most forms
B. multifida var. *multifida*
B. nova-anglica
B. parvula (coastal form)
B. tadgellii

Metung

Metung is on the Gippsland Lakes system, 17km west of Lakes Entrance. The garden is roughly 2km north of Metung Village and runs north/south; the southern slope is open to often very strong and cold winds. The prevailing wind is south-west — easterlies usually bring good rains. The average annual rainfall is 950mm. The climate is temperate, normally with milder winters and cooler summers than Melbourne. There are occasional frosts, and generally some summer rain.

Daisies have been trialled in two broad areas — one a sandy loam, the other clayey sub-soil left from cutting the house site. The latter area had gypsum and compost worked into the top few centimetres. Rocks and logs are used to retain and shape the soil and to protect roots. Native grasses are interplanted with various daisies and other herbs and forbs typical of grassland communities. These areas do not receive overhead shade, but the larger grass tussocks offer some protection and a little shade. Seagrass obtained locally is used to mulch everything. It is applied quite thinly to grass/daisy areas and is topped with coarse sand to encourage self-sown seeds to germinate. Several *Brachyscome* species have proved very suitable:

Sandy loam

B. aff. *curvicarpa*
B. decipiens
B. dentata
B. diversifolia — self-sows
B. melanocarpa — self-sows
B. multifida — various forms
B. petrophila

Clay

B. ciliaris — self-sows
B. aff. *curvicarpa*
B. dentata
B. diversifolia var. *diversifolia* — self-sows
B. multifida
B. segmentosa

Mount Buller

The Devonian granite massif of Mt Buller lies 160km north-east of Melbourne. Rising to an altitude of 1805m it is snow covered to a depth of one metre or more during the winter months. The garden surrounds a ski lodge in the alpine village at an altitude of 1600m, but it receives further dumps of snow from the lodge roof. Consequently, it is often buried under more than three metres of snow and ice for three to four months of the year. Rain, bitterly cold winds and frosts are prevalent during autumn and spring, but summer conditions can be fairly dry with warm days and cold nights (which help to keep soil temperatures low).

The natural vegetation is snowgum woodland (*Eucalyptus pauciflora)* with an understorey of predominantly *Oxylobium* and *Hovea* species. The garden area was formed from local soil, raised slightly above the natural ground level. Rocks have been used liberally to protect the roots of small plants and to provide anchorage. The garden is never artificially watered, except after the initial planting of small seedlings raised from local seed. Each alpine spring after the snow thaws, there is renewed growth and the plants compete vigorously with other local species. Flowering occurs mainly from January to March, and seed is set in April or May before the plants are again blanketed by winter snow. Some seed germinates in the autumn, but some seed appears to wait out the winter under the snow and to germinate when the thaw comes. Thriving and self-sowing under these harsh conditions are the five local species of *Brachyscome*:

B. decipiens
B. nivalis
B. rigidula
B. scapigera
B. spathulata

Mount Waverley

Mount Waverley is a Melbourne suburb 20km south-east of the city centre at an altitude of 100m. The average annual rainfall is 750–850mm, falling mainly in late winter to spring with heavy falls in December and January. The driest months are February and March. Very few frosts occur. The area is windy; the prevailing winds are westerlies and southerlies in winter and northerlies in summer. The soil is predominantly heavy clay-loam. The garden has been devoted to Australian plants for over thirty years. Apart from the preparation of beds for an exotic garden, little cultivation of the soil has occurred. The whole garden, including sunken pathways, was initially covered with 15cm of hardwood sawdust. Over the years the heavy clay-loam has been converted to a friable loam.

There are several distinct areas in this garden: a dry impoverished bed which is very hot in summer (designated *), a raised bed of clayey sand facing north in sun all day (designated #), a shaded damp area with sun in the late afternoon (designated †), a former bog garden with sun in the morning, but otherwise in shade (designated ‡), and an open sunny area facing north (designated ¤). The following species grow well:

B. aculeata (Wombargo, East Gippsland) #
B. aculeata (Hamilton Gap, " " ") #
B. aculeata (Shipwreck Creek, coastal ") #
B. angustifolia (nursery origin) *
B. cardiocarpa ‡
B. aff. *cuneifolia* (Derrinallum) *
B. decipiens †
B. dissectifolia — form †
B. formosa —pink, cerise *
B. aff. *formosa* (Moondarra Dam, Gippsland) *
B. aff. *formosa* (Neville, NSW) †
B. aff. *formosa* (Sydenham Inlet, Vic) *
B. gracilis (Upper Namoi, NSW) # — annual
B. multifida var. *dilatata* (East Gippsland) ¤
B. multifida var. *dilatata* (Inglewood, Vic) ¤
B. multifida var. *dilatata* — white *
B. nivalis ‡
B. radicans (Guyra) †
B. scapigera (Eastern Highlands) #†
B. spathulata subsp. *spathulata* (Gippsland) †
B. stuartii complex †
B. tadgellii ‡†
B. tenuiscapa var. *pubescens* (New England) #

Note: *B. formosa* dies back in hot, dry conditions and regenerates with rain.

Shepparton

Shepparton is located 175km north of Melbourne. Average minimum/maximum temperature range in summer is 14–30°C and in winter the range is 4–14°C. Average annual rainfall is 500mm, falling mainly in winter. Frosts and hot winds are often experienced and are the main hazards to gardening. The garden is about 60 metres from the Broken River on river flats which were formerly farmland.

When the land was developed for housing, the soil level was raised to the highest recorded flood level by adding clay and clay-loam. Over twenty-five years of gardening this difficult soil mix has been modified by the addition of sand, gypsum and mulch to yield a fairly friable soil. All beds are raised. Best results are achieved in the sheltered back garden where frosts and hot northerlies do the least damage. A cool root run is maintained by mulching, mainly with an organic mulch although an inorganic mulch (sand or crushed rock) has proved more successful for annuals. In these conditions plants receive minimum water during summer; this results in reduced flower size. Many *Brachyscome* species have grown well in these conditions. Reliable species over a long time are designated *. Species yielding good results over a three year period are designated †. Annuals, or species behaving as annuals in this district, are designated #.

The following species are recommended:

- *B. angustifolia* (nursery origin) *
- *B. angustifolia* x *B. formosa* hybrids †
- *B. basaltica* var. *gracilis* (Shepparton) *
- *B. dentata* †
- *B. diversifolia* var. *maritima* #
- *B. formosa* †
- *B.* aff. *formosa* (Bemm River, Vic) hybrid †
- *B.* aff. *gracilis* (Kings Billabong) — self-sows #
- *B. iberidifolia* — self sows #
- *B. melanocarpa* *
- *B. multifida* (nursery origin; mauve, white) *
- *B. multifida* var. *multifida* (Mt Kaputar) †
- *B. multifida* (white hybrid) †
- *B. nova-anglica* — self-sows #
- *B. oncocarpa* — self-sows #
- *B. pusilla* (Kings Park seed) — self-sows #
- *B. readeri* (Vic) #
- *B. scapigera* — needs extra water †
- *B. smithwhitei* #
- *B. stuartii* — needs extra water †

Note: *B. dentata* and *B. melanocarpa* look attractive among grasses. *B.* aff. *gracilis*, *B. readeri* and *B. smithwhitei* (sown in March) flowered well until the advent of hot winds in October and November, after which plants collapsed quickly. *B. diversifolia* var. *maritima* and *B. tadgellii* (below) die back in very hot, humid weather.

The following species have proved successful in an artificial bog area:

- *B. angustifolia* var. *heterophylla* (Tea Gardens)
- *B. angustifolia* hybrid
- *B.* aff. *cuneifolia* (Derrinallum)
- *B.* aff. *formosa* (Mt Drummer)
- *B. graminea*
- *B. parvula* var. *parvula* (Otways, Huntly)
- *B. radicans*
- *B. stuartii*
- *B. tadgellii* — flowers in other wet areas
- *B. tenuiscapa* var. *pubescens*

The species listed below are recommended for pots. The annuals grown in tubs each year for the Shepparton Wildflower Show and making an attractive display are designated ‡.

- *B. ciliocarpa* — lovely if seed is available ‡
- *B. formosa* — pleasing in a basket too
- *B. halophila* ‡
- *B. iberidifolia* ‡
- *B. parvula* var. *parvula* (Cape Otway)
- *B. pusilla* (Kings Park seed) — self-sows ‡
- *B. readeri* (Vic) ‡
- *B. scapigera*
- *B. spathulata* — perennial ‡
- *B. tadgellii*

South Oakleigh

South Oakleigh is a Melbourne suburb in the sandbelt area south of the city. Average summer minimum and maximum temperatures are 14°C and 26°C and in winter are 7°C and 14°C. The average annual rainfall is 650mm, falling mainly in winter and spring. Frosts are rare. The garden faces north. The soil is a rich sandy loam that dries to sand over summer and is mulched with organic matter (leaves and prunings). Individual plants are watered only if showing signs of stress. Brachyscomes are grown in full sun or dappled shade in the open areas of the garden.

The following are growing well:

- *B. aculeata* (origin unknown) — ten years old
- *B. angustifolia* var. *angustifolia* — nursery form
- *B. angustifolia* var. *heterophylla* — Tea Gardens
- *B. angustifolia* hybrids
- *B. basaltica* var. *gracilis*
- *B. exilis*
- *B. multifida* var. *dilatata* — many forms
- *B. parvula*
- *B. segmentosa*
- *B. stuartii*
- *B. tatei*
- *B. tenuiscapa* var. *pubescens*

Upper Lurg

Upper Lurg is in north-eastern Victoria, about 15km east-south-east of Benalla in the lower foothills of the Great Dividing Range. The elevation is 380 metres. Winters are generally cold with a lot of overcast skies and summers are usually hot. The garden was begun in 1987 and local reports put the rainfall at 650mm per year, falling mostly in autumn and spring. During the last eight years it has proved to be extremely variable and unpredictable, ranging from 660–1140mm (average 900mm). Most summers and some springs have been very dry while other years have produced very wet springs and summers and dry autumns and winters. As a general rule frosts are rare and very light, only occurring in small patches. In years of low rainfall the number of frosts increases and the whole garden is affected.

The garden straddles a narrow, rocky north-south ridge and is open to wind from all directions. In recent years the winds have reached gale force on many occasions. Some brachyscomes are growing in rockeries built up with 'imported' sandy loam. A local population of Black Wallabies and some rabbits means that most species have to be protected behind wire fences. Space in these areas is limited so most brachyscomes are grown in pots in commercial potting mix (a variety of brands over the years). Species growing in the open areas of the garden are those which have proved generally unpalatable to the local wildlife, although both wallabies and rabbits have been observed eating flowers only. These plants are mulched with pea straw and receive no artificial watering. They are often subjected to prolonged dry periods (up to nine months on at least two occasions, late winter to mid-autumn). The plants survive very well, but do not flower under these conditions although some (marked #) respond very quickly to good rain, coming into full flower within two weeks after it has fallen. Others are seasonal in flowering (spring and summer) and the amount of bloom is dependent on rainfall (marked †). All plants are growing in three-quarters to full sun unless otherwise noted. Species which do best are:

Open Garden	In Pots (water as required)
B. angustifolia var. *angustifolia* #	*B. angustifolia* hybrid — purple-violet
B. angustifolia var. *heterophylla* (Tea Gardens)#	*B. angustifolia* x *B. formosa* — mauve
B. formosa †	*B.* 'Betty Campbell'
B. aff. *formosa* (Sydenham Inlet, Vic) #	*B.* 'Maureen'
B. multifida var. *dilatata* — many forms #	*B.* aff. *curvicarpa*
B. multifida var. *multifida* (Weethalle, NSW) #	*B.* aff. *formosa* (Neville, Warby Range)
B. multifida hybrids — self-sows	*B. graminea*
B. nova-anglica †	*B. multifida* — mauve, white and pink
B. 'Pink Haze'	*B. multifida* 'Breakoday'
B. procumbens — needs extra water #	*B. nova-anglica*
	B. parvula — many forms
	B. procumbens
	B. ptychocarpa
	B. stuartii forms
	B. tenuiscapa var. *pubescens*

In addition, *B. melanocarpa* and *B. iberidifolia* (annual) self-sow readily and do reasonably well in the fenced area most years. *B. spathulata* (Tatong, north-eastern Victoria) grows well in the ground in the fenced area with some additional water. It is in full shade in winter and in sun for most of the day in summer.

Vectis

Vectis is 13km west of Horsham at the southern end of the Little Desert and quite close to Mount Arapiles. Temperatures range from 38°C plus in summer to –7°C in winter at night. Late winter and spring are usually the wettest months, with an annual rainfall of 425mm punctuated by severe and prolonged periods of frost. Hot north winds and cold south-westerlies cause some damage, as do the frosts.

The block consists of 37 acres, made up of a large area of deep sand with natural vegetation (unusual in the black soils of the Wimmera), a swamp area and a clear area of loam over clay where the house was built. The area adjacent to and surrounding the house is where the brachyscomes and other daisies are planted because this is serviced by piped water. Watering is necessary during the summer

and autumn months. Red-legged earth mites do a lot of damage, sucking out the leaf chlorophyll during winter and in other damp times. All the species suggested respond to pruning after flowering, with the exception of *B. basaltica* var. *gracilis* which dies if cut back before new shoots appear.

The following species perform well:

(+ designates garden, * designates pot outdoors in full sun and # designates partial shade)

B. angustifolia var. *angustifolia* +#
B. angustifolia var. *heterophylla* (Tea Gardens)*#
B. basaltica var. *gracilis* + and artificial bog area
B. aff. *curvicarpa* +*
B. melanocarpa +
B. multifida var. *dilatata* — varieties and forms +*
B. multifida var. *multifida* +*
B. parvula (Cape Otway) *
B. segmentosa +*
B. 'Strawberry Mousse'
B. 'Sunburst'
B. 'Valencia'

Yarrawonga

Yarrawonga is 250km north of Melbourne in the Murray Valley on the border of New South Wales and Victoria. The temperature range in February is 17–33°C with some days above 40°C. In July, the coldest month, the temperature range is about 4–14°C with many frosts. The rainfall averages 450mm, falling mainly in winter and spring. At the end of spring the soil suddenly dries out for the long summer-autumn period when the evaporation rates can be very high.

The garden is twenty years old. It lies just beyond the red gum forest on cleared, flat farmland. The remnant woodland nearby is dominated by box eucalypts and acacias growing on red clay soil which has been degraded by years of grazing and cropping. Garden beds are built up by the addition of gypsum, sand and compost, then mulched with prunings and bark. More recently 6mm gravel has proved very successful in reducing the extremes of soil temperature and permitting self-sowing and suckering of daisies. *Brachyscome* species do best in these conditions with some afternoon shade and occasional watering. The following are recommended:

B. angustifolia var. *angustifolia*
B. angustifolia var. *heterophylla*
B. angustifolia hybrid — purple-violet
B. formosa — best in gravel, dies out in bark
B. graminea — in a gravel-mulched pot
B. multifida var. *dilatata* — many forms
B. multifida var. *multifida* — many forms
B. segmentosa
B. 'Strawberry Mousse'
B. 'Sunburst'
B. 'Valencia'

Note: *B. formosa* disappears in harsh conditions, but reappears after good rains. *B. multifida* var. *multifida* layered and moved from a sunny position to a semi-shaded spot 50cm away. It flowers throughout the year. *B.* 'Strawberry Mousse' is the most tolerant hybrid in harsh conditions and recovers well after severe frosts.

Daisies doing well in gravel-mulched pots sitting in saucers of wet gravel are:

B. parvula
B. ptychocarpa
B. tadgellii
B. tenuiscapa var. *tenuiscapa*

Yarrawonga Township Gardens on Lake Mulwala, 7km away from the garden described, have milder weather conditions and sandier soils. Large, healthy patches of daisies are produced here with ease.

Tasmania

Murdunna

Murdunna is in the south-east of Tasmania, 70km from Hobart on the way to Port Arthur. It is dry sclerophyll dominated by *Eucalyptus globulus, E. obliqua* and *E. viminalis*. Average rainfall is 525mm annually, falling mainly in winter, but there are often long, dry periods even in winter. Temperatures are generally 5–11°C in winter and 14–22°C in summer. Most years there are a few frosts. The soil types in the garden vary from heavy clay to loam. Brachyscomes have to be grown in an electrically fenced area in clay as the native animals and rabbits regard them as epicurean delights, particularly

B. multifida. In this clay area most brachyscomes require built-up beds in order to thrive, the exception being *B. segmentosa*. In this garden over summer brachyscomes need more water than any other daisy species.

The following species have performed well over time:

- *B. angustifolia* var. *heterophylla*
- *B. dentata*
- *B. dentata* hybrids
- *B. diversifolia* (King Island)
- *B. diversifolia* hybrids
- *B. multifida* varieties and forms (with the exception of the pink-flowered form)
- *B. rigidula*
- *B. segmentosa*
- *B. segmentosa* hybrids
- *B. spathulata*

Species which did well for 2–3 years, but did not self-sow are:

- *B. aculeata*
- *B. basaltica* var. *gracilis*
- *B.* aff. *curvicarpa*
- *B. nova-anglica*

Brachyscome angustifolia var. *angustifolia* and *B. formosa* have survived over years, but have not performed well although many different situations have been tried.

South Australia

The Adelaide Plains

Soils are complex and variable, predominantly alkaline clay-limestone. Average temperatures in midwinter range between 7.4°C and 15°C, and in summer between 16.5°C and 28.5°C. Adelaide has an average rainfall of 585mm, falling predominantly in winter.

At Fitzroy, on the northern perimeter of the parklands which surround the city of Adelaide, the soil is limestone-mallee. Mallee soils are mainly of windblown origin (loessal) and have a light, well-drained soil profile. The characteristic mallee soil consists of a dark brown sandy loam to about 30cm deep over a limestone band which is usually 15–20cm thick. Beneath this band the soil is light clay with lime. In the early days of settlement a number of lime kilns were in operation in the area. The pH ranges between 7 and 8 and the alkalinity increases with depth.

At Hope Valley, approximately 15km from Adelaide in a north-easterly direction, the soil is black earth.

Most of the brachyscomes at Fitzroy and Hope Valley are grown in pots or hanging baskets, but the following have done well in raised beds:

<u>At Fitzroy</u>

- *B. angustifolia* var. *angustifolia*
- *B. basaltica* var. *gracilis*
- *B. diversifolia* var. *maritima*
- *B. formosa*
- *B. multifida* — many forms
- *B. segmentosa*
- *B.* 'Valencia'

<u>At Hope Valley</u>

- *B. formosa*
- *B. multifida*
- *B. parvula*
- *B. segmentosa*
- *B. spathulata*
- *B.* 'Valencia'

The following species grow well in containers standing in saucers of water (to maintain moist conditions) or in hanging baskets:

- *B. angustifolia*
- *B.* aff. *curvicarpa*
- *B. dentata*
- *B. formosa*
- *B. graminea*
- *B. iberidifolia*
- *B. parvula* var. *lissocarpa*
- *B. ptychocarpa*
- *B. pusilla* (Kings Park seed)
- *B. rigidula*
- *B. stuartii*
- *B. stuartii* x *B.* aff. *curvicarpa*
- *B.* 'Valencia'

Auburn

The Clare Valley starts at Auburn and extends north to Clare about 25km away. It is hilly, part of the Northern Mount Lofty Ranges. The elevation of the Valley varies from 150–450 metres above sea level. The summers are hot and dry, the winters are cold and wet, with the number of frosts varying considerably. Average annual rainfall at Auburn is 500mm. Little of the original vegetation is left in the area; there are no brachyscomes and very few other daisies. The trees are mostly *Eucalyptus leucoxylon* and *E. odorata*. The soil is brown loam over limestone, although it changes further up the valley.

The brachyscomes growing in the garden at Auburn need summer watering and in some dry years they need extra water in winter too. The following species have performed well:

- *B. ciliaris*
- *B. formosa* — wanders all over the garden
- *B. iberidifolia*
- *B. melanocarpa*
- *B. multifida* — many forms
- *B. segmentosa*

Coonalpyn

Coonalpyn is 165km south-east of Adelaide. The average annual rainfall is 400–420mm, falling mainly in winter and spring. Temperatures average 15°C in winter, with some frosts, and 30°C in summer. Coonalpyn is 50km from the coast and the nights are usually cooler than those in Adelaide. The natural soil is shallow calcareous loam over limestone or over lime nodules and marl and has pH 7.5–9.0. It has been beneficial to cover the soil with 150–500mm of sand with pH 6.5–7.5. This eliminates most of the original weeds and facilitates the easy removal of any that do grow. Drift sand is an excellent mulch to conserve moisture beneath, and allows a quick root run for smaller plants although trees blow over more easily.

Brachyscomes have been trialled in two different areas: a sand mound to 300mm which is watered regularly (designated *), and a sand mound to 150mm over loam into which pig and cow manure had been hoed before the sand was added and which is watered only three times in summer/autumn (designated #). The following brachyscomes have grown well in their designated areas:

- *B. angustifolia* (tall form, possibly a hybrid) *
- *B. ciliaris* (local form) *
- *B. melanocarpa* — flowers continuously #
- *B. multifida* var. *dilatata* *
- *B. multifida* var. *dilatata* (mauve nursery form)*
- *B. multifida* 'Breakoday' *#
- *B. nova-anglica* *
- *B. parvula* #
- *B. segmentosa* *
- *B. tadgellii* — exposed, granite mulch *

Note: *B. parvula* dies back in dry, hot periods and regenerates after rain. A third area, similar to the mound designated # but planted with grevilleas, correas and *Eucalyptus perriniana*, was also trialled with many species of *Brachyscome* but they did not grow well. Poor growth may have been due to the shade or to root competition.

Valley View

Valley View is an inner suburb of Adelaide about twenty minutes driving from the city centre. It is situated in a north-easterly direction on the lower slopes of the Mount Lofty Ranges. The average winter temperature range is 7–16.5°C and in summer it is 17–29°C. Frosts are rare. The annual rainfall averages 585mm, falling mainly in winter and spring.The soil profile ranges from red-brown to brown clay and is alkaline.

Brachyscomes grow quite well as a rule, but they do require supplementary watering over summer. During this stressful period some plants show the typical iron deficiency symptoms. The foliage turns yellow and some plants even disappear, but survive somehow to appear again in winter and spring. With a little knowledge of species' requirements a suitable niche in the garden will see these delightful plants prosper. The following species grow well:

- *B. angustifolia*
- *B. ciliaris*
- *B.* aff. *curvicarpa*
- *B. iberidifolia*
- *B. melanocarpa*
- *B. multifida* — many forms
- *B. nova-anglica*
- *B. pusilla* (Kings Park seed)
- *B. segmentosa*
- *B. stuartii*

Western Australia

Albany

Albany is 402km south of Perth on King George Sound. In summer the average temperature ranges from 20–30°C and in winter the average temperature ranges from 10–15°C. The average annual rainfall is about 875mm.

The garden is on a hillside and the soil is sandy loam. Two *Brachyscome* species have been grown in this situation over a period of about ten years and are regarded as impressive, long-flowering plants. They are both trimmed back hard when necessary.

B. iberidifolia

B. multifida

West Perth; Kings Park and Botanic Garden

Kings Park and Botanic Garden is located adjacent to the Swan River and about 1.5km from the Central Business District of Perth. The total area of the park is approximately 400 hectares with one third being developed, e.g. lawns, exotic gardens and Botanic Garden (17 hectares, 14 hectares devoted to WA flora), the rest being remnant vegetation.

The park at its highest point rises to 70m above sea level. As a result of past weatherings, Kings Park slopes from high areas in the north-east to low lying areas in the south-west with limestone cliffs being exposed as the Swan River receded. The soil can be divided into two main types: medium size calcareous sands, and shallow sands with exposed limestone. The pH of the soil varies considerably from 6.5 to 8.5.

Kings Park experiences a Mediterranean climate, characterized by wet winters (average annual rainfall 880mm) and dry hot summers. Hot dry easterly winds are experienced in summer, often moderated by south-easterly cool sea breezes in the afternoon. When these fail temperatures can reach 38–42°C. Winter temperatures rarely fall below 3°C, although an occasional light frost is experienced. The coolest month is August with an average mean minimum of 9°C. Perth has the wettest winter and driest summer of all state capital cities in Australia. As well as being the sunniest capital city with the greatest number of clear days, it is also the windiest.

Though many species of *Brachyscome* occur naturally in Western Australia very few are grown in home gardens. When they are grown they are either sown in situ in April and May or planted out in a similar manner to annual bedding plants.

Plants grown in the Park as spring annuals are used for the following purposes: general displays in the everlasting daisy section of the Botanic Garden, Floral Clock, Public Display Glasshouses, Annual Wildflower Exhibition and bedding displays at the main entrance to Kings Park and Botanic Garden. Plants are raised in Kings Park nursery from seed sown in late autumn and either planted out as small seedlings or planted out just before flowering. Specimens for the Wildflower Exhibition are grown on in pots.

At present the only brachyscome grown is *B. iberidifolia,* white and blue forms, which put on a spectacular display. Other species recently tested which grow well in pots include:

B. ciliocarpa

B. pusilla

B. latisquamea — grown from cuttings

6

Brachyscomes for Containers and other Uses

Brachyscomes are excellent subjects for tubs and pots because the majority flower for long periods. Most species and cultivars are suitable for this purpose and many can be used in hanging baskets (see below). Species preferring boggy conditions should stand in water. It is necessary to ensure that the soil never dries out completely. The potting mix should contain at least 10–15% of peat moss, coconut fibre or similar moisture retaining material. Mulching with a relatively thick layer of granite or other chips will help to conserve moisture. To counteract leaching, nutrients should be applied more often to container plants. Occasional flushing is needed to remove excess salts built up in the potting mix. Regular tip pruning and removal of spent flower stems will extend the flowering period and keep plants attractive.

Annuals: Some annual brachyscomes will provide masses of colour for three to six months and will self-sow in the containers whenever suitable conditions prevail. Species suggested for this purpose are listed below:

- *B. halophila*
- *B. iberidifolia* and cultivars
- *B. nodosa*
- *B. pusilla*

Perennials: The following species are recommended:

- *B. angustifolia* varieties and forms
- *B. ascendens*
- *B. ciliaris* — some forms
- *B. dissectifolia*
- *B. diversifolia* — some forms
- *B. formosa*
- *B. multifida* varieties and forms
- *B. nivalis*
- *B. nova-anglica* — some forms
- *B. parvula* — some forms
- *B. procumbens* — some forms
- *B. rigidula* — some forms
- *B. segmentosa*
- *B. sieberi* var. *gunnii*
- *B. spathulata* — some forms
- *B. stuartii*
- *B. tatei*
- *B. tenuiscapa* var. *pubescens*
- *B.* sp. (Darling Downs)

Cultivars: Most brachyscome cultivars are suitable for container planting. They include the following:

- *B.* 'Amethyst'
- *B.* 'Betty Campbell'
- *B.* 'Blue Haze'
- *B.* 'Breakoday'
- *B.* 'Bright Eyes'
- *B.* 'Happy Face'
- *B.* 'Just Jayne'
- *B.* 'Lavender Mist'
- *B.* 'Lemon Twist'
- *B.* 'Maureen'
- *B.* 'Pink Happy Face'
- *B.* 'Pink Haze'
- *B.* 'Strawberry Mousse'
- *B.* 'Sunburst'
- *B.* 'Toucan Tango'
- *B.* 'Valencia'

Hanging baskets

Species selected should have trailing or ascending stems so that the flower-heads may be seen to advantage. Water is lost very quickly in these exposed conditions, which means that watering must be frequent. Self-watering baskets or those with water wells are recommended. While they reduce the need for watering quite so often, vigilance is still essential. The annual species listed for containers are also very attractive in hanging baskets for ten weeks or longer. Perennial species recommended are:

- *B. angustifolia* varieties and hybrids
- *B. ascendens* and cultivars
- *B. basaltica* var. *basaltica* (Goodna)
- *B. basaltica* var. *gracilis*
- *B. ciliaris* — some forms
- *B.* aff. *curvicarpa* hybrids
- *B. formosa* forms and hybrids
- *B. multifida* varieties and cultivars
- *B. nova-anglica* forms
- *B. parvula* forms
- *B. rigidula* forms
- *B. sieberi* var. *gunnii*

Brachyscomes suitable for posies

The majority of brachyscomes have ray florets that curl under in the evening or in cold, wet weather. This makes them unsuitable for posies. The following species stay open at night when picked:

B. ascendens and cultivars
B. dissectifolia
B. diversifolia var. *diversifolia*
B. formosa
B. 'Happy Face'
B. 'Pink Happy Face'
B. segmentosa
B. 'Sunburst'
B. tatei

Brachyscomes for bog gardens

Useful species for bog gardens or boggy conditions are the following:

B. angustifolia var. *heterophylla*
B. angustifolia hybrids
B. basaltica var. *basaltica*
B. basaltica var. *gracilis*
B. cardiocarpa
B. chrysoglossa
B. aff. *cuneifolia*
B. dissectifolia
B. diversifolia var. *diversifolia*
B. aff. *formosa* Entity 1
B. graminea
B. obovata
B. parvula var. *parvula*
B. radicans
B. scapigera
B. segmentosa
B. stolonifera
B. stuartii
B. tadgellii
B. tenuiscapa var. *pubescens*

Ground covers

Plants defined as ground covers spread to at least 0.5m and cover the soil. As well as being attractive garden plants they serve to keep soil temperatures relatively constant, discourage weeds and preserve soil moisture. The following brachyscomes are recommended:

B. aculeata — some forms
B. angustifolia var. *angustifolia* (nursery origin)
B. angustifolia var. *heterophylla* (nursery origin)
B. dissectifolia
B. graminea
B. multifida var. *dilatata*
B. multifida forms
B. radicans

Perennial grassland species

The establishment of relatively large areas of low maintenance perennials in rural areas has proved the value of some of the more easily grown daisies such as *Calocephalus citreus, Chrysocephalum apiculatum* and *C. semipapposum.* Native grasses have also been incorporated into these areas. The following *Brachyscome* species are suggested for interplanting in such situations:

B. aculeata — some forms
B. angustifolia — some forms
B. basaltica var. *gracilis*
B. chrysoglossa
B. ciliaris — some forms
B. aff. *curvicarpa*
B. dentata
B. melanocarpa
B. microcarpa (coastal NSW)
B. multifida var. *dilatata*
B. nova-anglica
B. sieberi var. *gunnii*
B. spathulata — some forms
B. trachycarpa

7

Reproduction and Hybridization

Sexual reproduction in plants involves pollination, fertilization and growth of the resulting embryo into a seed which can germinate and develop into a new individual with characters inherited from its parents.

Breeding systems

Most species of *Brachyscome* produce large amounts of pollen and are believed to commonly cross-pollinate. Indeed, some species may well be self-incompatible, i.e. in order to produce viable seed, plants must cross-pollinate. In contrast, a few species of *Brachyscome*, i.e. *B. breviscapis*, *B. glandulosa*, *B. goniocarpa* and *B. perpusilla* seem to mainly self-pollinate. Such species have comparatively inconspicuous ray florets, sometimes have fewer anthers, and produce fewer pollen grains per anther than their outbreeding relatives. For example, in *B. dichromosomatica* the five anthers in each disc floret together produce about 4,000–8,000 pollen grains but in *B. goniocarpa* the anthers, of which there are usually only 4, collectively produce approximately 200–400 pollen grains per disc floret (Watanabe *et al.*, 1991). There are also a few taxa within *Brachyscome* that do not sexually reproduce. Thus, Davis (1964) reported that two varieties she recognised within *B. ciliaris* are agamospermous, i.e. the seed develops without fertilization having taken place.

Pollination

Pollination is the transfer of pollen (male cells) from anthers (male organs) to stigmas (female organs). This transfer may occur in the same flower or in the same plant or from one plant to another. Pollen is usually transferred by wind or insects. In the case of brachyscomes, bees and hover flies are the normal pollinators. For successful pollination to take place in nature the following circumstances should prevail simultaneously:

- Pollinators should be abundant.
- Plants must be growing in close proximity. It is recognized that insect pollinators work within metres rather than kilometres.
- Plants must be in flower simultaneously.

In gardens the same factors are involved, but many more plants and species may be growing in close proximity. Generous watering and application of nutrients extend flowering times and so increase the likelihood of cross-pollination.

Fertilization

Fertilization takes place when the sperm (from the pollen) fuses with the ovum (in the ovule at the base of the style). Several steps are involved:

- The pollen absorbs water on the stigma surface.
- The pollen germinates.
- An outgrowth on the pollen surface develops and becomes a root-like tube containing the sperm. The tube penetrates the stigmatic surface.
- The tube grows down through the style, enters the ovary and penetrates the ovule.
- Fertilization occurs when the sperm in the tube fuses with the ovum.

Fertilization does not necessarily follow pollination. Physical and chemical barriers are present at each step. Compatible pollen is recognized and incompatible pollen will have further development prevented by these barriers at any one of the stages, and so no fertilization will take place.

Relationships between species

Artificially produced hybrids are one means of establishing relationships between species. If two species hybridize and the progeny produce fertile seed, the inference can be drawn that the two species are either entities within one species or are very closely related.

The exact status of various entities thought to be *B. angustifolia* has been a source of confusion to Study Group members. Cross-fertilization experiments were performed to clarify the matter. Two species were isolated and hand-pollinated by rubbing heads together over a period of 2–4 weeks. If mature seed was collected it was sown. The following results were noted:

B. angustifolia var. *angustifolia* (mauve, nursery origin) and *B. angustifolia* var. *heterophylla* (mauve-pink, nursery origin) crossed readily and produced fertile offspring.

B. angustifolia var. *angustifolia* (mauve, nursery origin) and *B. angustifolia* var. *heterophylla* (Tea Gardens) crossed readily and produced fertile offspring.

B. angustifolia var. *angustifolia* (mauve, nursery origin) and *B. angustifolia* var. *heterophylla* (Northern Tablelands) crossed less readily but produced fertile offspring.

It was concluded that all the entities trialled could be included in *B. angustifolia* or were very closely related.

Brachyscome hybrids

A propensity for *Brachyscome* species to cross has resulted in the production of a plethora of cultivars. A list of hybrids registered with the Australian Cultivar Registration Authority, protected under the Plant Varieties Act or under Plant Breeders Rights, may be found in the chapter titled 'Brachyscome Hybrids'. Other hybrids have arisen but are not readily available to the public. They are mentioned under the descriptions of the parent species.

Although vegetative propagation of species can be used to ensure that plants produced are the true species, the same cannot be said for plants propagated from seed. One of the aims of the Study Group has been to make seed of new species available to gardeners. Unless such species are grown in isolation and hand-pollinated, it now appears that much of the seed collected is likely to be the result of hybridization. After some years of trialling and observation of results, the following lists have been compiled.

Species likely to cross

Study Group members have observed that some species (as the female or seed-producing parent) are very likely to hybridize with other species if numerous brachyscomes are grown together in gardens. Seed collected from the following garden-grown species has not come true when it was sown, that is a proportion of the progeny did not look and behave like the female parent:

- ***B. angustifolia*** **varieties**
- ***B. ascendens***
- **B. aff. *curvicarpa***
- ***B. formosa***
- **B. aff. *formosa***
- ***B. graminea***
- ***B. multifida***
- ***B. nivalis***
- ***B. segmentosa***
- ***B. stuartii***
- **B. sp. (Darling Downs)**

Species likely to come true

Members have observed that some species have been found not to cross readily with other brachyscome species in the garden. When seed is collected from the following garden-grown species the progeny have come true for several generations, although as the male parent they may cross with other species:

- ***B. basaltica***
- **B. aff. *cuneifolia*** **(Derrinallum)**
- ***B. diversifolia***
- ***B. goniocarpa***
- ***B. melanocarpa***
- ***B. nova-anglica***
- ***B. parvula***
- ***B. petrophila***
- ***B. procumbens***
- ***B. ptychocarpa***
- ***B. spathulata***

Hybrids in Australian Asteraceae

Members have observed hybridization in their gardens between species in *Bracteantha*; *B. bracteata* hybridizes with *B. viscosa* and with *B. papillosa.* In 1856 German plant breeders produced colourful hybrid Strawflowers by cross-fertilizing *Helichrysum bracteatum* (now *Bracteantha bracteata*) with *Helichrysum* species from southern Asia and Africa. By contrast, species within *Rhodanthe* and *Hyalosperma* have not hybridized in members' gardens. In nature there is only one area where it is suspected that *R. polygalifolia* and *R. oppositifolia* have hybridized. Both have the same chromosome number (n = 11) and are morphologically similar. Plant breeders have made vain attempts to cross *R. anthemoides* ($2n$ = 22) with *R. chlorocephala* subsp. *rosea* (n = 7).

Chromosomes

Chromosomes are thread-like structures containing genes and they are present in the nuclei of cells. They occur in pairs in somatic or diploid cells (the cells of an organism which are not reproductive cells), both members of the pair being identical in size and shape. The reproductive or haploid cells of an organism have only one member of a pair of chromosomes in their nuclei. The haploid number is referred to as 'n', the diploid number is '$2n$'.

Chromosome number determinations have been made for many species. As examples, the chromosome number varies from n = 2 for *B. dichromosomatica* to n = 13 for *B. radicans*, with n = 9 for the majority of *Brachyscome* species.

Table of chromosome number determinations for *Brachyscome* species

Chromosome number	Taxon
$n = 2$	***B. dichromosomatica***
$n = 3$	***B. debilis, B. leptocarpa, B. muelleri, B. nodosa, B. smithwhitei***
$n = 4$	***B. breviscapis, B. chrysoglossa, B. curvicarpa,*** *B.* aff. ***curvicarpa,*** ***B. dentata*** (n = 4, 8, 12), ***B. diversifolia*** var. ***dissecta, B. eriogona, B. goniocarpa, B. gracilis*** ($2n$ = 8), *B. papillosa,* ***B. tetrapterocarpa***
$n = 5$	***B. campylocarpa, B. readeri***
$n = 6$	***B. basaltica*** var. ***gracilis, B. dissectifolia, B. linearioba*** (n = 6, 8), ***B. melanocarpa*** (n = 6, 12), ***B. nova-anglica*** (n = 6, 7), *B. ptychocarpa,* ***B. rara, B. stuartii***
$n = 7$	***B. multifida*** var. ***multifida***
$n = 8$	***B. basaltica*** var. ***basaltica***
$n = 9$	***B. aculeata*** (n = 9, 18), *B.* aff. ***aculeata*** (Mt Gingera, ACT), ***B. angustifolia*** var. ***angustifolia, B. angustifolia*** var. ***heterophylla, B. bellidioides, B. cardiocarpa, B. cheilocarpa, B. ciliaris*** (n = 9, 18, 27, 36), ***B. ciliaris*** var. ***lyrifolia, B. cuneifolia, B. decipiens*** (n = 9, 27), ***B. exilis, B. formosa, B. graminea, B. halophila, B. iberidifolia, B. latisquamea, B. multifida*** var. ***dilatata, B. oncocarpa, B. parvula, B. perpusilla, B. procumbens, B. pusilla, B. rigidula, B. riparia, B. scapigera, B. sieberi*** var. ***gunnii, B. spathulata*** subsp. ***glabra, B. spathulata*** subsp. ***spathulata*** (n = 9, 18, 27, 36, 45), ***B. tenuiscapa*** var. ***pubescens, B. tesquorum, B. uliginosa***
$n = 10$	***B. microcarpa***
$n = 11$	*B. nivalis*
$n = 13$	*B. radicans*
$n = 15$	*B. stolonifera*
$n = 16$	*B. diversifolia* var. *diversifolia* ($2n$ = 24)
$2n = 24$	*B.* aff. *gracilis*
$n = 27$	*B.* aff. *aculeata* (Halls Gap), *B. trachycarpa* ($2n$ = 36)

[This table has been derived from the following: Short, P.S. (1994). Australian Compositae. *Compositae Newsletter* 24: 6–25, Watanabe, K. and Short, P.S. (1992). Chromosome number determinations in *Brachyscome* Cass. (Asteraceae: Astereae) with comments on species delimitation, relationships and cytogeography. *Muelleria* 7: 457–471.]

Smith-White *et al.* (1970) have suggested that the ancestral brachyscome was a mesic perennial with $n = 9$. A mesic perennial occurs in high, rocky tablelands. The evolutionary path followed by brachyscomes is thought to move from perennial to annual, from mesic to arid habitats, these movements being correlated with changes in chromosome make-up, and usually a reduction in chromosome number.

The chromosomes should match up when cross-fertilization occurs. They are more likely to do so if the chromosome number is the same, as it would be within a species or closely-related species.

Polyploidy

Polyploid brachyscomes have more than two sets of chromosomes in the nuclei. Plants with multiple pairs of chromosomes are often larger and more vigorous than plants with only 2 pairs. Examples of polyploid brachyscomes are *B. dentata, B. spathulata* and *B. trachycarpa.*

Brachyscome tenuiscapa **var. *tenuiscapa* with a pollinator browsing mature florets. (Alf Salkin)**

Brachyscome microcarpa **(coastal form) is an attractive small container plant with mauve or purple flower-heads. (Alf Salkin)**

Brachyscome stuartii **has proved to be an easily grown, small perennial with a neat habit and long flowering period (Alf Salkin)**

A beautiful clump of Snow Daisy (*B. nivalis*) growing among rocks at Falls Creek. (Alf Salkin)

An unusual, tufted alpine daisy (*B. tadgellii*) suitable for semi-shaded spots in temperate regions. (Alf Salkin)

Brachyscome diversifolia is a large-flowered perennial occurring in diverse habitats. Good forms perform well in cultivation. (Alf Salkin)

This vibrant daisy, *Brachyscome formosa*, is a charming garden plant. It is pictured roaming happily in a Shepparton garden. (Judy Barker)

Brachyscome rigidula **revelling in an exposed position at the summit of Mount Buller. (Judy Barker)**

Brachyscome spathulata **growing attractively among native grasses at Mount Buller. (Joy Greig)**

Brachyscome scapigera **is an erect, tufted perennial growing in alpine grasslands. (Alf Salkin)**

Brachyscome Species

Brachyscome aculeata (Labill.) Less.

Hill Daisy

PERENNIAL
30–60cm high
10–30cm wide
WHITE

Synonyms: *Bellis aculeata* Labill.
Brachyscome billardieri Cass.
Brachyscome stricta DC.

Derivation: *aculeata* — prickly, a reference to the pappus at the apex of the fruit.

Tall, branching, perennial herb with a profusion of large, pure white flower-heads over a long period.

Distribution and habitat: Qld, NSW, ACT, Vic. Occurs in southern Queensland, the Coast and Tablelands of New South Wales, to eastern Victoria and in the Grampians. It has been recorded from a few districts in the western plains of New South Wales. *B. aculeata* is found in well-drained situations at the coast, in open woodland, and with snow grass in alpine areas.

Description: In cultivation most forms are erect or ascending perennials 30–60cm high. Many glandular-hairy stems arise from the rootstock and branch a number of times along their length. Plants produce basal clusters of shiny, dark green leaves at the beginning of the growing season. The clusters disappear as the season progresses. **Leaves** in the basal cluster (or low on the stem) are 4–6cm long or longer, usually oblanceolate. The stem leaves are sessile, oblanceolate to linear, 1–5cm x 1–6mm, and decrease in size up the stem. The margins are toothed or lobed to varying degrees, usually near the tip, and the uppermost leaves are often entire. The leaves may be glabrous or bear glandular hairs. The lower surface is green, never purplish. **Flower-heads** are 2–4cm across, with about 30 white ray florets which may be pinkish or mauve beneath. This colour fades with age. The involucral bracts are biseriate (in two rows); the outer bracts are glandular with acute tips, the inner bracts are broader with obtuse tips and thin, transparent, often purplish margins. **Fruits** are 3–4mm x 2–3mm, pale brown and flat. The body is obovate, smooth or with a few small tubercles near the apex. The wings may be entire or irregularly notched and are fringed with small hairs. The pappus, while obvious, is relatively short (less than 0.5mm). **In the wild** plants are usually shorter and the flower-heads smaller (1.5–3cm across).

Flowering period: Usually spring to summer in the wild, but in the garden *B. aculeata* flowers from late spring to late autumn. If plants are trimmed to keep them neat, several bursts of flowering will result.

Cultivation and uses: Under garden conditions *B. aculeata* suckers and may retain the basal clusters for some time. This species prefers an open, partly shaded position and moist soil. Plants from dry areas will tolerate drier conditions, but may not grow as vigorously. If they are not watered in hot weather they may disappear from sight, but established plants will shoot again after good rain. This handsome perennial may be used as a container plant, in rockeries or in pockets in the garden.

Propagation: Good germination from seed in 14–30 days when sown in autumn, but seedlings are sometimes difficult to raise in cold, wet weather. This species may be more successfully raised when sown in spring. Also propagate from cuttings or by division.

Forms:

- A form from Mt Buller (Vic) has stiff, upright stems to 50cm and flower-heads 3cm across. Once established this form spreads quite vigorously.

- A form from the Mallacoota region (Vic) has ascending stems to 40cm and flower-heads 2.5–3cm across. The foliage is softer and bears many more hairs than the Mt Buller form.

Similar species: ***B. cuneifolia*** differs from *B. aculeata* in having a persistent basal cluster of leaves. There are fewer stems, branching is sparse, and the involucral bracts have blunt tips. The pappus is not obvious on the fruit, the bristles are of uneven lengths and most are very short. *B.* aff. *cuneifolia* is a white-flowered perennial with a similar fruit from western Victoria. Like *B. aculeata* it does not have a persistent basal cluster but differs in having shorter stems (to 30cm) which are almost glabrous. Sparse glandular hairs are present only on the flower stem immediately below the head.

B. aculeata — Hamilton Gap, NSW (x 1) Fruit — Mt Buller, Vic (x 20)

B. dentata is also a white-flowered perennial with toothed leaves. It differs in that it does not sucker, the fruit bears large tubercles and the wing is deeply and irregularly dissected.

B. sieberi* var. *gunnii is very like *B. aculeata,* but it occurs only in Tasmania [unless *B.* aff. *aculeata* Mt Gingera is found to be conspecific with *B. sieberi* var. *gunnii* (Stace, 1981)]. It differs in habit; plants are more dense and the stems branch more frequently.

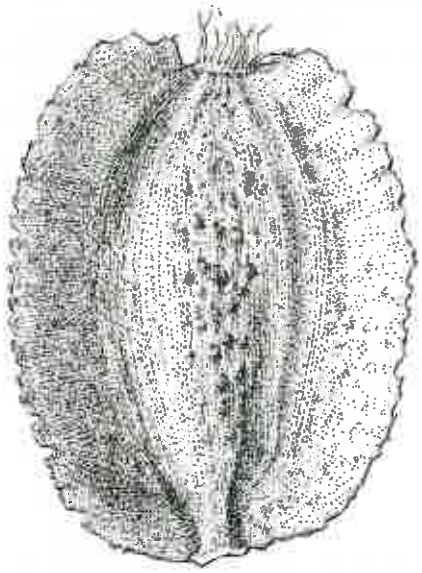
B. spathulata has mauve rays (rarely white) and the involucral bracts are extremely acute and narrow. The basal cluster of leaves persists for quite a large proportion of the growing season and consists of relatively large, thick, spoon-shaped leaves. The lower surfaces of the leaves are often purplish.

Special notes: Davis (1948) revised the genus *Brachyscome.* Her classification into species rested mainly on the basis of the characters of the fruit. Cytological studies of the *B. aculeata* species complex by Stace (1981) led to the recognition of four separate taxa in the complex, namely *B. aculeata, B. cuneifolia, B. sieberi* var. *gunnii* and *B. spathulata.*

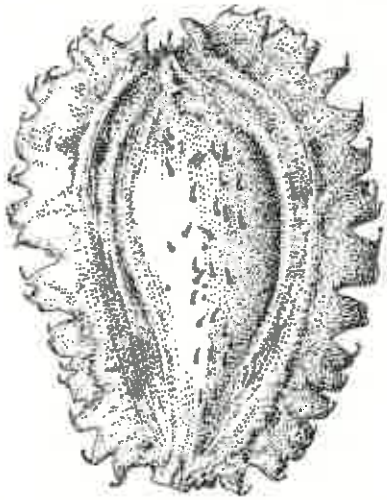
In the same article Stace recorded that she had collected specimens with a morphological similarity to *B. aculeata* from Mt Gingera (ACT) and the Grampians (Vic), but that they either would not cross-fertilize or would cross in only one direction. She designated these entities *B.* aff. *aculeata* (Mt Gingera) and *B.* aff. *aculeata* (Grampians). *B.* aff. *aculeata* (Mt Gingera) was shown to cross-fertilize with *B. sieberi* var. *gunnii,* which led Stace (1981) to suggest that the two taxa might be conspecific. *B.* aff. *aculeata* (Grampians) may be *B.* aff. *cuneifolia.*

Polyploidy has been demonstrated in *B. aculeata.* Polyploidy means having more than two sets of chromosomes. Stace (1981) determined chromosome numbers of $n = 9$ and 18 and $2n = 18$ for *B. aculeata.*

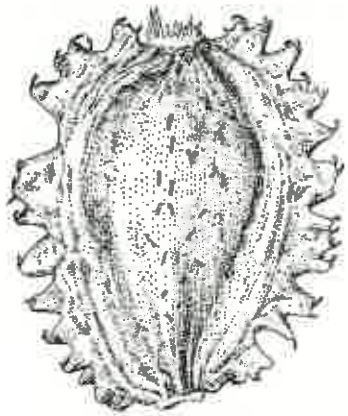
The description in *Flora of South-eastern Queensland* mentions that the ray florets may be white, lilac or blue. The illustrated fruit bears more resemblance to the fruit of *B. ascendens* than to that of *B. aculeata.*



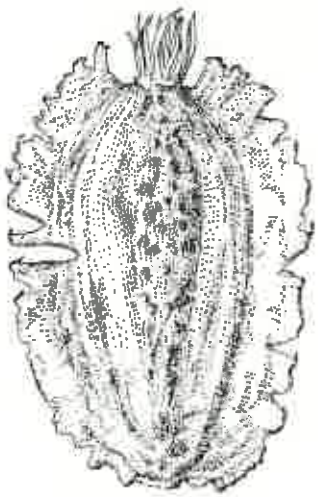
B. aculeata



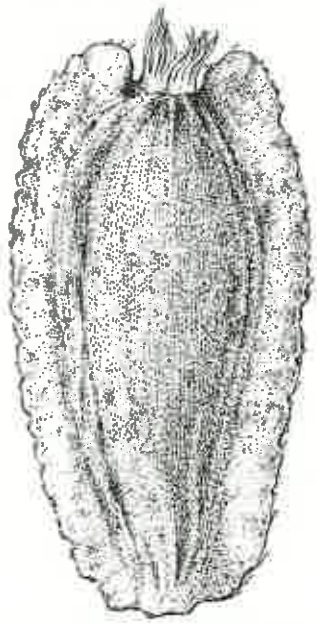
B. cuneifolia



B. sp. aff. *cuneifolia*



B. sieberi var. *gunnii*



B. spathulata

***Brachyscome aculeata* complex (x 20)**

Brachyscome angustifolia Cunn. ex DC.

Two varieties of this species have been recognized by Davis (1948) based on the shape of the leaves.

KEY to the VARIETIES

1. Leaves narrow-lanceolate to narrow-elliptical, entire .....var. *angustifolia.*
2. Leaves narrow to broad-elliptical, pinnatisect .....var. *heterophylla.*

The two varieties will be described separately.

Brachyscome angustifolia Cunn. ex DC. var. *angustifolia*

Stiff Daisy, Grassland Daisy

PERENNIAL
15–20cm high
30–40cm wide
MAUVE, PINK

Synonym: *B. linearifolia* DC.

Derivation: *angustifolia* — with narrow leaves.

Attractive perennial with masses of flower-heads over a long period. Spreads by suckering. Cultivated forms are easy to grow and very useful.

Distribution and habitat: NSW, Vic, Tas, SA. Occurs along the South and Central Coast and the Tablelands in New South Wales, in eastern Victoria, from sea level to 900m in Tasmania and in the south-east of South Australia. (The distribution is likely to change following revision because some of the collections in the various herbaria may have been wrongly identified.) Grows in eucalypt forest and in rocky gullies along rivers.

Description: **In cultivation** a branching perennial with erect or ascending stems, spreading by sending out suckers. The stems are almost glabrous, a few short glandular hairs being present. **Leaves** are 1.5–5cm x 1–5mm, narrow-elliptical or narrow-lanceolate, with entire, slightly recurved margins and acute tips. A few glandular hairs are present along the margins but can be seen only under magnification. The undersurface is pale. **Flower-heads** are 1.5–2cm across on flower stems 8–12cm long with one or two small leaves at the base.The ray florets are pink or mauve on the upper surface and much paler beneath, relatively broad, and vary from 12 to 24. Involucral bracts (about 14) are linear to narrow-lanceolate with acute tips and torn, almost transparent margins with a purplish tinge. Sparse glandular hairs are present on the outer surface. **Fruits** are brown, 1.8–2.5mm x 1–1.4mm, with flattened faces covered with tubercles, some of which are tipped with a long hair. The margins are thickened and raised and the narrow wings are irregularly lobed and bear long hairs along the edges. The pappus is conspicuous, straw-coloured, and slightly longer than the notch between the wings. **In the wild** plants are slender, scrambling and suckering. They do not flower profusely and are hard to find.

Flowering period: In its natural habitat var. *angustifolia* flowers from late spring to early autumn. A selected form of nursery origin flowers from September to May.

Cultivation and uses: The Study Group has trialled only plants of nursery origin in the garden. They are very adaptable and more easily grown than plants propagated from the wild. Plants grow and flower best in sun or dappled shade, prefer moist soil and root protection but tolerate short dry periods. They withstand mild frosts, and grow well at the coast. This form may be grown in a range of climatic conditions — subtropical, cool temperate, cool montane and hot inland. It makes a good ground cover or rockery plant.

Propagation: Seed germinates well in 10–30 days, cuttings strike readily and the transplanting of suckers is a very simple method of increasing this variety.

Forms:

- The form of nursery origin has narrow, entire leaves, 1–3cm x 2–4mm, stiff, pale green and elliptical. The heads are mauve, 1–2cm across. Plants sucker strongly, are easy to grow and form quite extensive clumps.

B. angustifolia var. *angustifolia* — Warnervale, NSW (x 1)

Fruit — Warnervale, NSW (x 1)

- Two forms from the South and Central Coast (NSW) have been trialled in containers by members. The leaves are dark green, elliptical, 1–5.5cm x 1–2mm. The heads are pale mauve-pink or bright pink, 2–2.5cm across. Plants are very slender and scrambling and do not sucker strongly. They are dainty in hanging baskets.

- A form from the Central Tablelands of New South Wales has similar leaves to 4cm and pink or mauve heads 1.5–2cm across.

Similar species: ***B. graminea*** vegetatively resembles var. *angustifolia*. *B. graminea* differs in that the leaves are more limp. The fruit is swollen, has no tubercles on the faces and no pappus.

Some forms of ***B. parvula*** resemble var. *angustifolia*, but the fruits identify them. *B. parvula* has shorter fruit (to 1.8mm) with smooth translucent margins, no pappus and no tubercles. There are many more ray florets per head (30–60) and plants do not sucker.

Special notes: The chromosome number of var. *angustifolia* has been determined as *n* = 9 (Smith-White *et al.*, 1970). Members have crossed var. *angustifolia* with var. *heterophylla* (Tea Gardens and Mt Kaputar forms), *B. formosa* (Coonabarabran, Timor Rocks, 'Pilliga Posy' and mauve forms) and with *B. procumbens* (Mt Kaputar) — all of which have *n* = 9. The resultant hybrids are quite stable and indicate a close relationship of the aforementioned taxa.

Brachyscome angustifolia Cunn. ex DC. var. *heterophylla* (Benth.) G. Davis

PERENNIAL
25–35cm high
20–30cm wide
PINK, MAUVE

Synonyms: *B. heterophylla* Benth.
B. linearifolia DC. var. *heterophylla* (Benth.) Moore and Betche

Derivation: *heterophylla* — bearing leaves of more than one kind.

Long-flowering perennial with erect or ascending habit, toothed leaves and pink flower-heads. Spreads by suckering.

Distribution and habitat: NSW, Vic. Said to be widespread in New South Wales from the Coast to the Tablelands and Western Slopes, and to occur in eastern Victoria. [An entity in Victoria has been wrongly identified with var. *heterophylla* in the past (Short, 1988). It has affinities with *B. formosa* and is referred to as *B.* aff. *formosa*. Depending on the outcome of the revision, the distribution may need alteration.] This variety grows on sandy soil near the coast and in dry open eucalypt forest.

Description: **In cultivation** a branching, suckering herb to 35cm. The stems are erect or ascending, almost glabrous, with a few short glandular hairs sometimes present. **Leaves** are 1–4cm x 0.5–1cm, petiolate, lobed with 3–7 acute lobes. A few glandular hairs are present along the edge of the stalk, but can only be seen under magnification. **Flower-heads** are 2–2.5cm across on flower stems 10–15cm long. Ray florets (12–24) are pink or mauve-pink and are paler beneath. Involucral bracts (about 14) are similar to those of var. *angustifolia*, and also bear a few glandular hairs. **Fruits** are similar to those of var. *angustifolia* but the wing seems a little broader. **In the wild** plants are upright and not very common.

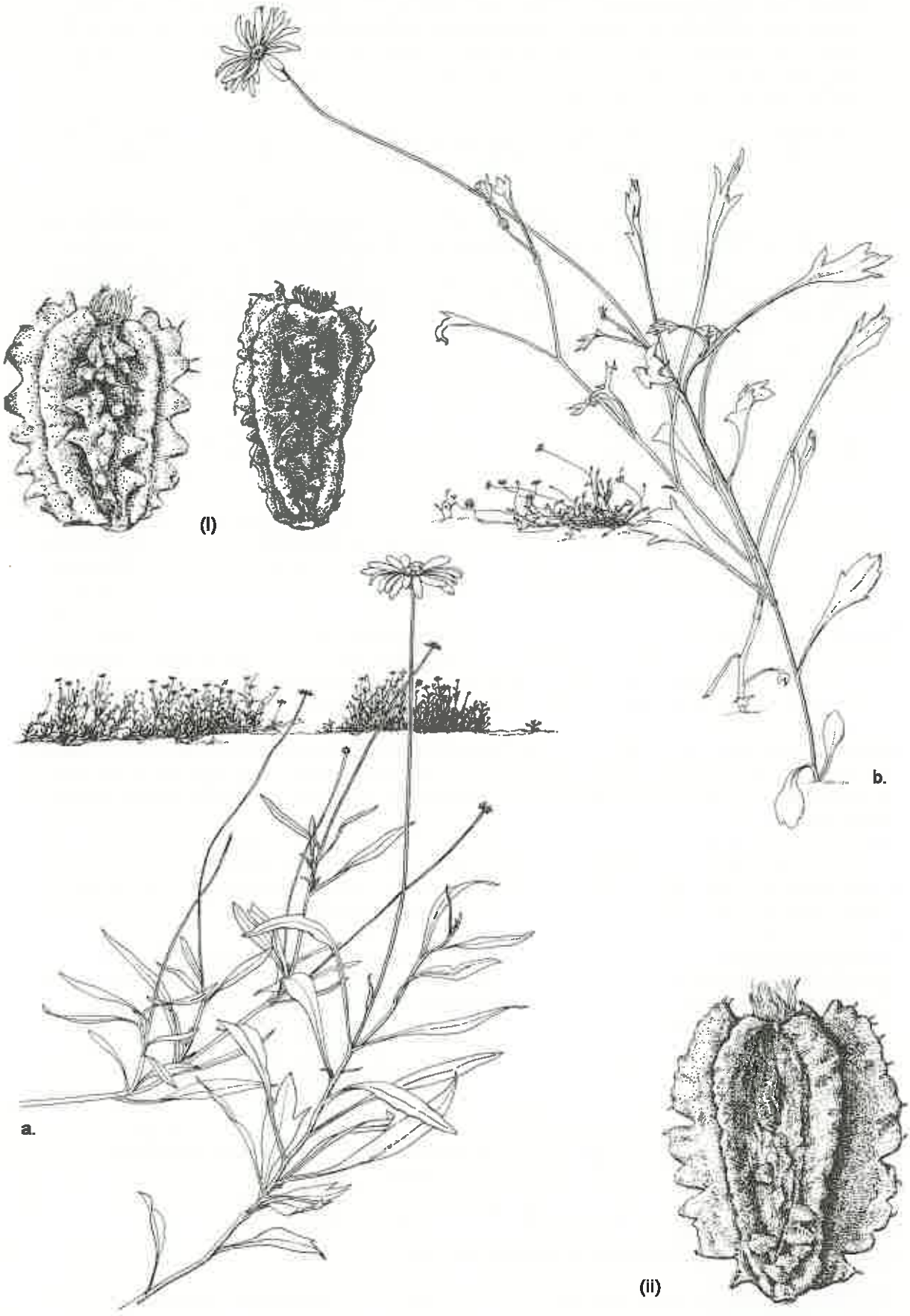
Flowering period: Late spring to autumn.

Cultivation and uses: This species is easily grown. It prefers morning sun but tolerates full sun if given adequate root protection and moisture. It is suitable for most climates from subtropical to cool montane and will grow at the coast. The long flowering period recommends it for general garden planting, for bog gardens, rockeries, containers and hanging baskets.

Propagation: Seed germinates in 10–50 days. Cuttings strike readily and suckers may be transplanted easily.

Forms:

- One form of nursery origin has broad-lanceolate leaves, 1–4cm x 2–8mm, usually petiolate. Many of the leaves are entire but there are also numerous leaves with three acute teeth at the tips. The



B. angustifolia var. *heterophylla* — a. nursery origin (x 1), b. Tea Gardens, NSW (x 1)
Fruit — (i) nursery origin, showing variation, (ii) Tea Gardens, NSW (x 20)

heads are mauve-pink, 2–2.5cm across, and the plant behaves very much as does the nursery form of var. *angustifolia*. If the identification follows the key to the varieties as set out by Davis (1948), this form is var. *heterophylla*. It is certainly like the illustration for var. *heterophylla* in Davis. The original provenance is unknown; these plants could even be hybrids. Accidental crossing in gardens and nurseries has already produced hybrids between the two forms of nursery origin (var. *angustifolia* and var. *heterophylla*). In addition, the majority of the resultant seedlings from the cross var. *heterophylla* (Tea Gardens) x var. *angustifolia* mauve (nursery origin) have foliage similar to the form described above.

- A form from Tea Gardens (NSW) has petiolate leaves to 3.5cm with 3–5 acute teeth. The heads are 2–2.5cm across on flower stems to 15cm. It has proved a very reliable garden plant.

- Three forms from the Northern Tablelands (NSW) have been trialled for a short time and are provisionally identified by the Study Group as var. *heterophylla*, but they do have a number of characters different from those of typical var. *heterophylla*. They are all rhizomatous perennials with erect or procumbent branching stems to 40cm. **Leaves** are 2.5–5cm x 1–1.5cm, the lower ones petiolate, the upper ones sessile and partly sheathing the stem. The young growth has short hairs. The leaves are lobed or toothed, but the lobes are sometimes blunt. **Flower-heads** are 1.5–2cm across with bright pink or mauve-pink ray florets and buff reverses. Involucral bracts number 10–20, narrow-lanceolate with acute tips and torn transparent purplish margins. They are densely covered in short glandular hairs. **Fruits** are cream to golden, 1.8–2.5mm x 0.8–1.2mm, with a thickened raised margin enclosing flattened faces covered with tubercles bearing short hairs at the apex. The pappus is of straw-coloured bristles of uneven length. The wing is usually narrow, slightly lobed and edged with a few hairs.

  These plants appear to have horticultural potential, but may need selection over a few years to become reliable. At present they seem to indicate a preference for dappled sun, moist soil and root protection. The lower leaves go brown if left in hot sun even for a short time. They are beautiful in hanging baskets for warm shaded areas and could be handsome trailing plants.

Similar species: An entity known to the Study Group as ***B.* aff. *formosa*** Entity 1 has been previously confused with var. *heterophylla*. This entity is differentiated mainly by its leaves which are orbicular to obovate and more regularly lobed. The heads have been mauve in the collections made to date, and have been larger in some forms (to 3.5cm across). The fruit has a broad wing.

B.* aff. *formosa Entity 2 is also morphologically similar and has similar fruits. It differs in that the leaves, stems, and sometimes the involucral bracts bear septate hairs. Although the leaf bases may be narrowed the leaves are sessile and the heads may be white, pink or mauve. The fruit has a narrow wing.

B. microcarpa might be mistaken for var. *heterophylla* because it is a perennial with pink or mauve heads, and the leaves are lobed. The fruits distinguish the two species; typical *B. microcarpa* has smaller fruits (to 1.8mm long), black, with a smooth margin, not raised.

Special notes: Variety *heterophylla* is not abundant. It has taken the Study Group a long time to find it in its natural habitat. Other vegetatively similar entities have been found but, until the revision is completed, there is little certainty of identification. Examination of the herbarium specimens filed under *B. angustifolia* var. *heterophylla* has suggested that some of them may have been wrongly identified in the past. The only statement that could be made with confidence is that the entities described, together with *B.* aff. *formosa*, *B. formosa*, and *B. procumbens*, are closely related. They all have suckering habits, fruits very similar in appearance, and chromosome numbers of $n = 9$ (where a determination has been made).

Both varieties of *B. angustifolia* have chromosome numbers of $n = 9$ (Smith-White *et al.*, 1970). Study Group members have hybridized var. *heterophylla* (Tea Gardens) with *B. angustifolia* (nursery origin) and with *B. procumbens*. The resultant seedlings are stable and colourful.

In the key to the varieties Davis (1948) describes the leaves of var. *heterophylla* as 'pinnatisect'. If the definition of a pinnatisect leaf is that the margin is divided almost to the midrib, some of the forms listed for inclusion in this variety have leaves that are pinnatifid rather than pinnatisect.

It should be noted that two of the illustrations in the description of *B. angustifolia* in *Australian Daisies for gardens and floral art* (Australian Daisy Study Group, 1987) **are incorrectly identified; *B. angustifolia* var. *angustifolia* should be *B. angustifolia* var. *heterophylla*** (nursery origin) **and *B. angustifolia* var. *heterophylla*** (Mt Drummer form) **should be *B.* aff. *formosa*** Entity 1 (Mt Drummer form).

B. angustifolia complex — Barrington Tops, NSW (x 1) Fruit — Barrington Tops, NSW (x 20)

Brachyscome ascendens G. Davis

PERENNIAL
25–30cm high
40–60cm wide
MAUVE

Derivation: *ascendens* — having ascending stems.

Handsome perennial with many large, long-stemmed, mauve flower-heads over a long period. Relatively new to horticulture.

Distribution and habitat: Qld. An uncommon species occurring in the Border Ranges which extend from Springbrook along Main Range to Cunninghams Gap and adjacent isolated peaks south of Boonah. Grows in open forest on rock ledges and in damp rocky crevices.

Description: In cultivation a hairy, branching perennial with ascending, obviously hairy stems. **Leaves** are mid to dark green, 1.5–5cm x 0.5–1.2cm, with lobed or toothed margins. The shape is variable, usually wedge-shaped, with 2–11 acute-tipped lobes. The lobes vary in size; the upper ones broad (3–4mm wide at the base) and the lowest linear and short. Long septate hairs cover both surfaces and are especially numerous on the margins and midrib. **Flower-heads** are 2.5–3.5cm across, held at the tips of flower stems 12–20cm long. These stems bear septate and glandular hairs and have two leaves near the base. The ray florets are mauve with pale reverses and are numerous (30–34). **Fruits** are brown, 2–2.5mm x 1.5–1.8mm, oblong, with flattened faces bearing small tubercles down the centre. The wing-like margin is lobed and thick, with long hairs at the tips of the lobes. The lobes resemble tubercles and are often larger on one side — giving the fruit a lop-sided appearance. The apical part of the margin is usually smooth and has short hairs. The pappus is short but conspicuous. **In the wild** plants are much smaller and weaker, with shorter leaves and only a few flowers.

Flowering period: In cultivation plants flower from at least late winter to autumn. In subtropical climates *B. ascendens* flowers through winter too.

Cultivation and uses: *B. ascendens* first appeared in cultivation in Queensland. It has not been trialled for long, but gives every indication of possessing great horticultural potential. It grows well in morning sun, but may need protection and extra watering in summer. Added nutrients enhance flower production and growth. It is attractive in gardens, containers and hanging baskets.

Propagation: Seed germinates in 12–20 days and cuttings are easy to strike.

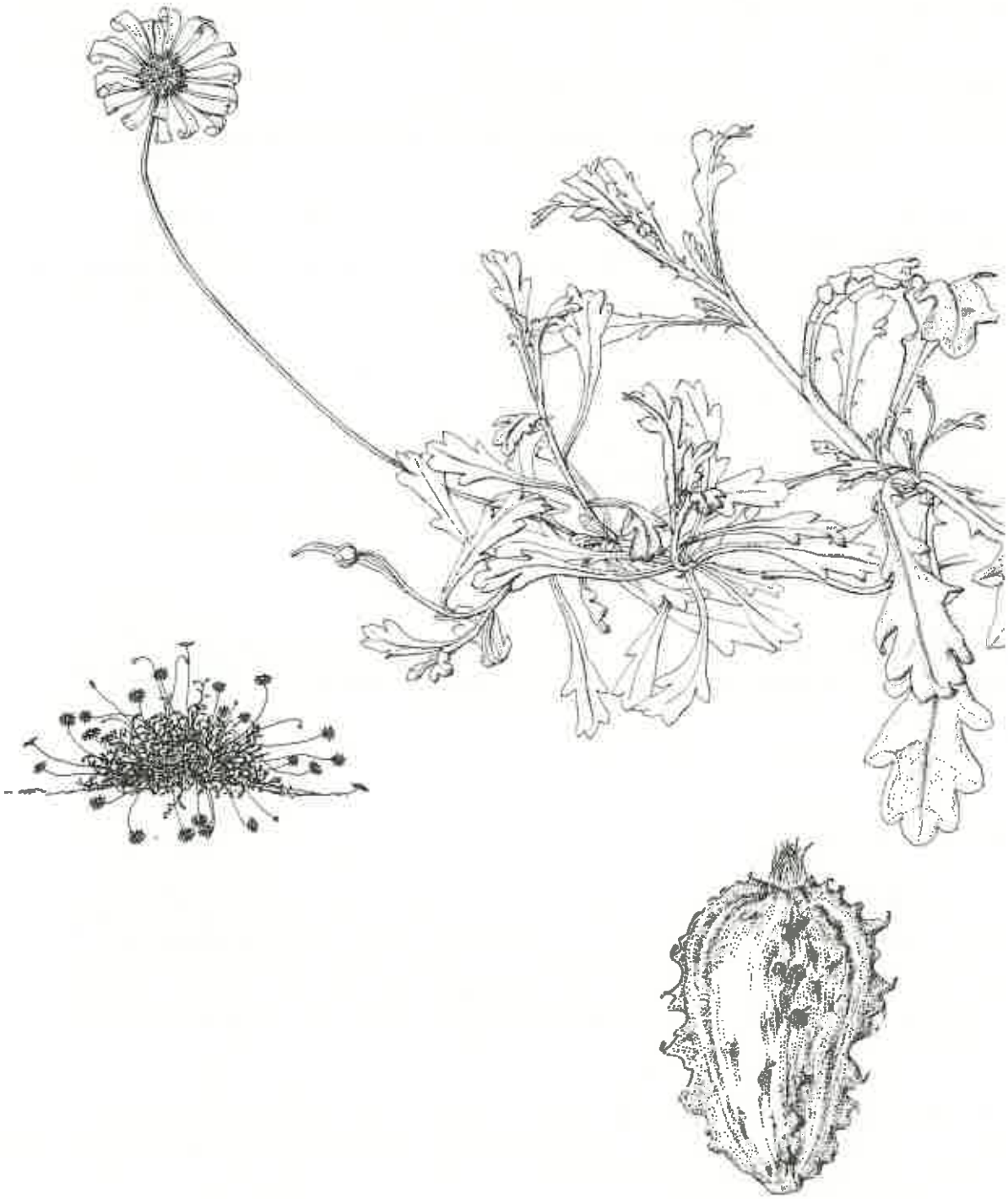
Similar species: ***B. melanocarpa*** may be distinguished by its fruit which, although tuberculate, is black. The habit is not as neat, plants are more upright at first, and the flower stems are not obviously hairy. The habitat is woodland or grassland subject to seasonal flooding.

B. nova-anglica is a perennial with leaves like those of *B. ascendens* and the stems and leaves bear a similar mixture of glandular and septate hairs. Davis (1948) observed that the leaves are broader in *B. ascendens*, but the suckering form of *B. nova-anglica* has leaves of the same size and the heads are nearly as large. The fruits are the distinguishing feature; they are smaller (up to 2mm x 1mm), black, with tuberculate faces, smooth margins and a minute pappus.

B. petrophila is a mauve-flowered perennial with toothed leaves, but it is an uncommon species which occurs only in Victoria. It can be distinguished by the leaves and stems which bear short glandular hairs rather than septate hairs, and by the fruits which are smaller, darker and wingless.

Special notes: Davis (1948) noted that there is a strong vegetative resemblance to *B. nova-anglica*, but that the leaves are usually broader in *B. ascendens*. Study Group members have observed that *B. ascendens* crosses readily with other species, notably *B.* aff. *curvicarpa* and possibly *B. procumbens*. The progeny have flowered with yellow, pale pink and pale mauve ray florets.

B. ascendens **is considered to be a vulnerable species.**



B. ascendens — Border Ranges, Qld (x 1)

Fruit — Border Ranges, Qld (x 20)

Brachyscome basaltica F. Muell.

Two varieties of this species have been recognized by Davis (1948) based on the appearance of the leaf.

KEY to the VARIETIES

1. Leaves broad- to ovate-lanceolate, lower ones 3-veined below .....var. *basaltica.*
2. Leaves narrow lanceolate to linear, grass-like, 1-veined below .....var. *gracilis.*

The two varieties will be described separately.

Brachyscome basaltica F. Muell. var. *basaltica*

Basalt Daisy, Swamp Daisy

PERENNIAL
15–30cm high
35–50cm wide
WHITE, PINK

Derivation: *basaltica* — referring to the habitat, basaltic plains.

Perennial with white or pale pink flower-heads over a long period.
New to cultivation.

Distribution and habitat: Qld. Occurs on basalt plains from Peak Range to the Darling Downs. Grows in heavy, black clay soil among grasses.

Description: In cultivation an almost glabrous perennial with branching, erect and decumbent stems to 40cm. It spreads slowly by suckering. **Leaves** are glabrous, elliptical, 1–10cm x 0.5–1.5cm, sessile or narrowed into a petiole. The tips are acute. The main feature of the leaves is the presence of three veins, an obvious midrib and two less conspicuous veins. **Flower-heads** are white (or pale pink in some forms), 1.5–2.5cm across, on flower stems 5–15cm long which are naked or have a small leaf near the base. Involucral bracts are narrow-oblong with acute tips, torn transparent margins and a few glandular hairs. **Fruits** are brown, obovate, 1–2mm x 0.6–1mm, swollen and covered with tubercles. Some fruits are so swollen at maturity that the margin is obscured. The pappus is a short, transparent circlet which appears to consist of papillae. **In the wild** plants grow in moist, heavy soils and are usually erect under these conditions.

Flowering period: Throughout the year if conditions are suitable.

Cultivation and uses: Trialling of var. *basaltica* has been carried out only for a short period. Plants appear to be tough enough to survive in hard conditions. This variety prefers moist, heavy soil and an open position. It should be suitable for bog gardens and should be tried in hanging baskets.

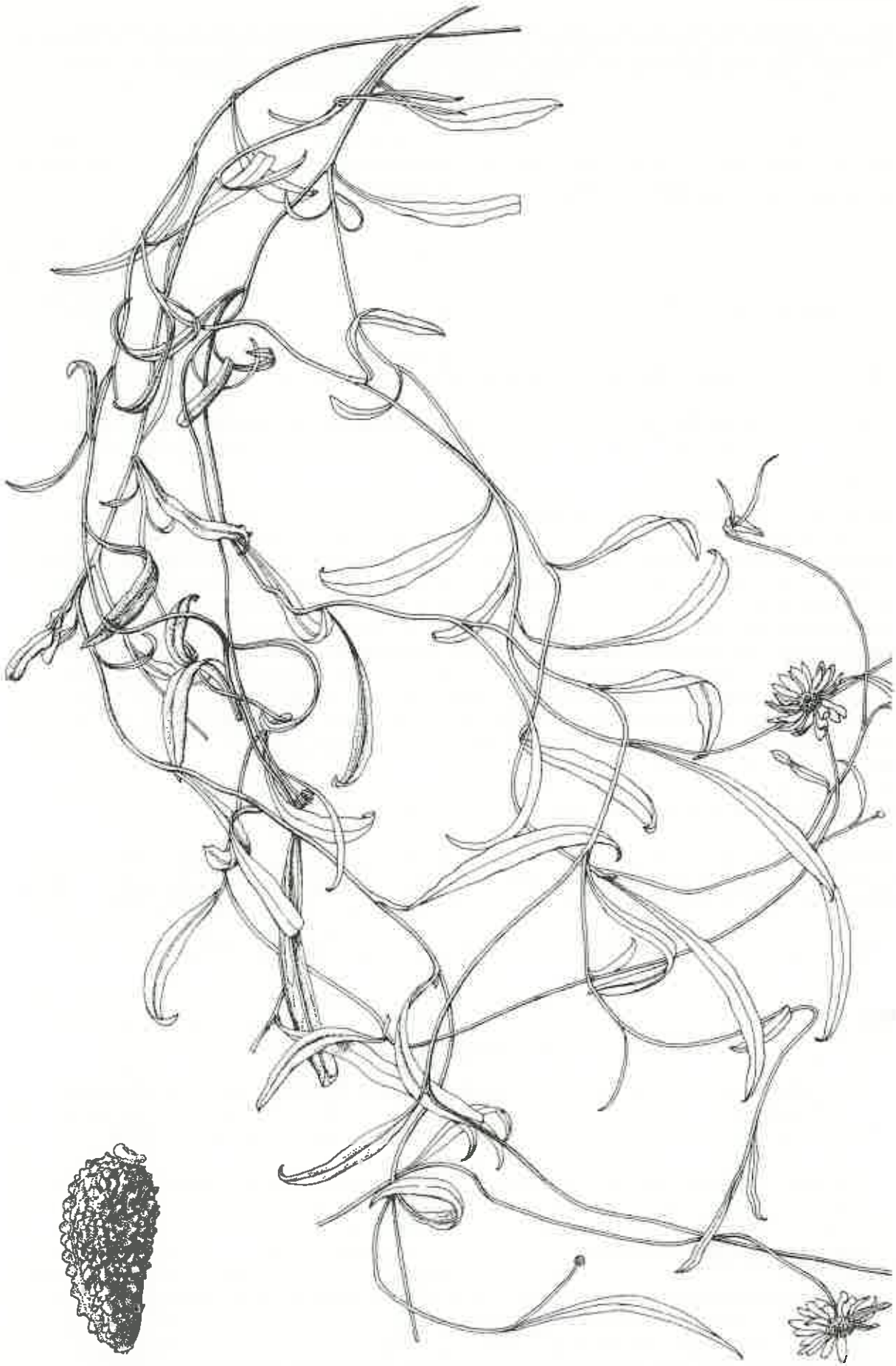
Propagation: Seed germinates poorly in 15–40 days. Cuttings strike easily and plants can be divided.

Forms:

- A form from Goodna near Ipswich in Queensland is an open slender plant, 20cm x 40cm, with rigid, glabrous stems. Leaves are elliptical, 2–5cm x 2–5mm, sessile, quite stiff, and with 3 veins on the blade. Flower-heads are 2–2.5cm across with white or pale pink ray florets (20–22) in one row. Flower stems are 10–20cm long. Involucral bracts (18–20) are narrow-lanceolate with acute to acuminate tips, torn scarious margins and a few glandular hairs. Fruits are 1.5–2mm x 0.8–1mm, swollen to such an extent that they appear four-sided. The margin is either absent or obscured. The pappus is a short thick collar, apparently composed of transparent scales or papillae.

Similar species: ***B. graminea*** might be mistaken for var. *basaltica.* It differs in being stoloniferous rather than rhizomatous. The growth habit is much lower and weaker; it would reach 30cm or more only if it used the surrounding plants as supports. The fruit differs in that it is broader (to 1.5mm), very swollen, and there are no tubercles on the faces.

B. rara is vegetatively close to var. *basaltica*, but differs slightly in the character of the fruit. It is reputed to be an annual rather than a perennial.



B. basaltica* var. *basaltica — Goodna, Qld (x 1) Fruit — Goodna, Qld (x 20)

Special notes: Smith-White *et al.* (1970) determined a chromosome number of $n = 8$ for var. *basaltica* from Milmerran (Qld).

Several collections of a succulent herb have been made in the Northern Territory by botanists. The herbarium specimens have been tentatively identified as *B. basaltica* var. *basaltica*. Plants are described as having a branching habit to 1m, thick stems and white ray florets. They grow in swampy conditions, in damp black soil in table drains and around bores.

Brachyscome basaltica F. Muell. var. *gracilis* Benth.

PERENNIAL
30–60cm high
30–80cm wide
WHITE

Derivation: *gracilis* — slender, referring to the habit.

Tall, slender perennial with grass-like leaves and white flower-heads from spring to autumn if kept well watered.

Distribution and habitat: Qld, NSW, Vic, SA. Widespread in swampy places, often growing in water. Also found in grasslands, river forests, open woodlands in damp areas, moist depressions along roadsides and beside streams.

Description: **In cultivation** a perennial to 60cm, spreading by underground rhizomatous roots. The thin branching stems may be strong and erect or weak and straggling. **Leaves** are produced along the stems and may also be basal. They are fine and grass-like, hairless, 2–9cm x 0.5–5mm, with flat margins and usually blunt tips. The upper leaves may be almost thread-like. This variety has one prominent vein on the lower surface. **Flower-heads,** 2–3cm across, are always white and appear singly at the tips of flower stems, 3–20cm long. **Fruits** are brown, 1.5–2mm x 0.8–1mm, obovate and slightly swollen with obvious tubercles on the faces. The tubercles are enclosed by a slightly raised ridge. A swollen, wing-like margin projects beyond the ridge. The pappus is a minute ring. **In the wild** *B. basaltica* var. *gracilis* usually grows upright to 1m. An ethereal effect is created when innumerable white flower-heads are held suspended above grasses on almost invisible stems. In these habitats the roots are well protected by grasses or are in water for considerable periods.

Flowering period: In cultivation var. *gracilis* will flower from spring to early autumn. In Queensland it flowers from winter to late summer and for most of the year in South Australia.

Cultivation and uses: This undervalued plant excels itself with strong growth and a mass of flowers when it is provided with moist to wet ground and good drainage. Some forms tolerate drier conditions, but all perform best in damp situations. Plants succumb when pruned hard; if they are looking untidy nip back with moderation and leave a few tall stems. It is suitable for inland planting and tolerates frost to –5°C. For good growth and an attractive display several plants should be grouped together or closely planted with other mixed species. This variety is an ideal choice for a bog garden and is pretty in a hanging basket while it is flowering, but may have to be relegated to an out of the way place if it begins to look dejected. All forms will self-sow in the garden. It has been suggested as a grassland plant for country gardens where an occasional mowing could be beneficial.

Propagation: Germinates from seed in 10–33 days. Cuttings strike easily and the rootstock can be successfully divided.

Forms:

- The best forms trialled were found at Narrabri (NSW) and in the vicinity of Kerang and Werribee (Vic). They are erect, grow vigorously on thin strong stems, and spread rapidly from their rootstock. These forms flower profusely for a long time. They tolerate quite dry conditions and self-sow enthusiastically in the garden.

- A form from Menindee Lakes (NSW) has been identified tentatively as *B. basaltica* var. *gracilis*. It is a robust, dense plant, 30cm x 90cm, that is proving very dependent on water. The glabrous stems are weak. Leaves are elliptical, 1–8cm x 3–10mm, mostly petiolate and the blades are limp and have 3 obvious veins. Flower-heads are 1.5–2cm across with white ray florets (34–36) in two rows. The flower stems are 8–12cm long with one small leaf near the base.

Brachyscome 'Lemon Twist', a newly released cultivar, bred to broaden the palette of *Brachyscome* colours. It is a compact perennial flowering from spring to early winter.
(John Armstrong)

Brachyscome aff. *multifida* (Hat Head) is a ground-hugging perennial ideal for exposed coastal conditions.
(John Armstrong)

Brachyscome 'Happy Face', another recently introduced cultivar, is an eye-catching perennial with large flowers over a long period.
(P.G.A.)

A sea of *Brachyscome ciliocarpa* carpets this Mulga woodland in Western Australia. (John Armstrong)

Brachyscome ciliocarpa (WA) illustrating reflexed ray florets. (Alf Salkin)

Dainty eastern Australian form of *B. ciliocarpa* growing naturally in northern New South Wales. (John Armstrong)

Brachyscome latisquamea adding colour to a sand dune at Exmouth, Western Australia.
(John Armstrong)

Wreath Brachyscome, a member of the *B. iberidifolia* species complex (WA form), grows as a circlet of delicate flower-heads, usually pink. This is an unusual white form.
(John Armstrong)

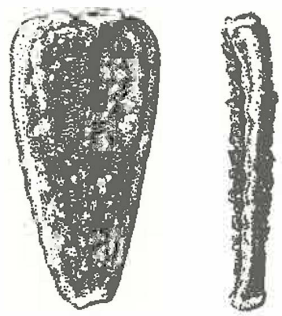
Brachyscome tatei is a rare brachyscome, useful for calcareous soils and pot culture.
(Joy Greig)

Brachyscome angustifolia is a valuable perennial for most situations and flowers profusely for a long period. (John Armstrong)

Brachyscome sieberi var. *gunnii*, a newly introduced species from Tasmania, flowers for months in cultivation. (Rodger Elliot)

Brachyscome cardiocarpa is a perennial with grass-like foliage. It is especially suitable for moist conditions. (Judy Barker)

B. basaltica var. *gracilis* —Shepparton, Vic (x 1)



Fruit — Nathalia, Vic (x 20)

Sparse glandular hairs are present on the flower stem and become more numerous just below the head. Involucral bracts (13–15) are oblanceolate or oblong with blunt tips, torn scarious margins, and a few glandular hairs. Fruits are brown, 1–1.3mm x 0.6–1mm, somewhat swollen but flatter than the Goodna form. A slightly raised ridge encloses the face which is covered with tubercles. A narrow swollen wing-like margin extends beyond the ridge. The pappus is the same as it is in the Goodna form.

Similar species: ***B. cardiocarpa*** could be mistaken for *B. basaltica* var. *gracilis* because it also grows in swamps and the leaves are long and grass-like, but *B. cardiocarpa* has larger flower-heads on shorter, unbranched flower stems (to 40cm). The leaves persist as a basal cluster and are usually longer (to 28cm). *B. cardiocarpa* has no underground rhizome. The fruit is also different; it has a broad wing, there are no tubercles on the body and the pappus is obvious though small.

B. rara is very close to the form of var. *gracilis* collected from Menindee Lakes (NSW). The fruit is generally more swollen and the tubercles are more prominent.

Special Notes: Smith-White *et al.* (1970) determined a chromosome number of $n = 6$ for var. *gracilis* from western New South Wales and western Victoria. Since the chromosome number of var. *basaltica* from Mimerran (Qld) is $n = 8$, these workers suggested that the two varieties deserved specific status. Watanabe and Short (1992) observed that var. *gracilis* seemed to have affinities with *B. rara* which also has $n = 6$.

The Menindee Lakes/Kinchega N.P. material is referable to *B. basaltica* var. *gracilis* as evidenced by the fruit morphology and the chromosome number even though the leaves bear three obvious veins. This could mean that the key to the varieties should be based on the appearance of the fruit rather than on the appearance of the leaves. The situation will become clearer when more collections are made in the area.

B. basaltica var. *basaltica* — Menindee Lakes, NSW (x 1) Fruit — Menindee Lakes, NSW (x 20)

Brachyscome bellidioides Steetz

ANNUAL
*2–15cm high
*2–15cm wide
WHITE, MAUVE (rarely)

Derivation: *bellidioides* — like the genus *Bellis*.

Slender, glabrous annual. Not tested in cultivation.

Distribution and habitat: WA. Occurs on the coastal plain from the Jurien Bay area southwards. Grows on sandy soils and coastal heathlands.

Description: **In cultivation** it is assumed that *B. bellidioides* will perform as does *B. pusilla*. **In the wild** it is a slender glabrous annual, 2–15cm x 2–15cm, single-stemmed or branching once or twice near the base. **Leaves** are stalkless, 1–2.5cm x 1–1.5mm, usually linear along the stem. The basal leaves often have one or two small irregular linear lobes with blunt tips. **Flower-heads,** 1–2.5cm across, have white ray florets (or mauve rarely). Heads are borne singly at the tips of leafy flower stems. **Fruits** are said to be black, 0.9–1.1mm x 0.5–0.6mm, wedge-shaped, with flattened and microscopically tessellated faces. The glabrous fruit of *B. bellidioides* is the main character distinguishing this species from *B. exilis*, *B. iberidifolia* and *B. pusilla*. The pappus is very difficult to see but if present is minute and shaped like a crown.

Flowering period: *B. bellidioides* flowers from August to October in its natural habitat.

Cultivation and uses: The Study Group has not collected this species and has not been able to acquire seed, but *B. bellidioides* is said to be vegetatively identical to *B. pusilla* and it is assumed that it would behave in a similar fashion under cultivation.

Propagation: Seed is not available.

Similar species: ***B. exilis*** is also a small annual with white flower-heads (or mauve very rarely). It differs from *B. bellidioides* in that the stem leaves are broader (5–10mm), sometimes have glandular hairs, and the lobes are either finger-shaped or longer and more numerous. The fruit is not glabrous.

B. eyrensis is a small decumbent annual. The ray florets are very small (1.5–2mm long cf. 2.5–6mm) and the leaves have 3–5 deeply cut lobes.

B. iberidifolia has a taller habit (to 40cm), the leaves are more lobed (5–10 or more), and the fruits are not glabrous.

B. pusilla is vegetatively identical, but the fruits bear hairs.

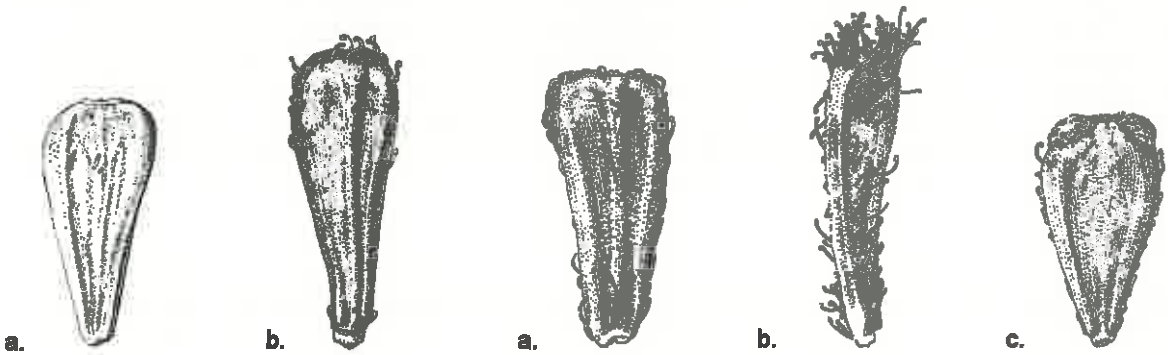
Special notes: ***Brachyscome bellidioides*** **belongs to a group of species known as the** ***B. iberidifolia*** **complex, which includes** ***B. exilis, B. eyrensis, B. iberidifolia*** **and** ***B. pusilla.*** **The species within this complex demonstrate much variation. The Study Group has tried to describe the species in the complex as they are known under the current taxonomy. In some cases the specimens in herbarium collections have been wrongly identified previously and this has led to much confusion.**

For a number of years seed which was wrongly identified as ***B. bellidioides*** **has been available from seed sources. Microscopic examination has revealed hairs on the body and shoulders of the fruits which indicates that they are seeds of** ***B. pusilla*** **or a hybrid between** ***B. pusilla*** **and** ***B. iberidifolia.*** **It should be noted therefore that many plants labelled** ***B. bellidioides*** **have been grown and distributed under the wrong name.**

Davis (1948) and Grieve and Blackall (1975) state that the ray florets of ***B. bellidioides*** **are white, but Marchant** ***et al.*** **(1987) observe that the ray florets may be sometimes blue.**

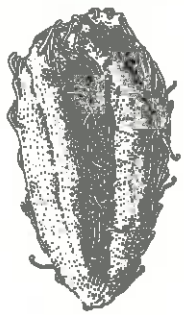
*** refers to the dimensions of the species in its natural habitat.**

B. exilis



a. Commercial seed b. Wreath Brachyscome a. Dookanooka, WA b. Thargomindah, Qld c. Darling Range, WA

B. iberidifolia



B. pusilla

Species *B. bellidioides* and *B. eyrensis* have yet to be collected by ADSG

Brachyscome iberidifolia complex (x 20)

Brachyscome blackii G. Davis

WOODY PERENNIAL
30–40cm high
20–30cm wide
MAUVE, WHITE

Derivation: *blackii* — after John McConnell Black (1855–1951), author of *Flora of South Australia* (1922–1929).

Stiff, open, upright perennial with a woody base. Dainty mauve or white flowers and light green, divided, very aromatic leaves.

Distribution and habitat: SA, WA, NT. Occurs among rocks on ridges or cliffs and on stony ground.

Description: In cultivation an erect, open, branching perennial to 40cm. The stems are woody at the base, often corky in appearance. The whole plant is covered with glandular hairs. **Leaves** are sessile, pale green and sticky, 1–3.5cm x 0.5–1cm, pinnate with up to 16 broad lobes, sometimes lobed again. **Flower-heads,** 1.5–2cm across, have 40–60 mauve or white ray florets. Heads are produced at the tips of short flower stems, 7–8cm long, bearing one or two pinnate leaves. **Fruits** are mid-brown, narrow, 1.5mm x 0.5–0.8mm, wedge-shaped and flattened. The margins are slightly thickened and two faint vertical ridges are present, but wings are absent. The faces usually bear sparse inrolled hairs and sometimes a few small tubercles. The pappus is either absent or microscopic. **In the wild** plants form dense bushes with corky stems and many small flower-heads.

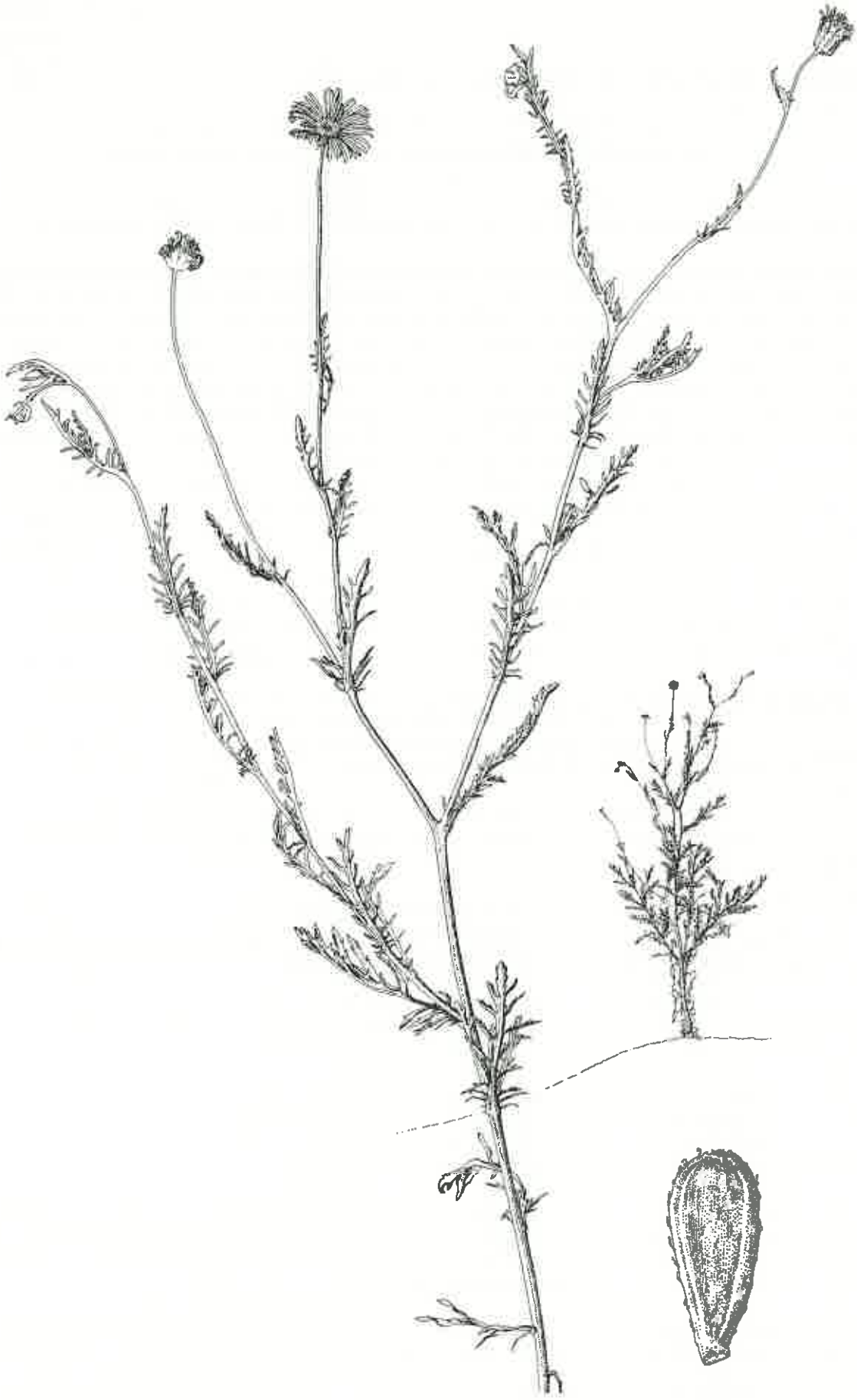
Flowering period: In their natural state plants flower from August to September, but in cultivation the flowering period starts later (usually October) and extends through the summer into autumn.

Cultivation and uses: *B. blackii* is a beautiful little bush in its natural habitat, but its cultivation has proved to be a challenge in cool, wet climates. Relatively fragile plants can be grown in pots but their appearance does not repay the effort. In warm, dry climates *B. blackii* could be a handsome garden plant. It requires well-drained soil and is best suited to an open situation in sun for at least half of the day. While plants are small the soil should not be allowed to dry out and the foliage should be protected from rain. Plants are prone to aphid attack.

Propagation: Seed germinates poorly in 12–30 days. Germination is more successful if pots are left outside in natural conditions and not watered artificially until seedlings appear. Propagate also from cuttings.

Similar species: Some forms of ***B. ciliaris*** could be mistaken for *B. blackii*. *B. ciliaris* is a perennial with similar divided leaves and it is sometimes woody at the base. It is distinguished by its fruits which are dimorphic.

B. tesquorum is also a woody perennial from Central Australia. It has very similar fruits and corky stems, but the leaves are either entire or have a few narrow teeth and are not sticky.



B. blackii — Ormiston Gorge, NT (x 1)

Fruit — Ormiston Gorge, NT (x 20)

Brachyscome breviscapis C. Carter

ANNUAL
*1–2cm high
*1–2cm wide
WHITE

Derivation: *breviscapis* — having short stems.

Tiny annual with entire or divided leaves in a basal cluster.
A plant for the specialist.

Distribution and habitat: SA. Occurs only along the western coast of the Eyre Peninsula to the Streaky Bay area. Grows in moist spots on limestone cliffs and on the margins of salt pans.

Description: In the wild a very small annual. **Leaves** in a basal cluster are somewhat succulent, linear and entire or pinnatisect, 5–7mm long, with 1–4 linear lobes occurring in the top half of the leaf. The lobes are 1–3mm x 1mm. A few septate hairs may be present near the base. **Flower-heads** are inconspicuous, 5–6mm across, with white ray florets less than 1mm long which hardly exceed the involucral bracts. The broad, blunt bracts have reddish purple margins. The flower stems are leafless, decumbent or ascending, often tinged reddish purple, and are 1–2cm long; the first formed stem is less than 1cm long. The fruiting heads are hemispherical; the seeds are packed into the involucre and are slow to shed. **Fruits** are wedge-shaped, brown, 1.5–2.2mm x 1–1.5mm. The body is cylindrical with a groove between it and the swollen wings. The wings are edged with a dense fringe of long inrolled hairs. The pappus is very conspicuous, 1mm long, and is composed of barbed white bristles of unequal length in fused bundles. The pappus is often shed whole.

Flowering period: Late winter and early spring.

Cultivation and uses: This species is so small that its horticultural potential appears to be non-existent. The only possible use might be as a subject for a miniature garden. The most suitable conditions would be full or part sun and calcareous soil in a shallow container.

Propagation: Members have trialled *B. breviscapis* only since late 1994. Seed germinated moderately well in 17–45 days following treatment with a seed primer that had been impregnated with smoke. It is too soon to know whether the pretreatment is necessary but it has hastened germination. Self sown seed has germinated after heavy autumn rains.

Similar species: ***B. dichromosomatica*** differs from *B. breviscapis* in that plants are much taller (to 25cm) and have heads up to 3.5cm across. The fruits are usually longer and the chromosome number is $n = 2$.

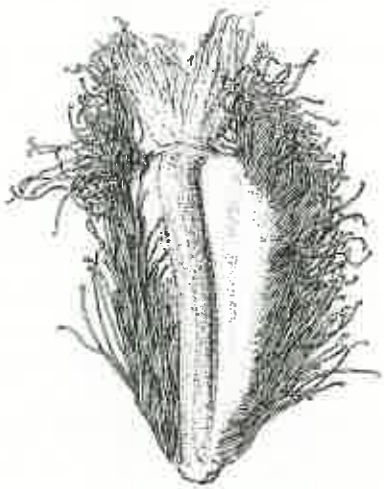
B. lineariloba looks like a taller form of *B. breviscapis.* It has longer ray florets (1–6mm) and the length of the flower stem is 2–20cm compared with 1–2cm. Cytodeme E (the smallest of the three *B. lineariloba* chromosome races) and *B. breviscapis* occur together on the western coast of the Eyre Peninsula. In these hard conditions the two may be very difficult to separate. The largest plants of *B. breviscapis* should be more robust and have several heads, while the smaller plants of *B. lineariloba* are very slender with only one or two heads. *B. lineariloba* tends to have less succulent, more lobed leaves.

B. xanthocarpa is a small white-flowered annual with a very restricted distribution on the central Eyre Peninsula. It differs from *B. breviscapis* in that plants have conspicuous ray florets, a few branching stems and they soon lose their basal leaves. The fruits are quite different; the body is covered with large yellow tubercles and the margin is pale green and smooth.

Special notes: The cytology of the *B. lineariloba* complex has been studied extensively since Smith-White and Carter (1970) recognized five unnamed species in this complex. These species were designated sp. A, $n = 2$; sp. B, $n = 6$; sp. C, $n = 8$; sp. D, $n = 4$; sp. E, $2n = 10$. Species D was subsequently recognized as a separate species, *B. breviscapis* C. Carter (1978b). See also Special notes in *B. lineariloba*.

***B. breviscapis* is self-compatible and largely inbreeding. Artificial hybrids have been produced by crossing *B. breviscapis* with *B. dichromosomatica* var. *alba* (Watanabe and Smith-White, 1987).**

*** refers to the dimensions of the species in its natural habitat.**



B. breviscapis — Haslam–Smoky Bay, SA a. dried plants showing mature seed in heads (x1)
b. head showing placement of seed on receptacle (x 10)
Fruit — Haslam–Smoky Bay, SA (x 20)

Brachyscome campylocarpa J. Black

Large White Brachyscome, Large White Daisy

ANNUAL
*10–25cm high
*10–20cm wide
WHITE

Derivation: *campylocarpa* — bearing bent fruit.

White-flowered annual. Difficult to propagate.

Distribution and habitat: Qld, SA. Occurs in north-eastern South Australia and has been recorded over the Queensland border at Birdsville. Grows on flood plains, at the base of sandhills and on road verges where the soil has been disturbed. A population with affinities to *B. campylocarpa* has been recorded in southern Queensland in the Yelarbon district.

Description: In the wild a branching annual to about 25cm. The stems are hairless and relatively thick. **Leaves** at the base may be pinnate or entire but are soon lost. Stem leaves are pinnate, up to 11cm long and reducing in size up the stem. There are 3–9 linear lobes. The leaf bases are dilated, slightly stem-sheathing, and bear a collection of long hairs. **Flower-heads** are white, 1.5–2cm across, on flower stems, 6–12cm long, with one or two small pinnate leaves at the lower end. **Fruits** are black, 2.5–3mm x 0.8–1mm, regularly curved. The thick wings are broader at the apex and irregularly lobed, each lobe bearing one or two marginal hairs. The pappus is conspicuous. The fruiting heads are conical.

Flowering period: Late winter to spring.

Cultivation and uses: The Study Group has no experience in growing *B. campylocarpa.* The horticultural potential of the species is extremely limited because *B. smithwhitei* is almost identical in appearance and is very much easier to grow.

Propagation: Despite valiant efforts seed has not germinated using normal sowing methods, but new procedures will be tested.

Forms:

- An entity from the vicinity of Yelarbon, Queensland, has similar fruit to that of *B. campylocarpa* but a comparatively erect habit and leaves with generally longer segments than in *B. campylocarpa.* The status of this taxon is yet to be resolved. Plants in this area have been observed growing in water up to their heads.

Similar species: ***B. dichromosomatica*** is another annual with pinnate leaves which occurs in South Australia. It does not have the pronounced stem development of *B. campylocarpa*, the fruit is brown and straight, and the fruiting heads are hemispherical rather than conical.

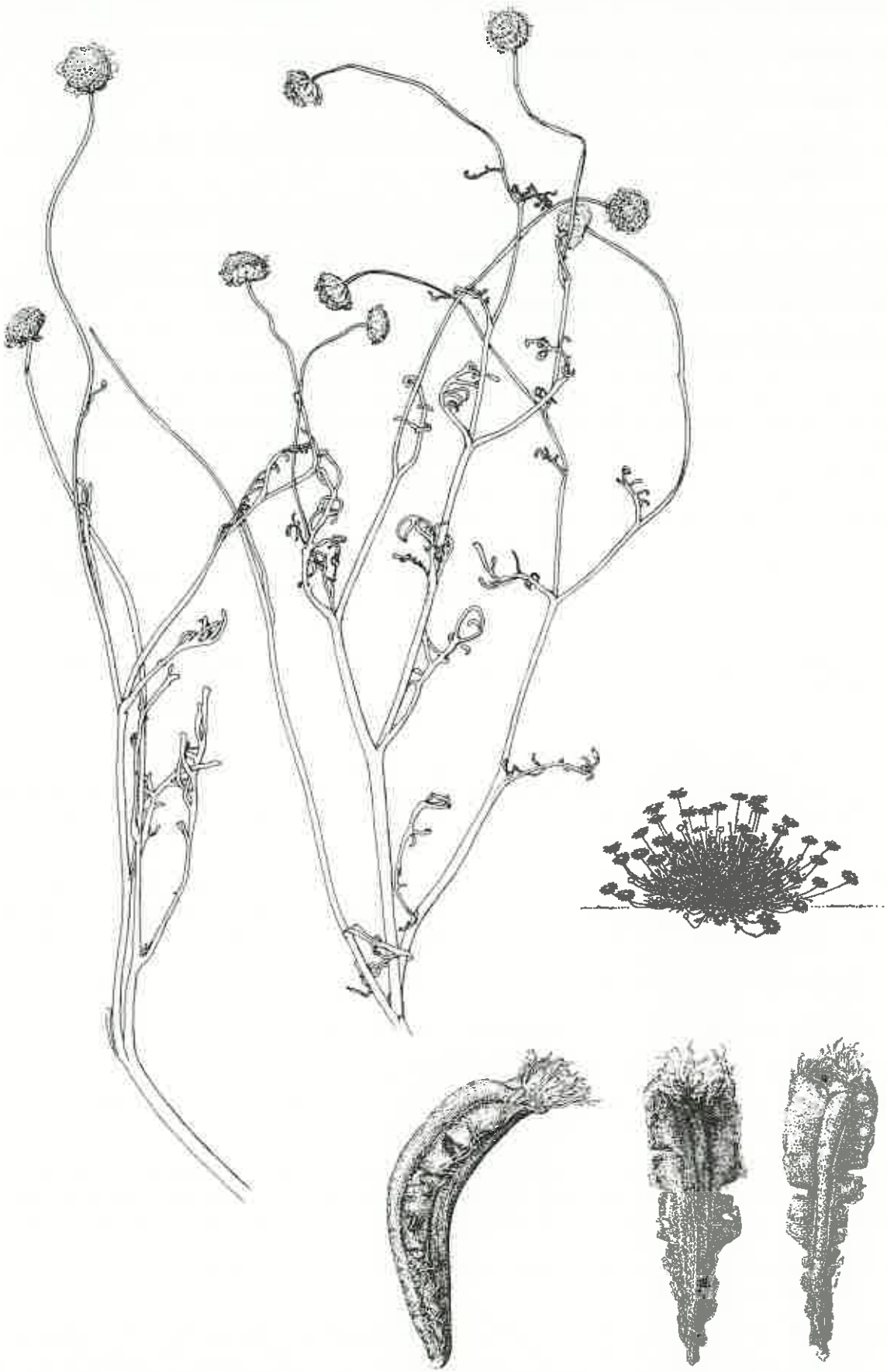
B. eriogona is a white-flowered annual with pinnate leaves which also occurs in north-eastern South Australia. The distinguishing character is the fruit; it is brown, strongly curved, the wings not dissected and inrolled hairs are present along the whole length of the wing.

B. lineariloba is a widespread annual with white flowers and pinnate leaves. It is distinguished from *B. campylocarpa* in that the stems branch at or near ground level, the fruit is brown and straight, and the fruiting heads are hemispherical rather than conical.

B. smithwhitei is morphologically similar, but is found only in Queensland and New South Wales. The distinguishing character is the fruit; it is dark brown to black, and there is a conspicuous wing only in the upper curved portion which is edged with inrolled hairs. There are two tufts of hair at the base.

Special notes: ***B. campylocarpa*** **has a chromosome number of** $n = 5$ **(Smith-White *et al.*, 1970, who referred to it as '*B. campylocarpa* sp. B').**

Davis (1948) included *B. smithwhitei* in her description of *B. campylocarpa*. Subsequently Smith-White *et al.* (1970) recognized three species within the *B. campylocarpa* complex on the basis of differing chromosome numbers. The three species were designated sp. A, $n = 4$; sp. B, $n = 5$ and sp. C, $n = 6$. After further work on chromosome numbers Watanabe and Short (1992) suggested that sp. A was *B. eriogona* which is widespread in northern South Australia, and sp. B was *B. campylocarpa sens. str.* (meaning in the strict sense). They suggested that sp. C was an undescribed taxon occurring in arid areas of southern Queensland and New South



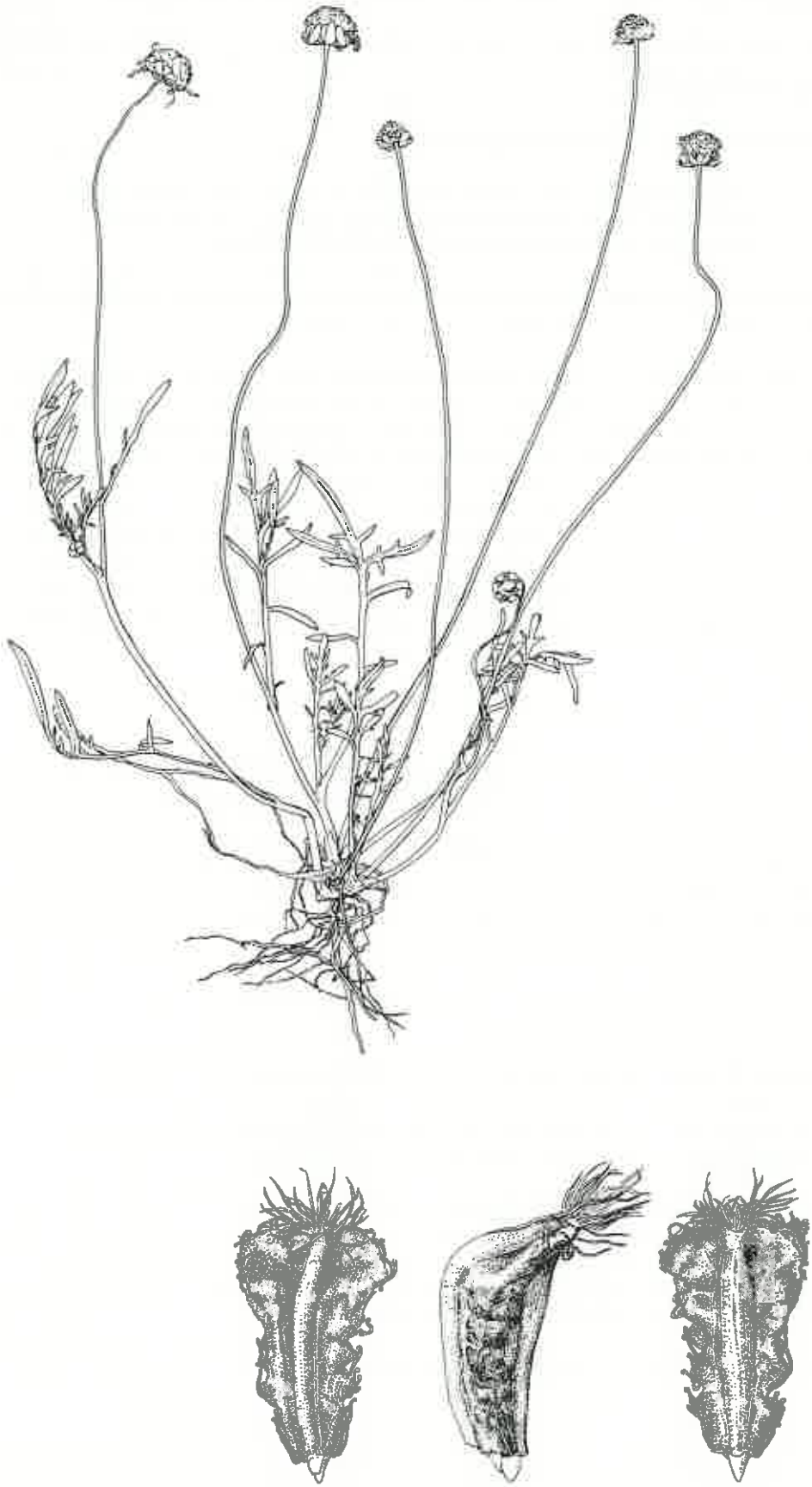
B. campylocarpa — Coober Pedy–William Creek, SA (x 1) Fruit — Coober Pedy –William Creek, SA (x 20)
[Illustrated from ADSG Herbarium]

Wales. In 1993 Short and Watanabe described sp. C as *Brachyscome smithwhitei* in *Aust. Syst. Bot.* 6. This recent work means that errors in the species distribution have been made. The following publications have included *B. campylocarpa* in New South Wales whereas it occurs only in Queensland and South Australia:

- *Australian Systematic Botany Society* (1981). *Flora of Central Australia* (Ed. J.P. Jessop) p. 370.
- Black, J.M. (1965). *Flora of South Australia* edn. 2 Part IV p. 855.
- Jacobs, S.W.L. and Pickard, J. (1981). *Plants of New South Wales. A Census of the Cycads, Conifers and Angiosperms* p. 72.
- Jessop, J.P. and Toelken, H.R. (Eds.) (1986). *Flora of South Australia* edn. 4 Part III p. 1448.

The illustration of the fruit (Fig. 71B) in Stanley, T.D. and Ross, E.M. (1986), *Flora of South-eastern Queensland,* Vol. 2, p. 512 appears to be of the fruit of the population occurring at Yelarbon. The pappus is absent and the wings have a pronounced swelling in the upper part.

*refers to the dimensions of the species in its natural habitat.



B. aff. *campylocarpa* — Yelarbon, Qld (x 1) [Illustrated from ADSG Herbarium]
Fruit — Yelarbon, Qld (x 20)

Brachyscome cardiocarpa F. Muell. ex Benth.

Swamp Daisy

PERENNIAL
20–40cm high
12–25cm wide
WHITE, MAUVE

Synonym: *B. linearifolia* Hook. f.

Derivation: *cardiocarpa* — having heart-shaped fruit.

Appealing perennial daisy with tufts of grass-like foliage, pink buds and large white or mauve flower-heads. A delight to the eye when growing in profusion in shallow pools.

Distribution and habitat: NSW, Vic, Tas, SA. Found on swampy ground, in wet depressions or open grasslands.

Description: **In cultivation** an upright, glabrous, perennial herb. **Leaves** are bright green, narrow and grass-like, forming a neat clump. The basal leaves are up to 28cm x 1–2mm, with entire margins and blunt tips. Three to five narrow leaves, 1–7cm long, appear up the stems; the upper, shorter ones often twist and curl around the stem. **Flower-heads,** 3–4.5cm across, are pale mauve or white and are produced singly at the tips of sturdy, erect unbranched stems, 20–40cm long, sometimes tinged red. The stems with their pendent buds of soft mauve, pink or cream straighten as the buds develop. The showy heads open and they turn their faces to follow the sun all day. **Fruits** are brown, 2mm x 2mm, flat with broad, thin wings. The margins are entire or undulating and bear short, glandular hairs. The pappus is obvious but small, no longer than the notch between the wings. **In the wild** *B. cardiocarpa* often grows and flowers in shallow water. Under these conditions the stems may be longer with larger flower-heads, up to 5cm across.

Flowering period: Winter to early summer. The main flowering period is July to October.

Cultivation and uses: Prefers sun or partial shade. This daisy adapts to most soils as long as they are moist. It will not tolerate frost, but grows naturally in some coastal areas where it is protected from salt spray. As the buds appear so do the aphids. Squash them or spray with pyrethrum in order to obtain large, perfect flowers. This species regenerates well after bushfire, and shoots again from the perennial root following good autumn rain. Plants regenerate even if the ground is occasionally mown. When planted in the garden flowering has been poor, the plants have never flourished and have ultimately died, probably due to dry conditions. *B. cardiocarpa* is best suited to a container standing in water and is an ideal bog plant.

Propagation: To date germination has been poor from seed. Seedlings have taken 11–28 days to appear. Division of the rootstock is easier.

Similar species: ***B. basaltica* var. *gracilis*** grows in similar habitats and might be confused with the white-flowered form of *B. cardiocarpa*. *B. basaltica* var. *gracilis* is distinguished by several characters; the heads are smaller (2–3cm across), the stems are branching and the habit is rhizomatous. The fruits have tubercles on the faces and the pappus is a minute ring.

***B. uliginosa*,** the Small Swamp Daisy, might be mistaken for *B. cardiocarpa* because it grows in similar habitats, flowers on unbranched stems and has a winged fruit. *B. uliginosa* is easily differentiated by the leaves; it has a small, basal tuft of dark, oblanceolate leaves, 4–9cm x 5–10mm, which may be entire or have one or two lobes. The head is usually smaller, 2–2.5cm across, white or pale mauve, and the flower stem is only 10–20cm long.

Special notes: ***B. cardiocarpa* has a chromosome number of *n* = 9 (Smith-White *et al.*, 1970).**

B. cardiocarpa — Poolaijelo, Vic (x 1)

Fruit — Mt Wallace, Vic (x 20)

Brachyscome cheilocarpa F. Muell.

ANNUAL
10–30cm high
10–30cm wide
MAUVE-PINK

Derivation: *cheilocarpa* — having lipped fruit.

Pretty, small herb from semi-arid areas, similar to *B. ciliocarpa* in appearance. Appealing mauve-pink heads with ray florets curving under gently. Showy when massed.

Distribution and habitat: WA. Occurs in the Austin district on red sands, red sandy loams or claypans in mallee scrub.

Description: In cultivation this species acts as an annual in the experience of Study Group members although it has been described as 'probably perennial' by Davis (1948). An upright or ascending herb, 10–30cm high, with stems branching near the base, and again branching once or twice as plants develop. The fleshy stems are leafy and tend to break very easily. **Leaves** are 2–6cm long, deeply lobed with 6–12 narrow lobes. The lobes are 1–3.5cm x 1–2mm, and may be entire or have secondary lobes. Stems and leaves bear a variable number of septate hairs. **Flower-heads,** 2.5–3.5cm across, appear singly at the tips of leafy flower stems 10–15cm long. The mauve-pink ray florets are broader (to 5mm across) and fewer in number (10–15) than they are in most *Brachyscome* species. They reflex quickly after unfolding, an unusual characteristic which is shared with the closely related group made up of *B. ciliocarpa, B. halophila* and *B. oncocarpa.* The involucral bracts are lanceolate with thread-like tips and septate hairs on the outer surface. **Fruits** are straw-coloured to brown 2–2.5mm x 1–1.5mm, wedge-shaped, and thickened at the apex. The body is flattened and bears tubercles, some of which have long hairs attached to them. The most outstanding feature of these fruits is the large, bladder-like swelling at the apex. There is a narrow, irregularly lobed wing with long stiff inrolled hairs on the margin. The pappus has bristles of various lengths and it is conspicuous. **In the wild** the heads are usually smaller (1.5–2cm across) and the ray florets are narrower. Individual plants are often only 6–10cm x 2.5–8cm in their natural habitat, but when massed they can be a most impressive sight.

Flowering period: July to October in Western Australia, depending on rainfall. In south-eastern Australia this species has flowered in autumn and winter when sown in mid-February.

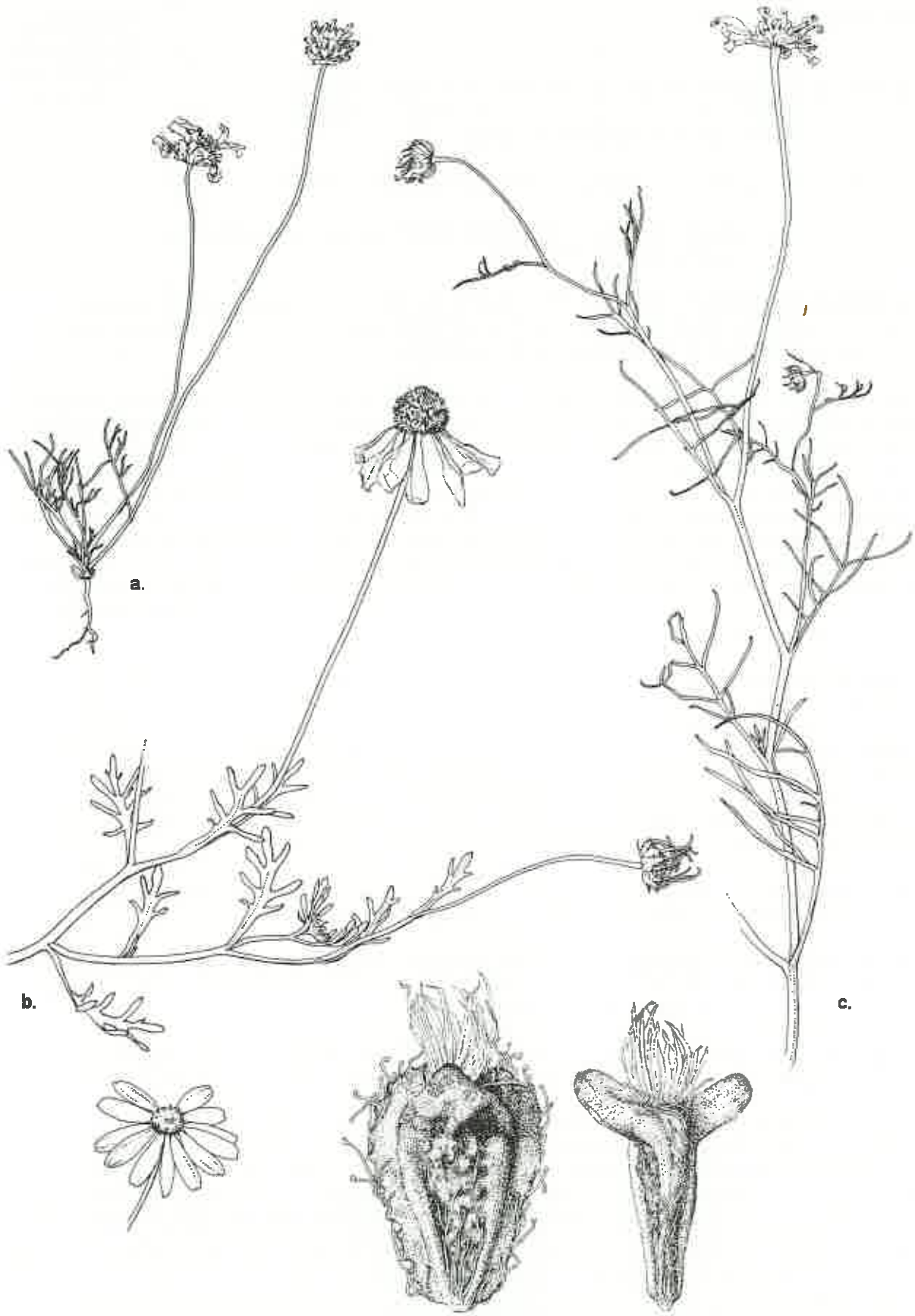
Cultivation and uses: *B. cheilocarpa* has not prospered in the cold, wet winters it has encountered in Victoria. It has been grown successfully in South Australia, but in both States it has been trialled in the relative safety of containers. Good drainage and protection from cold seem to be required. Experience has taught that in cultivation succeeding generations often become easier to grow, so we should do more work with this species before pronouncing sentence.

Propagation: Seed usually begins to germinate 6 days after sowing. Percentage germination is low. It is said to be capable of rooting from cuttings.

Similar species: *B. cheilocarpa* bears many similarities to ***B. ciliocarpa, B. halophila*** and ***B. oncocarpa,*** all of which are members of the *B. oncocarpa* complex. The four species have broad ray florets which droop quickly and are relatively few in number (9–15 per head). The fruits all possess the unique feature of having two large secretory canals in the pericarp (Watanabe and Short, 1992). *B. cheilocarpa* is the only member of the complex to have lanceolate involucral bracts with thread-like tips and septate hairs on the outer surfaces.

B. dichromosomatica* var. *dichromosomatica has pinnate leaves and large, pale mauve ray florets. The flower stems are usually leafless and the fruit does not have a bladder-like swelling at the apex.

Special notes: ***B. cheilocarpa* has a chromosome number of *n* = 9 (Carter, 1978a). As more herbarium specimens in this complex are collected and examined, the range of variation within each species is increasing. Future revision may see a number of changes taking place within this complex.**



B. cheilocarpa — a. Yalgoo–Mullewa, WA, b. Monkey Mia, WA, c. Onslow Cemetery, WA (x 1) [Illustrated from ADSG Herbarium] Flower-head (x 1) [Illustrated from print] Fruit — Paynes Find–Yalgoo, WA (x 20)

Brachyscome chrysoglossa F. Muell.

Yellow-tongue Daisy

PERENNIAL
20–30cm high
30–50cm wide
YELLOW

Synonyms: *B. marginata* Benth. var. *chrysoglossa* (F. Muell.) G. Davis [*B. heterodonta* DC. var. A incorrectly cited in Jacobs and Pickard (1981), and Everett, J. (1992)].

Derivation: *chrysoglossa* — gold tongue, referring to the gold ray florets.

Easily grown perennial with yellow ray florets. A rather untidy habit in cultivation.

Distribution and habitat: NSW, Vic. (After revision this distribution may need to be extended.) Occurs in inland New South Wales and just over the border into Victoria. Grows on heavy grey or black clay in grasslands or on floodplains under scattered eucalypts.

Description: In cultivation a branching perennial with ascending stems. The basal stems are almost glabrous. **Leaves** are sessile, 1–6cm x 1–10mm, variable in shape; some with 3 blunt lobes at the apex, others wedge-shaped with 5–10 irregular teeth around the margin. The shorter leaves may be entire. A few glandular hairs are scattered over the surface and there are woolly hairs around the margin. Young growth is more hairy. The basal tuft of leaves is lost as the plant develops. **Flower-heads** are 1.5–2cm across on flower stems 12–18cm long. These stems bear 2–4 leaves at the base and sparse glandular hairs which become more numerous just below the head. **Fruits** are brown, 2–2.5mm x 1.5–2mm. The body is obovate with scattered inrolled hairs over both faces. There is a smooth, slightly raised margin. The wing is irregularly lobed, edged with inrolled hairs and may be flat or curved inwards. The pappus is obvious and the bristles are of unequal length. **In the wild** plants are more upright than they are in cultivation.

Flowering period: Spring in its natural habitat, late winter to autumn in cultivation.

Cultivation and uses: Yellow ray florets are rare in the genus *Brachyscome*, so this is a species which should be grown more often. It has a tough disposition, but is unfortunately somewhat untidy and sprawling in its habit. Although it disappears when the soil dries out it reappears when soil moisture is adequate. *B. chrysoglossa* grows well in sun or dappled shade, prefers moist soil and has a more upright habit if the soil is heavy. This species could be used in a rockery or massed in the garden, but is not neat enough for containers.

Propagation: Seed germinates at a rate of 15–20% in 10–40 days. Seedlings need protection in cold, wet weather. It may be preferable to sow in early spring. Cuttings strike easily.

Similar species: ***B.* aff. *curvicarpa*** is the only other entity with yellow ray florets. There is very little difference between the two entities; *B.* aff. *curvicarpa* has more glandular hairs on stems and leaves and the fruits are strongly curved with infolded wings.

B. dentata may open with pale yellow ray florets in some forms, but the florets then age to white. A further difference is that the body of the fruit is covered with long finger-like tubercles.

Special notes: ***B. chrysoglossa*** **is included in the *B. dentata* complex and it has a chromosome number of *n* = 4 (Short, 1994). This taxon was described by Davis (1948) as a variety of *B. marginata* Benth. and she named it var. *chrysoglossa* (F. Muell.) Davis. She observed that the ray florets were 'brilliantly orange-yellow', but that it was otherwise identical with *B. marginata*. In fact, the fruits of this yellow-flowered entity differ from those of *B. dentata* (syn. *B. marginata*) in having inrolled hairs on the body rather than large, conspicuous tubercles, and a narrow, irregularly lobed or toothed wing. It is because of these differences that the taxon is thought to be worthy of specific rank and the name *B. chrysoglossa*, first reinstated in Ross (1990) and used by Watanabe and Short (1992), has been accordingly adopted in this book.**

It is difficult to delineate the two yellow-flowered brachyscomes, *B. chrysoglossa* and *B.* aff. *curvicarpa*. At the southern extremity of the range *B. chrysoglossa* is sparsely glandular-hairy and the fruits are mainly flat. At the northern extremity *B.* aff. *curvicarpa* is densely glandular-hairy and the fruits are strongly curved like those of *B. curvicarpa* (although they are brown rather than black). The wing margin is usually entire and somewhat thickened. Between the two extremities there appears to be a gradation of these characters.

B. chrysoglossa — Ulupna Island, Vic (x 1)

Fruit — Ulupna Island, Vic (x 20)

Brachyscome ciliaris (Labill.) Less.

Variable Daisy, Fringed Daisy, Bushy Cut-leaf Daisy

ANNUAL, PERENNIAL
20–40cm high
10–40cm wide
MAUVE, WHITE

Synonyms: *Bellis ciliaris* Labill.
Brachyscome drummondii Walp.
B. dimorphocarpa G. Davis
B. billardieri Benth. *nom. illeg.*

Derivation: *ciliaris* — fringed with hairs.

An extremely variable herb with a long flowering period.
Some forms make very attractive garden plants.

Distribution and habitat: Qld, NSW, Vic, Tas, SA, WA. (Reports of *B. ciliaris* occurring in Tasmania may be erroneous.) Widespread on the mainland in inland habitats as diverse as woodland, shrub and mallee communities, sandhills, gibber plains and claypans. Grows in relatively dry situations on most soil types.

Description: In cultivation a variable, much-branched herb, usually with an erect, bushy habit. Plants are generally hairy, rarely glabrous. **Leaves** are 1–6cm long, either entire, lyrate or pinnatisect with 3–9 pointed lobes which may be lobed again. Short glandular hairs or woolly hairs may be present or the leaves may be glabrous. **Flower-heads** are white or mauve, 1–2.5cm across, on flower stems 3–6cm long with one or two leaves near the base. **Fruits** are dimorphic, i.e. the ray and disc fruits are of different shapes. The **ray fruits** are narrow, obovate, 1.5–1.8mm x 0.5–0.8mm, dark brown to black with flattened tuberculate faces and a smooth margin. The pappus is minute. The **disc fruits** are brown to grey-black, obovate, 2–3mm x 1.8–2mm. The surface is smooth and usually bears a number of hairs. The broad wing is shallowly lobed or entire and edged with long inrolled hairs. The pappus is conspicuous. **In the wild** some of the forms are extremely showy, especially after good rains, but the stiff dead foliage from previous years often detracts from the plant's appearance.

Flowering period: *B. ciliaris* flowers most of the year in the wild. In cultivation it flowers when the weather is warm, dying back in the colder months.

Cultivation and uses: Plants prefer full or part sun, and supplementary water in dry spells. They tolerate frost to –7°C. Prune to keep tidy. Use in rockeries and scattered about the garden singly or in groups. Some forms are suitable for hanging baskets or containers.

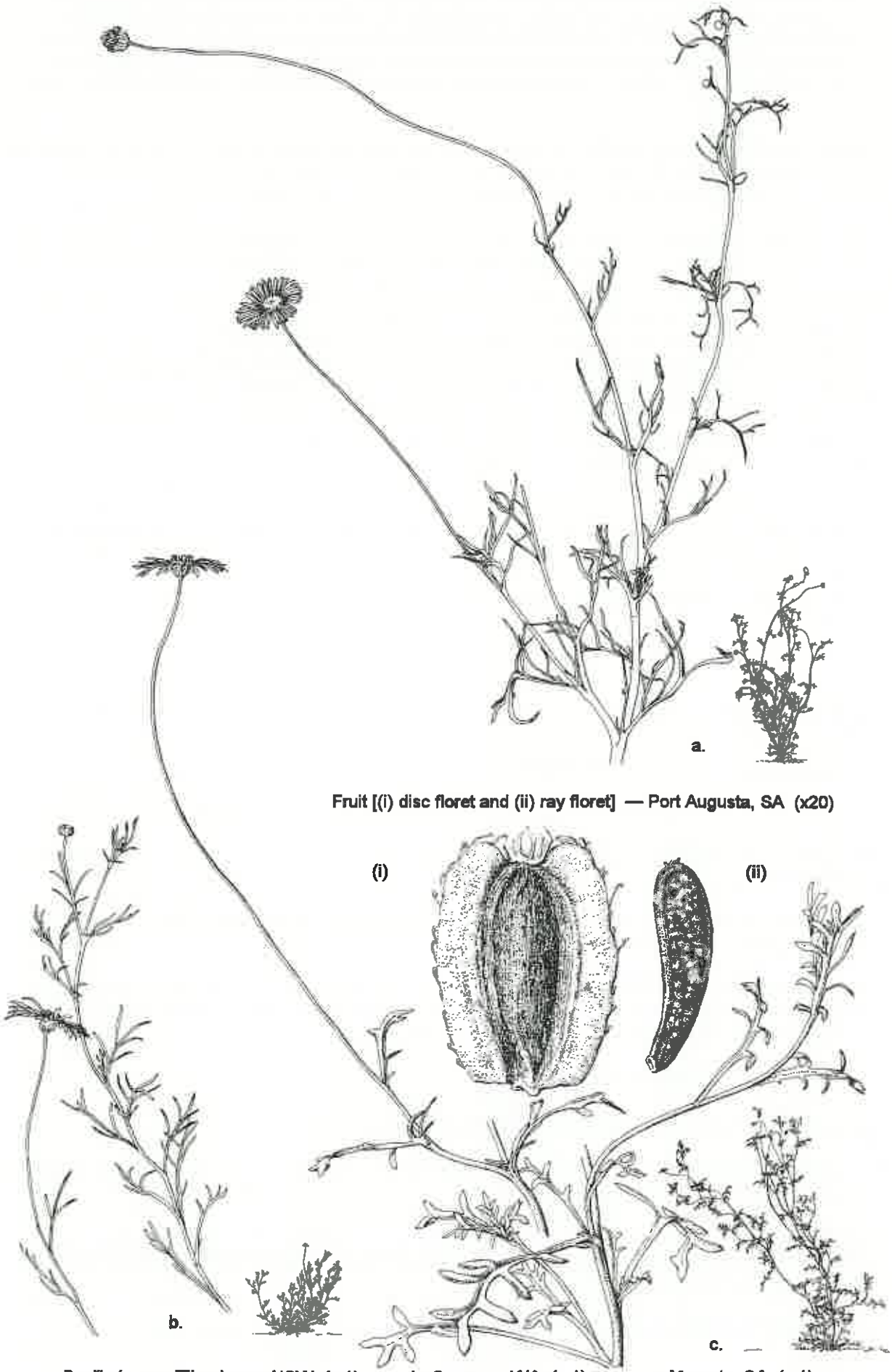
Propagation: Wild seed germinates rather poorly in 8–60 days, but seed collected from garden-grown plants germinates in 2–10 days and there is a marked increase in percentage germination. Once established, this species self-sows generously in gardens. Stem cuttings strike easily.

Varieties: Four varieties have been recognized by Davis (1948); var. *ciliaris*, var. *lanuginosa* (Steetz) Benth., var. *lyrifolia* (J. Black) G. Davis and var. *subintegrifolia* G. Davis. Subsequently, a fifth variety from the Murraylands in South Australia was described, var. *brachyglossa* E. Gauba. These varieties have been based on morphological variation of leaf shape, type of hair and length of ray floret. There is considerable variation, however, within the varieties. Watanabe and Short (1992) suggest that it may be preferable to recognize only one variety, var. *lyrifolia*. This variety will be described separately.

Forms:

- A form from Monarto (SA) has great horticultural potential. Plants are annual, upright at first (25cm x 15cm) with pinnatisect foliage. They produce masses of dainty mauve heads (1.5–2cm across) with many fine ray florets. The young leaves and stems are dense with short glandular hairs. The weight of the heads pulls the stems down, so this form is eminently suitable for trailing over a wall or hanging basket. The flowering period is long and the ray florets turn white from May to July.

- A form from Port Augusta (SA) grows 20cm tall. The young stems appear silvery due to a dense covering of woolly hairs.



Fruit [(i) disc floret and (ii) ray floret] — Port Augusta, SA (x20)

B. ciliaris — a. Tibooburra, NSW (x 1), b. Ongerup, WA (x 1), c. Monarto, SA (x 1)

B. dimorphocarpa has been included in *B. ciliaris* (Cooke, 1985). There is a strong vegetative similarity and the fruits are dimorphic. It differs from *B. ciliaris* in the appearance of the disc fruit which is curved and has inrolled wings. In cultivation plants grow 15–20cm x 15–20cm. Stems branch and have short glandular hairs which are more numerous near the head. Leaves are pinnatisect with 7–11 lobes. Flower-heads are mauve-pink, 2cm across, on flower stems 7–8cm long.

Similar species: ***B. trachycarpa*** and other perennials with pinnatisect foliage, such as ***B. multifida*** and ***B. rigidula***, appear vegetatively similar, but *B. ciliaris* is the only species in the genus with dimorphic fruits. The two shapes can be clearly seen if a good hand lens is used.

Special notes: The ***B. ciliaris*** complex is difficult to classify. Davis (1964) reported that var. ***ciliaris*** and var. ***lanuginosa*** were apomictic, that is they produced viable seeds which had been formed without fertilization.

A number of workers later reported polyploidy in ***B. ciliaris*** [DeJong (1963), Turner (1970), Smith-White ***et al.*** (1970) and Carter (1978a)]. Chromosome numbers of $n = 9$, 18, 27 and 36 have been determined. Carter (1978a) observed that there was no strict correlation between the varieties described by Davis on morphological grounds and the different polyploids. All the polyploids examined by Carter were pollen-sterile. Two diploids with $n = 9$ produce normal pollen; one is var. ***lyrifolia*** and the other is a morphologically different entity collected from the Ongerup district in Western Australia. The latter does not fit into any of the varieties described by Davis.

Watanabe and Short (1992) suggest that in view of the fact that the ***B. ciliaris*** complex is an apomictic polyploid group, it may not be desirable to describe and name taxa within it.

Brachyscome ciliaris (Labill.) Less. **var. *lyrifolia*** (J. Black) G. Davis

PERENNIAL
5–10cm high
5–15cm wide
MAUVE

Synonym: *B. lyrifolia* J. Black

Derivation: *lyrifolia* — lyre-shaped leaves.

Weak perennial with trailing stems. Difficult to grow.

Distribution and habitat: SA. Occurs only in the Flinders Ranges. Grows in the rock faces of gorges and in woodland.

Description: **In cultivation** a perennial with ascending or decumbent stems densely covered with a mixture of septate and glandular hairs. **Leaves** are soft and limp, 0.5–3cm x 2–10mm, obovate or lyrate with 3–8 quite broad lobes. The base is narrowed into a short stalk. Septate and glandular hairs cover both leaf surfaces. **Flower-heads** are mauve, 1.5–2cm across, on flower stems 2–4cm long. **Fruits** are as described for *B. ciliaris*. **In the wild** var. *lyrifolia* is a small perennial (5–15cm wide) with trailing stems and roots firmly anchored in the rock fissures.

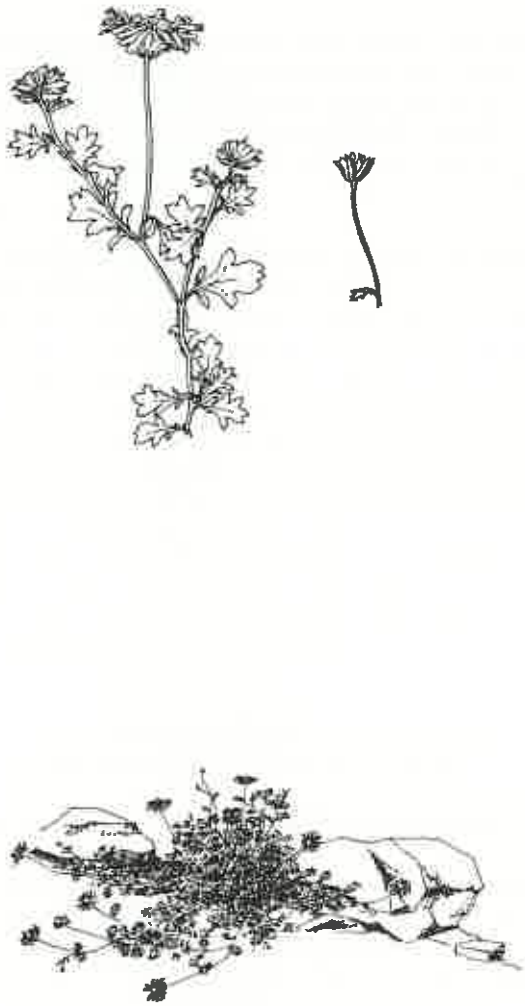
Flowering period: From May to October.

Cultivation and uses: Little horticultural potential is displayed by this variety.

Propagation: Fruits are rarely found and do not germinate well. Plants may be grown from cuttings but are usually weak and difficult to keep alive.

Similar species: The habitat of var. *lyrifolia* is so restricted that it is unlikely to be mistaken for any other species. The dimorphic fruit distinguishes it from ***B. leptocarpa*** and ***B. trachycarpa*** which are also found in the Flinders Ranges.

Special notes: The chromosome number of var. ***lyrifolia*** is $n = 9$ (Watanabe and Short, 1992).



B. ciliaris var. *lyrifolia*— Chambers Gorge, SA (x 1) [Illustrated from ADSG Herbarium]

Brachyscome ciliocarpa W.V. Fitzg.

Showy Daisy, Ciliate-fruited Daisy

ANNUAL
10–30cm high
10–30cm wide
MAUVE-PINK

Derivation: *ciliocarpa* — having fringed fruit.

Small annual from semi-arid areas with large, showy, mauve-pink flower-heads, divided leaves and tufted habit.
A magnificent sight in its natural habitat.

Distribution and habitat: Qld, NSW, WA. There are two forms of *B. ciliocarpa.* The form from eastern Australia occurs inland in Queensland from the Charleville and Quilpie areas south to the Sturt National Park and east to the North Western Plains in New South Wales. The form from Western Australia occurs inland in the Austin and Irwin districts. Found on red sands or loams, on sand plains and low hills, usually under the cover of mulga scrub or mallee woodland. May also occur on the edges of lakes.

Description: In cultivation an upright, annual herb, 10–30cm high, with many branching stems. **Leaves** are 0.5–10cm x 0.3–4cm, deeply divided into long narrow lobes and are produced at the base and up the stem. The lobes may be up to 2.5cm x 1mm and may bear secondary lobes. The degree of hairiness and the types of hairs differ in plants from different origins (see Forms below). **Flower-heads,** 2.5–3.5cm across, appear singly at the tips of glabrous flower stems, 5–13cm long, which are usually robust and bear a few leaves. There are 12–15 large mauve-pink ray florets which make the head conspicuous, but they reflex quickly and drop off easily. The involucral bracts are hairless, broadly ovate in shape and the tips are subacute. **Fruits** are brown, 2–2.5mm x 1–1.2mm, wedge-shaped, thick and usually four-angled. The centre of each face is slightly depressed and bears a number of curling white hairs. In *B. ciliocarpa* (WA) the sides have a raised vertical ridge with curling hairs along it. In *B. ciliocarpa* (eastern Australia) the fruits lack the long hairs on the shoulders. The pappus bristles are long, conspicuous, and usually lie flat along the top of the fruit. **In the wild** the flower-heads may be up to 5cm across. It is a breathtaking experience to see swathes of this species flowering naturally.

Flowering period: *B. ciliocarpa* flowers at any time during winter or spring following good rainfall. Under cultivation in warm climates it may flower as early as May.

Cultivation and uses: This attractive annual will grow in shade or dappled sun. It prefers well-drained soils and tolerates frost. Unfortunately, the flowering period is short, sometimes only two weeks, and plants die off quickly in hot weather. By comparison, the Swan River Daisy, *B. iberidifolia,* flowers profusely for ten to twelve weeks. The cold, wet southern winters are not to its taste, but *B. ciliocarpa* is such a beautiful species we should persevere with it and try to improve its horticultural performance by selection.

Propagation: In Perth seed germinates in 8–45 days. In Adelaide good results are achieved by sowing seed in large pots and withholding water until rain triggers germination. In Melbourne seed germinates in 6–60 days when sown in summer or early autumn. Seedlings have germinated in January, three days after an overnight rainfall of 48mm — a testimony to the ephemeral nature of this species.

Forms:

- Plants from Queensland and New South Wales are glandular-hairy, but not septate-hairy. The fruits usually lack the long hairs on the shoulders.
- Plants originating in Western Australia are hairless, although the insides of the leaf bases (especially of the lower leaves) usually bear a few septate hairs. The fruits have long hairs on the shoulders.
- Some forms collected north of Newman (WA) have fruits which resemble the eastern Australian forms.

Similar species: Both forms of *B. ciliocarpa* are similar in many respects to ***B. chellocarpa, B. halophila*** and ***B. oncocarpa*** — all being members of the *B. oncocarpa* complex.

B. ciliocarpa — Paynes Find–Yalgoo, WA (x 1)

Fruit — Paynes Find–Yalgoo, WA (x 20)

B. cheilocarpa differs from *B. ciliocarpa* (WA and eastern Australia) in having lanceolate involucral bracts with thread-like tips and a few septate hairs on the outer surface. The fruit has a pronounced bladder-like swelling at the apex of each face and an undulating wing edged with apically inrolled hairs.

B. halophila differs from *B. ciliocarpa* mainly in that there is no pappus on the fruit.

B. oncocarpa is very similar to *B. ciliocarpa* (WA), the main difference being in the development of conspicuous swollen shoulders on the fruit. This character may simply be at one extreme of a range of shapes. *B. oncocarpa* differs from *B. ciliocarpa* (eastern Australia) in the development of the conspicuous shoulders on the fruit, and in the presence of septate hairs on the leaves and basal parts of the stem.

Special notes: *B. ciliocarpa* (WA and eastern Australia) are included in the *B. oncocarpa* complex. All members have fruit with two large secretory canals in the pericarp and a chromosome number of $n = 9$ (Watanabe and Short, 1992).

A number of unnamed entities in the complex differ in the appearance of the fruit and the number and type of hairs on the leaves, stems and bracts. Future revision will determine whether they are new species. Watanabe and Short (1992) observe, 'The true application of the names *B. ciliocarpa* and *B. clementii* Domin are also yet to be ascertained. In keeping with current usage, in this paper the name *B. ciliocarpa* is used for the eastern Australian collection, *Short 3607*. The name is, however, likely to be either reduced to synonymy under *B. oncocarpa* or, if retained, apply to a western taxon.'

B. clementii was described by Professor Karel Domin in *Bibliotheca Botanica* in 1929. The specimens were collected by E. Clement in Western Australia between the Ashburton and De Grey Rivers. Davis (1948) suggested that the species would be identified as *B. cheilocarpa*, but was unable to find the syntype specimens to prove her supposition.

B. ciliocarpa (eastern Australia) — a. Eulo–Cunnamulla, Qld; mallee woodland (x 1)
b. Eulo–Cunnamulla, Qld; red sand mulga (x 1)
[Illustrated from ADSG Herbarium]
c. Quilpie, Qld; flower-head and bud (x 1) [Illustrated from print]

Brachyscome cuneifolia Tate

PERENNIAL
15–30cm high
10–20cm wide
WHITE, PINK (rarely)

Derivation: *cuneifolia* — wedge-shaped leaf.

Neat perennial with single heads held erect on sturdy stems above a basal cluster of leaves. Not easy to grow.

Distribution and habitat: SA. Occurs in calcareous soils under eucalypts or scrub in south-eastern South Australia. It also grows on coastal cliffs.

Description: In cultivation a perennial spreading slowly by suckering. The stems are erect, usually unbranched but may branch once or twice near the base. **Leaves** in the basal cluster are sessile, 3–6cm x 0.5–1.5cm, thick, spathulate to oblanceolate and with lobed margins. The leaves are either glabrous or bear fine glandular hairs. **Flower-heads** are 2–3cm across on flower stems to 20cm long. The stem leaves (3–6) are narrow, decreasing in size up the stem, sessile, the blade toothed or entire. A few glandular hairs are present on the flower stems, becoming more numerous near the heads. Ray florets are white with mauve-tinged reverses or pink (rarely). Involucral bracts are broad, oblanceolate or elliptical, blunt, and either glabrous or with sparse glandular hairs. **Fruits** are brown, 3–4mm x 1–2.5mm, with a few hairs on the faces. The wing is broad, irregularly lobed and fringed with small hairs. The pappus bristles are short and of uneven length. **In the wild** plants can grow up to 50cm high in deep sand, but the height varies with the habitat. On coastal cliffs plants may grow to only 15cm.

Flowering period: From August to October in its natural habitat, but in cultivation it flowers mainly in spring and intermittently in autumn.

Cultivation and uses: *B. cuneifolia* is new to cultivation. Coastal forms should do well in seaside gardens. Protect the roots and ensure the soil does not dry out. This species will grow in alkaline soils. Use in rockeries or group in the garden.

Propagation: Seed germinates in 10–25 days but seedlings are difficult to raise. Propagate also from cuttings or by division.

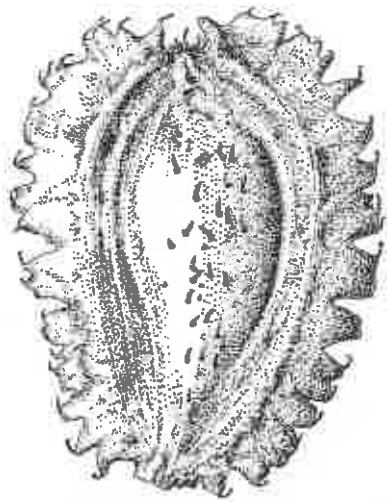
Forms:

- A form from Tintinara has a neat habit and erect stems to 30cm. Heads are predominantly white with a small proportion of pink-flowered plants in the population. Plants are sometimes weak and flower poorly in cultivation.

- A form from Yorke Peninsula has white flower-heads 1.5–3cm across on flower stems 15–40cm long which bear 4–6 leaves.

- Forms from western Victoria. More than one species may exist under *B. cuneifolia*. Specimens collected from the Derrinallum district and small populations in the Grampians show affinities with *B. aculeata* and *B. cuneifolia* and are entities of uncertain status. They are perennials, 20–30cm high, slowly spreading 15–30cm by suckering. Leaves at the base are sessile, thick, 2–8cm x 0.5–1cm, oblanceolate with 6–10 lobes. A few glandular hairs and sparse woolly hairs are present. Flower-heads are white, sometimes mauve beneath, 2–3.5cm across, on flower stems to 25cm bearing 3–4 leaves in the lower half. Glandular hairs are sparse on the flower stems, becoming more numerous immediately below the heads. Involucral bracts are oblanceolate with torn purple margins and are sparsely glandular-hairy at the base. Fruits are similar to those of *B. cuneifolia*, but the pappus bristles appear more conspicuous. Until the status of these entities is established, the Study Group refers to them as *B.* aff. *cuneifolia*. In cultivation plants flower in spring and autumn and sporadically over summer. They prefer sun, moist soil and root protection and are excellent subjects for bog gardens, but will also grow in quite dry conditions. *B.* aff. *cuneifolia* is easier to grow than *B. cuneifolia*.

Similar species: ***B. aculeata*** is a white-flowered perennial with similar fruit but longer pappus bristles. It also differs in that the basal cluster is not persistent, the stems branch more often and are obviously hairy. *B. aculeata* does not occur in South Australia.



B. cuneifolia [drawn from regenerating plant] – Tintinara, SA (x 1)

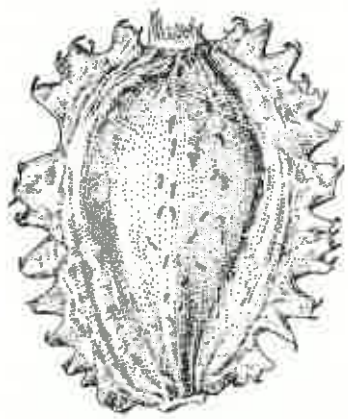
Fruit — Tintinara, SA (x 20)

B. sieberi* var. *gunnii is also a white-flowered perennial. Distinctive characters are that the pappus bristles are long and obvious, the basal cluster is not persistent and the involucral bracts have acute tips. This species only occurs in Tasmania.

B. spathulata is a perennial with a persistent basal cluster and the fruit is generally similar in appearance, but the flower-heads are usually mauve. It can also be distinguished by the longer pappus bristles and the tapered involucral bracts.

Special notes: Davis (1948) considered ***B. cunelfolia*** to be conspecific with ***B. aculeata***, but Stace (1981) found that reproductive barriers were present in varying degrees between the members of the ***B. aculeata*** complex and she reinstated ***B. cunelfolia*** as a separate species. The chromosome number is $n = 9$ (Stace, 1981).

B. aff. *cuneifolia* — Derrinallum, Vic (x 1)



Fruit — Derrinallum, Vic (x 20)

Brachyscome curvicarpa G. Davis

Curved-seed Brachycome, Curved-seed Daisy

ANNUAL
15–25cm high
20–50cm wide
WHITE, MAUVE

Derivation: *curvicarpa* — having curved seeds.

Branching annual with lobed leaves. Suitable for inland climates.

Distribution and habitat: Qld, NSW. Occurs on the Darling Downs in Queensland and the Western Plains and Central Western Slopes of New South Wales. Grows in saltbush communities and on the grey or brown clays of floodplains.

Description: In cultivation a glandular-hairy annual with ascending branches. The stems bear long, septate-glandular hairs and some woolly hairs. **Leaves** in the basal cluster soon wither. The stem leaves are sessile, moderately hairy, 4.5–6.5cm x 2–10mm, pinnatifid with 5–9 lobes, some broad, some linear. **Flower-heads** are white or pale mauve, 2–2.5cm across, held at the tips of flower stems 12–24cm long. One or two small lobed leaves are present near the base. **Fruits** are black, strongly curved, 1.8–2.2mm x 1.5–2mm. The body is obovate and has white inrolled hairs which sometimes arise from small tubercles. The wing is broad, thin, shining, folded in but not so far as to obscure the body. White inrolled hairs fringe the edge of the wing. The pappus is obvious, the bristles equal in length. **In the wild** this annual has more erect stems. After heavy rain it is common on flood plains.

Flowering period: Late winter to spring.

Cultivation and uses: The Study Group has not grown this species in cultivation for long. It has proved difficult to raise seedlings in cold, wet climates, but they will grow reasonably well if protected. *B. curvicarpa* is best suited to warm, moist situations in heavy soils.

Propagation: Seed sown with no pretreatment germinates poorly in 2–4 months. Percentage germination is markedly increased if seed is soaked overnight in water.

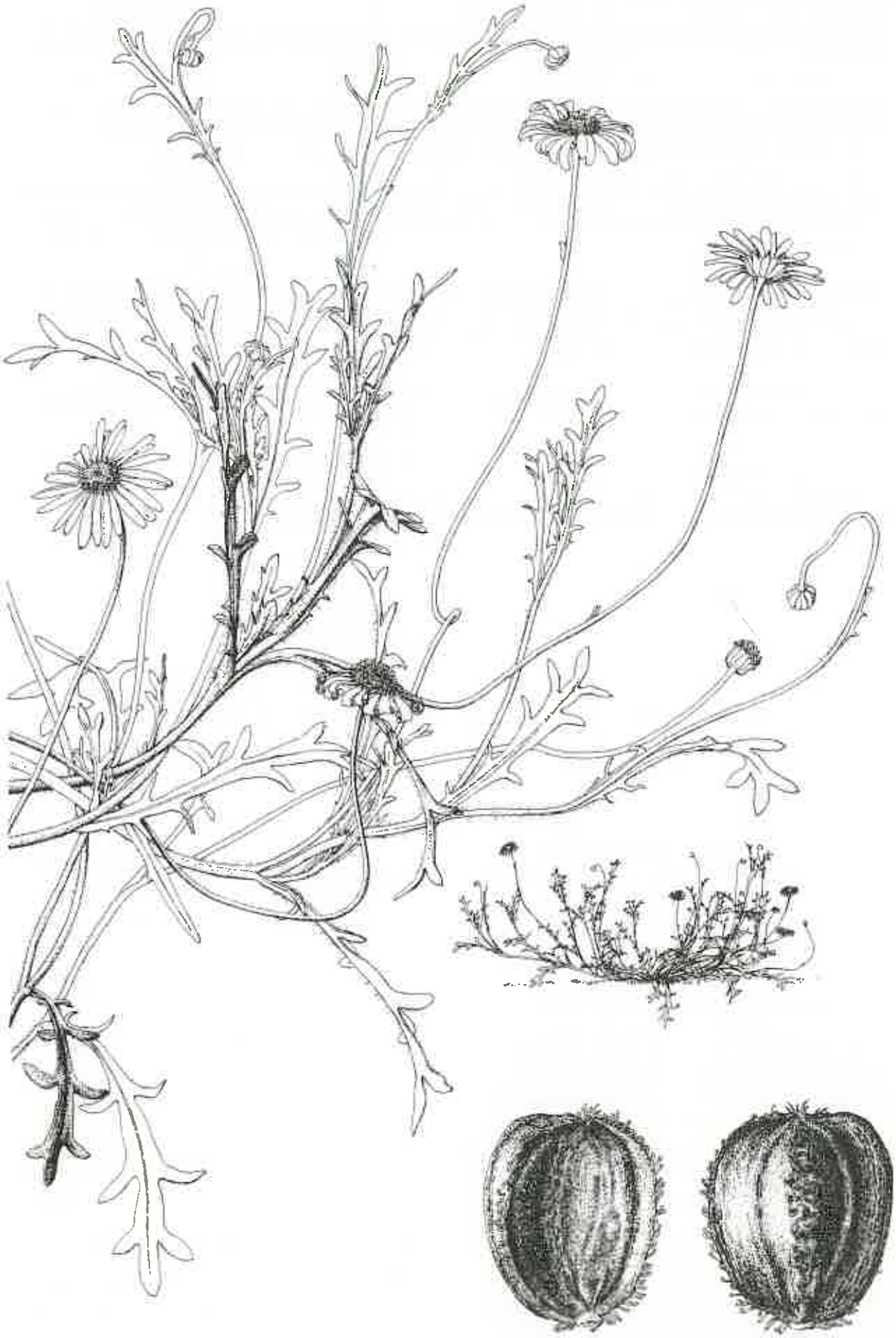
Forms:

- *B.* aff. *curvicarpa* is an entity of uncertain status with affinities to *B. curvicarpa* and *B. chrysoglossa*. It occurs in Queensland, growing in grassland or on floodplains in clay, but never in abundance. In cultivation it is a straggling, woody herb, 20–30cm x 10–30cm, with glandular-hairy stems. Leaves are variable in shape, sessile, 2–3.5cm x 1–1.5cm. In the basal tuft they are almost spoon-shaped with a long stalk-like base, or they may be oblanceolate with 5–8 lobes. The basal tuft soon withers and disappears. The stem leaves may be entire or wedge-shaped with a few apical teeth. The leaves bear a mixture of woolly and short glandular hairs. The woolly hairs are more numerous on young growth. Flower-heads are 1.5–2cm across, with many narrow, bright yellow ray florets (>30). The flower stems are 8–16cm long, with sparse glandular hairs becoming more dense near the head. Fruits are brown, 1.8–2mm x 1.5–2mm, with inrolled hairs on the obovate body. The broad wing is folded in and fringed with inrolled hairs as it is in *B. curvicarpa.* The edge of the wing is usually thickened and entire, but may be slightly lobed.

  B. aff. *curvicarpa* flowers from spring to autumn if it receives extra water over the hot months. The yellow heads are unusual in this genus and create colour over a long period. It is annual in hot climates but perennial in the cooler southern States. This entity needs to be pruned to keep it tidy. It grows best in moist, heavy soil in full or part sun, and is not suitable for cold, montane areas. *B.* aff. *curvicarpa* is especially recommended for warm inland or sub-tropical gardens and is attractive in hanging baskets. Seed germinates in 10–60 days and will continue to germinate for twelve months. Seedlings need protection in cold, wet weather. Propagate also from cuttings.

Similar species: ***B. chrysoglossa*** is distinguished from *B. curvicarpa* by its yellow ray florets and brown fruits.

B. dentata is vegetatively similar in some of its forms to *B. curvicarpa.* The fruit is the distinguishing character; the body is covered with large tubercles, and the irregularly dissected wings are flat rather than folded in over the body.



B. curvicarpa — north of Bourke, NSW (x 1)

Fruit — north of Bourke, NSW (x 20)

B. papillosa differs from *B. curvicarpa* in having larger golden-brown fruit with flat, leaf-like tubercles covering the body and a broad, flat wing.

B. tetrapterocarpa is so similar to *B. curvicarpa* that the four-winged fruit is the only distinguishing character.

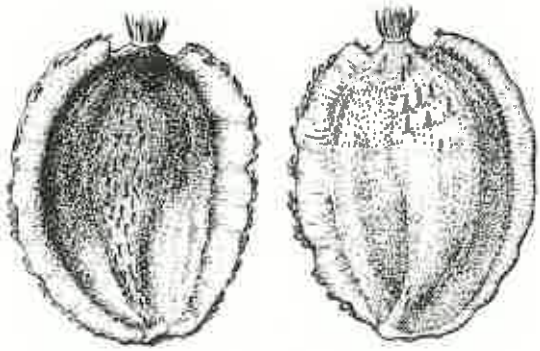
Special notes: *B. curvicarpa* is included in the *B. dentata* complex with *B. chrysoglossa*, *B.* aff. *curvicarpa*, *B. dentata*, *B. papillosa* and *B. tetrapterocarpa*. All members of the *B. dentata* complex have a base chromosome number of $x = 4$ (Watanabe and Short, 1992).

Some of the specimens collected in Queensland and examined by Davis (1948) were listed under *B. curvicarpa* but have now been identified as *B. tetrapterocarpa* (Morrow, 1964). *B. tetrapterocarpa* occurs only in inland Queensland north from a latitude of about 27°. It has now been established that the ranges of the two species do not overlap.

Smith-White *et al.* (1970) observed that they found *B. curvicarpa* to exist in two forms; one with white flowers and black fruits, and the other with yellow flowers and brown fruits. Both species had the same number of chromosomes, but differences in size and shape were found even within the white-flowered form. The name *B.* aff. *curvicarpa* was adopted by Watanabe and Short (1992) for the yellow-flowered entity.

B. aff. *curvicarpa* appears to cross with other species in members' gardens with relative ease. Hybrids have been reported with *B. angustifolia*, *B. papillosa*, *B. segmentosa* and *B. stuartii*.

Three registered cultivars have *B.* aff. *curvicarpa* as one parent. Two have been granted protection under the Plant Varieties Act. *Brachyscome* 'Lemon Drops' (*B. multifida* x *B.* aff. *curvicarpa*) and *Brachyscome* 'Sunburst' [*B. segmentosa* (seedling) x *B.* aff. *curvicarpa*]. A third cultivar *Brachyscome* 'Lemon Twist' (*B. multifida* var. *dilatata* x *B.* aff. *curvicarpa*), has had an application for Plant Breeders Rights accepted.



B. aff. *curvicarpa* — Charleville, Qld (x 1)

Fruit — Charleville, Qld (x 20)

Brachyscome debilis Sonder

Weak Daisy

ANNUAL
10–25cm high
5–10cm wide
WHITE, PINK, MAUVE

Derivation: *debilis* — weak, frail, small.

Delicate little annual with soft divided leaves and flower-heads in pale shades.

Distribution and habitat: NSW, Vic, SA. Occurs in open woodland, under shrubs on granite outcrops and in seepage areas.

Description: In cultivation a weak annual, upright at first but later tending to sprawl. Stems branch once or twice, and bear septate and sparse glandular hairs. **Leaves** at the base are up to 1.5cm long, linear and entire, but they soon wither. Stem leaves are hairy, 0.5–2cm long, entire or pinnatisect with 3–7 lobes. **Flower-heads,** 1.5–1.8cm across, are held on naked flower stems, 7–9cm long, which are glandular-hairy below. The ray florets are white, mauve or pale pink. **Fruits** are brown, flat, 2–2.3mm x 1mm, with a transparent wing which may be entire or toothed. Curled hairs edge the wings and sometimes appear on the body. The pappus is conspicuous. **In the wild** stands of this species create a delicate picture; the flower-heads are too few to look like a carpet. In an inhospitable environment the little plants may be single-stemmed and only 3cm high.

Flowering period: Usually spring, but since it is an ephemeral herb it may flower at any time if conditions are suitable.

Cultivation and uses: The horticultural potential of *B. debilis* seems extremely limited at this stage. If enough viable seed could be produced it would be a pretty subject for grassland planting. No other suggestion springs to mind. This annual prefers moist soil conditions and dappled sun.

Propagation: Seed germinates poorly in 15–90 days. In cool, temperate climates it is better to sow in late winter.

Similar species: ***B. leptocarpa*** is vegetatively almost identical (as observed in the Special notes section). If it is decided that the two species are not conspecific the only distinguishing character is the fruit which possesses no wing.

Special notes: *B. debilis* frequently grows intermixed with *B. leptocarpa* and is vegetatively identical.

Watanabe and Short (1992) observed that the two species may be conspecific. If this proves correct then *B. debilis*, the earlier name, will have priority.

Smith-White *et al.* (1970) determined a chromosome number of $2n = 6$ for material collected from Mt Arapiles (Vic).

B. debilis— Mt Arapiles, Vic (x 1) a. Variation in leaf shape Fruit — Mt Arapiles, Vic (x 20)

Brachyscome decipiens Hook. f.

Field Daisy

PERENNIAL
10–20 cm high
15–25 cm wide
WHITE, MAUVE

Derivation: *decipiens* — deceptive, often used of a species which might be mistaken for another.

Modest perennial daisy, unobtrusive except when flowering. White heads on thick stems arise from flat rosettes of quite large, deep green leaves.

Distribution and habitat: NSW, ACT, Vic, Tas. (Recorded for SA, but not seen this century.) Found in cool damp places from coastal hills to alpine areas. Occurs in alpine heaths and herbfields, subalpine and montane woodlands, grasslands and swamps. Grows in damp places, often scattered under snow gums.

Description: **In cultivation** *B. decipiens* grows as a rosetted perennial. **Leaves** are variable, usually 5–10cm (sometimes almost twice as long) x 1.5–3cm. They are broad-tipped, shining, dark green, often limp, lying flat on the ground. The margins may be entire or toothed and may have a few sparse hairs down the midrib but are mainly glabrous. **Flower-heads** are single, 2–3.5cm across, with white or pale mauve ray florets (up to 40). The unbranched stems are hollow, hairless and relatively thick. They may be short or up to twice as long as the leaves and usually have one leafy bract near the head. As the season progresses, new flowers may be smaller and on shorter stems. **Fruits** are large, 3–4mm x 1.3–1.8mm, dark brown, wedge-shaped, with scattered straight white hairs on the body. The margin is slightly swollen and has a vertical groove at the extreme edge. The pappus is very short. **In the wild** the heads may be larger (up to 4cm across in alpine regions) and, if plants grow among grasses, the leaves may not lie flat on the ground.

Flowering period: In lower altitudes *B. decipiens* flowers in spring; in alpine areas it flowers in summer.

Cultivation and uses: *B. decipiens* is best suited to cool climates. A moist situation in sun or dappled shade is preferred and roots should be protected. It dies back after it has flowered and may completely disappear until the following autumn when cool, moist conditions allow it to emerge again. Plants have remained alive in pots for five years, flowering every year. Lowland forms have remained alive in gardens for more than two years. Slugs and snails regard this species as a delicacy, which is a major drawback to its cultivation. *B. decipiens* is recommended for alpine gardens and some forms are suitable for coastal planting.

Propagation: Fresh seed germinates well in 11–40 days. Plants may be successfully divided.

Forms:

- The best form for cultivation is a lowland form from the Mornington Peninsula (Vic). The flower-heads are about 2cm across on stems 15cm high. The basal rosette, 15–20cm across, has handsome toothed leaves to 10cm long.

- Alpine forms are available from specialist nurseries. Flower-heads, 2–4cm across, are held on stems 10–20cm long.

Similar species: ***B. scapigera*** occurs in similar habitats and has glabrous leaves in basal clusters. It differs from *B. decipiens* in that the leaves are erect in dense tufts, less than 1.5cm wide, and the margins are always entire. The fruit is similar in appearance although not as long (2.5–3mm), and there are no hairs on the body.

Special notes: **Polyploidy has been reported in *B. decipiens*. Material collected by Solbrig *et al.* (1964) was hexaploid with $2n = 54$. Smith-White *et al.* (1970) reported $2n = 18$.**

The biseriate, eglandular hairs on the fruit of *B. decipiens* are flat and weak and not found on the fruits of other species of *Brachyscome*. (P.S. Short, pers. comm.).

The Study Group has not collected any mauve-flowered forms of *B. decipiens*. Some forms collected have had white ray florets with mauve reverses.

B. decipiens — Mt Buller, Vic (x 1) Fruit — (i) Mt Buller, Vic, (ii) Lankeys Plains, Vic (x 20)
a. Alternate leaf shape

Brachyscome dentata Gaudich.

Tall White Daisy, Lobe-seed (or Lobed-seed) Daisy

PERENNIAL
15–50cm high
10–50cm wide
WHITE

Synonyms: *B. marginata* Benth.
B. calocarpa F. Muell.
B. heterodonta DC.

Derivation: *dentata* — toothed.

Variable, long flowering perennial with large white flower-heads. The untidy habit usually seen in cultivation is a disadvantage.

Distribution and habitat: Qld, NSW, ACT, Vic, SA, NT. A widespread species occurring in a variety of habitats from open woodland to heavy clay flood plains, sand plains and grasslands.

Description: In cultivation a perennial to 50cm high with a woody rootstock. Stems branch from the base, sometimes upright, sometimes sprawling. The stems and leaf axils are usually hairy or the plant may be hairy all over. **Leaves** are extremely variable in shape, usually linear to wedge-shaped with 3 acute teeth at the tip, but they may have up to 13 acute teeth around the margin, or may be entire, or pinnatisect with up to 8 linear lobes. The leaves are 2–12cm x 1–10mm. A basal cluster is produced in young plants but is later lost. The stem leaves are sessile, but the basal leaves may be stalked. **Flower-heads** are white, 2.5–3.5cm across. Some forms have yellow heads when the rays first open but they become white after about 48 hours. Both colours may be seen at once on some plants. Robust flower stems, 10–25cm long, have a few reduced leaves at the base. **Fruits** of this species are easy to identify. They are brown, broadly wedge-shaped, 2.5–4mm x 2–3mm, with large, conspicuous tubercles covering the faces. Broad, flat wings are deeply dissected into variable lobes and edged with inrolled hairs. The pappus is large and conspicuous. **In the wild** plants grow more erect.

Flowering period: In the wild it flowers from spring to early summer. In cultivation plants may flower again in autumn.

Cultivation and uses: Open conditions in heavy soils are probably best if an erect plant is required. Moist soil and root protection are necessary in hot conditions. If it dries out this species may not recover. It tolerates frost and has performed well in cool montane and inland gardens. It is prone to attack by sap-sucking insects such as aphids, and is also attacked by slugs and snails. Tip pruning may help to keep plants bushy. *B. dentata* has not been employed to any extent in garden culture, but it could be a useful species for mass planting or for intermingling with other plants. Certain forms will suit some garden conditions better than others. *B. dentata* seems to have less horticultural potential than *B. aculeata,* which it resembles in many respects, because it does not sucker, usually sprawls in cultivation and is harder to keep alive.

Propagation: Seed germinates moderately well in 7–60 days and regenerates naturally in the garden. Seed ripens quickly and is shed from the heads equally quickly. Young seedlings often perish in cold, wet weather; it is advisable to sow this species from late winter to late spring or to protect young seedlings in winter. Propagate also from cuttings.

Forms: The Study Group has trialled forms from many locations. Brief descriptions of the best forms follow:

- A form collected between Dalgety and Jindabyne (NSW) was erect and tufted in its natural habitat, but in cultivation the stems are ascending and the basal tuft is soon lost. Plants grow 10–25cm high and 40–55cm across. The leaves are narrow and the heads are white, 2.5–3cm across.

- A form collected near Armidale (NSW) was also erect and tufted in the wild. The heads open yellow and turn white.

- A form from West Wall Forest (Vic) is tall and narrow, 20–50cm x 25–30cm, with stiff, slender stems. The narrow leaves are sparse and the white heads (to 3.5cm across) are sometimes mauve beneath.

B. dentata — a. Bundarra, NSW (x 1), b. Rankins Springs, NSW (x 1)

Fruit — western NSW (x 20)

- A form from Port Augusta (SA) is open and bushy, 35–50cm high and 50–90cm wide, upright at first, later straggling. Masses of white heads, 2–2.5cm across, are produced from spring to autumn.

Similar species: ***B. aculeata*** is also a white-flowered perennial with toothed leaves, but it is easily distinguished by its suckering habit and by the fruit which lacks the large tubercles and the deeply lobed wing.

B. chrysoglossa has a similar growth habit to that of *B. dentata,* but the ray florets are golden yellow and the fruits differ. These species often grow in association.

B. curvicarpa is vegetatively similar to some forms of *B. dentata,* but can be identified by the dark brown to black fruit. The wings fold in to give it the shape of a cowrie shell and there are white hairs on the body rather than large tubercles. *B.* aff. *curvicarpa* has a similar habit to that of *B. dentata,* but the rays are yellow and the fruits are strongly curved.

B. papillosa is like some forms of *B. dentata* and the fruits bear a superficial resemblance, but the tubercles are flattened rather than finger-like, and the wing margin is entire or undulating rather than irregularly dissected.

B. sieberi **var.** ***gunnii*** is also a perennial with toothed foliage, but the fruits bear only a few small tubercles, and the species is confined to Tasmania.

B. tetrapterocarpa is a white-flowered herb with lobed leaves, but it is easily distinguished from *B. dentata* by its four-angled fruits.

Special notes: Smith-White *et al.* (1970) reported chromosome numbers of $n = 4$, 8 and 12 for *B. dentata.* These results were confirmed in later chromosome number determinations (Watanabe and Short, 1992). This means that diploids, tetraploids and hexaploids are produced and may account for the variation recorded within the species.

In her revision of *Brachyscome,* Davis (1948) adopted the name *B. marginata* Benth. for this species and recognized two varieties, var. *marginata* (with white ray florets) and var. *chrysoglossa* (F. Muell.) Davis (with 'orange-yellow' ray florets). The specific name *B. marginata* Benth. was used by botanists including Black (1965), Burbidge and Gray (1970) and Smith-White *et al.* (1970). Subsequently, many botanists adopted the earlier name *B. heterodonta* DC., which had been incorrectly listed by Davis as a synonym for *B. marginata* Benth. The botanists included Eichler (1965), Willis (1972), Jessop (1981), Jacobs and Pickard (1981), Beadle *et al.* (1982), Cooke (1986) and Everett (1992). Burbidge (1982) subsequently noted that *B. dentata* Gaudich. should take precedence over *B. heterodonta* DC. She had examined a herbarium sheet of Gaudichaud material housed in the Muséum National d'Histoire Naturelle in Paris and had observed that one specimen bearing the words '*Brachycome dentata*' exactly matched material referred to *B. heterodonta* DC. (1836).

The botanists who adopted the name *B. heterodonta* DC. then adopted *B. heterodonta* DC. var. A for *B. marginata* var. *chrysoglossa* (F. Muell.) Davis. The combination for var. *chrysoglossa* to be placed under *B. dentata* has not been made because confusion still exists as to whether it is an individual species or a variety of *B. dentata.* Until the situation is clearer it is recommended that the name *B. chrysoglossa* Benth. be used, as in Ross (1990).

The *B. dentata* complex includes *B. chrysoglossa, B. curvicarpa, B.* aff. *curvicarpa, B. dentata, B. papillosa* and *B. tetrapterocarpa* (Watanabe and Short, 1992).

Study Group members growing *B. dentata* have reported that hybrids have appeared in their gardens; in one case it had probably crossed with *B. multifida* and in another with *B. ciliaris.*

a.

B. dentata — western NSW (x 1)

a. Typical leaf shapes

Brachyscome dichromosomatica C. Carter

ANNUAL
15-25cm high
15-25cm wide
MAUVE, WHITE

Synonym: *B. lineariloba sensu* J. Black, *Fl. S. Aust.* p. 852 (1957), partly, *non* (DC.) Druce

Derivation: *dichromosomatica* — having two chromosomes ($n = 2$).

Handsome, large-flowered annual with a basal tuft of divided leaves. Difficult to germinate.

Two varieties of this species have been recognized based on the colour of the ligules (or ray florets), *B. dichromosomatica* C. Carter var. *dichromosomatica* and *B. dichromosomatica* var. *alba* C. Carter. The two varieties will be described together as they differ only in the colour of the ray florets, the distribution and some small chromosomal differences.

KEY to the VARIETIES (Carter, 1978b)

Ligules pale blue, at least on the undersides .....var. *dichromosomatica.*

Ligules white .....var. *alba.*

Distribution and habitat: NSW, SA. *B. dichromosomatica* var. *dichromosomatica* occurs in South Australia in the Flinders Ranges and surrounding areas. It grows in mallee saltbush, arid low shrubland and on rocky outcrops.

B. dichromosomatica var. *alba* occurs in New South Wales in the region east of Wilcannia and south of Broken Hill. It grows on open plains among scattered eucalypts, dry creek beds and clay pans.

Description: In cultivation an almost glabrous annual with very short stems which branch near the base. **Leaves** are basal and present on the lower part of the stem, 1.5–8cm long, pinnatisect with 3–7 linear lobes in the top half of the leaf. The lobes are 1–2cm x 1–2mm. Very sparse long septate hairs may be present near the base. **Flower-heads** are pale mauve or white and pale mauve beneath, 2.5–3.5cm across, with 8–16 broad ray florets. The ray florets are 5–15mm x 1.5–4mm. The involucral bracts are broad, blunt and rarely have the reddish purple margins of *B. lineariloba* or *B. breviscapis*. The hemispherical fruiting heads are densely packed with seed which is slow to shed. The flower stems are erect, 10–20cm long, and are usually leafless. **Fruits** are brown, 3.5–5mm x 1.5–2mm. The body is cylindrical; the wing is swollen and edged with many long inrolled hairs. The pappus is long and very conspicuous, the bristles fused into bundles of unequal lengths. **In the wild** the heads may be larger (up to 4.5cm across). Plants usually grow on bare soil and are either scattered or form large colonies. They often grow in association with *B. lineariloba*.

Flowering period: From June to September in the wild. In cultivation it flowers in October and November, but it should be noted that this species has only been trialled for short periods due to the difficulty of germination.

Cultivation and uses: *B. dichromosomatica* prefers full sun. Of all the members of the *B. lineariloba* complex it is the most vigorous and tolerant of drought. The large flower-heads and attractive habit indicate excellent potential for horticulture, but until higher germination rates are achieved it will remain a little known species.

Propagation: Although seed looks mature the germination rate is extremely poor, e.g. 1% germination after six months. Strategies to break dormancy should be tried. Removal of the seed coat after soaking in water for 24 hours has been used successfully in laboratory conditions. Other techniques should be tried because *B. dichromosomatica* is worthy of cultivation.

Similar species: ***B. breviscapis*** is also a member of the *B. lineariloba* complex, but it differs from *B. dichromosomatica* in having short ascending or decumbent stems (0.1–2cm) and short ray florets (less than 1mm). It is confined to the western coast of the Eyre Peninsula (SA) and has a chromosome number of $n = 4$.

B. dichromosomatica — Leigh Creek, SA (x 1) Fruit — Leigh Creek, SA (x 20)

B. eriogona could be mistaken for *B. dichromosomatica* because the fruits are very similar and the leaves are pinnatisect, but plants are usually of a larger size, have branching stems and the fruiting heads are conical rather than hemispherical. The fruits are curved.

B. lineariloba is very similar to *B. dichromosomatica* and often grows in close association with it, but the stems are decumbent or ascending, the ray florets are shorter (1–6mm) and the margins of the involucral bracts are reddish purple.The chromosome numbers of the cytodemes are $2n$ = 10, 12 and 16.

B. smithwhitei is also an annual with white heads and pinnate leaves growing in western New South Wales. It differs from *B. dichromosomatica* in having a pronounced stem development, strongly curved fruit and conical fruiting heads.

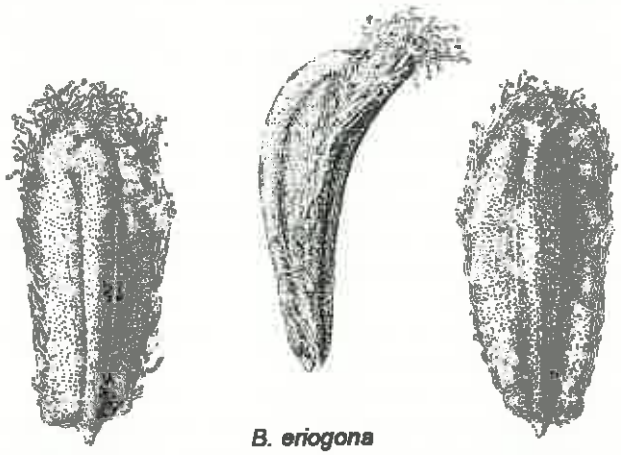
Special notes: The cytology of the *B. lineariloba* complex has been extensively studied since Smith-White and Carter (1970) recognized five unnamed species within it. These species were designated sp. A, n = 2; sp. B, n = 6; sp. C, n = 8; sp. D, n = 4; sp. E, $2n$ = 10. Species A was subsequently described as *B. dichromosomatica* (Carter, 1978b) and two varieties were recognized at the same time.

Species A was found to include four cytodemes (A_1, A_2, A_3 and A_4) on the basis of chromosome morphology (Watanabe *et al.*, 1975) although the basic chromosome number of all four was n = 2. Two kinds of accessory chromosomes (large B chromosomes and very small micro-B chromosomes) were found to be also present in numbers varying from 0–3. A_1, A_2 and A_4 occur in adjoining areas and the differences in chromosome make-up were so small that it was decided there was no justification for altering their taxonomic rank. Cytodeme A_3, however, was found only in a small area in New South Wales about 600km from the Flinders Ranges and the ray florets are always pure white. It was thought to deserve the taxonomic status of a variety.

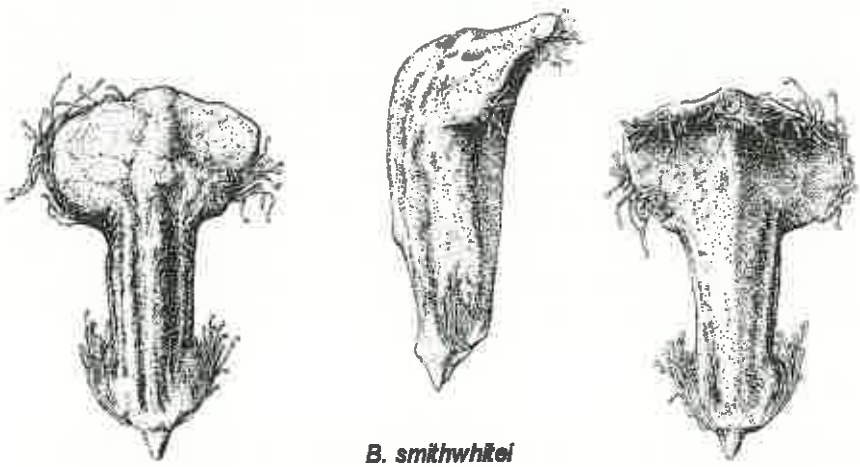
B. dichromosomatica is outbreeding and generally self-incompatible (Watanabe *et al.*, 1975). It grows in close association with *B. lineariloba* which is self-compatible and largely inbreeding. Natural hybrids have been found between var. *dichromosomatica* and Cytodeme B (n = 6) and between var. *alba* and Cytodeme C (n = 8).

Artificial hybrids have been produced between var. *alba* and *B. eriogona* (n = 4) (Watanabe *et al.*, 1976), *B. breviscapis* (n = 4) and var. *alba* (Watanabe and Smith-White, 1987) and *B. goniocarpa* (n = 4) and var. *dichromosomatica* (Watanabe *et al.*, 1991). This work suggests that a relationship exists between species in the *B. lineariloba* complex, the *B. campylocarpa* complex and the *B. diversifolia* complex.

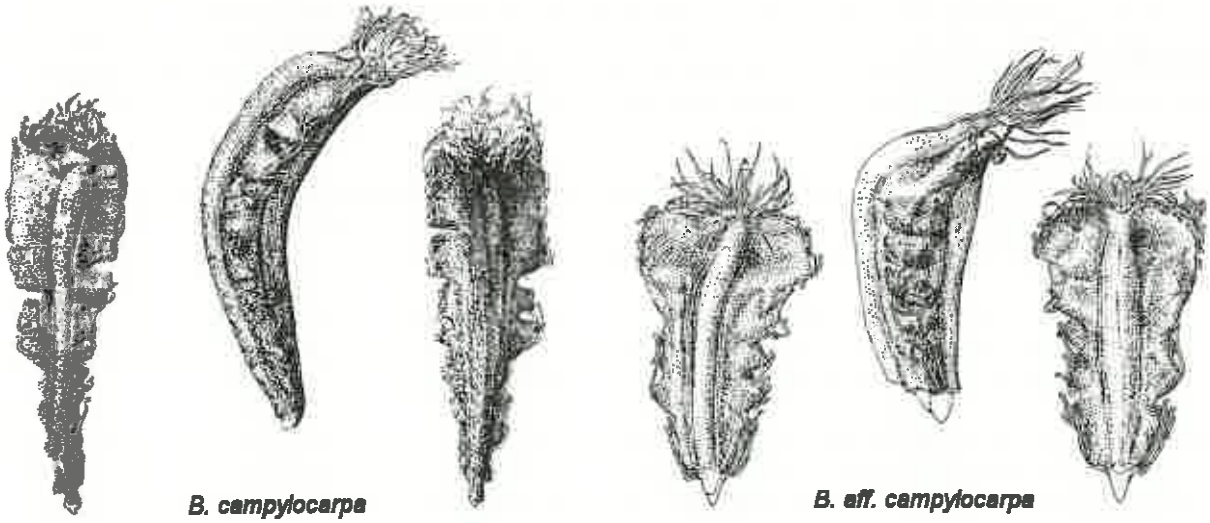
The cotyledons of *B. dichromosomatica* are linear and narrow, as are the first seedling leaves. Lobes begin to develop by the time the third pair of seedling leaves form. The appearance of cotyledons and seedling leaves is the same for *B. lineariloba*.



B. eriogona



B. smithwhitei



B. campylocarpa *B. aff. campylocarpa*

***Brachyscome campylocarpa* complex (x 20)**

Brachyscome dissectifolia G. Davis

Swamp Daisy

PERENNIAL
5–20cm high
5–15cm wide
MAUVE, WHITE

Derivation: *dissectifolia* — leaves cut into many segments.

An attractive perennial with divided leaves in a basal tuft and dainty flower-heads on slender stems above the foliage. Spreads by sending out runners.

Distribution and habitat: NSW. Occurs on the Northern Tablelands and North Western Slopes. Grows in roadside ditches and on swampy ground.

Description: **In cultivation** a stoloniferous perennial. At the base thick short stems are produced which lie just above the soil, and root where they touch the ground. **Leaves** in basal tufts are petiolate, 3.5–6.5cm x 0.4–1.5cm, and even on the one plant are quite variable in shape. They may be oblanceolate with an entire margin, toothed with 3–5 acute teeth, or pinnatisect with 6–12 lobes, the apical lobe usually being broader than the others. The leaves may be almost glabrous or the margins may be edged with a few short glandular hairs. Long woolly hairs appear at the base of the stalk. **Flower-heads** are 1–2cm across with about 40 white, mauve or mauve-pink ray florets. The heads are on slender flower stems, 5–20cm long, either naked or with one small sessile leaf bract curling around the stem. **Fruits** are dark brown to black, 1.5–1.8mm x 1–1.3 mm, obovate, with a thickened body. Two raised folds enclose the tuberculate faces, each tubercle often tipped by an inrolled hair. Broad wings of a paler colour are edged with numerous inrolled hairs. The pappus has short bristles of unequal lengths. **In the wild** plants grow in poorly drained soils in the open or shaded by overhead trees. They are not very floriferous and some plants are tiny.

Flowering period: Early spring to late autumn.

Cultivation and uses: *B. dissectifolia* is a pleasing small plant with the advantage of a slowly spreading habit. It prefers moist soil in full or part sun and is suitable for cool temperate or cold climates, but it has not proved satisfactory in subtropical conditions. It is useful as an edging plant, for grouping in the garden, for rockeries or containers. It is in its element in a bog garden.

Propagation: Seed germinates in 6–20 days at rates of 80–100%. Its readiness to self-sow means that seedlings may be dug up and moved with ease. Stolons may also be cut off and transplanted.

Forms:

- A form from Mt Kaputar is low-growing with a markedly stoloniferous habit. White or mauve heads, 1–1.5cm across, are held singly at the tips of flower stems 5–15cm long. The leaves are 4–6cm x 0.5–1cm and the apical lobe is very broad.

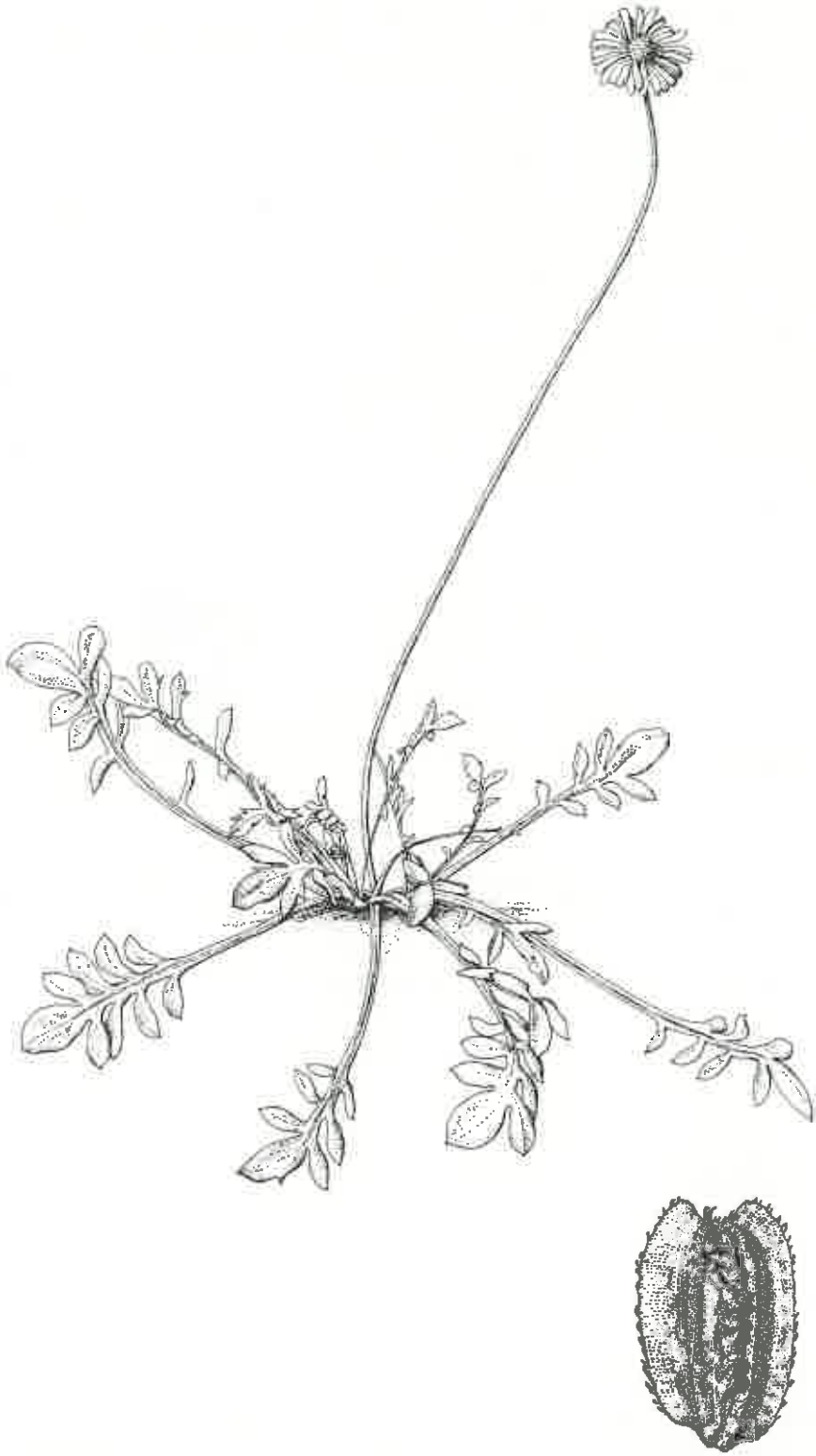
- A form from south-east of Tingha is slower to spread. The heads are mauve-pink, 1.5–2cm across, on flower stems 15–20cm long. The leaves are 3–7cm x 0.2–1.2cm, the apical lobe being not as broad as in the Mt Kaputar form. The pappus is conspicuous.

Similar species: ***B. nivalis*** is also a perennial with a basal tuft of pinnatisect leaves and white heads on flower stems above the foliage. The heads are much larger (2–4cm across), the flower stems are more robust and usually leafy in the lower half. The fruits are brown, much longer (2–3mm) and the faces are not tuberculate.

B. ptychocarpa is a perennial with a basal tuft of pinnatisect leaves and small white or pink heads on slender flower stems 10–30cm long. It differs in having narrow-linear lobes on the leaves which may sometimes be bipinnate. The fruits are black, but are shorter (to 1mm long) and have a central raised fold in addition to the two peripheral folds.

B. stuartii is a perennial which resembles *B. dissectifolia* in many respects. *B. stuartii* differs in that it is not stoloniferous. The heads are usually larger, 2–3cm across, the leaves are longer (to 10cm) and the lobes are often irregularly toothed or lobed again. The fruits are black but rarely possess wings.

Special notes: Smith-White *et al.* (1970) suggested that *B. dissectifolia* has a very close relationship with *B. ptychocarpa* and *B. stuartii*. All three have the same chromosome number ($n = 6$), have similar growth habits

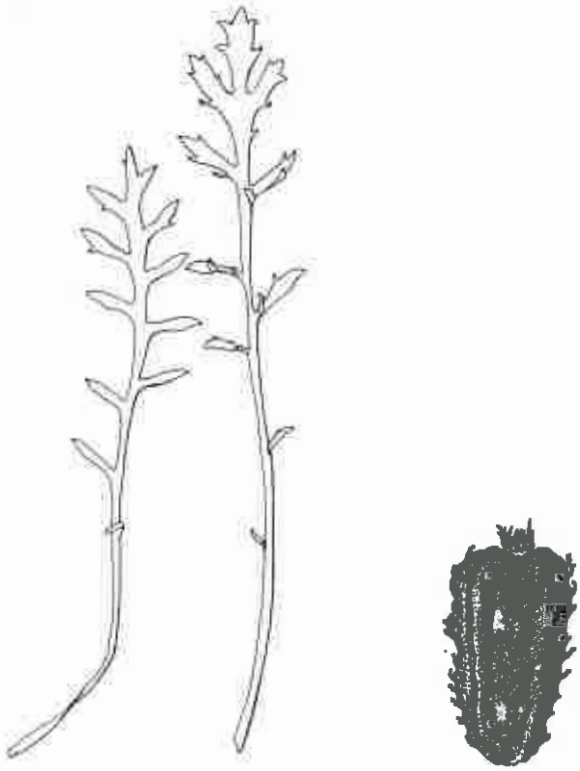


B. dissectifolia — Mt Kaputar, NSW (x 1)

Fruit — Mt Kaputar, NSW (x 20)

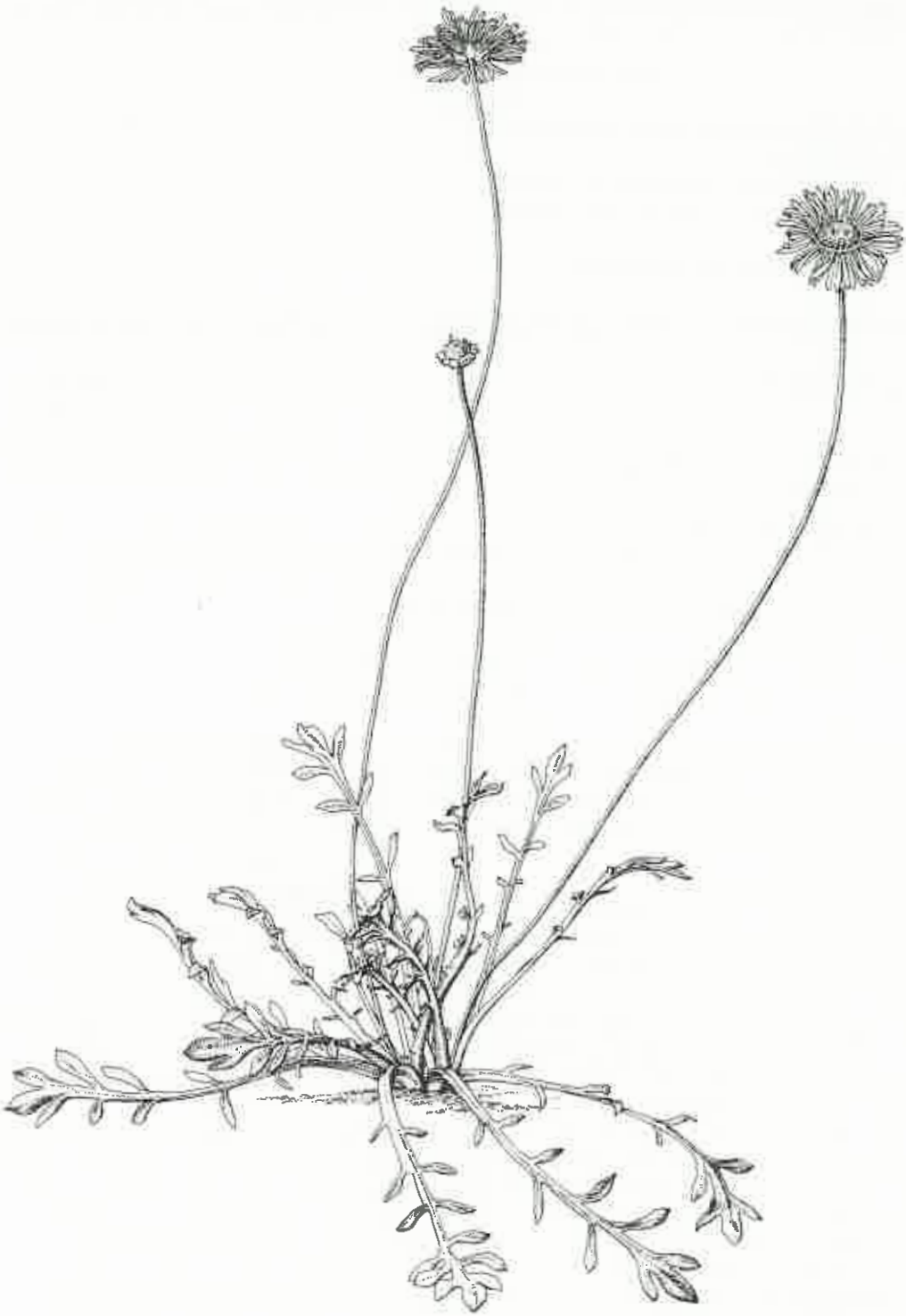
and occur in similar habitats. These workers noted that they had collected specimens with fruit characters between *B. dissectifolia* and *B. stuartii*.

B. dissectifolia has been recorded growing in dunes at Port Stephens on the Central Coast of New South Wales (Davis 1948, and Everett 1992). It seems an unlikely habitat for this species; the specimen may have been wrongly identified.



B. stuartii form — Emmaville, NSW; sites B and D, variation in leaves (x 1)
Fruit — Emmaville, NSW (x 20)

Illustrations comparing the characters of entities in the *B. stuartii* complex



B. dissectifolia form — south-east of Tingha, NSW (x 1) Fruit — south-east of Tingha, NSW (x 20)

Brachyscome diversifolia (Graham ex Hook.) Fischer and Meyer

Three varieties of this species have been recognized by Davis (1948) based on the shape of the leaves and leaf segments.

KEY to the VARIETIES

1. Leaves cuneate in rough outline, singly pinnatisect .....var. *diversifolia*.
1. *Leaves doubly pinnatisect.....2.
2. Ultimate leaf segments thick, obcuneate to oblong .....var. *maritima*.
2. *Ultimate leaf segments thin, linear to linear-oblong .....var. *dissecta*.

The three varieties will be described separately.

Brachyscome diversifolia (Graham ex Hook.) Fischer and Meyer var. *diversifolia*

Tall Daisy, Large-headed Daisy

PERENNIAL
10–50cm high
20–50cm wide
WHITE

Synonyms: *Pyrethrum diversifolium* Graham in Hook.
Brachystephium leucanthemoides Less.
Steiroglossa humilis DC.
Brachycome diversifolia (Graham) Fischer and C. Meyer var. *humilis* Benth.

Derivation: *diversifolia* — having leaves of more than one kind.

Attractive perennial with lobed leaves, hairy stems and very large white heads. Some forms have neat, upright, tufted habits.

Distribution and habitat: NSW, ACT, Vic, Tas, SA. A widespread species occurring from the Tablelands and Western Slopes of New South Wales through Victoria to south-eastern South Australia and several coastal areas of Tasmania. It occurs from altitudes of 1500m at Mt Magdala in Victoria to sea level near Anglesea and Portland. Grows in open forest, on steep rocky banks and gullies, and on coastal cliffs.

Description: **In cultivation** a variable perennial with hairy erect or ascending stems. The hairs are a mixture of short glandular hairs and long septate hairs. The stems may branch near the base as plants develop. **Leaves** are extremely variable. The radical leaves are soon lost. The lower leaves are 4–11cm long, wedge-shaped, petiolate with a broadened base, and pinnatisect or lobed with 6–10 lobes which may be blunt or acute. The lobes are variable, 5–10mm x 1–5mm, and may have broad secondary lobes. The leaves reduce in size up the stem, becoming sessile and less lobed until the uppermost leaves are usually lanceolate, 1–2cm x 2–4mm. The leaf bases are expanded, a feature of the leaves of the *B. diversifolia* complex. The leaves usually bear a mixture of glandular and septate hairs which are more numerous on young growth. **Flower-heads** vary in size in different forms from 1.5–6.5cm across. The ray florets are white but may have red or pink reverses which colour the buds. The flower stems are long (10–30cm) and have 7–12 stem leaves in the lower half or two-thirds. The large heads of some forms cause the stems to arch over with their weight, always keeping the heads facing upwards. **Fruits** are brown, 2–3mm x 0.8–1.5mm, wedge-shaped, thickened at the top to appear four-sided. Two raised vertical folds on each face are joined at the apex which may bear a few small hairs. In some forms the area between the folds bears a number of tubercles, some of which are tipped with hairs. The pappus is obvious and is set obliquely. **In the wild** the heads are never as large as they are in cultivation and the habit usually remains erect and tufted.

Flowering period: Spring to early summer in the wild, but in cultivation they often start flowering in winter.

Cultivation and uses: This variety prefers a position in full sun in winter, but part shade during summer. It will wilt quickly if the soil dries out. If plants die back they will shoot from the root stock when the soil becomes sufficiently moist. The very hairy foliage is not able to withstand high humidity, so var. *diversifolia* is unsuitable for subtropical or cold, wet climates, but grows well in cool temperate regions and is excellent for coastal planting. It is moderately tolerant of frost. Plants flower while they are quite small. The heads last well when picked and picking extends the flowering period. Slugs and

B. diversifolia var. *diversifolia*— a. Beechworth, Vic (x 1), b. Grampians, Vic (x 1) Fruit — King Island (x 20)

snails love the foliage. *B. diversifolia* var. *diversifolia* makes a good focus alone or in a group, in rockeries, bog gardens and in containers.

Propagation: Seed from the wild germinates in 10–60 days at a rate of about 25%. The rate is markedly increased when seed is harvested in cultivation. This variety self-sows in gardens and pots. Propagate also from basal stem cuttings or by division of rootstock.

Forms:

- A form from the Beechworth area of north-eastern Victoria is a most handsome plant with sturdy, upright stems to 45cm, and orange buds opening to solid heads 3.5–4.5cm across.
- A form from Mt Samaria (Vic) has a neat, upright habit, stems to 30cm and heads 3–3.5cm across.
- A form from west of Stawell (Vic) is unusual in that the lower leaves are bipinnate with broad, usually blunt secondary lobes. The fruits differ from the norm in being dark brown to black and the faces are tuberculate between the raised folds. This form has stems 20–30cm long, heads 3–4cm across, and the habit is neat and attractive.

Similar species: ***B.* aff. *gracilis*** is vegetatively close to *B. diversifolia* in having white heads on septate-hairy stems. It has a very restricted occurrence in the Mildura area, is generally smaller than *B. diversifolia* and is annual rather than perennial. The fruit is similar in shape, but is shorter (to 1.8mm long), black, curved and has tuberculate faces.

B. readeri has similar leaves, obviously hairy stems and an upright habit initially. It differs in that the stems only bear septate hairs but no glandular hairs, plants are not as tall (to 25cm high), and are annual. The fruit is black with a centrally placed, stellate pappus.

B. tenuiscapa* var. *tenuiscapa has been mistaken for *B. diversifolia* growing at 1500m. It is also a perennial with white heads on leafy flower stems, but it can be distinguished by the permanent rosette of radical leaves at the base and by its suckering habit. The fruit is quite different; dark brown to black, relatively flat, with a swollen margin and smooth faces. The pappus is very short and centrally placed.

Leucanthemum vulgare (syn. *Chrysanthemum leucanthemum*), the Ox-eye Daisy, is an introduced species which has often been mistaken for *B. diversifolia*. It is a perennial with tall, branching, ribbed, hairy stems and terminal white daisies to 5cm across. It differs from *B. diversifolia* in being a rampant grower which suckers and layers. The fruit is spindle-shaped, ribbed and has no pappus.

Special notes: *B. diversifolia* was first described and illustrated by R. Graham in Vol. 3 of *Exotic Flora* (1827) by W.J. Hooker. This was published to introduce plant 'novelties' from abroad which, in the opinion of the author, were 'deserving of being cultivated in our gardens'. The material for the description and illustration came from the garden of William Hooker where it had been grown from seed sent by Charles Fraser. In this volume the plant was described as *Pyrethrum diversifolium* and the common name assigned to it was Hairy New Holland Pyrethrum. The author noted that, 'The broad and dilated petiole, and the very distinctly jointed hairs, are striking characters in this species ..... '

In 1817 Cassini described the genus *Brachyscome* and by 1835 Friedrich Ernest von Fischer and Carl Anton Meyer had included Graham's *Pyrethrum diversifolium* in this genus as *Brachycome diversifolia*.

Bentham in *Flora Australiensis* (1866) Vol. 3 described three varieties of *B. diversifolia;* var. *diversifolia*, var. *humilis* and var. *maritima*. The variety *humilis* is no longer recognized; *humilis* means of low growth and it is thought the specimen may have been depauperate.

B. diversifolia exhibits polyploidy and has a base chromosome number of $x = 4$ (Watanabe and Short, 1992). The *B. diversifolia* complex includes *B. diversifolia, B. goniocarpa, B. gracilis, B.* aff. *gracilis, B. nodosa* and *B. readeri* and all appear to be closely related. All the members have lobed leaves and expanded leaf bases, but *B.* aff. *gracilis* and *B. readeri* are the only two likely to be confused with *B. diversifolia* from a morphological standpoint. Watanabe and Short (1992) also suggest there is a relationship between this complex and the *B. linearifoba* and *B. campylocarpa* complexes. It has been the experience of Study Group members that *B. diversifolia* comes true from seed but, as the male parent, it is believed to have crossed with *B. gracilis* and *B. nivalis*.

It should be noted that in *Plants of Western New South Wales* (1981) *B. diversifolia* is described as 'white or mauve' and the accompanying coloured illustration appears to be of another species, possibly *B. ciliocarpa*.

Fruit of *B. diversifolia* var. *diversifolia* — west of Stawell, Vic (x 20)

Brachyscome diversifolia (Graham ex Hook.) Fischer and Meyer var. *dissecta* G. Davis

PERENNIAL
*35–45cm high
width unknown
WHITE, MAUVE

Derivation: *dissecta* — cut into many segments, referring to the leaves.

Erect perennial with divided leaves, branching stems and white or mauve flower-heads. Not in cultivation to date.

Distribution and habitat: Qld, NSW. Occurs in the Darling Downs region of Queensland and north from the Blue Mountains on the Tablelands, North Western slopes and North Western plains of New South Wales. Grows in sandy soil or in soil pockets among rocky outcrops.

Description: **In the wild** this variety is described as an upright perennial, 35–45cm high, with many branching stems. **Leaves** are doubly pinnatisect, the upper lobes being thin, narrow, and linear or linear-oblong. The radical leaves are up to 9.5cm long and persist for some time. **Flower-heads** are white, or mauve, about 2.5cm across, on slender flower stems with one or two small leaves in the lower half. **Fruits** are identical to those of var. *diversifolia*.

Flowering period: June to December.

Cultivation and uses: The Study Group has not been able to collect this variety despite strenuous efforts.

Propagation: It should germinate from seed and strike from cuttings.

Similar species: ***B. multifida* var. *dilatata*** is vegetatively close to *B. diversifolia* var. *dissecta* (Davis, 1948). *B. multifida* is distinguished by the absence of radical leaves and by the leaf bases which are straight, not expanded. The fruit differs in being black, tuberculate, and in having a centrally placed pappus.

*** refers to the height of the variety in its natural habitat as described in the literature.**

Brachyscome diversifolia (Graham ex Hook.) Fischer and Meyer var. *maritima* Benth.

PERENNIAL
40–50cm high
40–60cm wide
WHITE

Derivation: *maritima* — confined to the coast.

A shrubby perennial with bright green, thick, doubly pinnatisect leaves and many white heads.

Distribution and habitat: Tas. Restricted to the Bass Strait islands where it is locally abundant on cliffs. It occurs in Tussock Grass with *Allocasuarina verticillata, Leptospermum laevigatum* and *Myoporum insulare*. It usually grows in sheltered places, never in exposed situations.

Description: In cultivation a dense, shrubby perennial with freely branching, leafy stems which may be erect or ascending. The stems are often woody at the base. Although plants look glabrous to the naked eye the leaves and stems are covered with very short glandular hairs. **Leaves** are thick, almost fleshy, pinnatisect, with broad lobes which are usually lobed again. The basal leaves are 8.5cm long and reduce in size up the stem. They are petiolate and expanded at the base. **Flower-heads** are white, solitary, 2.5–4.5cm across, on robust flower stems 10–15cm long. There are 1–4 small leaves in the lower half of the flower stem. This variety produces more heads per plant than var. *diversifolia*. **Fruits** are identical with those of var. *diversifolia*. **In the wild** this variety is fairly common on the Bass Strait islands. Plants are smaller, more compact and less floriferous than they are in cultivation.

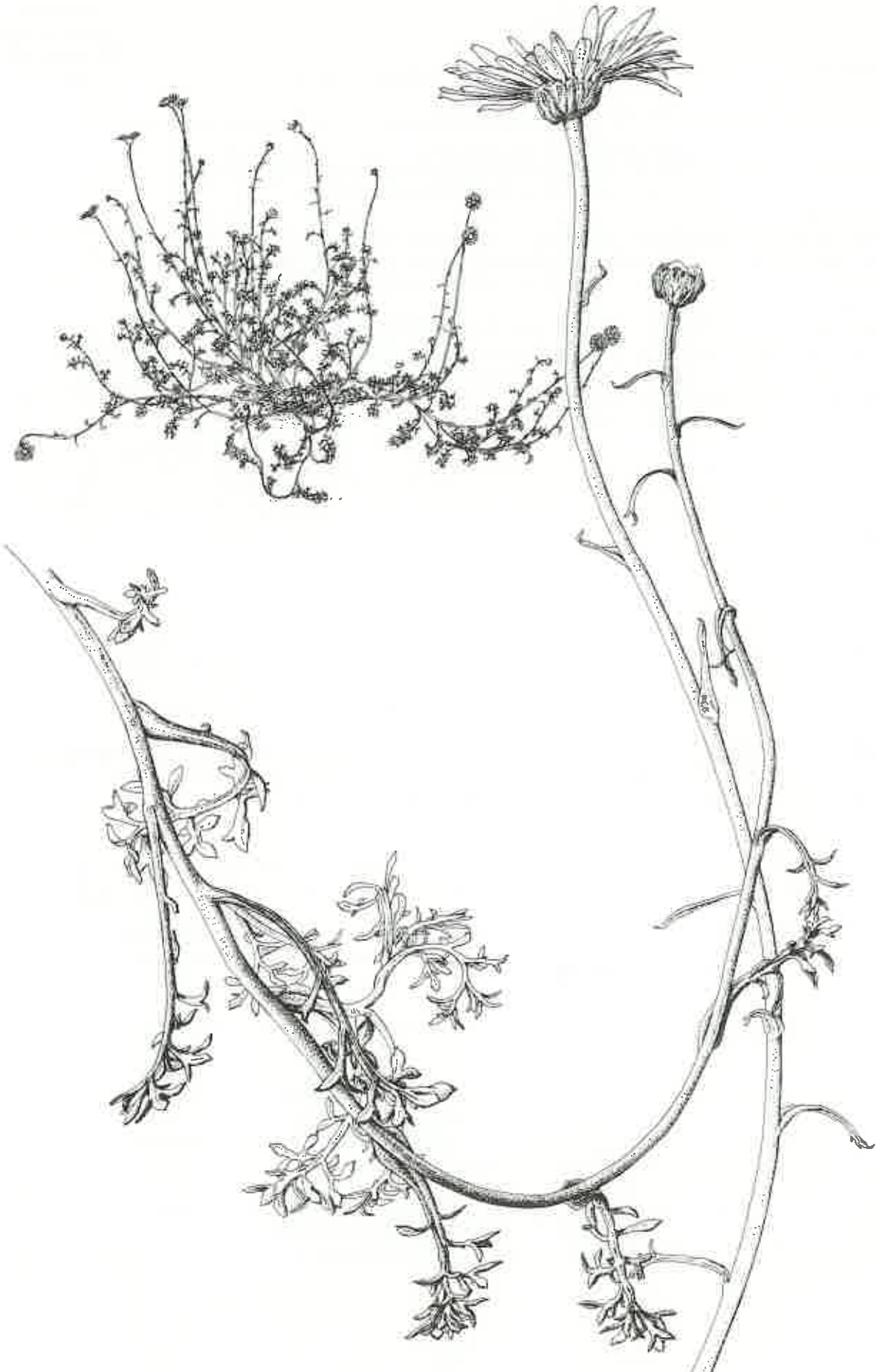
Flowering period: Spring and late summer to autumn.

Cultivation and uses: This attractive variety has handsome foliage and produces many, relatively long-lived heads over an extended period. It grows in sun or dappled shade in most soils. It withstands moderate frosts and thrives in protected coastal situations. The habit is dense and so it can be used as a tall ground cover. It is suitable for general planting or large containers.

Propagation: Seed germinates poorly in 10–40 days. Cuttings strike readily.

Similar species: ***B. segmentosa*** is a white-flowered perennial endemic in Lord Howe Island and it has fruit of a similar shape. Both entities have doubly pinnatisect leaves, but in *B. segmentosa* the leaves are thinner and shorter, and the lobes are thin rather than thick and fleshy. The flower stems are glabrous. The fruit has a pappus which is only slightly off centre.

Special notes: Davis (1948) has noted that var. *maritima* and *B. segmentosa* have close affinities. Both occur in island populations, but var. *maritima* is found at sea level and *B. segmentosa* at altitudes above 350m. Geologists are of the opinion that Lord Howe Island was never joined to the mainland, and so the evolutionary path appears obscure. Davis suggested that seed may have been carried to Lord Howe Island from the mainland on the feet of a bird. Plants then developed differently from the parent stock in isolation although some similarities between the two remained.



B. diversifolia var. *maritima* — Erith Island, Tas (x 1)

Brachyscome eriogona (J. Black) G. Davis

ANNUAL
15–20cm high
30–40cm wide
WHITE

Synonym: *B. goniocarpa* Sonder & F. Muell. var. *eriogona* J. Black

Derivation: *eriogona* — having a woolly border, referring to the appearance of the seed.

White annual with divided leaves and a straggling habit.
In its arid place of origin the habit is neater.

Distribution and habitat: Qld, NSW, SA. Occurs near Lake Frome in north-eastern South Australia, just over the border in Sturt National Park (NSW) and in the south-west corner of Queensland. It grows in arid areas in sand, on gibber plains and along watercourses.

Description: In cultivation a weak, almost hairless annual. Thick, soft, branching stems are 7–20cm long. **Leaves** are bright green, sessile, 2–6cm long, pinnatisect, with 7–9 narrow linear lobes. The lower leaves do not form a basal cluster. At the junction of leaf base and stem there is a collection of long, fine hairs as well as glandular hairs. **Flower-heads** are white, 1.5–3cm across, on flower stems, 7–15cm long, with a few lobed leaves near the base. **Fruits** are brown, 2–2.5mm x 1–1.3mm, regularly curved along the length of the body. The wings are broad and thickened, often horizontally banded, and bear long white inrolled hairs erect along the edges. The pappus is conspicuous. In the wild plants are often shorter (10–15cm) and the stems are ascending and more numerous than they are in cultivation. In a good season *B. eriogona* carpets the ground on the gibber plains wherever water collects.

Flowering period: Spring.

Cultivation and uses: In outward appearance this species resembles *B. smithwhitei,* but it is neither as easy to germinate nor as easy to grow. Its horticultural potential appears to be limited to the dedicated collector. *B. eriogona* prefers an open, sunny position in well-drained soil. The flowering period is prolonged if soil moisture is maintained. Prune to encourage a neater habit.

Propagation: Seed is difficult to germinate. It may take up to a year and percentage germination is low. This is a 'hard-headed' species, that is, seed remains in the fruiting head for a long time. When the head has expanded into a conical shape the seed loosens and is mature.

Similar species: ***B. campylocarpa*** looks similar to *B. eriogona,* but the fruits differ; they have prominently lobed wings with one or two long hairs on the margin of each lobe. The chromosome number is $n = 5$.

B. dichromosomatica is similar, but may be distinguished by the absence of branching stems, the completely glabrous leaves, and the hemispherical fruiting heads. The fruit of this species is not curved.

B. lineariloba is also distinguished by the absence of branching stems, the lack of hairs at the leaf base, and the hemispherical fruiting heads.

B. smithwhitei is very similar in appearance. The fruit is the distinguishing character; *B. smithwhitei* has a fruit that is strongly curved at the apex, a prominent wing in the top part of the body and two tufts of hair at the base. This species is common in southern Queensland and inland New South Wales, but does not occur as far west as *B. eriogona.*

Special notes: ***B. eriogona*** **belongs to the** ***B. campylocarpa*** **complex, together with** ***B. smithwhitei*** **and** ***B. campylocarpa*****. They are closely related to the** ***B. diversifolia*** **and** ***B. lineariloba*** **complexes (Watanabe and Short, 1992). The chromosome number for** ***B. eriogona*** **is** $n = 4$ **(Smith-White *et al.*, 1970).**

B. eriogona — Sturt N.P., NSW (x 1)

Fruit — Sturt N.P., NSW (x 20)

Brachyscome exilis Sonder

Slender Daisy, Finger-leaved Daisy

ANNUAL
10–20cm high
15–35cm wide
WHITE

Synonyms: *B. exilis* var. *scabrida* Benth.
B. neglecta J. Black

Derivation: *exilis* — small, thin.

Dainty annual with a profusion of flower-heads for at least three months.

Distribution and habitat: NSW, Vic, SA, WA. Occurs in coastal and inland regions. Recorded from sandy red soils in Bluebush communities, in scrub, above saline flats and along roadsides.

Description: In cultivation a glabrous or glandular-hairy annual with ascending and erect stems branching in the top half. **Leaves** at the base are oblanceolate and may be entire or lobed, 1–4.5cm x 0.5–2cm, but wither with age. Stem leaves are thick, sessile, almost stem-clasping, 0.5–2cm x 5–10mm. The leaves have 3–7 lobes which vary in shape, some presenting the appearance of fingers on an open hand while others are pinnatisect with linear lobes. **Flower-heads** are abundant, white, 1–2.5cm across, held at the tips of slender flower stems, 2.5–6cm long. **Fruits** are pale brown, 1.5–2mm x 0.5–0.7mm, club-shaped and thickened into two small shoulders at the apex. The body narrows towards the base and is usually notched on one side. There are some inrolled hairs along the margins and on the shoulders, but some hairs are lost at maturity. Minute tessellations may be seen on the body of mature fruit. The pappus is absent. Ripe fruits are reflexed on the receptacle like those of *B. leptocarpa.* **In the wild** plants are usually very small and slender (8–10cm x 2–3cm) with only a few small flower-heads per plant, but in good conditions they may be up to 15cm x 15–30cm.

Flowering period: Late winter and spring.

Cultivation and uses: Plants grow well in most soils provided they have adequate moisture and nutrients. They prefer an open position in full or half sun. This is a very attractive species for massing or grouping in gardens, rockeries or containers. Coastal forms would be useful for seaside plantings.

Propagation: Seed germinates moderately well in 10–50 days. Plants seed freely and will regenerate naturally in the garden or in pots. Cuttings strike readily.

Forms:

- One Yorke Peninsula (SA) form is dainty and grows 12cm x 25cm, with small white heads to 1cm across.
- Another Yorke Peninsula (SA) form is larger (20cm x 35cm). The heads are large (to 2.5cm across) and the leaves are thick and lobed like the fingers of an outspread hand.
- The Pine Creek (SA) form has fresh green leaves which are pinnatisect and petiolate. In cultivation plants are 10–15cm x 20–30cm, and have white heads, (1.5–2cm across) which begin to open in June.

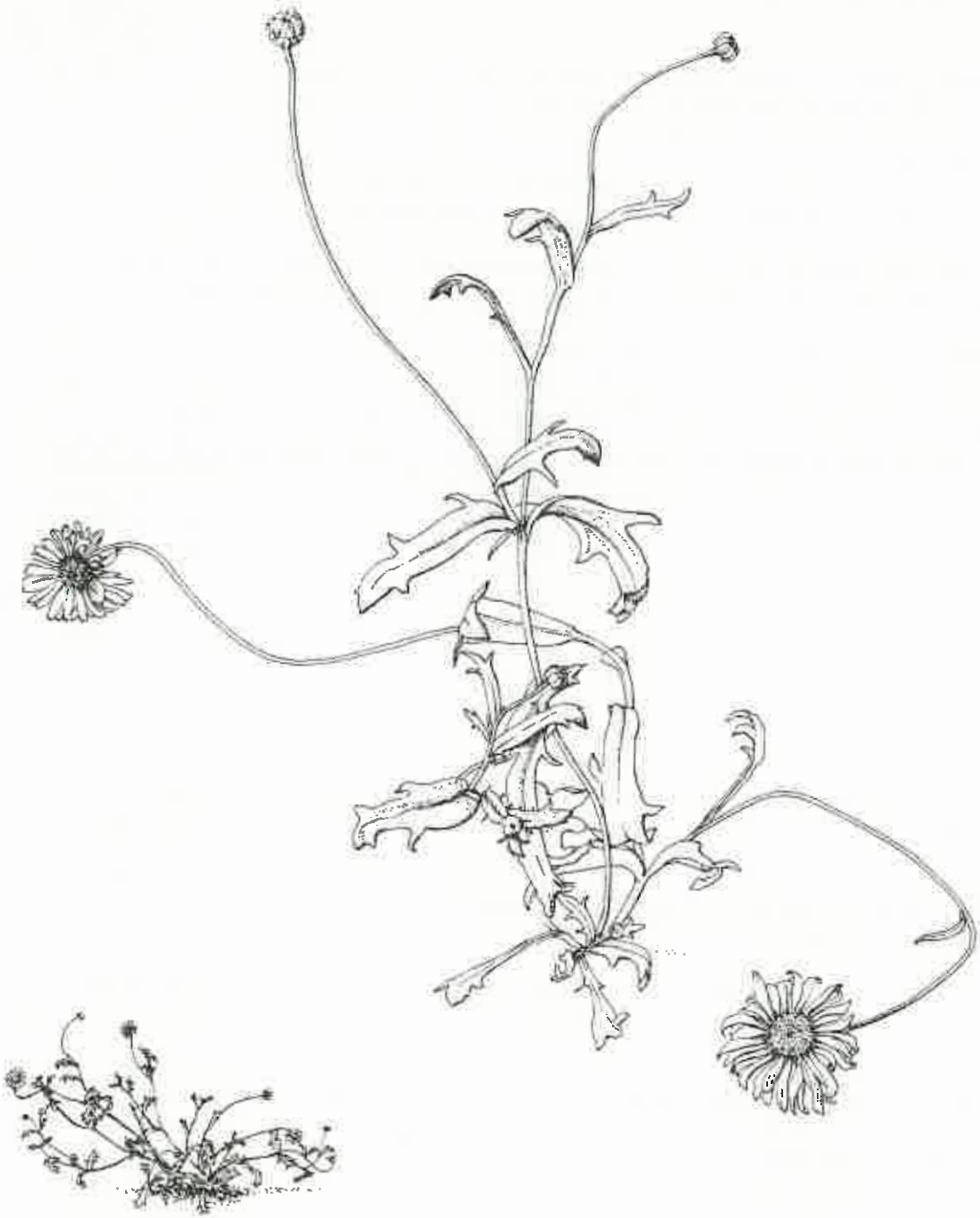
Similar species: ***B. bellidioides*** and ***B. pusilla*** are distinguished from *B. exilis* by the leaves which are entire or have only 1 or 2 small lobes.

B. eyrensis differs in that the ray florets are very short and the fruits are flattened.

B. iberidifolia has similar club-shaped fruits, but the apex does not develop shoulders to the extent that *B. exilis* does. The ray florets are longer (6–16mm cf. 3–6mm) and may be various shades of mauve or purple as well as white.

B. leptocarpa also has fruits reflexed on the receptacle at maturity, but the shape of the fruit is quite distinct. The body is linear, narrow, flattened and has a large obvious pappus.

Special notes: Davis (1948) suggests that *B. exilis* and *B. iberidifolia* may have originated as geographic subspecies because the similarities of appearance and fruit structure are so great. The chromosome number for *B. exilis* is *n* = 9 (Carter, 1978a).



B. exilis — Yorke Peninsula, SA (x 1) Fruit — Yorke Peninsula, SA (x 1)

Brachyscome eyrensis G. Davis

ANNUAL
*5–15cm high
*2–7cm wide
WHITE, MAUVE

Derivation: *eyrensis* — refers to the Eyre Region of Western Australia in which the species occurs. The specific epithet was suggested by Dr. J.H. Willis who collected specimens in 1950.

A small leafy annual with decumbent stems. Similar in appearance to some forms of *B. exilis*.

Distribution and habitat: WA. Occurs along the coastal belt near Israelite Bay and on the islands of the Recherche Archipelago. Grows among rocks and in dark peaty sand with other ephemeral plants.

Description: **In the wild** a decumbent annual to 15cm, branching at the base. Stems are leafy and bear small glandular hairs in the upper parts. **Leaves** are produced at the base and up the stem. The basal leaves are stalked, 1.5–2cm x 4mm, with 3–5 deeply cut teeth. The leaves reduce in size up the stem and the uppermost may be entire. There are sparse glandular hairs on the margins and the teeth have acute tips. **Flower-heads** 5–10mm across are held singly at the tips of flower stems which may have one small leaf bract. **Fruits** are grey or black when mature, 0.8–1mm x 0.5–0.7mm, wedge-shaped and microscopically tessellated. Sometimes a raised central ridge is present and the fruit is slightly thickened at the top of the body. The margin is narrow, wings are absent, and the pappus is minute and crown-shaped.

Flowering period: Spring.

Cultivation and uses: The Study Group has not grown this species.

Propagation: From seed.

Similar species: ***B. bellidioides*** is also an annual with microscopically tessellated fruit, but it differs from *B. eyrensis* in that plants are glabrous. The leaves are either entire or have only one or two short lobes, and the fruits are also glabrous.

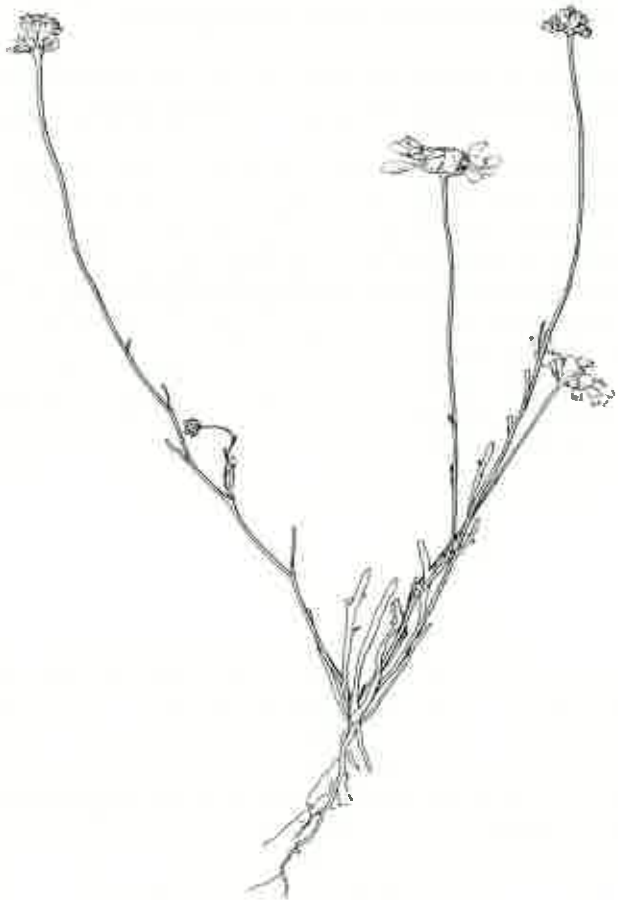
B. exilis is like *B. eyrensis* in habit and morphology, but the fruit is longer (to 2mm), pale brown and club-shaped with two apical shoulders.

B. iberidifolia is erect and taller (to 40cm) with much longer, more conspicuous ray florets (6–16mm). The fruit is similar to that of *B. eyrensis,* but it has two obvious longitudinal ridges on the faces, and is not as flat.

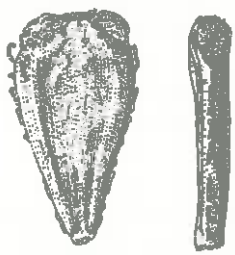
B. pusilla is similar to *B. eyrensis*, but *B. pusilla* differs in that plants are glabrous, have leaves with 1 or 2 small lobes, and longer ray florets (2.5–4mm). The fruits are thicker and have more inrolled hairs, especially at the apex.

Special notes: ***B. eyrensis*** **belongs to the *Brachyscome iberidifolia* complex together with *B. bellidioides*, *B. exilis*, *B. iberidifolia* and *B. pusilla* (Watanabe and Short, 1992). The species are closely related and all those examined so far have a chromosome number of $n = 9$. Future revision will probably produce changes in this complex.**

*** refers to the dimensions of the species measured from herbarium specimens.**



Brachyscome **species in the** ***B. iberidifolia*** **complex**
Darling Range, WA (x 1) [Illustrated from ADSG Herbarium]
Fruit — Darling Range, WA (x 20)



Brachyscome formosa P.S. Short

Pilliga Daisy

PERENNIAL
5–10cm high
10–15cm wide
PINK, CERISE

Synonym: See Special notes.

Derivation: *formosa* — beautiful.

Vibrant daisy with large pink or cerise heads, handsome foliage and a roaming habit.

Distribution and habitat: NSW. Occurs in the North and Central Western Slopes. Grows in open woodland and on roadsides in sandy loams and clays, or among granite boulders.

Description: **In cultivation** a small glabrous perennial which spreads by suckering. **Leaves** are variable, quite thick-textured, 1–4cm x 0.4–2.5cm, often tinged purple. The blade varies in shape from almost circular to broadly obovate and has 3–7 lobes, sometimes more. The lobes usually have rounded tips and may have one or two teeth. The leaf stalks are up to 3cm long and the bases are prolonged down the stems to produce raised lines. **Flower-heads** are cerise or pink, single, 2.5–3cm across, held above the leaves on stems 2–10cm long. **Fruits** are dark brown, large, 2–3mm x 1–1.4mm, with a number of tubercles enclosed by a raised margin. Many of the tubercles have stiff hairs at the tips. A narrow wing extends from the margin. The pappus is a ring of bristles, centrally placed. **In the wild** this rhizomatous species is only conspicuous when the large heads can be seen; dry or cold conditions render it invisible. Plants may reach a height of 15cm if growing among rocks or tall grasses.

Flowering period: In the wild *B. formosa* flowers in spring, but under cultivation it flowers mainly in spring and autumn.

Cultivation and uses: *B. formosa* will grow in most soils if there is enough moisture present. Plants will defoliate and disappear if the soil dries out too much, but they generally reappear nearby after good rain. Plants usually establish themselves as a series of small clumps and then send out underground shoots which travel up to 2m before reappearing to set up another little clump. Thus they meander around the garden and provide flashes of vivid colour. Growth in light sandy soil is improved by the addition of a moisture-retaining material such as peat moss or leaf mulch. It is a species that loves to get its roots under rocks or paving. Lightly shaded positions suit it best, but it grows in sun if kept moist. Granite or gravel chips have proved better mulches for this species than organic mulches. *B. formosa* may be burnt by frost but recovers quickly provided the affected foliage is not cut back until the frosts are over. It grows well in cool montane and cool temperate climates; in subtropical climates it may be short-lived. It tolerates protected coastal conditions. Use as a colonizing plant in the garden or rockery, but be prepared for it to disappear without notice. Be grateful if it reappears. It is an excellent choice for a planter box, hanging basket or container. Growth is more vigorous if the container base stands in water during periods of hot weather.

Propagation: Seed germinates in 15–30 days (but is not generally available). Propagation is easy from cuttings or by division. Young shoots from the base make the best cutting material. Plants should be divided and repotted in late summer or autumn.

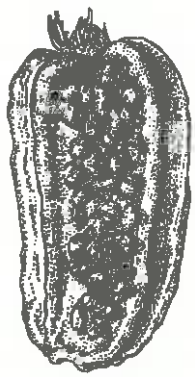
Forms:

- The most common form available from nurseries has large cerise flower-heads on relatively short stems and dark green leaves. This form is sold as *B. formosa* 'Pilliga Posy'.

- A form has been grown from the North Western Slopes with heads of paler pink on much longer stems (to 16cm). This form is pretty in a hanging basket as the branching stems (to 60cm) trail attractively over the rim.

- A beautiful form of unknown origin has appeared in some specialist nurseries. It has large mauve heads on short stems and thick blue-green foliage. This form may be a hybrid.

- Forms from the Mudgee area are reputed to be more reliable in cultivation (W.R. Elliot, pers. comm.).



B. formosa — Coonabarabran, NSW (x 1)

Fruit — Coonabarabran, NSW (x 20)

Two entities of uncertain status with affinities to *B. formosa* have been collected. The Study Group has termed them *B.* aff. *formosa* Entity 1 and Entity 2 until their status is determined.

B.* aff. *formosa Entity 1

Study Group members have made collections of this entity from the South Coast of New South Wales to eastern Victoria at altitudes below 200m. Locations include Timbillica in New South Wales and the Bemm River, Lind Highway, Mallacoota, Moondarra Dam, Mt Drummer, Sydenham Inlet and Wangarabell in Victoria. It grows in sheltered places on damp sandy or loamy soils and in eucalypt forests.

In cultivation it is a perennial, prostrate to 25cm high. It spreads to 10–15cm by suckering. Slender stems are erect and procumbent, and bear sparse glandular hairs. Leaves are petiolate, obovate to orbicular, 2.5–5cm x 0.5–2cm, with regularly lobed margins. Lobes number 7–10, are usually rounded, and are not deeply cut in towards the midrib. Sparse glandular hairs are present along the margins and midrib, but are more numerous on young growth. Purple colouration due to the presence of anthocyanin has not been noted on the backs of the leaves. Flower-heads are 2–3.5cm across on flower stems 8–16cm long which generally bear one small leafy bract. Ray florets (24–35) are various shades of mauve. Involucral bracts (14–20) are narrow-lanceolate with acute tips, torn transparent margins and sparse glandular hairs. Fruits are pale to mid-brown, 2.4–3mm x 1.2–1.5mm, wedge-shaped with a raised crimped margin. Flattened faces bear a number of tubercles tipped with hairs. The wing is relatively broad and has a shallowly lobed margin edged with hairs. The pappus is conspicuous.

This entity flowers in spring and autumn. It prefers shade or dappled sun, moist soil and root protection but tolerates dry conditions for a short time. As plants develop, the stems elongate and begin to sprawl. They should be pruned at this stage. This entity is suitable for cool montane and cool temperate climates and will grow at the coast. The vigorous suckering habit makes these plants useful small ground covers for shady areas and they have performed well in bog gardens. Some forms are pretty in hanging baskets. Seed germinates in 12–40 days and it is easy to transplant suckers.

B. angustifolia var. *heterophylla* has previously been confused with Entity 1. It differs in that the leaves have 3–7 acute lobes and the blades are longer and narrower. The majority of forms have pink or mauve-pink ray florets and there are fewer of them (12–24). The fruits are very similar but those of var. *heterophylla* generally have more tubercles. Plants do not sucker as vigorously.

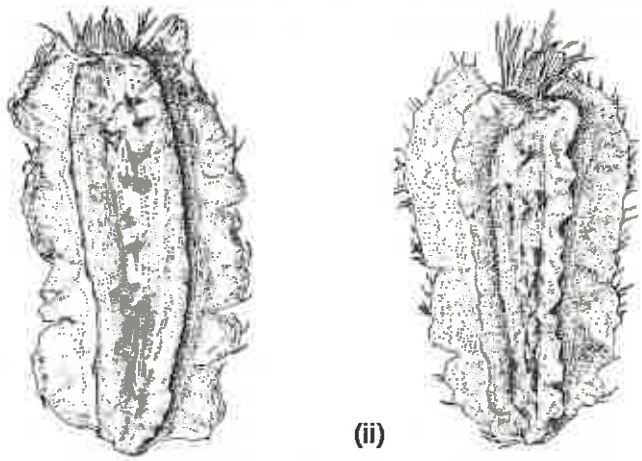
B.* aff. *formosa Entity 2

Study Group members collected this entity from the Central Tablelands of New South Wales and north-eastern Victoria at altitudes of 500–1000m. Locations include Barry, Neville and Trunkey in New South Wales and the Buckland Valley, Mt Firebrace, Mt Stanley and the Warby Range in Victoria. It grows in montane eucalypt forest and in poor gravelly soil among grasses on roadside verges.

In cultivation it is a small suckering perennial. The septate-hairy stems are erect or ascending and branch once or twice. Some stems develop horizontally to a length of 30cm and produce small bunches of leaves from which flower stems arise. Leaves are present in a basal tuft and along the stems. They are obovate, 1.5–7cm x 0.5–2cm, sessile, the base somewhat narrowed but still quite broad. Septate hairs are present on the blades and are more numerous on the margins. Lobes (3–9) are blunt or acute and may develop some small secondary lobing. Flower-heads are 2–3cm across on flower stems 5–20cm long with 1–3 small leaves. Ray florets (25–35) are white, mauve or pink. Involucral bracts (20–30) are lanceolate with acute tips and some septate hairs on the outer surface, especially at the base of the bract. The margins are transparent and usually purplish. Fruits are cream to brown, 1.8–2.5mm x 0.8–1.2mm, wedge-shaped with a raised margin enclosing faces covered with tubercles tipped with hairs. The narrow wing may be entire or slightly lobed and has short hairs along the edge. This entity appears to do better in its natural habitat than it does in cultivation.

Entity 2 flowers in spring. It is difficult to keep plants growing in gardens. Not only is the foliage a target for slugs and snails but plants may need a mycorrhizal association to reach their full potential. Ground moisture has a large bearing on flower production and on the amount of plant growth remaining above ground. The flowering period is too short for these plants to be of much value in horticulture. Seed germinates in 12–45 days and is green when it is shed. Propagate also by division.

B. aff. *formosa* Entity 1 — Timbillica, NSW (x 1)



(i) (ii)

B. aff. *formosa* Entity 1 — Fruit (i) Sydenham Inlet, Vic (x 20) (ii) Moondarra Dam, Vic (x 20)

B. angustifolia var. *heterophylla* has been confused previously with this entity. It differs in having sparse glandular hairs rather than septate hairs on stems, leaves and involucral bracts. The fruits look similar but the wing of var. *heterophylla* is much broader.

Similar species: Although *B. formosa* was at first thought to be like ***B. melanocarpa*** there is very little similarity. *B. melanocarpa* is an erect or sprawling, hairy perennial which does not sucker, has mauve or white heads and the stem leaves are wedge-shaped. The fruits are black, generally shorter (2–2.5mm), and have no wings.

B. microcarpa resembles *B. formosa* in having lobed leaves but the heads are smaller (1.5–2.5cm across). Plants are usually glandular-hairy. The fruits are much shorter (less than 2mm), dark brown to black, and rarely have wings.

B. procumbens could be confused with *B. formosa* since both are perennials which sucker, have leaves of a similar shape, and some forms have relatively large pink heads. In general, the heads are held on longer flower stems (to 25cm) and the leaves often have a short, acute lobe at the base of the blade. The character which distinguishes the two species most easily is the fruit; *B. procumbens* has broader fruit (to 2mm across) mainly due to the presence of a wide wing. Hairs edge the wing and fewer tubercles are present on the faces.

Special notes: *B. formosa* has been known as *Brachyscome* species aff. *melanocarpa* or '*B. pilligaensis*' in the horticultural trade for a long time. The term 'aff. *melanocarpa*' means with an affinity to or like *B. melanocarpa*. '*B. pilligaensis*' has no botanical validity and should never have been used. In eastern Australia it has been sold as *B.* 'Pilliga Posy' and in Western Australia as *B.* 'Tinker Bell', although none of these names has been registered with the Australian Cultivar Registration Authority. Short (1988) published the botanical description of *B. formosa* in *Muelleria*. The specific name '*formosa*' is aptly chosen because it means 'beautiful'.

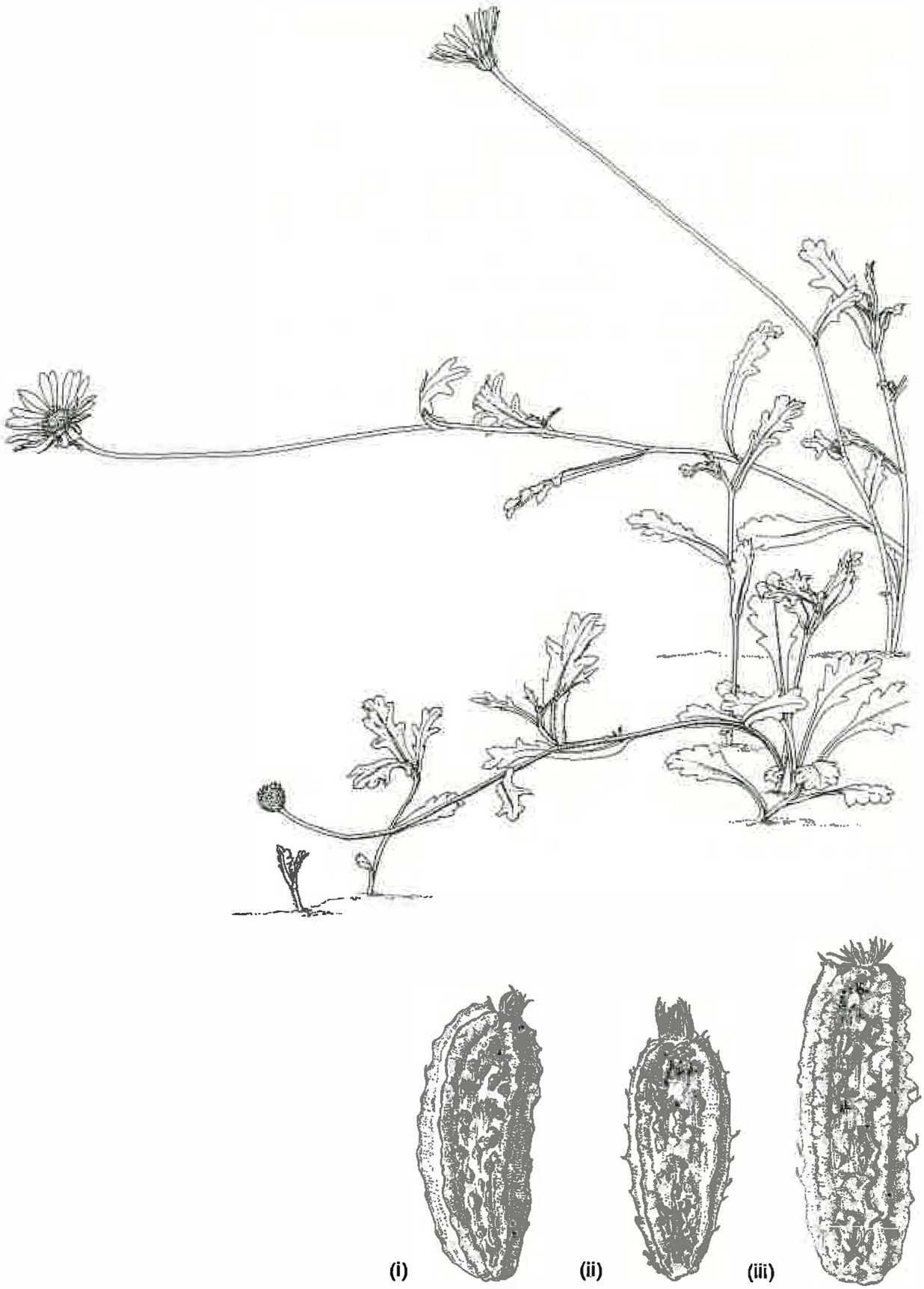
Short (1988) observed that '*B. formosa* appears to have close affinities with another, apparently unnamed, taxon from eastern Victoria and southern New South Wales. Collections of this taxon (e.g. *Forbes 512, Walsh 1214, Walsh 1492* — all at MEL) are commonly and erroneously referred to *B. angustifolia* A. Cunn. var. *heterophylla* (Benth.) Davis and *B. petrophila* Davis.' This description seems to apply to the entity the Study Group is referring to as *Brachyscome* aff. *formosa* Entity 1.

The chromosome number is $n = 9$ (Watanabe and Short, 1992). There is a close relationship between *B. angustifolia*, *B. formosa*, *B.* aff. *formosa* (Entities 1 and 2) and *B. procumbens*. They are all rhizomatous, their fruits are quite similar in appearance and $n = 9$ for all species (where the chromosome number has been determined).

Study Group members have artificially hybridized various forms of *B. formosa* with other species to try to establish relationships. The following hybridizations have been successful:

B. angustifolia var. *angustifolia* — mauve (nursery form) x *B. formosa* (Coonabarabran)
B. angustifolia var. *angustifolia* — mauve (nursery form) x *B. formosa* (Timor Rocks)
B. angustifolia var. *angustifolia* — mauve (nursery form) x *B.* 'Pilliga Posy'
B. angustifolia var. *heterophylla* — mauve-pink (nursery form) x *B.* 'Pilliga Posy'
B. aff. *formosa* Entity 1 (Timbillica) x *B.* 'Pilliga Posy'

B. formosa has been hybridized with *B. segmentosa* only by embryo rescue techniques, thus indicating that the relationship between the two species is not close.



B. **aff.** ***formosa*** **Entity 2 — Buckland Valley, Vic (x 1)**
Fruit — (i) Warby Range, Vic, (ii) Neville, NSW, (iii) Mt Stanley, Vic (x 20)

Brachyscome glandulosa (Steetz) Benth.

Sticky Daisy

ANNUAL
*10–25cm high
*5–10cm wide
WHITE

Synonym: *Silphiosperma glandulosum* Steetz

Derivation: *glandulosa* — having glands.

Slender, glandular-hairy annual with very short ray florets.

Distribution and habitat: WA. Occurs in the south-west of the state on coastal plains, inland areas and in the Stirling Range. Grows in well-drained soils; red sandy loams in wandoo woodland and black sand over granite.

Description: **In the wild** a small erect annual, usually 10–25cm high. Plants are single-stemmed, branching in the top third, and are densely glandular-hairy. **Leaves** are sessile, pinnate, 2–4cm long, with linear mucronate lobes to 1.5cm x 1mm. The lowest stem leaves are spoon-shaped with entire margins and are quickly lost. **Flower-heads** are white, 6–8mm across, on slender leafy stems. The ray florets hardly extend beyond the bracts. **Fruits** are pale brown, obovate, usually 2.5–3mm x 1.5–2.2mm, but some fruits are larger (4mm x 3mm). The body bears a few glandular hairs and is slightly curved with a shallow depression in the central area. The margin is quite broad and wing-like, golden-brown, smooth, entire and conspicuously notched at the apex. There is no pappus.

Flowering period: Late winter, sometimes early spring.

Cultivation and uses: The Study Group has not collected this species and therefore has not grown it. The shortness of the ray florets (about 1mm x 0.3mm) and the brevity of the flowering season hint that *B. glandulosa* has no horticultural potential.

Propagation: Presumably this species could be propagated from seed if available.

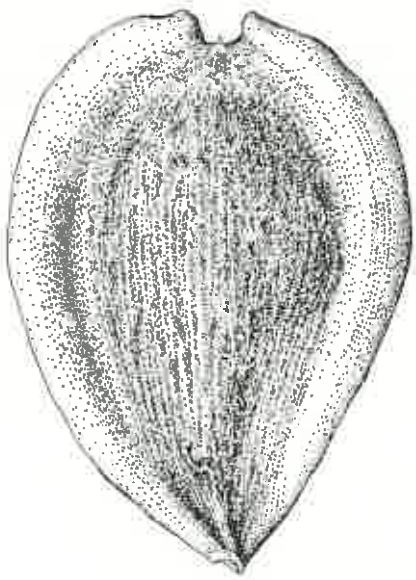
Forms:

- *B.* aff. *glandulosa* differs only in being glabrous rather than glandular-hairy. The wing of the fruit is entire. Small plants (7–10cm x 2–4cm) have been found in the Stirling Range and near Ongerup.

Similar species: ***B. perpusilla* var. *tenella*** is also a small annual with inconspicuous flower-heads and pinnate leaves. It is usually smaller than *B. glandulosa* (to 11cm high) and is either glabrous or sparsely glandular-hairy. The fruit is the distinguishing character; the shape is similar but the border of the margin is drawn into acute lobes, each tipped with a long inrolled hair.

Special notes: Davis (1948) in her description of *B. perpusilla* refers to herbarium specimens from Boulder (WA). These specimens combined material referable to *B. glandulosa* and *B. perpusilla* var. *tenella* plus some plants with the habit and indumentum of *B. glandulosa*, but the fruit had shallow lobes and a very long hair at the apex of each lobe like the fruit of *B. perpusilla*. Davis suggested that hybridization between the two species may have occurred. Future revision may see *B. glandulosa* and *B. perpusilla* included in one species (P.S. Short, pers. comm.).

* refers to the dimensions of the species measured from herbarium specimens.



B. glandulosa — origin unknown Fruit (x 20)

Brachyscome goniocarpa Sonder and F. Muell.

Dwarf daisy

ANNUAL
3–6cm high
2–5cm wide
WHITE

Derivation: *goniocarpa* — having many-sided fruit.

Tiny annuals with pale green lobed leaves and little white flower-heads.

Distribution and habitat: Vic, SA, WA. Occurs in open scrub habitats from western Victoria to the Esperance region in Western Australia. Usually found in damp shallow depressions in sand dunes and under eucalypts.

Description: **In cultivation** a small, branching, somewhat hairy annual to 6cm high. The habit is open and may be erect, ascending or sprawling. Glandular and septate hairs are present on the stems. **Leaves** are first produced in a basal tuft, but this tuft later disappears. Stem leaves are sessile, spathulate to wedge-shaped, 0.5–1.5cm x 2–5mm, slightly stem-clasping, and with 5–7 broad lobes at the apex.. The leaves bear a mixture of glandular and septate hairs. **Flower-heads** are small, 4–6mm across, and few in number. Ray florets (10–14) are white and 1–2mm long. Flower stems are leafy to the heads. **Fruits** are black and thick, 1.5mm x 0.8–1mm, wedge-shaped and four-sided, with vertical wing-like ridges usually bearing a few hairs. The lateral ridges appear to be formed of large tubercles. The pappus is flattened and set obliquely on the body. **In the wild** these little plants are so tiny as to be almost invisible, even when they are in flower.

Flowering period: Spring.

Cultivation and uses: It is difficult to think of any horticultural use for this diminutive species. Perhaps it could be used in a miniature rock garden. In order to be seen and admired it would need to be grouped. A sunny position in moist soil allows it to flower longer.

Propagation: Seed germinates poorly in 10 days to 6 months. Plants self-sow once they are established.

Similar species: ***B. breviscapis*** is a small white-flowered annual. It differs from *B. goniocarpa* in that the leaves are pinnatisect and the fruit is smooth, brown and has a conspicuous, centrally placed pappus.

B. gracilis is a white-flowered annual with black fruit. The habit is usually taller (10–20cm) and more slender than that of *B. goniocarpa*, and the flower-heads are larger (1.5–2.5cm across). The fruit is more strongly curved and the pappus is centrally placed.

B. nodosa is a recently described species which had been confused previously with *B. goniocarpa.* It is also a white-flowered annual with black fruits of a similar shape. *B. nodosa* differs from *B. goniocarpa* in the following respects: individual plants grow larger (10–15cm x 20–25cm) and the flower-heads are 2–2.5cm across. Mature fruits are more bulky (1.5–2mm x 1.8–2mm) and develop conspicuous knob-like projections at the apex. *B. nodosa* occurs only in Queensland and New South Wales.

B. xanthocarpa is also a small white-flowered annual. The fruit is the distinguishing character. The faces are covered with large yellow tubercles and the conspicuous pappus is centrally placed.

Special notes: ***B. goniocarpa* has a chromosome number of *n* = 4 (Watanabe and Short, 1992). These authors observed that the name *B. goniocarpa* has been used wrongly to identify at least two distinct entities in New South Wales and Queensland. True *B. goniocarpa* occurs only in Victoria, South Australia and Western Australia. It is a very small species with short, inconspicuous ray florets. Some of the specimens which have been identified as *B. goniocarpa* in the past are now known to be *B. gracilis* (NSW) and *B. nodosa* (Qld, NSW). Errors in the distribution of *B. goniocarpa* have thus been made in most state and regional floras published to date. The distribution should not include New South Wales and Queensland.**

Watanabe *et al.* (1991) produced artificial hybrids between *B. goniocarpa* (*n* = 4) and *B. dichromosomatica* (*n* = 2). These workers concluded that a close relationship existed between the two species. They suggested that the inflated wing of *B. dichromosomatica* fruit and the horse-shoe shaped lateral folds of *B. goniocarpa* fruit were fundamentally the same structures.

B. goniocarpa — Keith, SA (x 1)

Fruit — Keith, SA (x 20)

Brachyscome gracilis G. Davis

Dookie Daisy

ANNUAL
10–20cm high
8–30cm wide
WHITE

Derivation: *gracilis* — slender, referring to the habit.

Small, slender annual with divided leaves.

Distribution and habitat: NSW, Vic. Occurs on the Western Plains and South Western Slopes of New South Wales and in north-eastern Victoria. Grows in grasslands, in open forest and on moss among granite boulders.

Description: **In cultivation** a hairy annual with a relatively long life span. The habit varies with the origin of the form grown. Stems branch from the base, are erect to decumbent, and bear septate and glandular hairs. **Leaves** are 1–4cm long, deeply lobed or pinnatisect with 5–7 lobes (1–5mm long) sometimes lobed again. Glandular and septate hairs are present on the blades and the leaf bases are expanded. **Flower-heads** are 1.5–2.5cm across on flower stems 8–18cm long with 1–2 reduced leaves near the base. Ray florets are white. **Fruits** are brown to black, 1–2mm x 0.8–1mm, wedge-shaped and strongly curved at the apex. Small tubercles, some tipped with hairs, are usually present at maturity. Thickened wings extend above the point of pappus-insertion and are not clearly distinguishable from the body. A few hairs edge the wings and are more numerous at the apex. The pappus bristles are conspicuous, white, not stellate, and are centrally placed. **In the wild** the size of individual plants varies greatly with seasonal conditions. With good rainfall the species is present in abundance and flowers for quite a long time. In dry years plants flower fleetingly and die down quickly.

Flowering period: Spring. In cultivation some forms continue to flower intermittently into autumn if moist conditions are maintained.

Cultivation and uses: Most forms of *B. gracilis* trialled are too small to be of much use in horticulture. One form, from Upper Namoi, shows promise in the garden and as a container plant. Dappled shade and moist conditions suit it best.

Propagation: Seed germinates in 10–80 days, the germination rate varying according to the origin and age of seed. Seed is retained in the head for some time after it has matured.

Forms:

- A form from Rankins Springs (NSW) is very dainty, 10–15cm x 10–15cm, with flower-heads to 2.5cm across.

- A form from Upper Namoi (NSW) is quite robust, 15–20cm x 20–30cm, with a dense rounded habit. Flower-heads are 2.2–2.5cm across and are long-lasting in cultivation. Some individual plants have lived longer than twelve months. The fruits are brown and the wings are poorly developed.

- A form from the Beechworth (Vic) area is small and slender, 10–15cm x 8–10cm, with few flower-heads. It dies down with the onset of hot weather.

An entity of uncertain status with affinities to *B. gracilis* has been collected in a restricted location near Kings Billabong in the Mildura area of Victoria. Until its status is determined it is referred to as *B.* aff. *gracilis.*

B. aff. *gracilis*

This entity occurs on flood plains under Black Box and Red Gum. In cultivation it is an annual branching near the base. Ascending stems 30-35cm long, bear conspicuous long septate hairs at right angles. The stems branch several times as plants develop. The habit is open and sometimes untidy. Leaves are soft, sessile, 1–4.5cm x 0.2–1.8cm, lobed with 3–5 irregular lobes. The leaf bases are expanded and slightly stem-clasping. Although the blades are almost glabrous there are septate hairs along the margins. Flower-heads are white, 2–3.5cm across, on flower stems 20–25cm long, bearing 3–4 reduced leaves. Septate hairs are mixed with glandular hairs just below the head. Fruits are brown to black, wedge-shaped, 1.5–1.8mm x 0.8–1mm, and curved at the apex. Thickened wings, not

B. gracilis — Dookie, Vic (x 1)

Fruit — Dookie, Vic (x 20)

very distinct from the body, are edged with inrolled hairs. Small tubercles are present. The pappus is conspicuous, centrally placed and stellate, at least in the seed head. (In some individual fruits the pappus appears to be upright.) The wings extend above the point of pappus-insertion. The fruit shape seems to vary depending on where it lies in the seed head. In the wild plants are 20cm high. The relatively large heads are held on more upright, fewer-stemmed plants. They are a magnificent sight in full bloom. Their life span is limited by the conditions encountered each season. Very hot days of 36°C or more kill the plants. In some dry seasons plants have not appeared at all.

Plants flower in early spring in their natural habitat, but in cultivation they will flower from spring to early autumn if planted in protected positions. *B.* aff. *gracilis* is handsome and looks sturdy but its superstructure grows too big to be supported by the small root system. There is a real danger of the main stem snapping off in windy weather. It prefers warm, open conditions, moist heavy soil and some protection from the wind. It is most suitable for grouping or massing in inland gardens. Seed germinates in 8–60 days. Storing seed at 4°C improves germination. Plants will self-sow.

Similar species: ***B. goniocarpa*** has been previously confused with *B. gracilis*. *B. goniocarpa* is a much smaller plant (3–6cm x 2–5cm) with smaller flower-heads (4–6mm across). The fruits are not as strongly curved, do not have such a well-developed wing, and have a stellate pappus set obliquely.

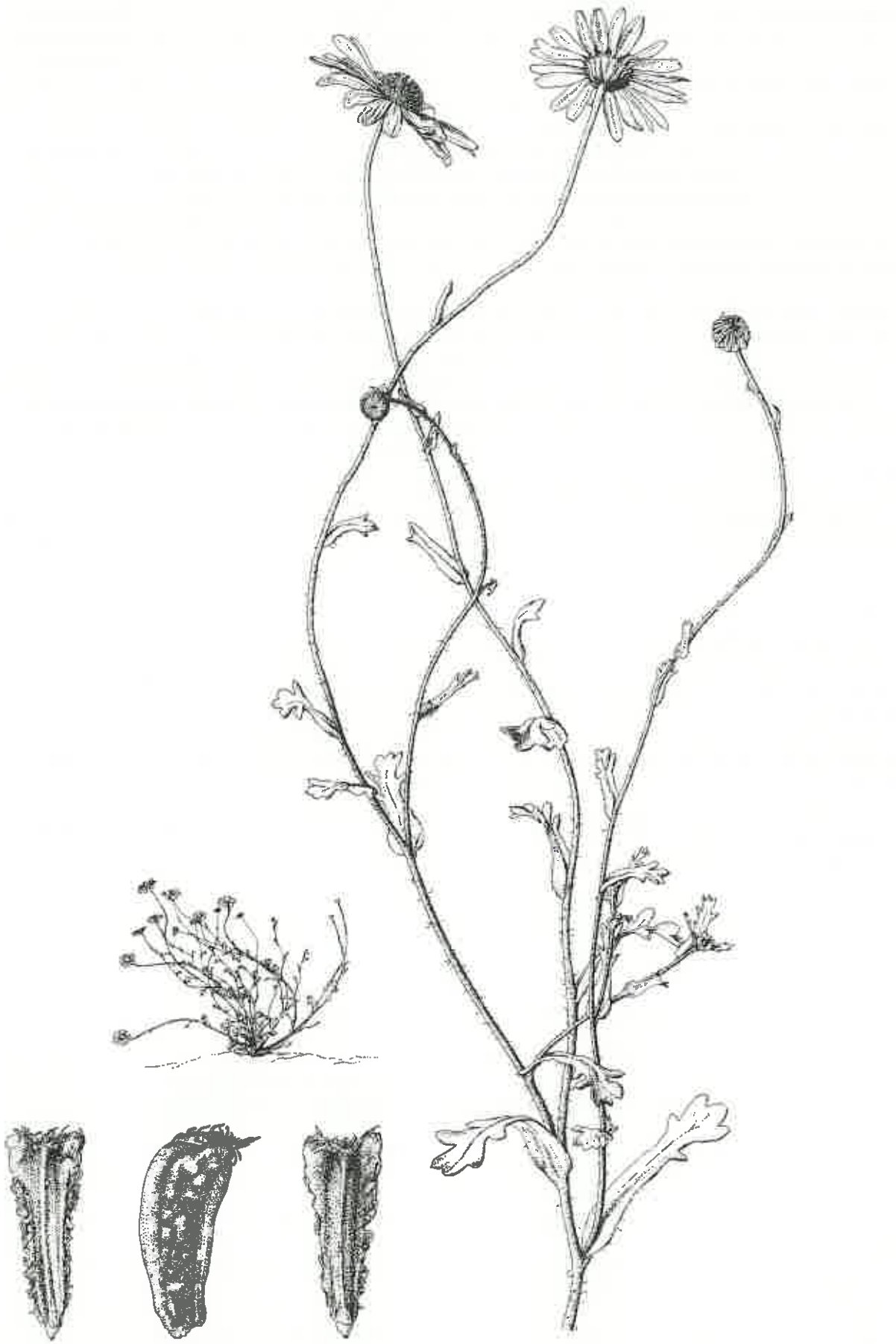
B. nodosa resembles *B. gracilis* vegetatively, although in cultivation the habit is more decumbent. The fruit is the main distinguishing feature; the tubercles of *B. nodosa* are usually larger and the fruit develops a prominent horn-like projection at the apex when it is fully mature. The pappus is stellate and obliquely placed.

B. readeri has a more robust and upright habit to 25cm and the leaves are longer (3–7cm). The fruit differs in that it is straight rather than strongly curved, and the thickened wing-like structure does not extend above the pappus.

Special notes: Watanabe and Short (1992) determined a chromosome number of $2n = 8$ for *B. gracilis* collected in the Warby Range (Vic). *B. gracilis* is a member of the *B. diversifolia* complex, all of which are closely related. The other species in the complex are *B. diversifolia* ($x = 4$), *B. goniocarpa* ($n = 4$), *B.* aff. *gracilis* ($2n = 24$), *B. nodosa* ($2n = 6$) and *B. readeri* ($2n = 10$). These species have a vestiture of mixed septate and glandular hairs, the leaves are deeply lobed to pinnatisect and have expanded bases, and the fruit has a thickened or expanded margin.

Davis (1955) suggested that the appearance of the fruit of *B. gracilis* may have indicated an affinity with *B. campylocarpa*.

Watanabe and Short (1992) pointed out that in Queensland and New South Wales the name *B. goniocarpa* had been wrongly applied to *B.* sp. aff. *goniocarpa* (described as *B. nodosa* in 1993 by the same authors). In New South Wales the name *B. goniocarpa* had been wrongly applied to *B. gracilis*.



B. aff. *gracilis* — Kings Billabong, Vic (x 1)

Fruit — Kings Billabong, Vic (x 20)

Brachyscome graminea (Labill.) F. Muell.

Grass Daisy

PERENNIAL
7–15cm high
spreading
MAUVE, WHITE

Synonym: *Bellis graminea* Labill.

Derivation: *graminea* — grass-like, referring to the leaves.

Small perennial with mauve or white heads, which spreads by sending out runners. Luxuriant growth in a moist position.

Distribution and habitat: Qld, NSW, ACT, Vic, Tas, SA. Occurs in moist areas from swamps to saline marshes, and along watercourses.

Description: In cultivation a small, weak-stemmed perennial spreading by above-ground runners. Stems are branching and appear hairless, but a few glandular hairs may be found on young leaves and stems (especially just below the head). **Leaves** are 1–15cm x 1–10mm, oblanceolate to almost linear with a long narrow stem. Margins are entire (though just occasionally a few leaves may develop one or two blunt lobes), and the midrib is conspicuous. **Flower-heads,** 1.5–2cm across, appear singly at the tips of slender branchlets. **Fruits** are golden to dark brown, 2mm x 1.5mm, obovate and sticky, with a broad swollen margin. Short glandular hairs can usually be found on the sunken body and around the margin. The pappus is minute or absent. **In the wild** *B. graminea* grows in open situations as a stoloniferous clump, 7–10cm high, but it will scramble up to a height of 70cm if supported by surrounding vegetation.

Flowering period: *B. graminea* flowers through the warmer months and may flower all the year if conditions are suitable.

Cultivation and uses: *B. graminea* is easy to grow in Melbourne gardens, but does not flower very prolifically. It is possible that the nutrients present in most garden soils result in luxuriant growth rather than flowers. In subtropical conditions plenty of moisture is needed to keep plants alive. It prefers full sun or part shade, and moist soil. It tolerates frost to –5°C and forms of coastal origin have succeeded in seaside gardens. Although plenty of runners are produced when it is grown in baskets or containers the flowers are sparse to non-existent. It is probably best suited as a bog plant or a green ground cover. It will quickly cover quite a large area if planted at 30cm centres.

Propagation: Seed germinates very well in 8–30 days when sown in autumn. Cuttings root quickly and root division is easy.

Forms:

- One form from East Gippsland (Vic) shows promise. It has relatively large white flower-heads and forms clumps 12–15cm x 30cm. When the soil dries out it dies back until moisture is present again.

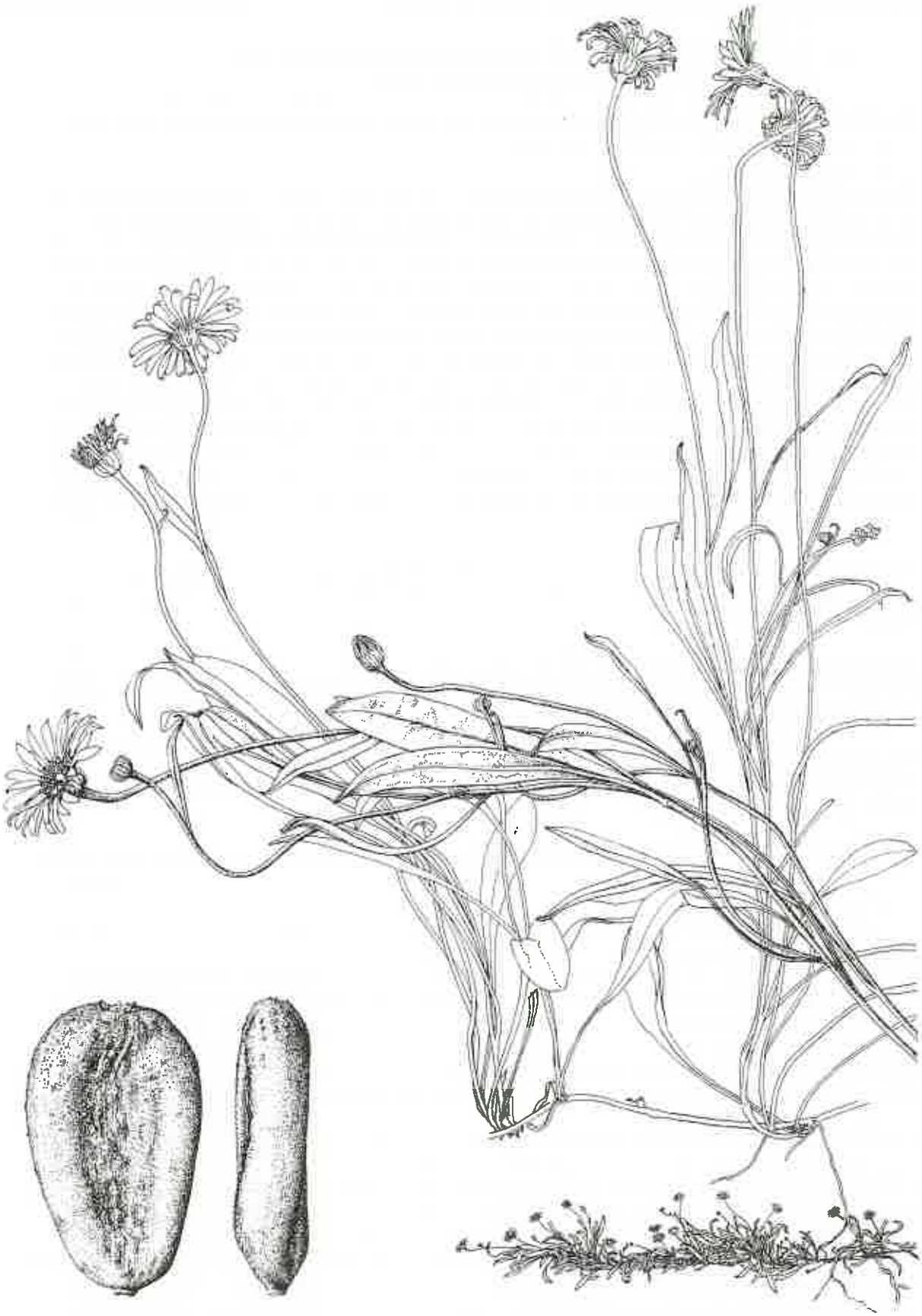
- Most other forms tested produced lush foliage but few flowers.

Similar species: ***B. angustifolia* var. *angustifolia*** is similar to some forms of *B. graminea*. It differs in that the leaves are stiffer, plants are more floriferous and the ray florets are frequently pink. The fruits are oblong, have tubercles on the faces, a small wing and an obvious pappus.

B. basaltica* var. *basaltica is rhizomatous rather than stoloniferous. The fruit is narrower (to 1mm) and the pappus is distinctive.

B. parvula might be confused with *B. graminea,* but the leaves are shorter, thicker, quite succulent-looking and are often irregularly lobed. The flower stem is usually shorter, and there are twice as many ray florets in the head (about forty compared to twenty). The fruits are flat not swollen, and about half the width of those of *B. graminea.*

Special notes: ***B. graminea* has a chromosome number of *n* = 9 (Smith-White *et al.*, 1970).**



B. graminea — Adaminaby, NSW (x 1) Fruit — Anglesea, Vic (x 20)

Brachyscome halophila P.S. Short

ANNUAL
10–30cm high
10–25cm wide
WHITE, MAUVE, PURPLE

Derivation: *halophila* — salt-loving, referring to the habitat.

Handsome, small annual with divided leaves and large white, mauve or purple heads.

Distribution and habitat: WA. Known only from two areas; near Yarra Yarra Lakes and Pindar. Found on sand ridges at the edge of salt lakes.

Description: In cultivation an upright annual herb, 10–30cm tall, with a few branching stems and an open habit. The stems are either glabrous or bear scattered long hairs. They sometimes have a reddish tinge and are easily snapped. **Leaves** are 1–8cm long (rarely to 12cm), usually pinnatisect. The lowest leaves are entire, linear, opposite and smaller, 1–4cm x 1–2mm. The pinnatisect leaves have 3–7 lobes, 1–1.5cm x 1–2mm, and are sometimes lobed again. All leaves have scattered septate hairs and are decurrent, that is the bases extend down along the stem. **Flower-heads** are 2.5–4cm across, have a faint scent, and appear singly at the tips of flower stems, 6–12cm long, bearing 3 or 4 leaves. Ray florets (about 9–20) are broad (2–4mm) and droop soon after the head opens. The ray florets are white or mauve if plants originate from the Yarra Yarra Lakes area, and usually purple with a white basal band if plants originate from the Pindar district. Involucral bracts (8–14) are glabrous and obovate or elliptical. **Fruits** are brown to dark brown, 2–2.5mm x 1–2mm, broadest at the apex. Lateral ridges form apical shoulders on each face. There is a wing which may be entire or have 3–10 lobes; the lobes usually bear one or more curled, twin hairs. The pappus is absent. **In the wild** plants may have single or branching stems, they are shorter and the heads are somewhat smaller (1.8–3cm across).

Flowering period: In its original habitat *B. halophila* flowers from August to October. Under cultivation in containers in Melbourne it has flowered from October to January (or longer) when watered daily.

Cultivation and uses: This species was first described in 1988 and has only been in cultivation since that time. It is proving to be a showy annual, rather similar to *B. iberidifolia* in character. In cool, southern climates it germinates more readily and grows more easily than its attractive cousins, *B. cheilocarpa*, *B. ciliocarpa* and *B. oncocarpa*. Two disadvantages have been noted; the stems are easily snapped and seedlings are very attractive to slugs and snails. This species performs better in low rainfall, frost-free areas. *B. halophila* is a handsome bedding plant and very striking in containers and hanging baskets.

Propagation: Seed germinates moderately well in 7–30 days. Propagate good forms from cuttings.

Forms:

- A white-flowered form from the area near Yarra Yarra Lakes has mauve backs to the ray florets.
- In the Pindar region there is a beautiful purple form with a white ring around the disc centre. Young disc florets of these plants have lobes often tinged red. This form is being propagated and released in Queensland.

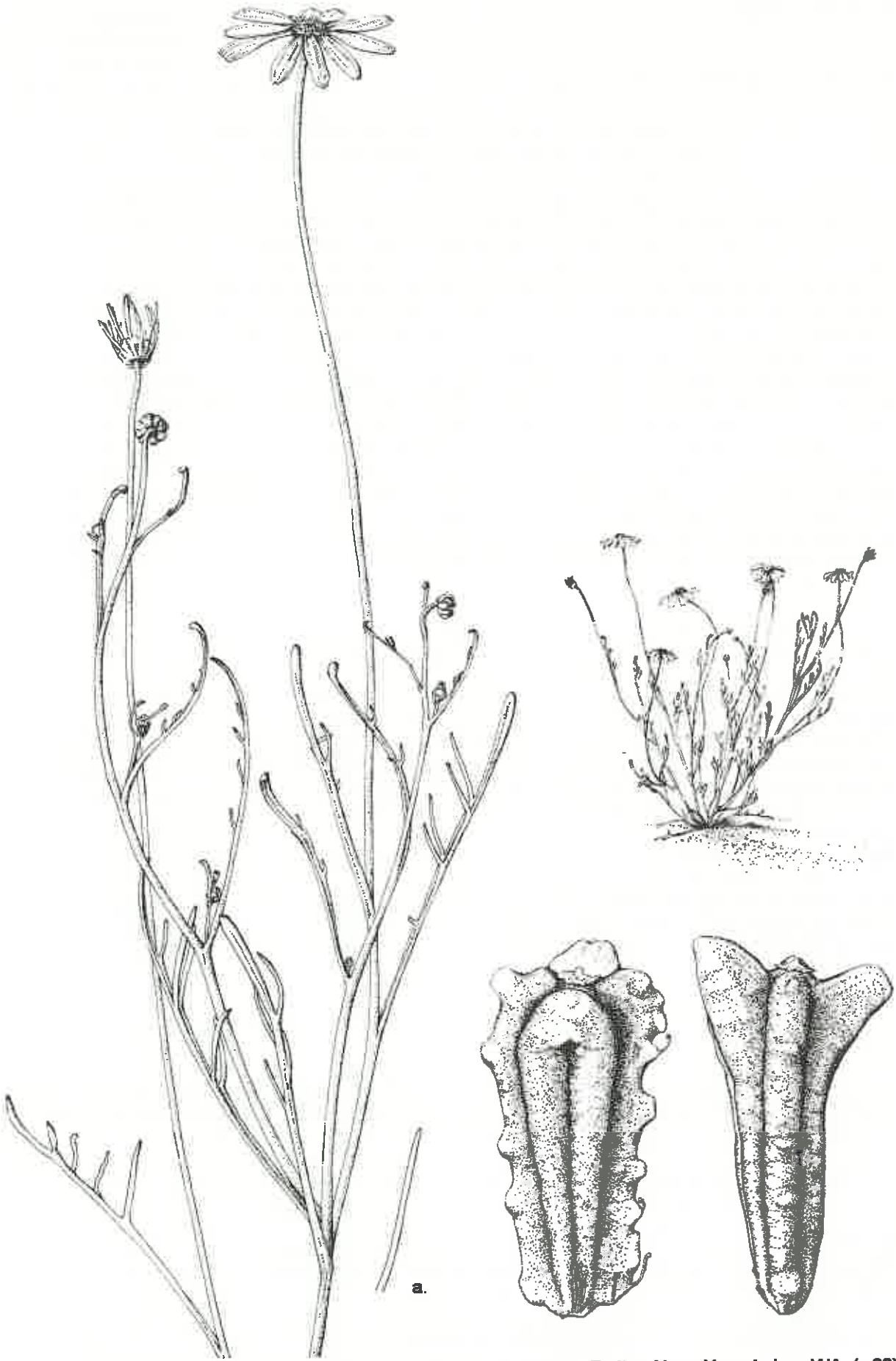
Similar species: ***B. cheilocarpa*** differs from *B. halophila* in that the fruit has a conspicuous pappus. The involucral bracts are lanceolate with thread-like tips and bear septate hairs.

B. ciliocarpa (WA and eastern Australia) also have fruit possessing a large, obvious pappus.

B. oncocarpa has fruit with similar swollen shoulders. It is distinguished by the conspicuous pappus.

Special notes: *B. halophila* has a chromosome number of $n = 9$ (Short, 1988). It is included in the *B. oncocarpa* complex with *B. cheilocarpa*, *B. ciliocarpa* and *B. oncocarpa*, all of which have two large secretory canals in the pericarp (Watanabe and Short, 1992).

A possible form of *B. halophila*, with a fruit bearing a pappus, has been found near Paynes Find (P.S. Short, pers. comm.).



B. halophila — Yarra Yarra Lakes, WA (x 1) a. basal leaf Fruit — Yarra Yarra Lakes, WA (x 20)

Brachyscome iberidifolia Benth.

Swan River Daisy

ANNUAL
5–40cm high
20–30cm wide
MAUVE, PURPLE, WHITE

Derivation: *iberidifolia* — leaves like those of *Iberis.*

Delightful, much-branched annual with masses of colourful flower-heads and fresh green, pinnate leaves. Popular and easy to grow.

Distribution and habitat: SA, WA, NT. Grows in sandy, clay or saline soils. Occurs along watercourses, on sandhills, on mallee sandplains and in depressions over granite.

Description: In cultivation an erect annual to 40cm tall with branching glabrous or sparsely glandular-hairy stems. The glandular hairs may be present only on the upper parts of the stems. **Leaves** are sessile, 1.5–6cm long, occasionally linear and entire but usually pinnatisect with 5–10 or more linear lobes (up to 1.4cm long). **Flower-heads** are 2–2.5cm across, with long ray florets in shades of mauve, purple or white and disc florets yellow, black or brown circled with yellow. The heads are held singly at the tips of flower stems, 2–6cm long with 0–3 leaves at the lower end. **Fruits** are grey to dark brown, narrowly club-shaped, 1–2mm x 0.5–0.8mm, with smooth margins. The central area of the body is slightly depressed between two lateral folds united at the apex to form two small shoulders. Apically rolled hairs appear sparsely on the margins and on the shoulders. When the fruit is ripe, minute tessellations appear between the lateral folds. The pappus is difficult to see; it is microscopic and crown-shaped. **In the wild** plants are quite variable depending on habitat and seasonal conditions. West of Southern Cross (WA) plants are slender and vary from 4–20cm x 1–4cm, while in the Paynes Find (WA) district plants lie flat on the ground and grow in the shape of a wreath to 30cm across.

Flowering period: In the wild the flowering period is usually late winter to spring, but in cultivation it flowers from spring to summer and intermittently at other times of the year.

Cultivation and uses: *B. iberidifolia* is easy to grow, tolerant of most soils and conditions and useful for many purposes. It is prone to attack by powdery mildew. Another disadvantage is that it is somewhat frost tender, but that drawback is overcome by sowing after frosts are over. Since the germination rate of commercial seed is high it is possible to broadcast Swan River Daisy to provide a natural carpet under trees or shrubs. It is also colourful in garden beds, rockeries, bog gardens, containers or hanging baskets, and is a good species for exposed coastal plantings.

Propagation: Seed from the wild germinates poorly in 14–35 days, but commercial seed germinates in 2–12 days at a rate of almost 100%. Seedsmen in Europe and U.S.A. have produced seed of this species for many years and have introduced many colourful cultivars. These are 'Little Blue Star', 'Red Star', 'Purple King', and the 'Splendour' series. Some of the cultivars have disappeared from the catalogues. Cuttings strike readily so particularly attractive forms can be kept going vegetatively.

Forms:

- 'Purple Splendour' has attractive deep purple heads with yellow or black disc centres. The habit is upright to 40cm.

- The 'Wreath Brachyscome' is a form from the Paynes Find district. The heads are white or pink and plants grow in the shape of a wreath, 5–10cm x 25–30cm. The Study Group has not grown this form for long. So far it is difficult to germinate and to grow.

Similar species: ***B. bellidioides*** differs from *B. iberidifolia* in having glabrous fruits. The leaves are mainly entire or with only a few short lobes.

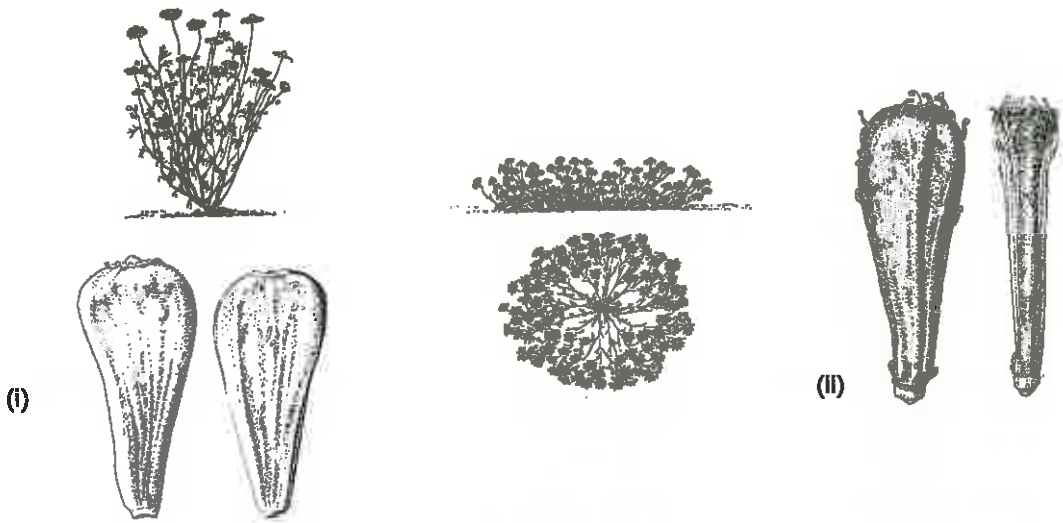
B. exilis resembles *B. iberidifolia* most closely, but the shoulders of the fruits are better developed. Plants are smaller in size and the ray florets are shorter. The 'finger-leaved' forms of *B. exilis* are easily recognized.

B. eyrensis has flattened fruits and very short ray florets.

B. pusilla is smaller (10–15cm high) and the leaf margins are entire or have a few short lobes.

B. iberidifolia — a. from commercial seed, WA (x 1)

b. Wreath Brachyscome, Yalgoo, WA (x 1)
[Illustrated from print]



Fruit — (i) commercial seed, WA (x 20), (ii) Wreath Brachyscome, Yalgoo, WA (x 20)

Special notes: The chromosome number of *B. iberidifolia* is *n* = 9 (Turner, 1970). Steetz (1845) described a number of varieties for *B. iberidifolia*, including var. *huegeliana*, var. *major*, var. *alba* and var. *divergens*, but these were later rejected by Bentham (1866). Bentham described var. *diffusa*, but this variety was rejected by Davis (1948). Black (1928) described var. *glandulifera*, but this variety was also rejected by Davis (1948).

The *B. iberidifolia* complex includes *B. bellidioides*, *B. exilis*, *B. eyrensis*, *B. iberidifolia* and *B. pusilla*. In addition, collections have been made of entities with similar fruits which have been grouped under the title *B. iberidifolia sens. lat.*, meaning 'in the broad sense'. It is possible that some of these entities are worthy of specific status. Brief descriptions of four collections of these entities are as follows:

1. From the Exmouth area and from Mt Augustus (WA). Plants are erect, 18–20cm x 8–20cm, with branching stems. The pinnate leaves have 3–9 lobes. The outstanding feature is that the leaves and stems are densely covered with long septate-glandular hairs.

2. From Petrudor Rock near Dalwallinu in the Avon Region of Western Australia. Plants are ascending, 8–10cm x 6–16cm, with a basal tuft of pinnatisect leaves having 3–6 lobes. The young stems and leaves have very short glandular hairs. Similar collections come from Peak Charles and the Lake Grace district of Western Australia.

3. From the Pindar district in the Austin Region of Western Australia. These are small, slender plants, 5–10cm x 2–8cm, with large mauve or pink heads. The leaves are pinnate with 3–7 narrow lobes. There are sparse glandular hairs on the upper parts of the stems. The habit and fruits are more like those of *B. pusilla*.

4. From Eulo and Thargomindah (Qld) and Enngonia (NSW) districts. Plants are branching, 7–15cm x 7–20cm, with pink terminal heads on flower stems 1–2.5cm long. The leaves are pinnate, 0.5–2.5cm long, with 7–9 narrow lobes. Stems and young leaves are covered with stiff septate hairs. The fruits are grey to dark brown, 1.8–2.2mm x 0.5–0.8mm, wedge-shaped, thickened and with microscopic tesselations. Two lateral folds unite at the apex but do not form shoulders. Long inrolled hairs cover the body and the apex and edge the margin, but are not so numerous as the fruit matures.

Fruit of *B. iberidifolia* complex — Dookanooka Reserve, WA (x 20)

B. iberidifolia complex — Thargomindah, Qld (x 1)

Fruit — Thargomindah, Qld (x 20)

Brachyscome latisquamea F. Muell.

Climbing Daisy

WOODY PERENNIAL
30–45cm high
25–30cm wide
WHITE, MAUVE-PINK

Derivation: *latisquamea* — broad scales, referring to the broad outer bracts.

Handsome perennial with large flower-heads and woody branches which may climb through surrounding plants. A species for warm, dry climates.

Distribution and habitat: W.A. Occurs on sand dunes along part of the north-west coast between Exmouth and Point Quobba, and further inland in saltbush country near Carnarvon.

Description: In cultivation a scandent woody perennial with a thick taproot. **Leaves** are glabrous, 2–3cm x 5–8mm, sessile, narrow-lanceolate with entire margins and acute or obtuse tips. **Flower-heads** are white or mauve-pink, 4–5cm across, held above the foliage on stems, 5–6cm long, with one broad convex leaf bract. The heads appear double due to the many ray florets (30–50). The overlapping involucral bracts are unusual; the outer bracts are very broad and half as long as the ray florets, the inner bracts are much narrower. **Fruits** are pale brown, 3–3.5mm x 2–2.5mm, flattened, with a broad entire wing. The pappus is a ring of small teeth. **In the wild** plants grow 0.3–2m x 0.5–1m. Large flower-heads (up to 8cm across) are borne in profusion.

Flowering period: *B. latisquamea* flowers from August to October in the wild, but in cultivation in warm climates it flowers intermittently throughout the year.

Cultivation and uses: This shrubby perennial is not often seen in cultivation, but the large handsome heads and ability to climb make it highly desirable. It is not suitable for cool temperate climates nor for acid soils. *B. latisquamea* needs well-drained soils or deep sand, full or part sun and root protection. The stems are so brittle that it also needs to be protected from wind. It has been successfully grown on alkaline soils and may need a mycorrhizal association in order to perform at its best. It can be grown in containers but the resulting woody stems are unattractive. It is better used as a climbing shrub or for general planting.

Propagation: Seed germinates moderately well in 12–40 days. Seedlings succumb to cold wet winters, so this species should be sown in spring. Propagate also from cuttings.

Forms:

- A coastal form grows from the lee of the foredunes to 1km inland. It is small and shrubby, and the rays are usually white.
- Inland forms have white or pinkish rays and taller, more straggly habits.

Similar species: There are no other species of *Brachyscome* which grow as tall and have such large flower-heads.

Special notes: It is possible that *B. latisquamea* should not be retained in the genus *Brachyscome*. It is very different morphologically from most other species; it grows tall and has woody stems, the involucral bracts are broad and thick, and the heads are very large. The chromosome number of *B. latisquamea* is *n* = 9 (Carter, 1978a).

B. latisquamea — a. Exmouth, WA (x 1) [Illustrated from ADSG Herbarium]
b. Exmouth, WA; flower-head and bud (x 1) [Illustrated from print]
Fruit — Exmouth, WA (x 20)

Brachyscome leptocarpa F. Muell.

Small Hairy Daisy, Downy Daisy

ANNUAL
10–20cm high
5–15cm wide
WHITE, PINK, MAUVE

Derivation: *leptocarpa* — bearing slender fruits.

Slender little annual with hairy stems and divided leaves.

Distribution and habitat: NSW, Vic, SA. Occurs from central and western New South Wales through the inland plains of Victoria to South Australia. Widespread in grassland, scrub, woodland and forest.

Description: **In cultivation** a slender annual 10-20cm high with a few upright branching stems bearing a mixture of glandular and septate hairs. **Leaves** are of two shapes; basal leaves are sparse, up to 3cm long, usually with entire margins, stem leaves are 1–3cm long, toothed or pinnatisect with 3–5 linear lobes. All leaves bear glandular and septate hairs. **Flower-heads** are 1–1.8cm across on flower stems 5–15cm long. Ray florets (7–18) are white, pink or mauve. **Fruits** are brown, linear to wedge-shaped, 1.5–2mm x 0.5mm, with flattened faces bearing inrolled hairs. The margin is smooth and slightly thickened. The pappus is white and conspicuous. Wings are absent. Fruits reflex on the receptacle at maturity. **In the wild** *B. leptocarpa* frequently grows in close association with *B. debilis*. Plants often flower when they are very small, no more than 3cm high, and may have only a single, unbranched flower stem.

Flowering period: Spring.

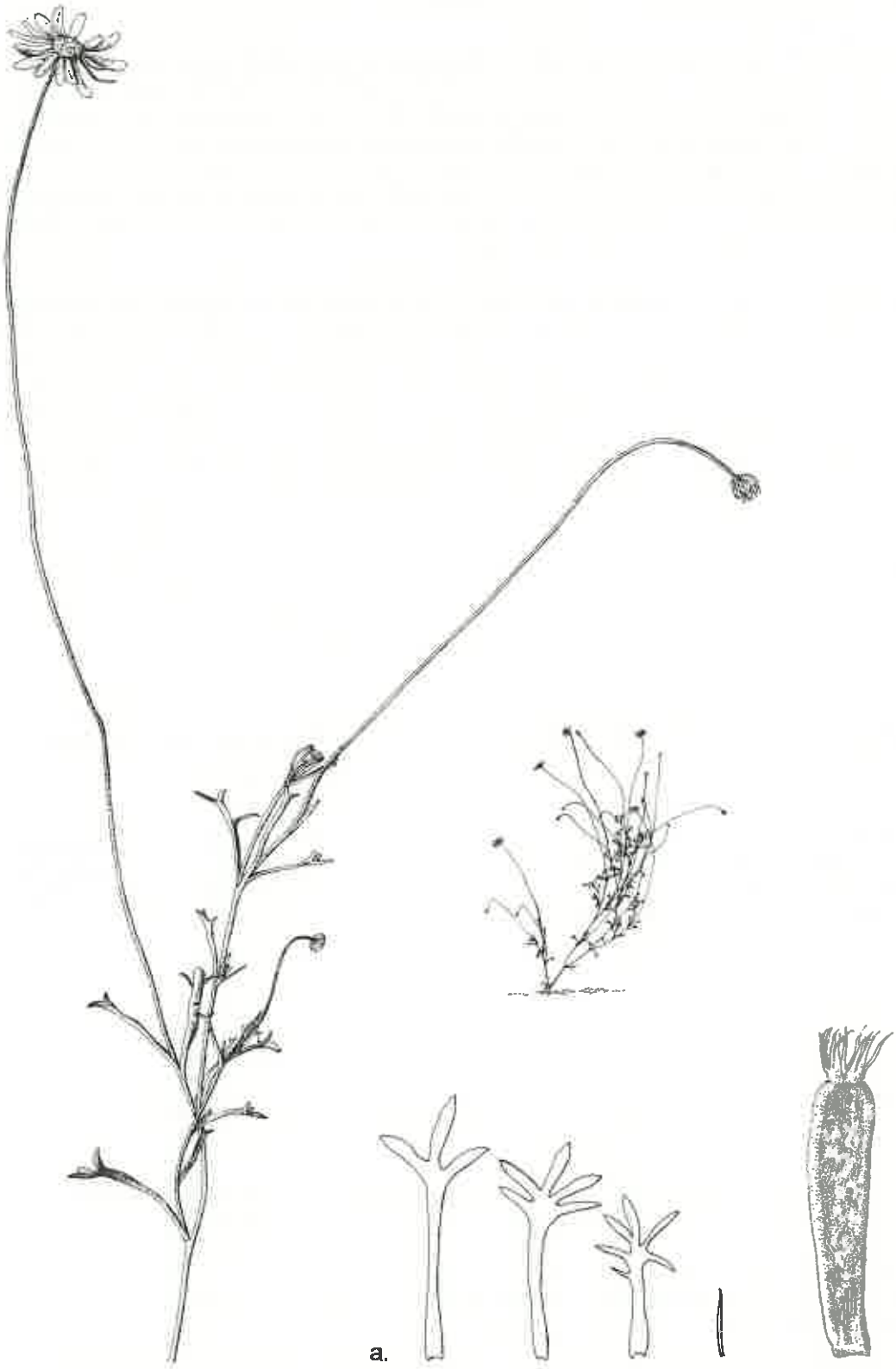
Cultivation and uses: *B. leptocarpa* has little or no horticultural potential. It is very pretty in its natural habitat and could perhaps be recommended as a grassland plant if seed becomes available in sufficient quantity. Plants need root protection and grow best in sheltered situations.

Propagation: Seed germinates poorly in 20–80 days.

Similar species: ***B. debilis*** is vegetatively almost identical with *B. leptocarpa*. The distinguishing feature is the fruit which in *B. debilis* has a broad, thin wing.

B. exilis has fruit reflexed on the receptacle at maturity but the fruit is of a different shape. It is club-shaped with two small apical shoulders and a very small pappus. The leaves are usually finger-shaped.

Special notes: Smith-White *et al.* (1970) determined a chromosome number of $n = 3$ for *B. leptocarpa*. They observed that the size and shape of the chromosomes were similar to those of *B. debilis*. They suggested that the presence or absence of a wing was the only means of separating the two species. If, after further research, the two species are considered to be conspecific, the earlier name, *B. debilis*, will take precedence (Watanabe and Short, 1992).



B. leptocarpa — Mt Arapiles, Vic (x 1) a. variation in leaf shape Fruit — Mt Arapiles, Vic (x 20)

Brachyscome lineariloba (DC.) Druce

Hard-headed Daisy (or Hard-head Daisy), Dwarf Daisy, Dwarf Brachycome

ANNUAL
2–20cm high
3–16cm wide
WHITE

Synonyms: *Steiroglossa lineariloba* DC.
B. pachyptera Turcz.

Derivation: *lineariloba* — having straight lobes, referring to the linear leaf lobes.

Variable small annual with white heads and divided leaves in a basal cluster. A striking feature of this species is that the head retains the seed for a long time after the florets have fallen. At this stage the heads resemble cream and grey pompoms.

Distribution and habitat: NSW, Vic, SA, WA. Common in a wide range of habitats including mallee, savannah woodland, river forest, gibber plains, flood plains and in saltbush communities. Grows in a wide variety of soils from red sands to heavy clays.

Description: In cultivation a variable annual with a tuft of basal pinnate leaves. The stems are very short, branching at ground level and usually bearing a few septate hairs. **Leaves** are 2–8cm long, generally basal, but also may be present low on the stem. They are pinnatisect with 3–9 linear lobes in the top half. Sparse septate hairs are often present, more numerous at the base of the leaf. **Flower-heads** are white, 0.7–1.5cm across, ephemeral, held at the tips of flower stems, 2–20cm long. The margins of the broad, blunt involucral bracts are usually reddish purple. **Fruits** are pale brown, 3.5–4.5mm x 2–2.5mm. The body is terete, the wings vary from broad to relatively narrow and are quite swollen. Many long, inrolled hairs fringe the edge of the wings. There is an obvious groove on either side of the body. The pappus is long and conspicuous, composed of fused bundles of bristles of unequal length. **In the wild** the plants may be flowering and seeding while they are extremely small. Species in this complex are very easy to identify by the hard-headed appearance of the hemispherical fruiting heads.

Flowering period: Winter to spring in its natural habitat, but in cultivation it flowers in late winter and spring, rests and then flowers again for a short time in early summer.

Cultivation and uses: *B. lineariloba* will grow in most situations, but performs best in full or part sun. The larger forms have more horticultural potential.This species could be suitable for naturalizing in inland areas and is an interesting subject for massing in a shallow container.

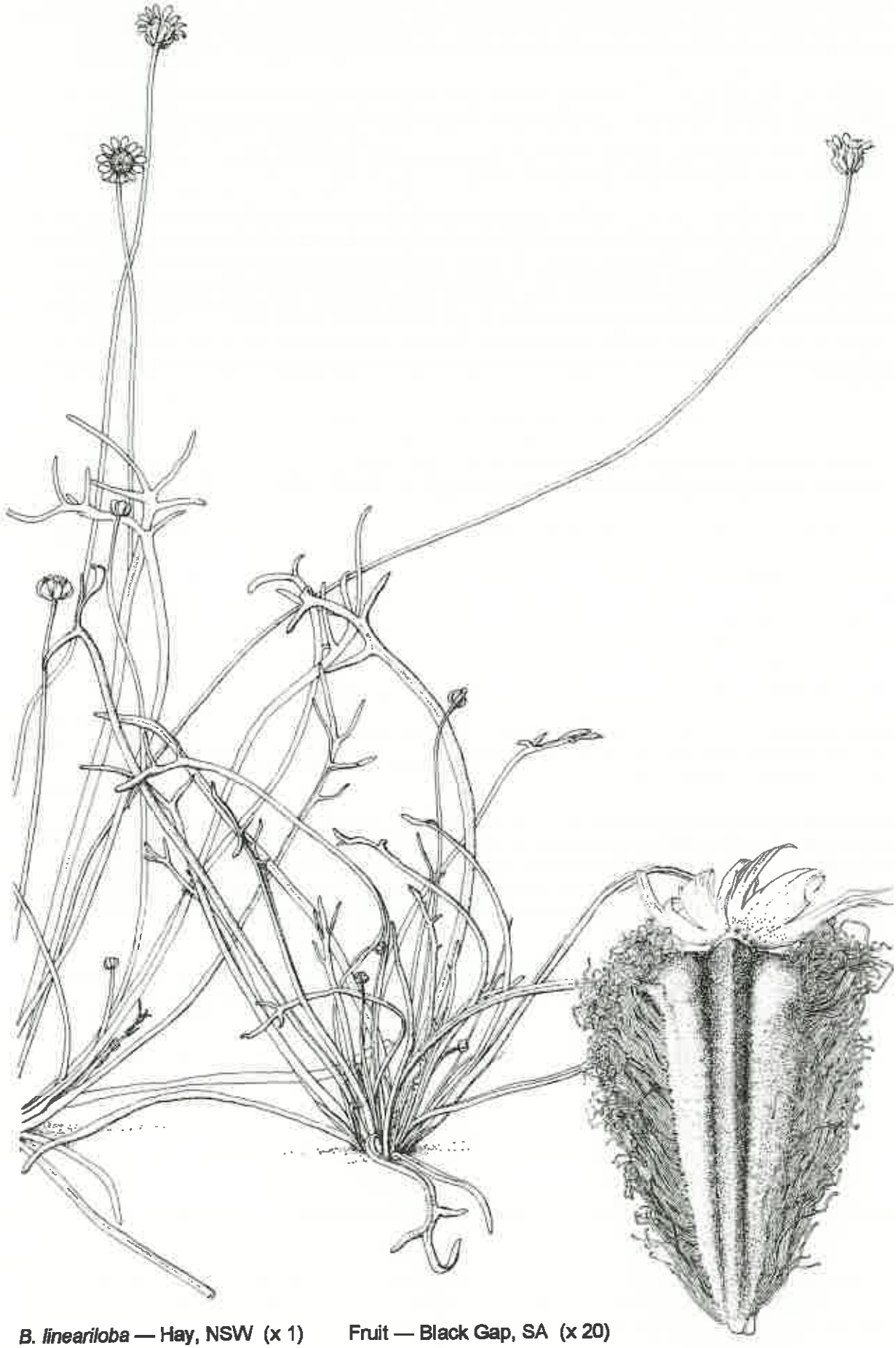
Propagation: Wild seed germinates very poorly in 8–50 days. Better results are achieved when the whole head is sown. Soaking seed overnight in water or removing the outer coat may improve germination. Much better germination is obtained from seed collected in cultivation. Seedlings are slow to develop good root systems. They respond well to warm weather so the best time to sow may be late winter or spring. Propagate also from cuttings.

Forms:

- The Hay (NSW) form has heads to 1cm across at the tips of slender flower stems, 12–18cm long.
- The Hillston (NSW) form only grows 2–5cm high forming stiff little plants with heads 5–8mm across.
- Two forms grow together north of Quorn (SA). One is very short (to 3cm) with inconspicuous white flower-heads; the other is taller (to 6cm) and the flower-heads are 2cm across.

Similar species: ***B. breviscapis*** looks like a small form of *B. lineariloba*. It is distinguished by the shorter ray florets (1mm compared with 1–6mm) and the length of the first flower stem formed (1cm compared with 1–20cm).

B. dichromosomatica differs from *B. lineariloba* in having erect flower stems rather than ascending or decumbent, and in having longer ray florets (5–15mm) which can be mauve as well as white. The fruits are sometimes longer (to 5mm) and usually narrower (to 2mm).



B. lineariloba — Hay, NSW (x 1) Fruit — Black Gap, SA (x 20)

B. eriogona has similar fruits to those of *B. lineariloba*, but it develops thick branching stems and conical fruiting heads.

Special notes: Davis (1948) observed in her description of ***B. lineariloba*** that there was considerable variation in the size of plants, leaf shape and length of ray floret. She thought there could have been two natural populations in existence, but felt more specimens were needed before new varieties could be described.

Cytological observations and chromosome number determinations led Smith-White and Carter (1970) to recognize five distinct chromosome number races within ***B. lineariloba***. They were designated sp. A, $n = 2$; sp. B, $n = 6$; sp. C, $n = 8$; sp. D, $n = 4$; sp. E, $2n = 10$. More work was later done on this subject including such aspects as the relationships between the five chromosome number races and meiosis in natural hybrids (Watanabe *et al.*, 1975 and 1976; Kyhos *et al.*, 1977).

A revised classification of the ***B. lineariloba*** complex was proposed by Carter (1978b) based on morphological evidence and the previously published cytological studies. He described new taxa, *B. breviscapis* C.R. Carter (which was sp. D) and *B. dichromosomatica* C.R. Carter (which was sp. A), and suggested that ***B. lineariloba*** included three chromosome number races (B, C and E). Carter observed that races B, C and E 'cannot be distinguished morphologically (even from living material) by any character other than chromosome number, although there is an increase in average size from E (the smallest) to B and C. There is, however, considerable overlap in size, and it cannot be used to discriminate effectively between the three "races" which are treated as belonging to one species.' Carter considered that the races could be distinguished as cytodemes for cytogenetic purposes.

KEY to the *B. LINEARILOBA* COMPLEX (Carter, 1978b)

1. Scapes erect, 30–250mm long. Ligules 5–12mm long, pale blue or white. Margins of involucral bracts not usually pigmented, rarely reddish purple .....*B. dichromosomatica* 2.

    2. Ligules pale blue, at least on the undersides .....var. *dichromosomatica* a.

    2. *Ligules white .....var. *alba* b.

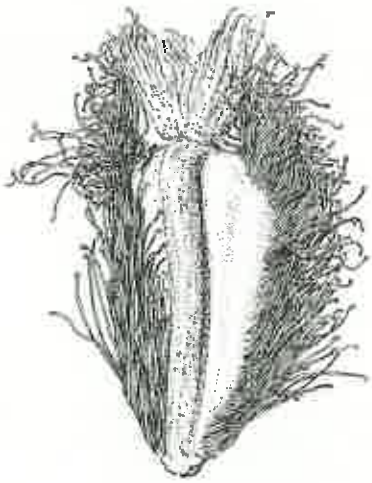
1. *Scapes decumbent to ascending, 1–200mm long. Ligules up to 6mm long, white. Margins of involucral bracts usually reddish purple.

    3. Scapes 1–20mm long, first-formed scape less than 10mm long. Ligules less than 1mm long .....*B. breviscapis* 3.

    3. *Scapes 10–200mm long, first-formed scape more than 10mm long. Ligules 1–6mm long .....*B. lineariloba* 1.

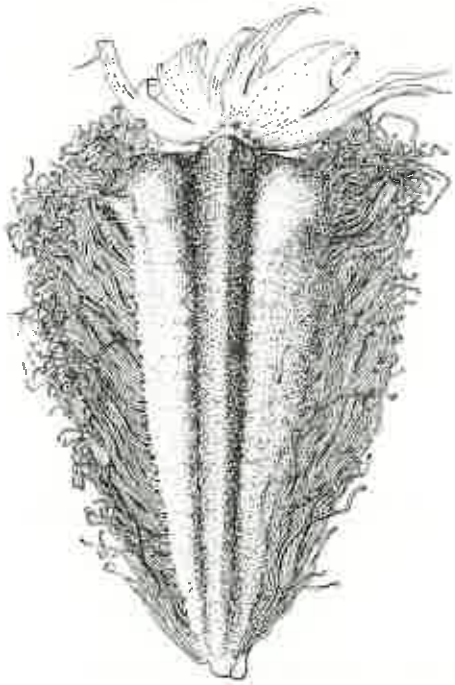
B. lineariloba and ***B. dichromosomatica*** grow in close association and natural hybridization is thought to occur (Kyhos *et al.*, 1977). ***B. lineariloba*** Cytodeme E and *B. breviscapis* also occur in close association, but no hybrids have been found, perhaps because they are largely inbreeders. Grieve and Blackall (1975) cite the common name of ***B. lineariloba*** as Stemless Daisy. This name has been omitted from the description because it seems confusing. Very short stems are present at the base of plants and the flower stems (or scapes) are from 2–20cm long.

The Study Group has observed that all the members of the ***B. lineariloba*** complex trialled have narrow-linear cotyledons and first seedling leaves. Lobes develop by the time the third pair of seedling leaves form.



B. breviscapis

B. dichromosomatica



B. linearioba

B. linearioba complex (x 20)

Brachyscome melanocarpa Sonder and F. Muell.

Black-seed (or Black-seeded) Daisy, Blue Daisy

PERENNIAL
25–40cm high
20–30cm wide
MAUVE
WHITE (rarely)

Derivation: *melanocarpa* — black fruit.

Handsome, long-flowering daisy with large mauve or white flower-heads and bluish green foliage. Neat when grouped.

Distribution and habitat: Qld, NSW, SA. (Recorded for Victoria but may since have become extinct.) Found on grasslands, in woodlands and on the heavy clay soils of flood plains.

Description: **In cultivation** a weakly upright or trailing perennial with branching stems. **Leaves** are produced at the base and along the stem and differ markedly in appearance. Basal leaves are 7–8cm long, wedge-shaped or oblanceolate and broadly lobed. The basal leaves are lost as plants develop. Stem leaves are narrowly wedge-shaped, 1–5.5cm x 4–10mm, usually sessile, and irregularly toothed. Stems and leaves bear septate and glandular hairs, and are green with a bluish tinge. **Flower-heads** are mauve (or white rarely), 2–3cm across, held singly at the tips of flower stems 5–15cm long. **Fruits** are black, swollen, obovate, 2–2.5mm x 1–1.2mm, and covered with tubercles. A thick entire margin encloses the body. In some forms the margins are coarsely tuberculate. There is no wing and the pappus is very conspicuous. **In the wild** plants usually grow erect but stems are sometimes ascending. Flower-heads are 2–2.5cm across.

Flowering period: *B. melanocarpa* flowers in spring in its natural habitat, but under cultivation it flowers from early spring to autumn and, if conditions are congenial, it may continue through winter.

Cultivation and uses: This species will grow in most soils provided the roots are protected. In cultivation single plants are inclined to be untidy. Prune to maintain a tidy habit. An open sunny position is best; in shade growth is weak and plants succumb to grubs, slugs and snails more easily. *B. melanocarpa* is moderately frost resistant. It is suitable for cool temperate and inland gardens and protected coastal planting. This species should be grouped in gardens and rockeries and two or three plants are preferable to one in hanging baskets.

Propagation: Seed germinates well in 8–30 days. *B. melanocarpa* regenerates naturally. It may also be propagated from cuttings.

Forms:

- The most reliable and robust form originated in the Menindee Lakes (NSW) area. It has mauve heads and has been cultivated by Study Group members from seed collected from several generations of garden-grown plants.

- A form from the Moree (NSW) region has white flower-heads. It is pretty but lacks vigour.

Similar species: ***B. ascendens*** may be distinguished by its brown fruit which has a lobed margin with hairs at the tips of the lobes and fewer tubercles on the faces. *B. ascendens* is an uncommon species occurring at relatively high altitudes whereas *B. melanocarpa* is found at low altitudes.

B. multifida has a similar black tuberculate fruit but it is immediately distinguished by the pinnate leaves.

B. microcarpa has black fruits similar in appearance but about one-third of the size. The flower-heads are usually smaller (1.5–2.5cm across) and the leaves are ovate-cuneate or orbicular.

B. nova-anglica is also a perennial with black tuberculate fruit and a mixture of septate and glandular hairs on stems and leaves. The fruit differs from that of *B. melanocarpa* in that the pappus is minute.

Special notes: ***B. melanocarpa*** **is polyploid. Chromosome numbers of** $n = 6, 12$ **were determined by Smith-White *et al.* (1970).**

B. melanocarpa — a. garden origin (x 1), small habit b. north of Bourke, NSW (x 1) Fruit — garden origin (x 20)

Brachyscome microcarpa F. Muell.

Forest Daisy

PERENNIAL
5–20cm high
20–50cm wide
MAUVE, WHITE, PINK

Synonym: *B. discolor* C. Stuart ex Benth.

Derivation: *microcarpa* — having small fruits.

An attractive perennial with a long flowering period.
The habit and foliage display great variation.

Distribution and habitat: Qld, NSW. Occurs on the Central and Northern Tablelands and the North Coast of New South Wales, and into south-eastern Queensland. (This distribution may need correction following revision.) Grows on well-drained soils in open forest or woodland, in sheltered places within granite outcrops, and among grasses on exposed coastal headlands.

Description: **In cultivation** a procumbent, ascending or weakly erect perennial with branching stems which may be hairy or almost glabrous. Some low-growing forms branch very sparsely. **Leaves** are variable, up to 7.5cm x 2cm. The basal leaves, when present, are spoon-shaped or almost circular with stalks 1–6cm long. The blades are bluntly lobed. The stem leaves are usually narrower, pinnatifid, wedge-shaped or spathulate, stalked or sessile, and decrease in size up the stem. The lobes become acute and the uppermost leaves are often opposite, which is unusual in this genus. The leaves may be very glandular-hairy or almost glabrous except for a smattering of small glandular hairs on the undersurface or margin. Some leaves have a purple colouration on the lower surfaces denoting the presence of anthocyanin. **Flower-heads** are 1.5–2.5cm across, occurring at the tips of flower stems, 5–20cm long, which may be naked or have one small leaf near the base. The flower stems either bear many glandular hairs or else they are sparse at the lower end and become more numerous just under the head. The ray florets are shades of mauve, white or pink. **Fruit** is brown to black, obovate, 1–1.8mm x 0.6–0.9mm. (Some forms have larger fruits — to 2.2mm x 1.2mm.) The faces are covered with tubercles, each tipped with a short inrolled hair.The margin is smooth and often bears a number of short hairs scattered on the shoulders. There is no wing, but an obvious pappus is present. **In the wild** plants may reach a height of 45cm or more if the stems are climbing through grasses. The coastal forms grow as low, dense plants, probably due to the exposed conditions.

Flowering period: Spring to autumn in the wild and intermittently throughout the year in cultivation.

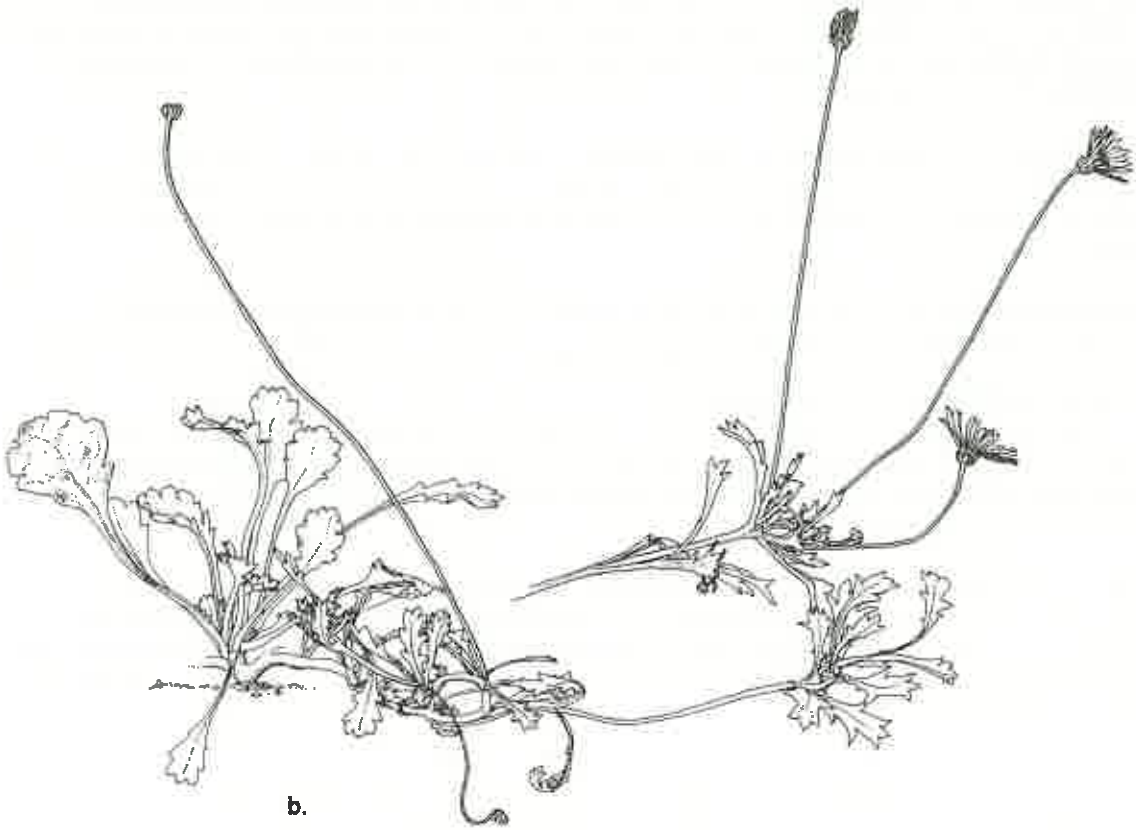
Cultivation and uses: This species grows well in dappled shade or part sun and some forms are suitable for planting in full sun, for example, the thick-leaved forms from the northern coast of New South Wales. Roots should be protected and the soil kept moist in hot weather. Some forms from the tablelands tolerate frost to –5°C; the coastal forms are usually cut back by frost but not killed. Regrowth occurs from the centre of plants under the dead foliage. Coastal forms are suitable for exposed seaside planting. *B. microcarpa* is very attractive in containers, in rockeries or grouped in the garden. Forms producing long, ascending stems, such as the one from the Stanthorpe-Wallangarra-Tenterfield region close to the border between Queensland and New South Wales, are pretty in hanging baskets.

Propagation: Seed germinates in 15–40 days, but may be difficult to collect as it is very small in some forms. Seedlings are slow to develop. Cuttings strike easily. Coastal forms with brown fruits sometimes layer and can be divided.

Forms:

- Forms from northern New South Wales (Tingha, Tenterfield and Yamba) have black fruits, 1–1.8mm x 0.6–0.9mm, with a short white pappus. Plants have slender, ascending main stems and white, mauve or pink heads (1–2cm across) on relatively long flower stems 10–15cm long.

- Forms from the northern coast of New South Wales (Crescent Head, Evans Head and Hat Head) have brown fruit, 1.5–2.2mm x 1–1.2mm, with a straw-coloured pappus. Plants have a dense, procumbent habit and thick, lobed leaves. The lobes are broad and vary from acute to rounded. The heads are 2–2.5cm across and vary in colour from mauve to deep purple. The sturdy flower



B. microcarpa — a. Yamba, NSW (x 1), b. east of Tingha, NSW (x 1) Fruit — Yamba, NSW (x 20)

stems are 5–10cm long and bear sparse glandular hairs which are more numerous just below the head.

Similar species: ***B. melanocarpa*** also has black fruits covered with tubercles, but the fruits (2–2.5mm x 1–1.2mm) are much larger than those of *B. microcarpa,* and the pappus is much longer. It occurs on heavy soils on the Western Slopes and Western Plains rather than the Tablelands and Coast where *B. microcarpa* is found.

B. nova-anglica is another glandular-hairy perennial with ascending stems, lobed leaves and black tuberculate fruits (1.8–2mm x 0.8–1mm) with a microscopic pappus. The fruit is intermediate in size between *B. melanocarpa* and *B. microcarpa*. A further distinguishing character is that the leaves are all sessile.

B. procumbens occurs in the same areas as *B. microcarpa*. *B. procumbens* has larger fruit (2.5–3mm x 2mm) with a broad wing.

***B.* sp. (Darling Downs)** has been mistaken for *B. microcarpa* because it has a small, black, tuberculate fruit (1.2–1.5mm x 0.8–1.0mm). The fruit differs from that of *B. microcarpa* in that the pappus is made up of very short bristles. The plants are quite distinct vegetatively in having a robust, rounded habit and upright, glabrous, many-branched stems. The flower-heads are often bright pink and the leaves are pinnatisect.

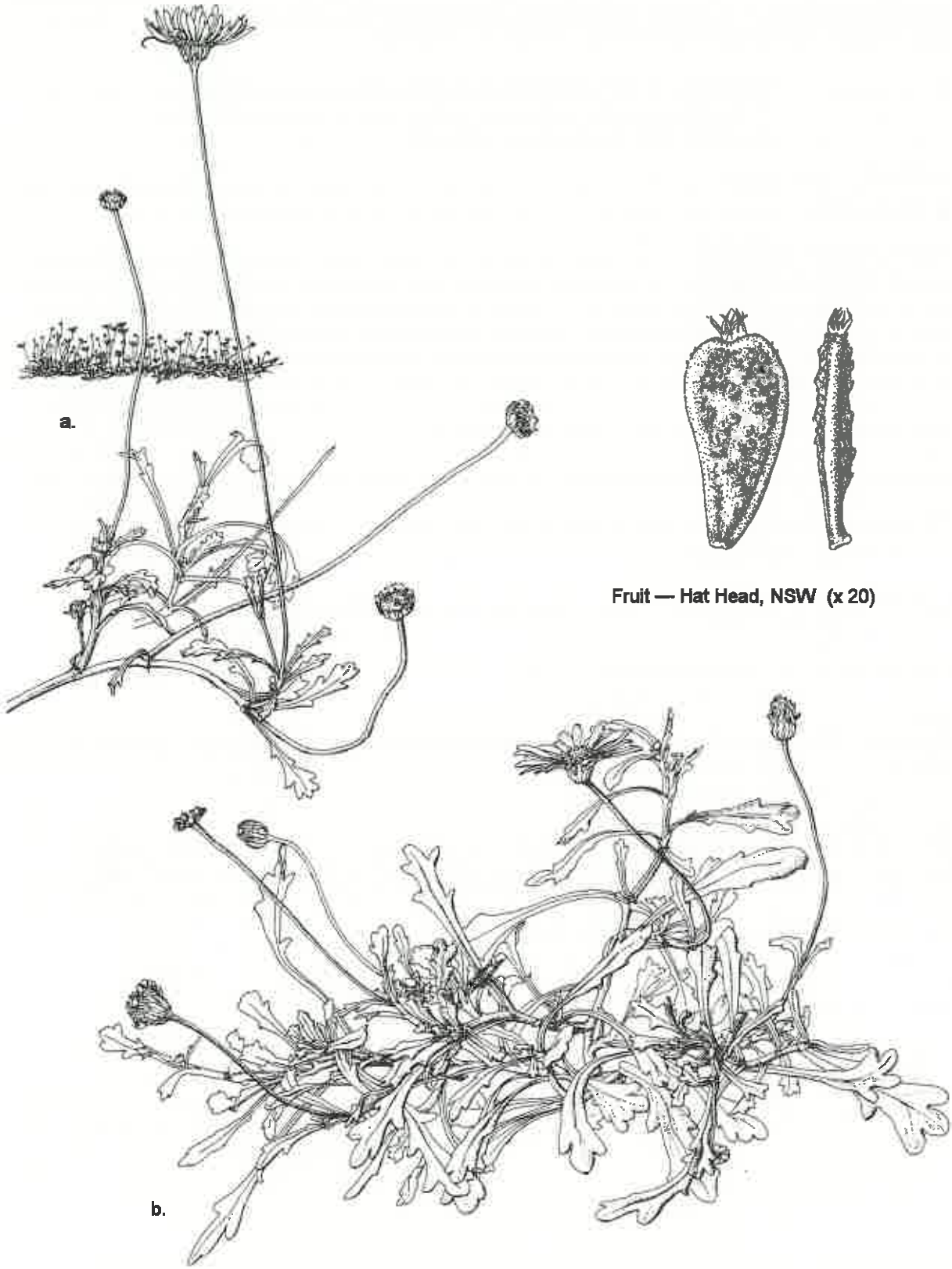
Special notes: There is such obvious variation within *B. microcarpa* that the situation has become a very confused one for naturalists and horticulturalists. The species seems to include a number of entities, the status of which is unknown at present. Revision may see some of the entities recognized as separate species, while some may be deemed varieties. Until the revision is completed the Study Group is able only to indicate the habit and character of the forms collected and grown.

Smith-White *et al.* (1970) collected specimens of material provisionally identified as *B. microcarpa* and determined chromosome numbers. They observed that only the material collected from south of Grafton (NSW) had fruits close to those described by Davis (1948), and they identified that entity as *B. microcarpa*. These workers determined $n = 10$ to be the chromosome number of *B. microcarpa*. The remainder of the material was designated sp. No. 1 to sp. No. 6. Subsequently, sp. No. 5 has been described as *B. formosa* (Short, 1988). Species No. 4 and No. 6 may be *B. formosa* or related to it.

Species No. 1 from Willow Tree (NSW) and sp. No. 2 from Long Wheeney Creek (NSW), (both *sensu* Smith-White *et al.*, 1970) have $n = 5$ and chromosomes of similar size and shape, but they differ in growth form and leaf size.

Species No. 3 (*sensu* Smith-White *et al.*, 1970) from Glen Innes, Drake and Torrington (all NSW) was found to have a chromosome number of $n = 6$. Although it was vegetatively similar to *B. microcarpa* and had fruit of the same shape, the fruit was larger, flatter and brown and the pappus was very small. The fruit collected by Study Group members from northern coastal locations in New South Wales such as Hat Head, Crescent Head and Evans Head is comparable to that described for sp. No. 3 with one exception: the pappus is narrow but obvious. The fruit is brown, obovate, 1.5–2.2mm x 1–1.2mm. The faces are flattened to slightly swollen, and are covered with tubercles bearing hairs at the tips. The margin is smooth and sometimes has a few short hairs along the apical edges. The straw-coloured bristles of the pappus are of unequal length. This is very close to the description of *B. discolor* C. Stuart in *Flora Australiensis* by Bentham. It is possible that the form described above and sp. No. 3 are the same.

Although Yamba lies on the coast between Hat Head and Evans Head the fruit from the Yamba collection is not like that of the Study Group's other three coastal collections in the same area. It is obovate, with tuberculate faces and smooth margins, but it differs in being black, and smaller (1.3–1.6mm x 0.6–0.8mm). The body is swollen and the pappus is broader, but the bristles are shorter and equal in length. This collection would seem to be *B. microcarpa* in the strict sense. It is interesting to note that Yamba is only about 50km east-north-east of Grafton.



Fruit — Hat Head, NSW (x 20)

B. microcarpa — a. Hat Head, NSW (x 1), b. coastal NSW (x 1)

Brachyscome muelleri Sonder

ANNUAL
5–20cm high
4–10cm wide
WHITE

Derivation: *muelleri* — in honour of Baron von Mueller (1825–96), botanist, plant collector, and Government Botanist in Victoria (1852–96).

Small annual with a restricted distribution, at serious risk of disappearing from the wild state in one or two decades. No discernible horticultural potential.

Distribution and habitat: SA. Restricted to a small area on the Eyre Peninsula. Grows among rocks in dense scrub.

Description: **In cultivation** a weak glabrous annual with short stems which branch at ground level. **Leaves** are in a basal cluster, 2–10cm long, glabrous, limp, and with 3–11 lobes. The lobes are ovate with mucronate or rounded tips and they decrease in size towards the base of the leaf. The base is slightly stem-clasping. **Flower-heads** are white, 1.5–2cm across, held at the tips of flower stems 9–12cm long, with 1–3 bract-like leaves in the lower half. **Fruits** are black, hairless, 1.3–2mm x 1–1.5mm, swollen and appearing almost square. The body is cylindrical; broad wings are folded over it and partly obscure it. The pappus is a microscopic ring. **In the wild** it is described as up to 20cm high with a long tap-root and robust flower stems.

Flowering period: Winter to early spring.

Cultivation and uses: Plants were grown for the Study Group in a polyhouse, which may have been the reason they developed weak stems. *B. muelleri* appears unlikely to interest gardeners.

Propagation: Fruits were given to the Study Group by Dr Philip Short (MEL). Because *B. muelleri* is an endangered species the fruits were germinated on a tissue culture medium.

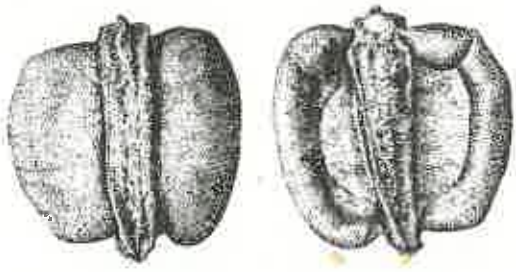
Similar species: ***B. muelleroides*** has fruit of a similar shape to that of *B. muelleri*, but it is much smaller (0.8–1mm x 0.5–0.6mm) and the pappus is conspicuous.

B. readeri bears a superficial resemblance to *B. muelleri*, but it is unlikely to be mistaken for it in view of the restricted distribution of *B muelleri*. *B. readeri* has septate-hairy stems and the fruit is completely different in shape.

Special notes: ***B. muelleri*** **has been described as an endangered species at serious risk of disappearing from the wild (Leigh *et al.*, 1984). They noted that the species was known only from one existing population from Corunna Hill near Iron Knob, South Australia. It now seems that the species also grows in the Gawler Ranges.**

The chromosome number is *n* = 3 (Watanabe and Short, 1992).

B. muelleri — near Iron Knob, SA (x 1)



Fruit — near Iron Knob, SA (x 20)

Brachyscome muelleroides G. Davis

ANNUAL
5–15cm high
5–10cm wide
WHITE

Derivation: *muelleroides* — resembling *B. muelleri.*

Dainty white-flowered annual with grass-like foliage.
Considered a vulnerable species.

Distribution and habitat: NSW, Vic. Occurs in the Riverina and north-central Victoria. Grows in seasonally inundated shallow depressions and heavy, cracking soils around lagoons.

Description: In cultivation a slender, erect or ascending, almost glabrous annual with branching stems. **Leaves** are sessile, 1.5–5.5cm x 5–10mm, linear with entire margins or having 1–2 very small lobes in the lower half of the blade. The apex is acute and there may be a few long white hairs in the leaf axils. **Flower-heads** are white, 8–10mm across on flower stems 4–6cm long which may be leafless or have one leaf near the base. **Fruits** are dark brown, 0.8–1mm x 0.5–0.6mm, almost circular in outline. The body is linear, curved, with a vertical line of inrolled hairs along the outer face. The wings are cream or brown, folded in, almost obscuring the body on one side. The pappus is conspicuous, composed of 5–6 bristles of unequal length, one or two being relatively long for the size of the fruit. **In the wild** this little annual is only noticeable when it is in flower. There are not many plants in each population and they only grow where leaf litter and other plants are sparse.

Flowering period: September to October in its natural habitat, and October to December in cultivation.

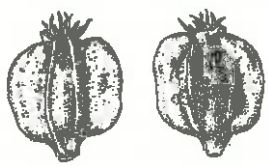
Cultivation and uses: There are many annuals more showy than *B. muelleroides.* It has little horticultural potential. In the past specialist growers have observed that this brachyscome prefers moist heavy soils, but under cultivation plants have survived better in containers than in the open garden. The vulnerable status of this species underlines the importance of adequate protection in reserves.

Propagation: Seed germinates poorly in about four months.

Similar species: ***B. muelleri*** is closest to *B. muelleroides* because the fruit is of the same shape although it is larger (1.3–2mm x 1–1.5mm), and the pappus is minute. *B. muelleri* also differs in that the leaves are basal or near-basal and are deeply lobed.

Special notes: Davis (1948) suggests that both *B. muelleroides* and *B. muelleri* originated from an ancestor of the *B. curvicarpa* type. So far the chromosome number has not been determined.

B. muelleroides — Ulupna Island, Vic (x 1)



Fruit — Ulupna Island, Vic (x 20)

Brachyscome multifida DC.

Two varieties of this species have been recognized by Davis (1948) based on the appearance of the leaf.

KEY to the VARIETIES

1. Leaves with lobes narrow-linear to awl-shaped .....var. *multifida.*

2. Leaves with lobes broad-linear, oblanceolate or cuneate .....var. *dilatata.*

The two varieties will be described separately.

Brachyscome multifida DC. var. *multifida.*

Cut-leaf (or Cut-leaved) Daisy, Rocky Daisy, Hawkesbury (or Hawkesbury River) Daisy.

PERENNIAL
20–40cm high
0.3–1m wide
MAUVE, WHITE, PINK

Derivation: *multifida* — divided into many segments.

Popular perennial with finely divided foliage and flowers throughout the year. Bushy habit. May layer but does not sucker.

Distribution and habitat: Qld, NSW, Vic. Occurs frequently in southern Queensland and New South Wales, but in Victoria confined to the drier terrain of a few north-western areas. Grows in well-drained soils in grassland, in mallee, and among rocks in open forest.

Description: In cultivation a much-branched, leafy, glabrous perennial which may spread by layering. **Leaves** are 3–6cm long, pinnate with 5–10 extremely narrow, linear lobes, 5–20mm x 0.5–1mm. The lobes taper to very fine tips and are rarely lobed again. **Flower-heads** are mauve, white or pink, 2–2.5cm across, held singly on flower stems, 4–16cm long. Involucral bracts (16–18) are narrow-oblanceolate with subacute tips and transparent margins fringed with small hairs. **Fruits** are black, 2–2.5mm x 0.8–1mm, wedge-shaped, thickened and covered with tubercles. Short hairs tip many tubercles, especially at the apex. Under x 40 magnification they are seen to be bifid hairs. There are no wings and the margin becomes less apparent as the fruit matures. The pappus is short but conspicuous. **In the wild** plants may grow to 45cm high and do not sucker or layer.

Flowering period: Plants flower throughout the year, but mainly between August and March.

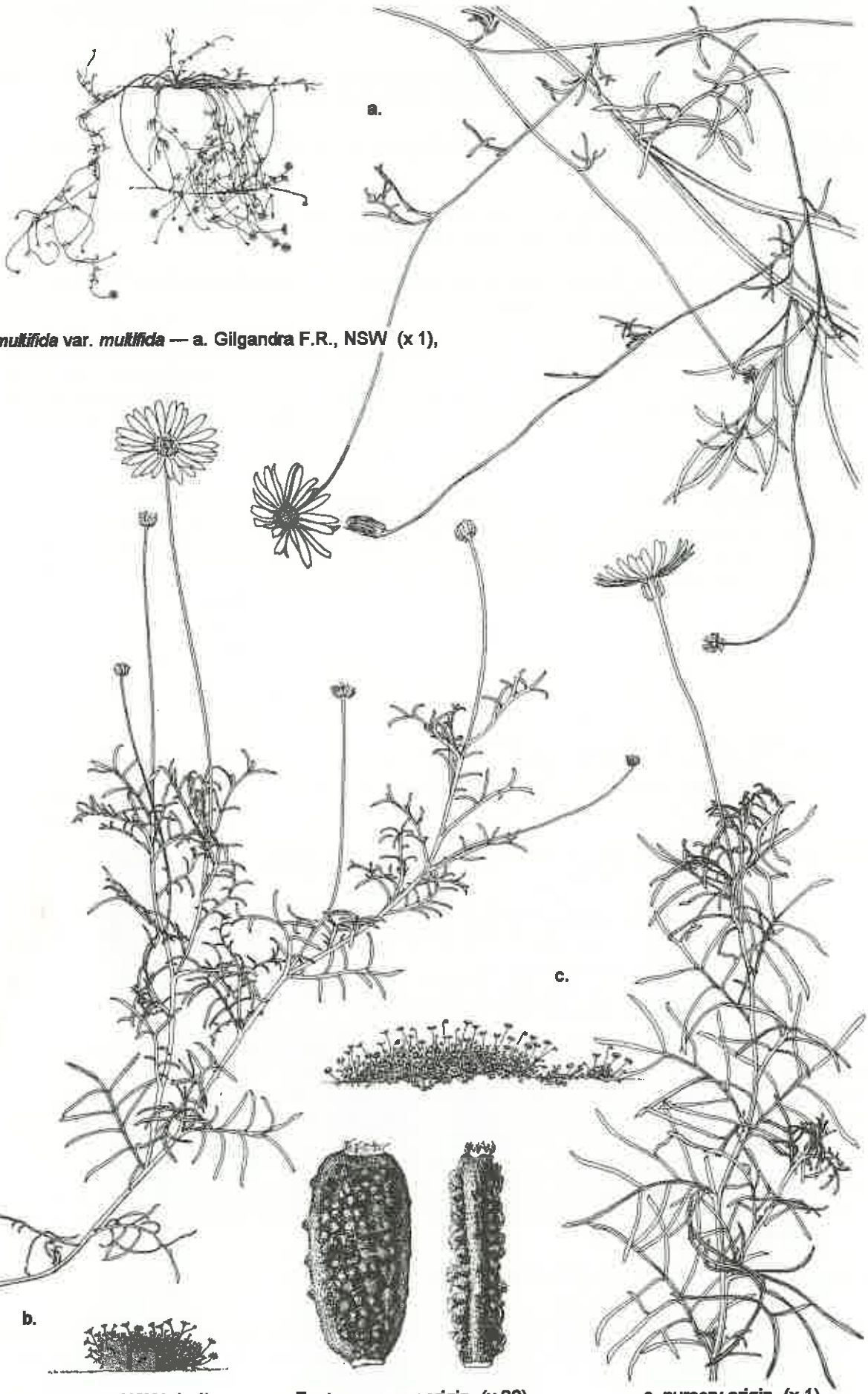
Cultivation and uses: This variety adapts to most soils and situations. Although it tolerates drier conditions than most other brachyscomes its performance is improved with some summer watering. It prefers sun but will grow and flower in part shade. To maintain a dense, compact habit, prune when new growth is observed in the centre of the plant. If allowed to sprawl the lower stems will often layer. Heavy frosts will burn the foliage but recovery is swift. Variety *multifida* grows at the coast although it seems less able to withstand exposure to salt and wind than var. *dilatata.* It is relatively free from pest attack. Use this variety for edging, rockeries, ground cover, containers or as a general garden plant. Particular cultivars or forms suit some purposes better than others. Plants may also act as low climbers given shady situations and shrubs through which to climb. In this way they can scramble up to 1m towards the light. A small posy of freshly opened flowers lasts three to four days.

Propagation: Seed germinates in 15–40 days but germination is relatively poor. Plants do not produce much seed. It is easier to propagate from stem or root cuttings, by division of rootstock, or by transferring layered plants to new positions.

Forms:

- A form from the Copeton Dam area (NSW) has white heads with mauve reverses, 2–2.5cm across, on sturdy flower stems, 10–17cm long.

- Forms from Gilgandra (NSW) grow to 15cm and have white, pink or mauve flowers, 1.5–2cm across on flower stems 4–5cm long.



B. multifida var. *multifida* — a. Gilgandra F.R., NSW (x 1),

b. Mt Kaputar, NSW (x 1)

Fruit — nursery origin (x 20)

c. nursery origin (x 1)

- Forms from Mt Kaputar (NSW) may be mauve or mauve-pink. The heads are 2–2.5cm across on flower stems 8–10cm long. These forms have fresh green foliage and are useful for colour contrast in the garden and for containers.

- Forms from the South Western Plains (NSW) have small white, mauve or pink heads, (1–1.5cm across). These are dainty little plants, 20cm x 10cm, best grown in groups.

Similar species: ***B. ciliaris*** also has pinnate leaves and a bushy habit, but the fruits are always dimorphic (of two shapes).

B. rigidula (subalpine form) has similar pinnate leaves and mauve, pink or white heads, but it can be distinguished by its glandular-hairy leaves and winged fruits.

***B.* sp. (Darling Downs)** is also a perennial with pinnatisect leaves but the lobes are broader and blunt. The fruit is much shorter (1.2–1.5mm)

Special notes: Smith-White *et al.* (1970) observed that they found differences in leaf form, habit and flower colour in plants of var. *multifida* from different areas. They noted that some of the forms in var. *multifida* differ more from one another than do forms within var. *dilatata*. They suggested that either the east coast var. *dilatata* should not be maintained or that several different varieties should be recognized within the species.

The chromosome number of var. *multifida* is $n = 7$ (Smith-White *et al.*, 1970).

A strange phenomenon has been noted in *B. multifida*. An occasional mauve-flowered plant will produce white flowers on some stems. After some time, as many as half the heads on the plant will be white, or a combination of white and mauve, and the remainder are mauve. If cuttings of the white or multi-coloured shoots are struck the resultant plants usually produce mauve heads. This is strange because vegetative propagation of plant variation should retain the new character permanently.

B. multifida DC. var. *dilatata* Benth.

Cut-leaf (or Cut-leaved) Daisy

PERENNIAL
10–40cm high
0.3–1m wide
MAUVE, PINK, WHITE

Derivation: *dilatata* — enlarged or widened, referring to the leaf lobes.

Attractive perennial with neat divided foliage and masses of flowers over a long period. Usually spreads by suckering.

Distribution and habitat: NSW, Vic. This variety is more widespread in Victoria than var. *multifida*. Occurs in grassland, open forest and coastal woodland.

Description: In cultivation a variable, branching, glabrous perennial which suckers. Stems are stiff, almost wiry. **Leaves** are 1–7cm long, pinnate and usually bipinnate, with 7–10 lobes. The lobes are broader than those of var. *multifida* (from 1–2mm wide), varying from oblanceolate to broad linear or wedge-shaped. The apex tapers abruptly. **Flower-heads,** 1.5–2.5cm across, are numerous on flower stems 3–12cm long. Ray florets are usually mauve but may be white or pink. Involucral bracts (16–20) are narrow-oblanceolate with subacute tips and transparent margins fringed with small hairs. **Fruits** are identical with those of var. *multifida*. **In the wild** the low forms spread from underground runners to form mats of neat, divided leaves. They become conspicuous when the heads are held erect on their stiff little stems.

Flowering period: Usually from spring to late autumn.

Cultivation and uses: Variety *dilatata* is a most versatile and reliable plant and makes an excellent garden subject for almost any purpose. It prefers full or part sun and even grows in full shade, but flowers are few and growth is not as lush. When planted at the coast the leaves and stems often turn dark red and in exposed positions the habit becomes more compact. Frost will burn the foliage, but recovery is fast. It is comparatively free from pest attack and benefits from pruning. Each new

B. multifida var. *dilatata* — a. Oodnadatta, SA (x 1), b. Blackwood, Vic (x 1), c. Kinglake, Vic (x 1)

season's growth must be established before pruning. This variety is often used in landscape work; it is a dependable and colourful plant for median strips, roundabouts and general planting. It has been used extensively overseas for planting in public gardens, in the nursery trade as an indoor or outdoor plant, and as the basis for much experimental hybridization. It may be used as an edging plant, in rockeries, for massed planting in different colours and as a ground cover. The suckering habit makes it an excellent binder for clay banks and the long flowering period recommends it for containers or hanging baskets.

Propagation: Cuttings strike easily and quickly. Suckers may be treated as cuttings or plants may be divided. Not much viable seed is produced unless many different forms are grown together, but seeds will germinate in 15–40 days although percentage germination is poor. Chance seedlings, such as *B. multifida* 'Breakoday', sometimes arise in the garden and may be interesting and attractive additions.

Forms:

- The white form from Blackwood (Vic) is the best white form trialled by the Study Group so far. Plants are 15–20cm high and spread to 1m or more by suckering. The heads are 2–2.5cm across on stems 3–6cm long. The dark green leaves make a nice contrast.

- A form from the Gippsland Lakes district (Vic) is a robust plant to 40cm. The flower-heads are white to pale mauve, 2–3cm across, and the leaves are 1–3cm long. This form has an upright habit and does not sucker.

- A dainty form from Inglewood (Vic) flowers from spring to summer. It has fine, mid-green foliage and pale mauve heads, 1.2–1.5cm across. Plants grow 25cm x 80cm and are reliable performers in cultivation.

An entity of uncertain status has been collected at Hat Head in the North Coast region of New South Wales. Until its status is determined it is referred to as *B.* aff. *multifida.*

B.* aff. *multifida

This entity was collected in an open situation on coastal cliffs among thick grasses. In cultivation it is a prostrate perennial with short branching glabrous stems and a dense leafy habit. It spreads by suckering. Leaves are glabrous, petiolate, 1–2cm long, pinnatisect with 7–8 oblanceolate lobes, 3–7mm x 1mm. The lobes have subacute to obtuse tips and occasionally one or two small secondary lobes. Flower-heads are mauve, 1.8–2cm across on flower stems 5–6cm long. Flower stems are naked or have one reduced leaf near the base. Ray florets (16) are mid-mauve with pale reverses, and are relatively broad (2–2.3mm). Involucral bracts (8–12) are broad with obtuse transparent fringed margins. Fruits are black, 1.8–2mm x 0.8–1mm, wedge-shaped and slightly swollen. The faces are tuberculate, many of the tubercles being tipped with a hair. At x 40 magnification these hairs are seen to be bifid or divided into two. The margin is smooth. The pappus is broad-based; the bristles are short but obvious. In the wild the secondary lobing on the leaves appeared only where plants were growing in damp sheltered spots.

Plants flower from spring to autumn. The Study Group has trialled this entity for a short period. It appears to prefer open conditions in sun or dappled shade, and needs root protection. *B.* aff. *multifida* grows moderately well in cool montane climates and is a useful low-growing plant for exposed coastal situations. Seed germinates well in 8–40 days. Propagate also from cuttings or by division.

B. aff. *multifida* differs from *B. multifida* var. *dilatata* in having leaf lobes with blunt tips, and the involucral bracts are unusually broad and few in number.

Similar species: ***B. ciliaris*** has similar foliage but it is not rhizomatous and has fruit of two shapes.

B. rigidula differs from var. *dilatata* in having leaves with glandular hairs and fruit with wings.

Cultivars and forms of unknown or uncertain origin:

- ***B. multifida* 'Amethyst'** is a beautiful fine-foliaged cultivar from Peg McAllister's garden in Victoria. The heads are amethyst-violet, with lime-green centres, 1.5–2cm across, on stems 10–12cm long which are often dark red. Plants grow 10–30cm x 20–60cm and do not sucker.

B. aff. *multifida* — Hat Head, NSW (x 1)

Fruit — Hat Head, NSW (x 20)

Stems tend to cascade which makes it an excellent choice for hanging baskets, but it is valuable for any purpose. It flowers throughout the year and is suitable for cool to subtropical climates.

- ***B. multifida* 'Breakoday'** is another chance seedling from Peg McAllister's garden. Its horticultural potential was recognized and it was developed by the nursery trade to become one of the most popular forms of *B. multifida*. The deep mauve heads, 2–3cm across, have lime-green centres when they first open. They are held above the foliage on stalks 6–10cm long. This plant suckers decorously and flowers profusely from spring to autumn.

- ***B. multifida* 'Bright Eyes'** is a cushion, 10–15cm high, prostrate and spreading. Small, deep mauve heads, 1–1.5cm across, are produced on leafy stems (to 4cm long) throughout the year. 'Bright Eyes' is relatively frost tolerant. It may brown off in the centre; prune after new growth appears. This cultivar also originated in Peg McAllister's garden as a chance seedling. It is the cultivar referred to as *B. multifida* 'Blue Eyes' in the *Supplement to the Encyclopaedia of Australian Plants* (1994) by Elliot and Jones.

- ***B. multifida* 'Evan'** is a diminutive cushion form with deep mauve-purple heads, 1–1.5cm across, on flower stems 2–4cm long. The little leaves, 0.5–1.5cm long, are close-packed. This cultivar was developed by Study Group member Bev Courtney and named in memory of Evan Schaumann. It is lovely in a small pot, but not suited to cold areas where snow and frost are experienced.

The following cultivars have been registered with the Australian Cultivar Registration Authority, but the Study Group has had no opportunity to trial them: *B. multifida* 'Alba', *B. multifida* 'Minima', *B. multifida* 'Roulette' and *B. multifida* 'White Surprise'.

Other forms of unknown origin have horticultural merit. They include the following:

- Pale, prostrate form. Plants are 15–18cm high and form a mat 2m across by layering. Masses of pale lilac heads, 1.8–2.2cm broad, are produced over a long period. This is a good, undemanding ground cover for part shade.

- Mauve form sold in nurseries for many years. This form has all the characters of var. *multifida* with its fine, lacy leaves and mauve heads, 1.8–2.5cm across, on long stems. It flowers for most of the year, spreads by layering itself, and makes a wonderful ground cover.

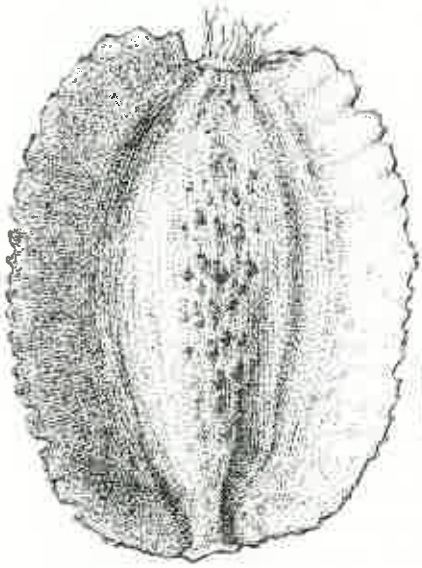
- Karwarra Australian Plant Garden pink form. Plants form small bushes and do not sucker. The heads are bright mauve-pink, 1.5–2cm across, on short stems. The leaves are small, 1–3cm long, very lacy and light green. This form persists in pots, but is short-lived in most gardens.

- Large-flowered form — a seedling from Peg McAllister's garden. A handsome rounded bush, 40cm x 40cm, producing big mauve heads (3–3.5cm across) from spring to autumn.

Special notes: Smith-White *et al.* (1970) determined *n* = 9 as the chromosome number for *B. multifida* var. *dilatata* from the Grampians (Vic). In the same article these workers determined a chromosome number of *n* = 7 for material identified as *B. multifida* var. *dilatata* from Smoky Bay, which is only about 20km north of Hat Head. It has been assumed that these two collections belong to the same species since they occur comparatively close to each other and share similar habitats.

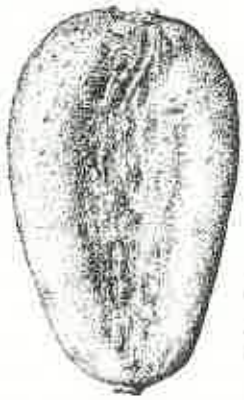
Study Group members have noticed that the cotyledons of the var. *dilatata* seedlings trialled to date have been narrow-linear. Hat Head seedlings, however, have relatively broad-obovate cotyledons. The Hat Head entity appears to have a close relationship with *B. multifida*.

Alpine *Brachyscome* species (x 20)

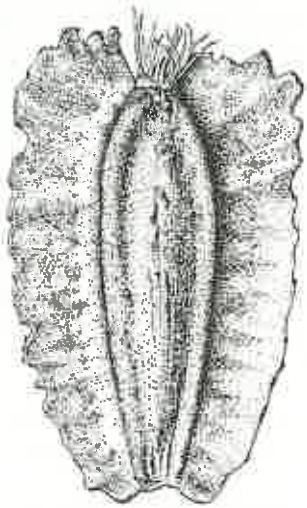


B. aculeata

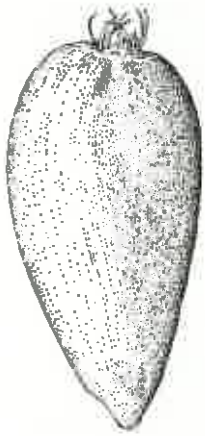
B. decipiens



B. graminea

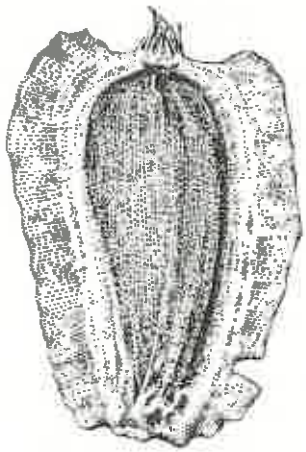


B. nivalis

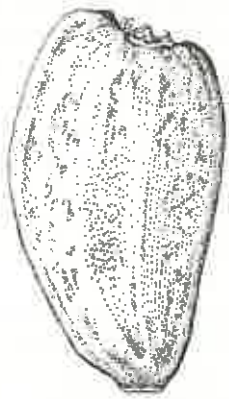


B. obovata

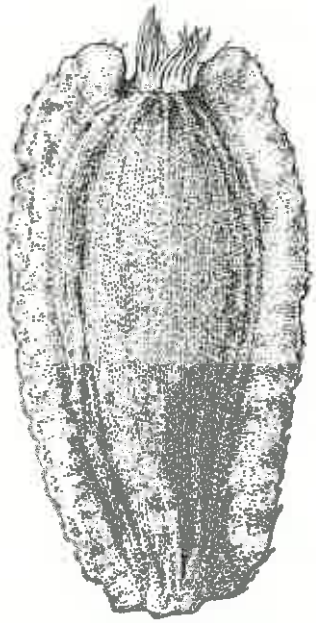
B. radicans



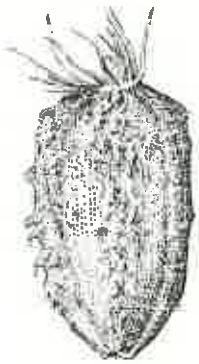
B. rigidula



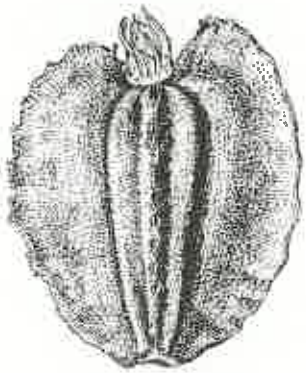
B. scapigera



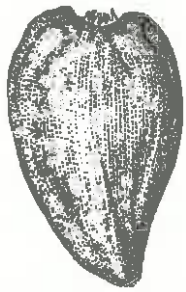
B. spathulata



B. stolonifera



B. tadgellii



B. tenuiscapa var. *tenuiscapa*

Brachyscome nivalis F. Muell.

Snow Daisy

PERENNIAL
10–30cm high
10–30cm wide
WHITE, BLUE (rarely)

Derivation: *nivalis* — growing near the snow line.

Handsome alpine, clump-forming perennial with stiff, shining, divided leaves. Large white flower-heads held conspicuously above the foliage.

Distribution and habitat: NSW, ACT, Vic. Occurs in alpine and subalpine regions, in damp situations along streams or in the deep soil of rock crevices.

Description: **In cultivation** a tight perennial clump which gradually expands from a thick root-stock. **Leaves** are petiolate, sparsely glandular-hairy, 5–15cm x 1–2cm, arising from a basal cluster. They are singly or doubly pinnatisect and have thick white stalks, channelled above, expanded at the base and stem-clasping. The lobes are linear, to 1cm long, thickened at the apex. **Flower-heads** are 2–4cm across held on strong stems (15–30cm long), about twice as long as the leaves. Young flower stems are often dark red; mature stems are thick and white at the base and hug the soil before rising. These old stems may branch once or twice. They may be almost leafless or bear several reduced leaves, pinnate in the lower half and the uppermost entire. Ray florets (25–50) are usually white, although a rare blue form has been recorded in the Kosciusko National Park. **Fruits** are mid-brown, 2–3mm x 1–2.5mm, flattened, with a slightly raised vertical band of glandular hairs down the centre of the body. The wings are translucent, broad, entire or slightly dissected, and edged with short glandular hairs. The pappus is conspicuous, longer than the notches between the wings. **In the wild** *B. nivalis* is regarded as one of the most spectacular of the mountain daisies. In these ideal conditions it forms extensive clumps.

Flowering period: *B. nivalis* flowers in summer and early autumn in its natural habitat. In cultivation it begins to flower as early as August.

Cultivation and uses: Although not often seen in native plant nurseries this species is usually stocked by alpine plant specialists. Where summer temperatures are mild it grows reasonably well in open conditions with light shade and moist soil. It grows best in alpine conditions. Plants die back immediately when the soil dries out, but may shoot again after autumn rain. Tropical and subtropical conditions are unsuitable for this species. Plants tolerate frost to –5°C and have survived an English winter in close-packed pots in the open. Snow Daisy makes a very attractive rockery plant and is pleasing in a container even when it is not in flower. It lasts quite well as a cut flower.

Propagation: Seed germinates readily in 8–40 days. It is easy to propagate by division.

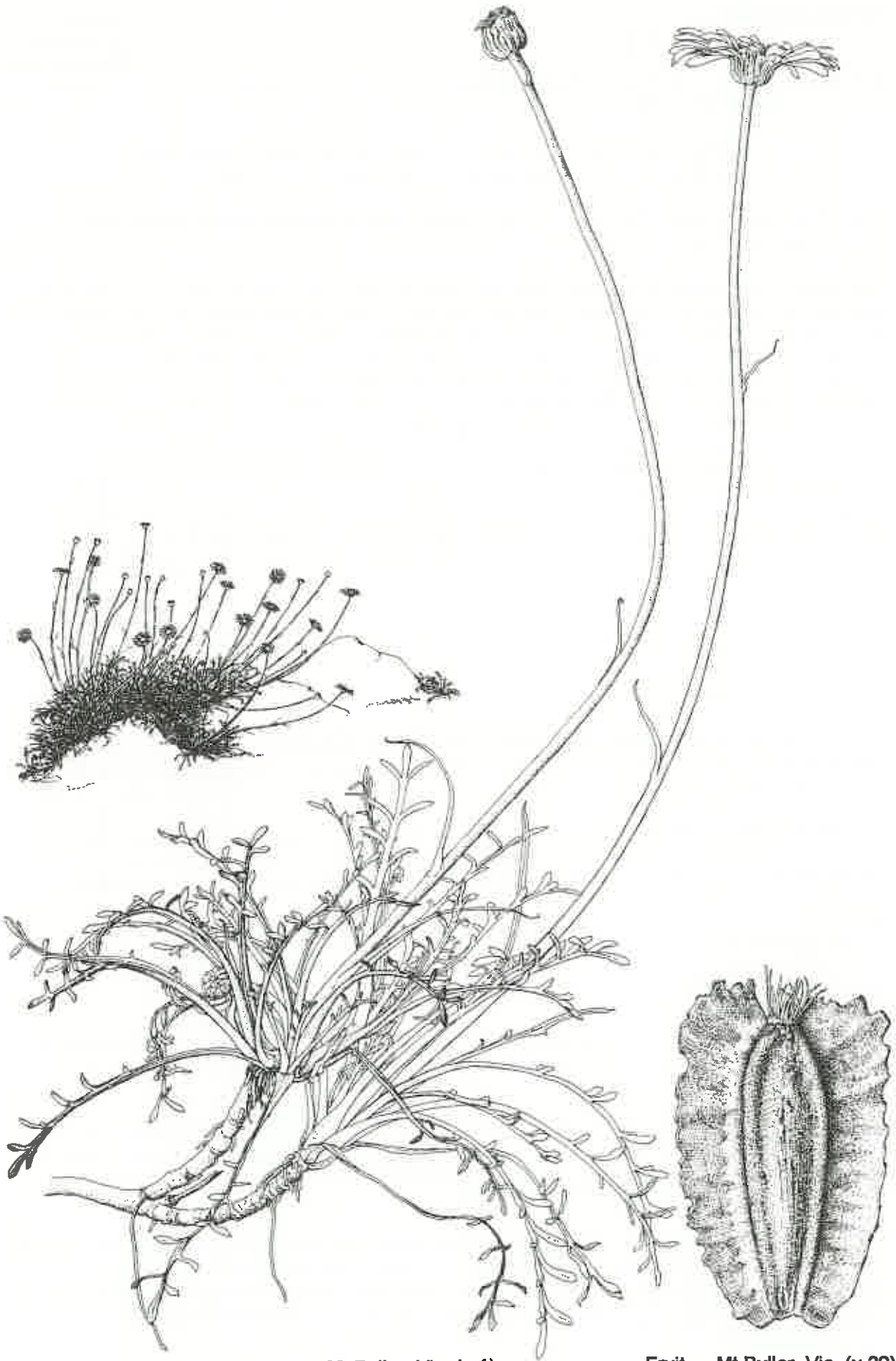
Forms: The Study Group has trialled only white-flowered forms. In general, forms with bipinnate leaves produce daintier, less vigorous clumps than forms with pinnate leaves.

Similar species: ***B. dissectifolia, B. ptychocarpa*** and ***B. stuartii*** are all perennials with pinnate leaves in basal clusters. They differ from *B. nivalis* in the following respects; the leaves are soft rather than stiff, the flower stems are slender and usually naked, and the fruits are shorter (less than 2mm). None of these species occur at the high altitudes at which *B. nivalis* is found.

B. tadgellii occurs in the same habitats as *B. nivalis* and was previously considered to be a variety of *B. nivalis*. It also has a basal cluster of shining green leaves, some of which are pinnate. The leaves, however, are never as regularly divided and often remain entire or lobed. The fruit is winged and resembles that of *B. nivalis*. In some forms the wing appears to be slightly swollen adjacent to the margin.

Special notes: Davis (1948) recognized two varieties in *B. nivalis*, var. *nivalis* and var. *alpina*, based on leaf shape. Variety *alpina* is now recognized as *B. tadgellii* (Forbes and Ross, 1988). *B. nivalis* has a chromosome number of $n = 11$ (Smith-White *et al.*, 1970).

Study Group members have observed that *B. nivalis* has hybridized in gardens. Seed collected from *B. nivalis* produced seedlings with characters very similar to those of *B. diversifolia* which had been flowering nearby.



B. nivalis — Mt Buller, Vic (x 1)

Fruit — Mt Buller, Vic (x 20)

Brachyscome nodosa P.S. Short and K. Watanabe

Knobby-fruit Daisy

ANNUAL
10–15cm high
20–25cm wide
WHITE

Derivation: *nodosa* — knobby, referring to the prominent tubercles that give the mature fruit a knobby appearance.

Pretty little annual with mauve buds and white flower-heads over a long period. Attractive divided foliage. New to cultivation.

Distribution and habitat: Qld, NSW. Occurs scattered along roadside verges in light soils, on flood plains in clay soils and in woodland.

Description: **In cultivation** an annual branching from the base. Stems are erect and decumbent, and bear conspicuous septate hairs and a few short glandular hairs. **Leaves** are produced basally and along the stem. Basal leaves are deeply lobed or pinnatisect, 4–6cm long, with 5–9 blunt lobes, 5–10mm x 1–2mm. Secondary lobing may occur. Basal leaves are lost as plants develop. Stem leaves are similar in shape and 2–4cm long. Leaf bases are all expanded and slightly sheathing. Long septate hairs are present, especially in the leaf axils, mixed with some short glandular hairs. **Flower-heads** are 2–2.5cm across on flower stems to 18cm long bearing 2–3 reduced leaves in the lower section. Flower stems are glabrous or bear scattered septate hairs. Ray florets (12–22) are white with white or mauve reverses. **Fruits** are dark brown to black, knobby, 1.5–2mm x 1.8–2mm, wedge-shaped and four-sided. When fruits are mature the outermost develop large tubercles on the faces and two large horn-like projections at the apex. The appearance varies according to the position of the fruit within the seed head and the degree of maturity. Immature fruits may be large but the tubercles and prominent apical horns may be absent. The pappus is stellate and set obliquely. **In the wild** plants are smaller and more erect than they are in cultivation.

Flowering period: In its natural habitat *B. nodosa* flowers in late winter and spring, but in cultivation it flowers from late September to the following winter.

Cultivation and uses: This annual appears to have potential. The number of heads produced and the long flowering period are valuable characteristics, as is its tolerance of a variety of conditions. Young plants should be protected during cold, wet winters. *B. nodosa* has displayed a preference for warm conditions and open situations. It is suitable for semi-arid and cool temperate climates and may be used grouped, massed or in containers.

Propagation: Seed germinates in 5–40 days, but percentage germination is poor. More success is achieved by natural regeneration. Trials indicate that January is the best time to sow. Seed is retained in the head for a long time after it appears mature, but is shed after prolonged rain or overhead watering.

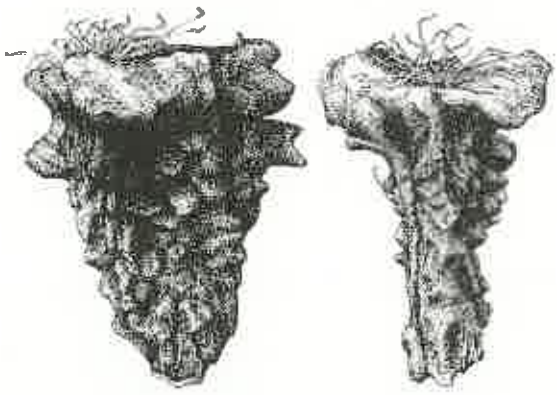
Similar species: ***B. goniocarpa*** has been mistaken for *B. nodosa* in the past because the black fruits look similar. *B. goniocarpa* does not occur in Queensland nor in New South Wales, plants are very small (3–6cm x 2–5cm) and the white heads are tiny (to 6mm across).

B. gracilis is another white-flowered annual of comparable size and leaf shape. The habit is not as robust and the fruit, although black, is winged and has a conspicuous upright pappus which is centrally placed.

B. readeri has white flower-heads and leaves like *B. nodosa*, but it differs in that the stems are more upright and the basal leaves are longer (to 7cm). The fruit is not as bulky (to 1mm across), does not develop the large apical horn and has a stellate pappus set in the centre rather than obliquely. *B. readeri* does not occur as far north as *B. nodosa*.

B. smithwhitei is an annual with white heads and pinnatisect leaves which sometimes grows in close association with *B. nodosa*. *B. smithwhitei* differs in that plants are taller (to 40cm) and the stems are glabrous. The fruits are brown with prominent wings fringed with hairs in the upper section of the body, and two tufts of hairs at the base. The pappus is not stellate and is centrally placed.

B. nodosa — Narrabri, NSW (x 1)



Fruit — Narrabri, NSW (x 20)

Special notes: *B. nodosa* has a chromosome number of $2n = 6$ (Watanabe and Short, 1992).

B. nodosa is referred to as *Brachyscome* sp. aff. *goniocarpa*, K. Watanabe and P.S. Short, *Muelleria* 7: 460, 469 (1992), and as *Brachycome* sp. A, Everett in G. Harden, *Flora of New South Wales* 3: 156, 162 (1992).

Davis (1948) included *B. nodosa* in *B. goniocarpa* in her revision of the genus, but she described a variation in the fruit of material collected from southern Queensland and northern New South Wales. She observed that the fruit at the periphery of the head had a margin which developed into a horn at the top (Davis 1948, p. 204). In 1993 Watanabe and Short described this entity as a new species and named it *Brachyscome nodosa.*

In the light of this new information changes should be noted in the following publications:

- In Beadle (1980) *Students Flora of North Eastern New South Wales* Part IV the description under *B. goniocarpa* (p. 633) applies to *B. nodosa*. The distribution should not include Vic, SA or WA.

- In Jacobs and Pickard (1981) *Plants of New South Wales. A Census of the Cycads, Conifers and Angiosperms* the distribution set out for *B. goniocarpa* (p. 72) applies to *B. nodosa* and should not include Vic, SA or WA.

- In Cunningham *et al.* (1981) *Plants of Western New South Wales* the description under *B. goniocarpa* (p. 651) is that of *B. nodosa*, but the illustration of the fruit (p. 648, fig. 64 p) is that of true *B. goniocarpa.* The distribution should not include Vic, SA or WA.

- In Stanley and Ross (1986) *Flora of South-eastern Queensland* Vol. 2 the description of *B. goniocarpa* (p. 511) refers to *B. nodosa*, as does the illustration (p. 512, fig. 71 I).

B. diversifolia (King Island, Tas) *B. diversifolia* form (west of Stawell, Vic)

B. goniocarpa

B. gracilis

B. aff. *gracilis*

B. nodosa

B. readeri

***Brachyscome diversifolia* complex (x 20)**

Brachyscome nova-anglica G. Davis

New England Daisy

PERENNIAL
20–30cm high
15–30cm wide
WHITE, MAUVE

Derivation: *nova-anglica* — New England.

Dense, small, branching perennial covered with white or mauve flowers for very long periods.

Distribution and habitat: NSW. This species is restricted to Mt Kaputar and the Northern Tablelands. It occurs on slopes among boulders and trees.

Description: **In cultivation** a decumbent perennial with branching stems covered with a mixture of septate and glandular hairs. **Leaves** are stalkless, 1–5cm x 2–9mm, mid-green and covered with septate hairs. There are 2–9 teeth, mainly appearing near the apex, but sometimes there are one or two narrow teeth at the base of the leaf. Seedling leaves may be much longer (to 6.5cm long). **Flower-heads,** 1.5–2.5cm across, appear in profusion at the tips of flower stems 3–7cm long, usually with one or two short, almost linear leaves. The ray florets are white or mauve. **Fruits** are black, 1.8–2mm x 0.8–1mm, somewhat flattened, obovate, with smooth margins and obviously tuberculate faces. The pappus is tiny. **In the wild** plants grow as small colonies at the base of large rocks and are usually more upright in these conditions. Sometimes they grow up through grasses and are quite tall. Some forms sucker.

Flowering period: In temperate climates *B. nova-anglica* flowers from late August to May.

Cultivation and uses: *B. nova-anglica* grows in sun or semi-shade and appreciates nutrients. If the soil dries out the plant may die back and disappear, but will shoot again when moist conditions prevail. It flowers so generously that it may need several light trimmings all over to keep it looking pretty for the duration of the flowering period. This is a good cool climate plant, tolerating frost to –5ºC. It is attractive grouped in the garden, edging paths, in a rockery or container.

Propagation: *B. nova-anglica* germinates well from seed in 14–30 days. Much seed is produced if groups of seedlings are grown together. Care must be taken to protect small seedlings from cold, wet weather or sow seed in late winter and early spring to avoid such conditions. Cuttings root readily.

Forms: (The Study Group has not collected a mauve form to date.)

- A white-flowered form from the Mt Kaputar area has been grown by members. This one has pretty buds — almost red at the base and creamy yellow above.

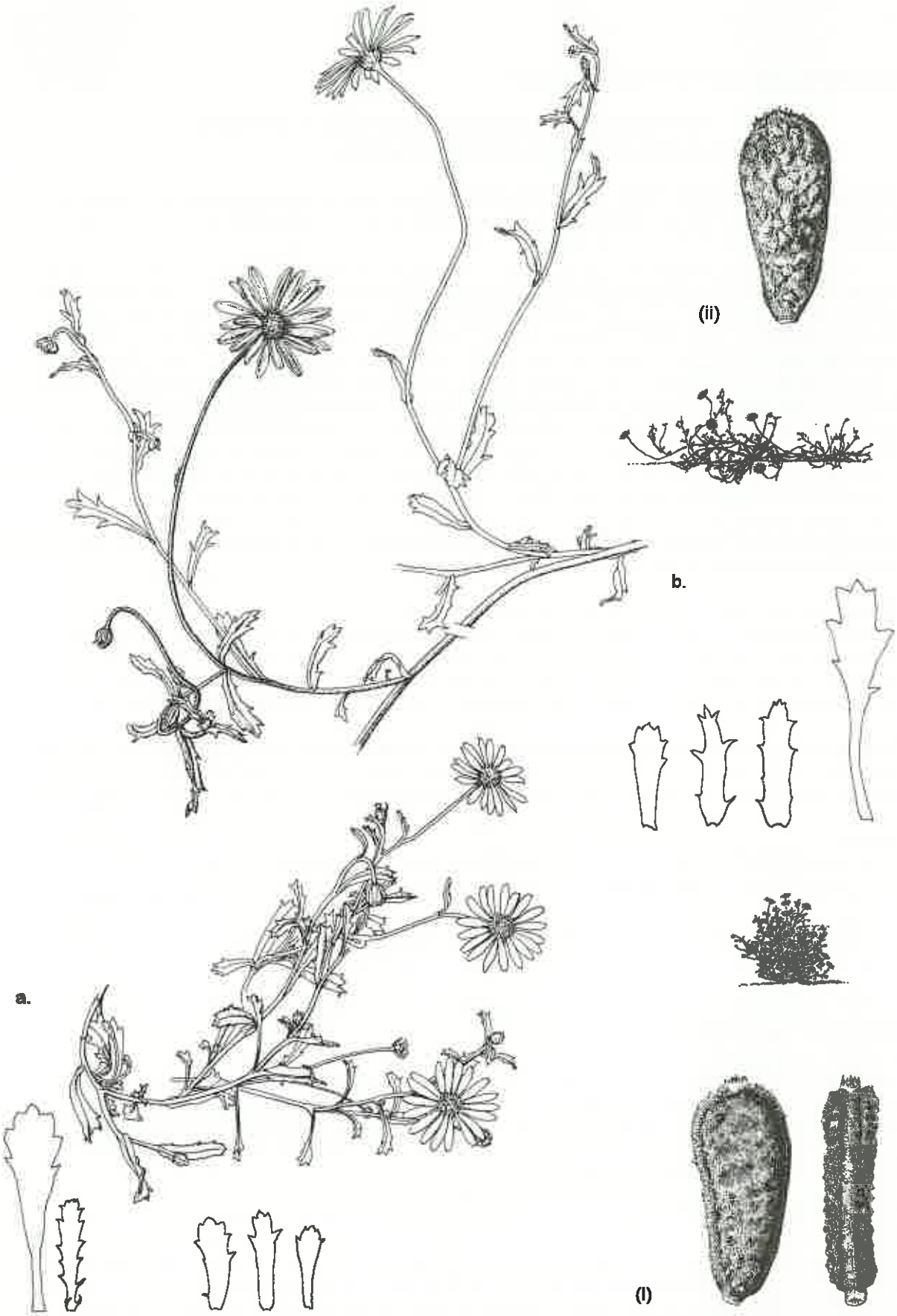
- A form from the Northern Tablelands has trailing, sparsely branched stems (to 15cm) and dark green leaves bearing septate hairs on both surfaces. The lower leaves are petiolate, becoming sessile further up the stem. The white heads are 2.5–3cm across on flower stems 10–15cm long. It differs from the Mt Kaputar form in that the heads are larger, the leaves are dark green, plants sucker and the habit is more open.

Similar species: ***B. ascendens*** is vegetatively similar to *B. nova-anglica* in the shape of the leaves and in the vestiture. *B. ascendens* is confined to the Border Ranges of Queensland, the heads are usually larger (2.5–3.5cm across), the ray florets are always mauve, and the leaves are generally broader. The fruits distinguish *B. ascendens*; they are larger (2.5mm x 1.8mm), have a short but conspicuous pappus, and a wing-like margin which is thick, lobed and edged with long hairs.

B. melanocarpa has a similar black tuberculate fruit, but it is larger (2–2.5mm x 1–1.2mm) and has a very conspicuous pappus. Flower-heads are usually more than 2cm across.

B. microcarpa also has black fruit with the same appearance as *B. nova-anglica,* but the fruit is smaller (1–1.8mm x 0.6–0.9mm) and the pappus, though small, is well defined. This species is also a branching perennial, usually hairy, but the leaves are more rounded in outline.

Special notes: Smith-White *et al.* (1970) found two chromosome numbers for *B. nova-anglica*; *n* = 7 in the central region of the New England Tablelands and *n* = 6 at the southern end near Walcha. They could observe no difference in the fruits but noted the leaves were narrower in the Walcha material. Study Group members report that B. nova-anglica appears to come true from seed collected from garden-grown plants.



B. nova-anglica — a. Mt Kaputar, NSW (x 1), b. Northern Tablelands, NSW (x 1)
Fruit — (i) Mt Kaputar, NSW (x 20), (ii) Northern Tablelands, NSW (x 20)

Brachyscome obovata G. Davis

PERENNIAL
10–30cm high
spreading
WHITE

Derivation: *obovata* — having obovate fruits.

A slow-growing tufted perennial with white flower-heads and narrow leaves. A water-loving plant.

Distribution and habitat: NSW, Vic. *B. obovata* is always found in moist situations in alpine and subalpine areas. It grows on creek banks where its roots may be in the water flow, in and around sphagnum bogs and other seepage areas.

Description: In cultivation a small clump of erect basal leaves. Plants are rhizomatous. **Leaves** are variable, usually 5–15cm x 2–7mm, but taller forms can be found at lower altitudes with leaves 15–25cm x 2–4mm. The shape is linear or narrowly oblanceolate with subacute tips and slightly expanded bases. Leaves are glabrous and sessile, although in some forms the blades taper at the base to present the appearance of a leaf stalk. The old fibrous leaves do not remain at the base of plants. **Flower-heads** are white or faintly tinged mauve, 2–3cm across. Flower stems are unbranched, bear 4–6 stem bracts with translucent tips and are glabrous except for the presence of a few small glandular hairs just below the head. **Fruits** are obovate, smooth and swollen, 2–2.5mm x 1–1.5mm. The pappus is small. **In the wild** colonies can be large, in excess of a hundred individuals. Some plants may be very robust — the tufts being up to 30cm high.

Flowering period: In cultivation *B. obovata* flowers reluctantly in late spring and summer, but in the wild it flowers in summer and early autumn.

Cultivation and uses: This species is difficult to grow in the garden, but may be reared in pots of peaty soil standing in water or with a constant source of basal water. Rate of growth is so slow compared with other alpine species, such as *B. nivalis* and *B. tadgellii,* that only the specialist may wish to rise to the challenge. Plants are beloved of snails and flower-heads may be ruined by grubs. *B. obovata* could be tried in alpine or bog gardens. It will persist in a pot, but only grudgingly.

Propagation: Fresh green seed will germinate within 14 days if sown soon after collection. In some cases seed may take 5–7 months to germinate. Germination seems to vary with provenance and method of storage. It is possible that stratification of mature seed is indicated. Plants can be divided.

Forms:

- Forms from the Southern Tablelands (NSW) may have narrow-oblanceolate or narrow-obovate leaves (to 1cm across) and may resemble some forms of *B. scapigera* or *B. tadgellii.*

- Victorian forms (from Lake Mountain and Mt Baw Baw) have linear, grass-like leaves, 8–12cm x 0.1–0.3cm, and may resemble some forms of *B. radicans.*

Similar species: ***B. radicans*** differs from *B. obovata* in being vigorously stoloniferous. The fruit is winged and has a conspicuous pappus.

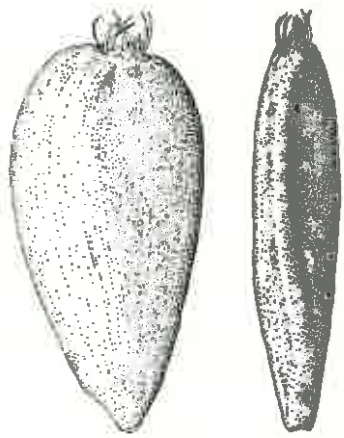
B. scapigera is a tufted plant occurring in alpine areas. Narrow-leaved forms are often confused with *B. obovata.* It differs vegetatively in that the tufts are more dense, there are fewer stem bracts (1–2 compared with 4–9) and the fibrous remains of the old leaves can be found at the base of plants. The fruits are also similar in shape, but those of *B. scapigera* are longer and less swollen, there is a faint but obvious margin, and the pappus is minute.

B. stolonifera may be differentiated by the fruit which has a conspicuous pappus and is smaller (2mm x 1mm).

B. tadgellii often grows in association with *B. obovata,* but it differs in having more vigorous leaf tufts and short glandular hairs on the scapes. Usually at least one leaf per plant is lobed. The fruit is winged and has a conspicuous pappus.

B. obovata — Mt Baw Baw, Vic (x 1)

Fruit — Lake Mountain, Vic (x 20)



Brachyscome oncocarpa Diels

Swollen-fruited Daisy

ANNUAL
5–15cm high
10–20cm wide
MAUVE, MAUVE-PINK

Derivation: *oncocarpa* — swollen fruit.

Handsome annual with pinnate leaves. Prefers a warm climate.

Distribution and habitat: WA. Occurs inland in the Austin district. Grows in clays or sands with mulga and *Callitris* species, often in areas adjacent to salt lakes.

Description: **In cultivation** an annual with erect or ascending flower stems. At first the main stems branch sparsely near the base. Secondary branching occurs later. **Leaves** are thick, 1.5–5.5cm long, pinnatisect with 3–7 lobes, 5–10mm x 1–2mm. The stalk is channelled and bears a number of septate hairs, more numerous in the leaf axils. Some forms in the area from Paynes Find to Yalgoo have numerous, glandular-septate hairs on the leaves and basal parts of the stems. **Flower-heads** are 1.5–3.5cm across and emit a faint scent of pansies. The ray florets are broad (to 3mm across), pale mauve or mauve-pink, relatively few in number (8–13), and droop downwards like the other species in the *B. oncocarpa* complex. Flower stems are stiff, 4–12cm long, with one or two leaves near the base, and may be glabrous or bear sparse short hairs. The involucral bracts are broad-obovate, almost glabrous, and have a rounded apex. **Fruits** are elaborately sculptured, brown, 2–2.5mm x 1.5–2mm at the shoulders. The main features are the two swollen, almost bulbous shoulders, each with a small collection of hairs at the tip. The faces have two raised vertical ridges with a flattened area between them. The margin or entire wing is fringed with long, apically rolled hairs and there is a bunch of similar hairs at the base of the fruit. The pappus is conspicuous. **In the wild** this species is more common than previously thought.

Flowering period: July to September in the Austin district, but in cultivation it flowers from August to November. Individual plants only flower for part of this period, but will produce a new crop of flowers if cut back at the end of the first flush.

Cultivation and uses: *B. oncocarpa* performs at its best in warm climates where it can be watered when necessary. Plants prefer a sunny position in well-drained soils. It is most suitable for grouping in gardens and will regenerate naturally in subsequent years. For a massed effect plant 10cm apart.

Propagation: Seed germinates in 4–25 days. Germination improves if garden seed is sown.

Forms:

- The form from Paynes Find to Yalgoo differs from the typical almost glabrous forms in having numerous glandular-septate hairs on the foliage. Heads are 2.5–3cm across.

Similar species: ***B. chelocarpa*** differs from *B. oncocarpa* in having septate-hairy, lanceolate involucral bracts with thread-like tips. The fruit has lobed wings and tubercles on the faces.

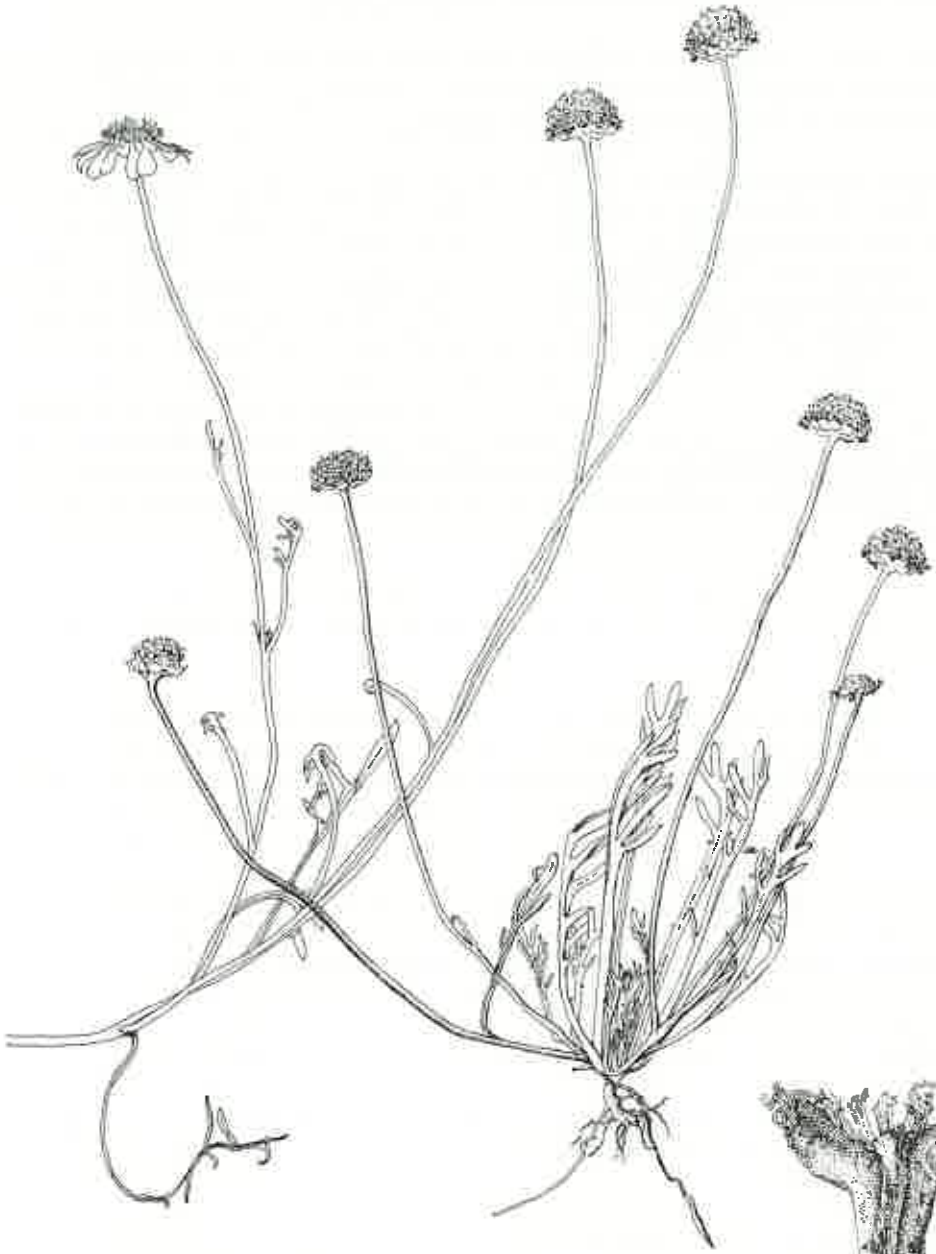
B. ciliocarpa (WA) has smaller shoulders on the fruit. *B. ciliocarpa* (eastern Australia) has glandular-hairy leaves and the fruit has neither well-developed shoulders nor long hairs at the apex.

B. dichromosomatica has mainly basal leaves and the fruit does not have shoulders.

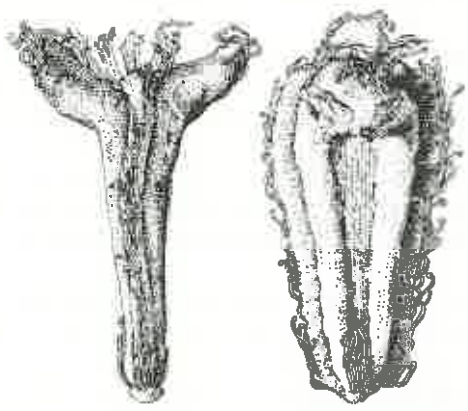
B. halophila has fruit with swollen shoulders similar to those of *B. oncocarpa*, but the pappus is absent and the wing often has 3–10 lobes.

Special notes: ***B. chelocarpa, B. ciliocarpa*** **(WA and eastern Australia),** ***B. halophila*** **and** ***B. oncocarpa*** **are all members of the** ***B. oncocarpa*** **complex and have chromosome numbers of** $n = 9$**. A further feature of this complex is that all the members have fruit with two large secretory canals in the pericarp or wall (Watanabe and Short, 1992).**

There are several unnamed entities which differ in the appearance of the fruit and in the amount and type of hair on the leaves, stems and bracts.



B. oncocarpa — Mongers Lake, WA (x 1)



Fruit — Mongers Lake, WA (x 20)

Brachyscome papillosa G. Davis

Mossgiel Daisy

PERENNIAL
30–40cm high
30–50cm wide
WHITE, MAUVE

Derivation: *papillosa* — having many nipple-like glands, referring to the large, flat protuberances on the fruit.

Perennial with white and mauve flower-heads for inland areas and heavy soils. Horticultural potential is low.

Distribution and habitat: NSW. Occurs on the South Western Plains from Mossgiel and Hay to Narrandera, but is not common. Grows in bladder saltbush communities on grey clay and is occasionally found in grassland. *B. papillosa* is a vulnerable species.

Description: **In cultivation** a perennial to 40cm, erect at first and later ascending. The stems are branching and bear a mixture of septate, glandular and woolly hairs, the woolly hairs more numerous on young shoots. **Leaves** are sessile and variable, 1–8cm x 1–5mm. They may have entire or toothed margins, or they may be pinnate with 5–8 irregular lobes. The leaves bear a few woolly and septate hairs, especially on the margins, midribs and towards the base of the blade. Leaves and stems may be tinged purplish. **Flower-heads** are single, 2–2.5cm across, on flower stems, 10–25cm long, with a few leaves in the lower part. Ray florets are mauve or white with pale mauve reverses, and are numerous (>40). **Fruits** are brown, 2.5–3.5mm x 2–3mm, the faces covered by flattened, leaf-shaped tubercles and enclosed in a wide smooth margin. The wing is broad with an entire or undulating edge fringed with short inrolled hairs. The pappus is conspicuous. **In the wild** *B. papillosa* occurs in small populations and is never the dominant vegetation in any area. Plants grow erect to 35cm high and have heads to 2.8cm across.

Flowering period: Spring in its natural habitat, but good seasonal conditions may extend flowering from June to December. In cultivation it flowers in spring and may flower again in summer and early autumn if cut back when it becomes untidy.

Cultivation and uses: *B. papillosa* prefers open conditions and heavy soils. It tolerates frost. The neat, erect habit becomes loose and untidy with time. This disadvantage may be outweighed by the showiness of the white heads. Pruning back hard at the end of the first flush of flowers may increase its horticultural potential. This species could be useful for inland regions. Seed is not generally available.

Propagation: Seed germinates moderately well in 10–50 days. Propagate also from cuttings.

Similar species: ***B. aculeata*** is also a white-flowered perennial, but it differs in that the habit is rhizomatous, the leaves have acute lobes and the fruits do not have large flat tubercles.

B. chrysoglossa has yellow ray florets, and the fruit does not have large flat tubercles on the faces.

B. curvicarpa is an annual with leaves very like those of *B. papillosa*. The strongly curved fruit is the distinguishing character. *B.* aff. *curvicarpa* differs from *B. papillosa* in having yellow heads, and the fruits do not have large flat tubercles.

B. dentata bears a strong resemblance to *B. papillosa* in habit and appearance of the fruit. In this species the fruits have long, finger-like tubercles and the wing is irregularly dissected. The lobes of the leaves are usually acute rather than rounded.

B. tetrapterocarpa is morphologically very similar to *B. papillosa*, but the fruits are four-winged and have no tubercles. This species is confined to Queensland.

Special notes: ***B. papillosa*** **is included in the** ***B. dentata*** **complex with** ***B. chrysoglossa, B. curvicarpa, B.*** **aff.** ***curvicarpa, B. dentata*** **and** ***B. tetrapterocarpa*****. These species have chromosome numbers of** $n = 4$ **(Smith-White** ***et al.*****, 1970; Watanabe and Short, 1992).** ***B. dentata*** **is a polyploid with** $n = 4, 8, 12$.

Study Group members have observed that ***B. papillosa*** **crosses with** ***B.*** **aff.** ***curvicarpa*****.**

B. papillosa — Mossgiel, NSW (x 1) habit a. Mossgiel, NSW b. in cultivation Fruit — Mossgiel, NSW (x 20)

Brachyscome parvula Hook. f

Two varieties of this species have been recognized by Davis (1948) based on the appearance of the leaves.

KEY to the VARIETIES

1. Leaves entire or rarely with 1–3 small teeth, up to 3.2cm long .....var. *parvula.*
2. Leaves pinnatisect, up to 10cm long with 3–5 segments .....var. *lissocarpa.*

The two varieties will be described separately.

Brachyscome parvula Hook. f. var. *parvula*

Coast Daisy, Small Daisy

PERENNIAL
12–20cm high
20–30cm wide
MAUVE, WHITE

Derivation: *parvula* — very small.

Pretty little perennial with a profusion of white to deep mauve flower-heads over a long period.

Distribution and habitat: Vic, Tas, SA. Occurs on sea-cliffs or in marshy coastal areas where the soils vary from alkaline clays to gritty black sands. It also extends inland where it can be found in open forest.

Description: **In cultivation** a branching perennial with erect or ascending stems. **Leaves** form a basal tuft and are 3.5–7cm x 0.5–1.5cm, usually thick and entire with obtuse tips or with 1–5 broad, rounded lobes. As plants develop, slender branching stems rise from the basal tuft bearing linear or narrow-obovate leaves. The margins are usually entire but a few small lobes may be present on the lower stem leaves. **Flower-heads** are white or mauve, 1.5–3cm across, at the tips of flower stems (10–16cm long) with 2–3 small leaves at the base. The flower-heads often appear double because there are 30–60 ray florets per head. **Fruits** are dark brown to black, 1–1.8mm x 0.8–1mm, wedge-shaped, flattened, and with a slightly swollen translucent margin. The body may be smooth or bear a number of curled white hairs in the central area. The pappus is microscopic. **In the wild** plants are often smaller and more compact due to the harsh coastal conditions they endure. The inland forms have smaller heads.

Flowering period: In their natural habitat plants usually flower in spring. In cultivation the flowering period may extend to April or May.

Cultivation and uses: This variety prefers part sun unless it is growing in very moist conditions when it will cope with full sun. If conditions are too dry plants will die, but all forms regenerate naturally from seed. It grows well in alkaline soil. Coastal forms are recommended for exposed seaside gardens. Variety *parvula* is more successful if planted in groups, and is suitable for rockeries, bog gardens and hanging baskets.

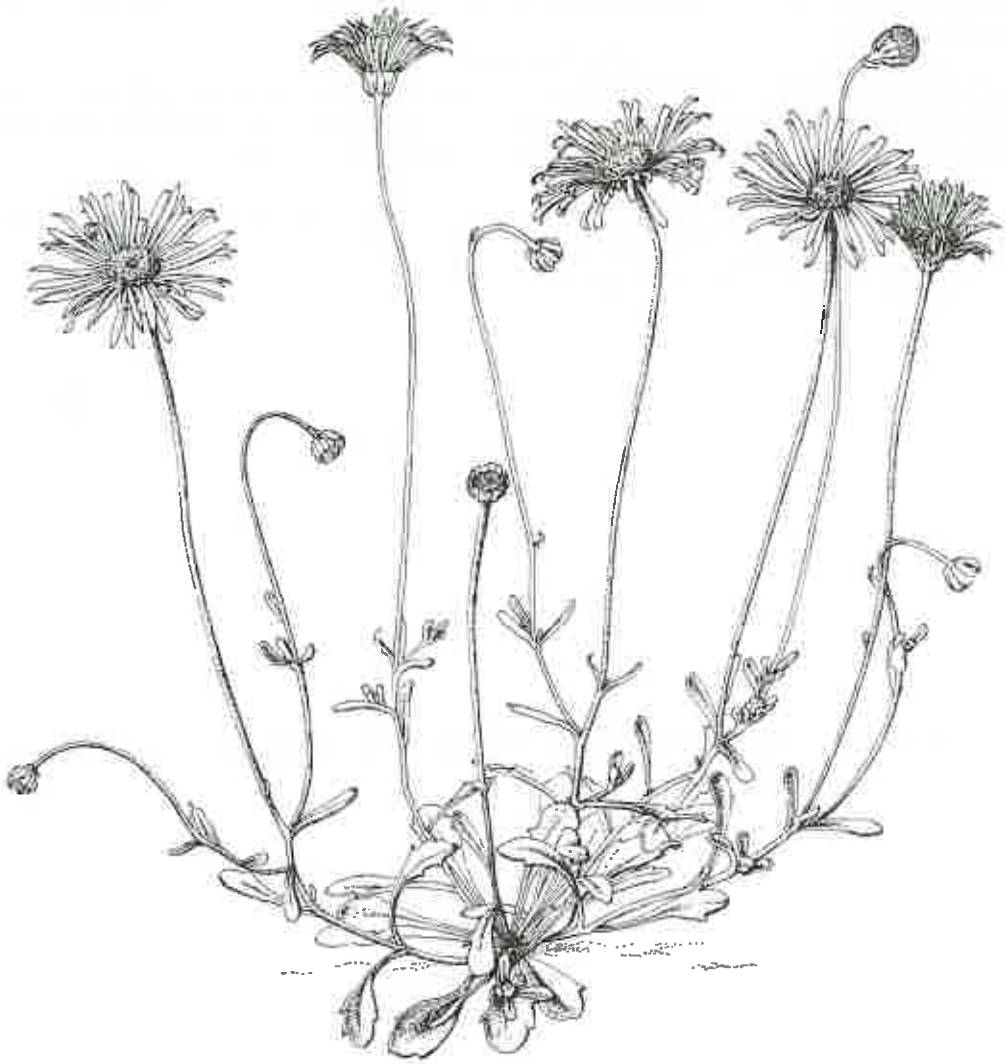
Propagation: Seed germinates well in 10–50 days. Propagation is more difficult from cuttings.

Forms:

- The Cape Otway (Vic) form has plump purple buds and large purple-mauve heads to 3cm across. The foliage is glossy dark green and the basal leaves are lobed. It has an open habit and ascending stems.

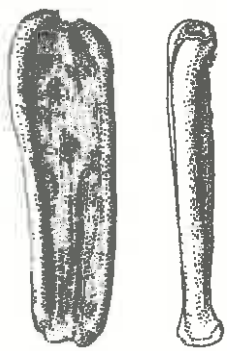
- The Port Campbell (Vic) form is daintier. The heads are mauve-pink, to 2cm across, and the basal leaves are smaller.

- The Huntly (Vic) form is upright with a basal tuft of pale green leaves, mostly entire. Fine branching stems bear a profusion of white heads, 1.5–2cm across. Plants grow 15–20cm x 15–20cm, and have excellent potential as garden plants.



B. parvula — Cape Otway, Vic (x 1)

Fruit — Cape Otway, Vic (x 20)



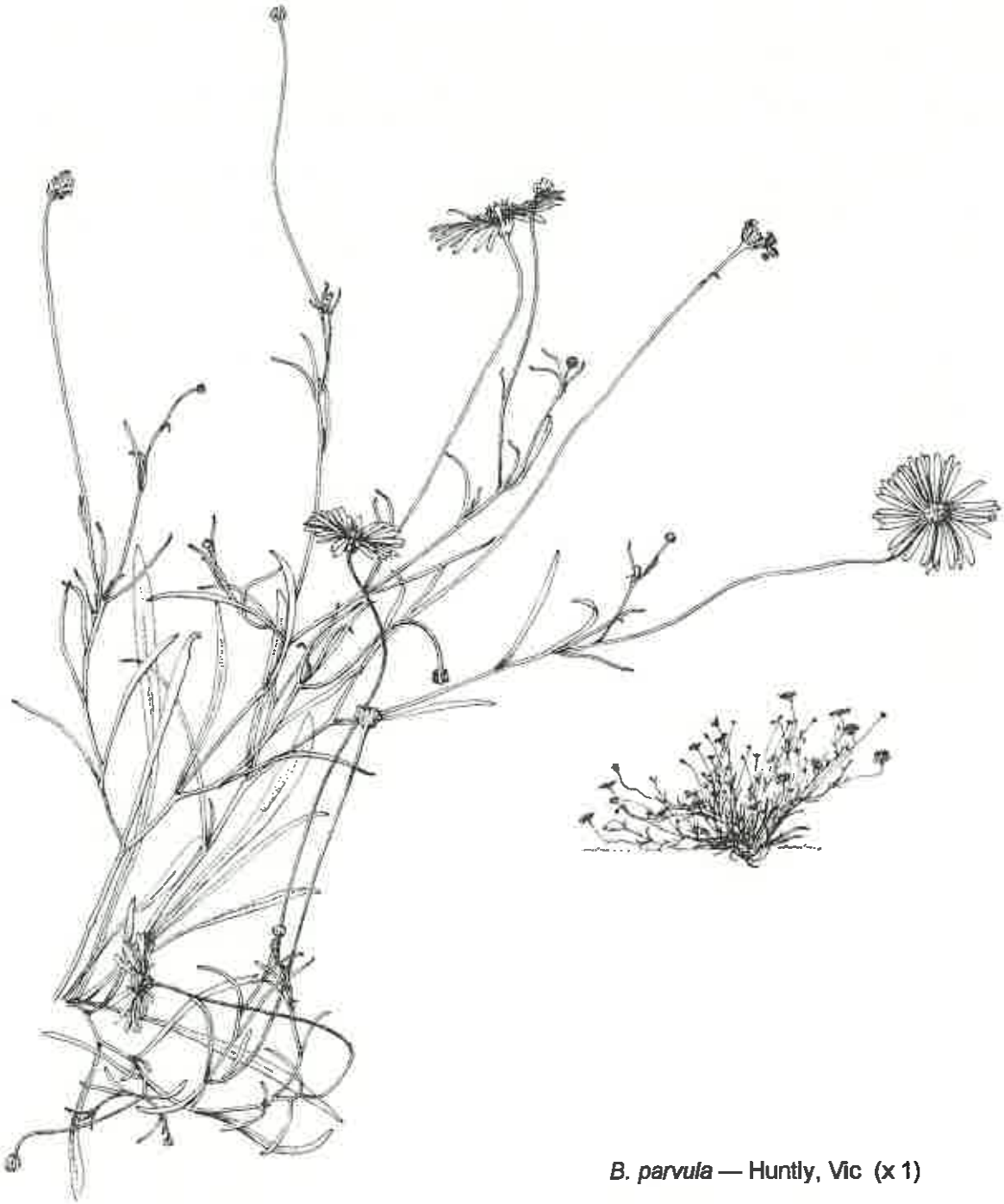
Similar species: ***B. angustifolia*** **var.** ***angustifolia*** differs from *B. parvula* in that the leaves are much thinner in texture, and the fruits are larger, the faces are tuberculate and the pappus is conspicuous.

B. exilis might be mistaken for the white inland form of *B. parvula* because plants are approximately the same size and both species occur in South Australia and western Victoria. *B. exilis* differs in having a less upright habit, about half the number of ray florets, and club-shaped fruit with distinct swelling at the apex.

B. graminea has longer, more flaccid leaves with entire margins. The flower-head has fewer ray florets (about 20). The fruit is the distinguishing feature; it is larger (to 2mm x 1.5mm) and has a broad swollen margin.

B. trachycarpa is similar to inland forms of var. *parvula,* but is generally taller (20–40cm) and has heads with less than 20 ray florets. The stems are woody near ground level and the fruit, while roughly the same size and shape, has conspicuous tubercles on the body.

Special notes: Smith-White *et al.* (1970) recorded as a new report a chromosome number of $n = 9$ for material identified as *B. parvula* from Curtin Springs (NT). Neither variety of *B. parvula*, however, has been recorded previously for the Northern Territory.



B. parvula — Huntly, Vic (x 1)

Brachyscome parvula Hook. f. var. *lissocarpa* (J. Black) G. Davis

PERENNIAL
20–35cm high
10–30cm wide
WHITE, MAUVE

Synonym: *B. lissocarpa* J. Black

Derivation: *lissocarpa* — smooth fruit.

Weakly erect, branching perennial with white or mauve flower-heads and pinnate leaves. New to cultivation.

Distribution and habitat: Vic, SA. Occurs in western Victoria and south-eastern South Australia. Grows in sheltered situations in gullies and forests on moist heavy soil.

Description: **In cultivation** an open perennial with slender ascending stems to 20cm. **Leaves** are thick, stiff, 2–4cm long (rarely to 8cm), occasionally entire and 1–2mm wide, mainly pinnatisect or lobed in the upper half. Lobes are short, to 5mm x 1mm. As plants develop, slender branching stems rise from the basal tuft bearing sessile linear to narrow-oblanceolate leaves, 1–4cm x 1–2mm. These leaves are in bundles of 6–7 at intervals along the stems. The undersurfaces have very small glandular hairs which can only be seen under magnification. **Flower-heads** are 1.5–2cm across on flower stems 5–10cm long with 1–2 reduced leaves at the base. The flower stems may have a few small glandular hairs just below the heads. Ray florets (20–60) are white or pale mauve. **Fruits** are the same as those described for var. *parvula*. **In the wild** the basal leaves are up to 10cm long and the lobing is often more pronounced. The heads may be smaller, only 1cm across.

Flowering period: Mainly September to December in the wild, but in cultivation plants flower intermittently from spring to autumn.

Cultivation and uses: This variety is neither as robust nor as colourful as var. *parvula* and does not seem to be a candidate for the horticultural trade.

Propagation: Seed germinates poorly in 7–30 days.

Forms:

- Group members have only trialled a form from western Victoria with ray florets that are white above and pale mauve beneath. Plants grow to 20cm x 30cm.

Similar species: ***B. exilis*** is a similar size and often has pinnatisect leaves. It differs from var. *lissocarpa* in that the fruit is club-shaped and swollen at the apex.

Special notes: The two varieties are differentiated on the appearance of their leaves; while var. *parvula* has mainly entire leaves with a few irregular lobes, var. *lissocarpa* has pinnatisect leaves with only a few entire leaves. Some herbarium specimens collected in Victoria from Mt Sturgeon and Upper Glenelg River, which were identified as var. *lissocarpa*, have pinnatisect leaves only, and others from Ararat and Langi Ghiran with narrow leaves and only 2–3 lobes are also so identified. Study Group members have found populations of var. *lissocarpa* with lobed leaves at Langi Ghiran only metres away from populations in which the leaves are all entire.

B. parvula var. *lissocarpa* — Booroopki, Vic (x 1)

Brachyscome perpusilla (Steetz) J. Black

Rayless Daisy, Tiny Daisy

ANNUAL
12–18cm high
15–25cm wide
WHITE

Synonyms: *Silphiosperma perpusillum* Steetz
B. tenella Turcz.
B. perpusilla (Steetz) J. Black var. *tenella* (Turcz.) G. Davis
S. collinum Sonder
B. collina (Sonder) Benth.

Derivation: *perpusilla* — very small or very weak and slender, referring to the habit.

Small annual with insignificant flower-heads.

Distribution and habitat: NSW, Vic, SA, WA. Widespread on the mainland. Occurs in mallee and woodland, in open heath and grassland, and among granite rocks. Grows in sands, clays and calcareous loams.

Description: **In cultivation** a small annual with branching glabrous or glandular-hairy stems and a relatively dense habit. **Leaves** may be glabrous or sparsely glandular-hairy, 0.5–2.5cm long, and with entire margins or pinnatisect with 3–7 linear lobes. The leaf bases are sheathing and often bear a number of small stiff hairs. **Flower-heads** are inconspicuous, small, 5–6mm across, at the tips of flower stems, 2–6cm long, bearing 2–4 reduced leaves. Ray florets are white and short (1mm). **Fruits** are brown, 2.5–4mm x 2.2–3mm, obovate, with a variable number of curled hairs on both faces. The margin is broad, wing-like, conspicuously notched at the top. It is lobed; the lobes are shallow or deeply cut, each lobe tipped with an inrolled hair. There is no pappus. **In the wild** plants are usually smaller, to 10cm high, and more slender, unbranched or with only one or two branches.

Flowering period: Late winter to spring. Flowering is not obvious because the ray florets hardly extend beyond the green bracts.

Cultivation and uses: *B. perpusilla* is easily grown provided watering is maintained.

Propagation: Seed germinates readily in 7–20 days. Plants regenerate naturally in pots and in the garden.

Similar species: ***B. glandulosa*** can be distinguished because the wing-like margin of the fruit is entire.

Special notes: Davis (1948) recognized two varieties based on the habit and on the appearance of the leaves. The key to the varieties was as follows:

1. Plant erect, glabrous, with an unbranched filiform stem. Leaves linear and entire, rarely with three minute teeth.....var. ***perpusilla.***

2. Plant weakly erect with several branching stems, sparsely and microscopically glandular-pilose. Leaves pinnatisect. .....var. ***tenella.***

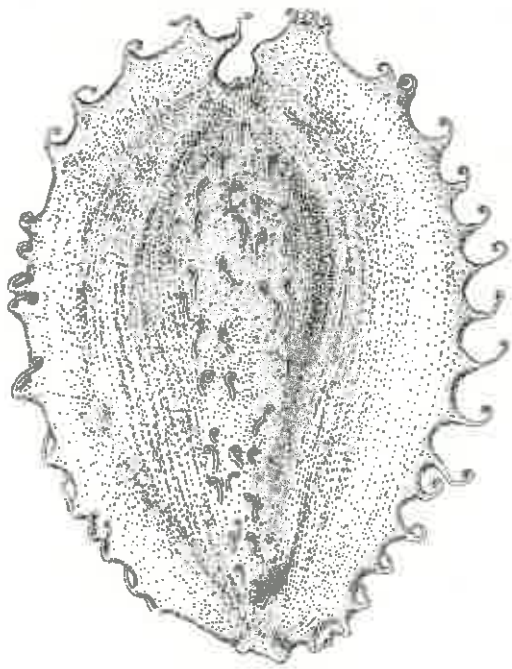
Specimens have been collected which cast doubt on this key. Many are glabrous, but the leaves are pinnatisect. The Study Group has described the species as a whole and has omitted the varieties.

The *Flora of South Australia* (1986) observes that '*Silphiosperma perpusillum* was described by Steetz from depauperate plants with entire leaves and unbranched stems. The more luxuriant plants with pinnatisect leaves usually found were treated as var. *tenella* by Davis. No discontinuity was observed in S. Aust. material to justify recognition of varieties within the species.'

The *Flora of New South Wales* (1992) lists *B. perpusilla* var. *tenella* and describes plants as glabrous to glandular-pubescent, and the leaves as either pinnatisect or as having entire margins.

A Census of the Vascular Plants of Victoria (1993) lists *B. perpusilla* var. *perpusilla* only. Future revision may see *B. glandulosa* and *B. perpusilla* included in one species (P. S. Short, pers. comm.).

B. perpusilla — Reef Hills, Vic (x 1)



Fruit — Stirling Range, WA (x 20)

Brachyscome petrophila G. Davis

Rock Daisy

PERENNIAL
25–35cm high
15–30cm wide
MAUVE, WHITE

Derivation: *petrophila* — rock-loving.

Small perennial with mauve or white flowers and toothed leaves. New to cultivation.

Distribution and habitat: Vic. Endemic in eastern Victoria where it occurs in moist, shaded places among rocks.

Description: In cultivation a branching perennial, erect at first. **Leaves** are oblong to obovate, 1.5–4.5cm x 0.5–2cm. The basal seedling leaves may be up to 11cm x 3.5cm, but are lost as plants develop. Leaves are sessile and toothed along the entire margin. Stems and leaves are covered with short, brown glandular hairs. **Flower-heads** are single, 2–2.5cm across, white or mauve with a paler central ring around the disc. The colour deepens as the heads age. Up to 50 ray florets make the flower-heads appear double. Flower stems, 15–18cm long, may be naked or bear 1–2 small toothed leaves. **Fruits** are dark brown, flat, wedge-shaped, 2mm x 1–1.2mm, with a few small tubercles near the apex of the body. Two raised longitudinal folds down each side of the body are enclosed by a smooth margin. There is no wing. The pappus is conspicuous and unusual because it is yellowish and has bristles in bundles of irregular length. **In the wild** plants are more straggly and have fewer, smaller heads.

Flowering period: Spring to autumn.

Cultivation and uses: *B. petrophila* is new to cultivation so opportunities for growing it have been limited. This species must be shielded from hot, drying winds, prefers a cool atmosphere and moist soil, and the roots need the protection of rocks. The difficulties of growing *B. petrophila* may outweigh its attractions but continued cultivation is making it more tolerant.

Propagation: Seed germinates moderately well in 13–30 days, but seed is not available. Cuttings should be successful.

Similar species: ***B.* aff. *formosa*** Entity 1 is a perennial with toothed leaves which occurs in the same general area as *B. petrophila,* but its habit is prostrate and suckering.

B. melanocarpa is vegetatively like *B. petrophila* in having a branching habit and hairy toothed leaves, but it differs in that the leaves are irregularly toothed. The fruits are larger, black, swollen and beset with tubercles. *B. melanocarpa* occurs on plains subject to flooding and is extinct in Victoria.

Some forms of ***B. nova-anglica*** have similar toothed leaves, but the habit is more rounded and dense. The flower stems are much shorter (3–7cm), the fruit does not have longitudinal folds and the pappus is tiny.

B. riparia occurs in the same region as *B. petrophila*. *B. riparia* has narrower leaves (1–5mm), the margins are toothed near the apex, and the shape is cuneate rather than oblong or obovate. The fruit is light brown and has a conspicuous wing which is acutely lobed.

B. spathulata* subsp. *spathulata may be distinguished by the thicker stems which are unbranched or branch only once or twice near the base. The fruit is larger (2–4mm x 1.2–1.8mm) and has broad wings.

Special notes: Short (1988) notes that an unnamed taxon having close affinities with *B. formosa* from eastern Victoria and southern New South Wales may have been confused with *B. petrophila* in the past.

B. petrophila — Little River Gorge, Vic (x 1)

Fruit — Little River Gorge, Vic (x 20)

Brachyscome procumbens G. Davis

PERENNIAL
10–30cm high
spreading
PINK, MAUVE

Derivation: *procumbens* — trailing or lying along the ground.

Long-flowering perennial with deep pink or mauve flower-heads on long stems. Attractive foliage. Suckering habit.

Distribution and habitat: Qld, NSW. Occurs in well-drained soil among rocks in open forests on the Northern Tablelands and North Coast of New South Wales.

Description: **In cultivation** a rhizomatous, hairless perennial branching from the base. The habit varies according to the situation in which it is planted. In full sun plants form compact clusters, but with an easterly aspect they produce trailing stems about 30cm long. **Leaves** are dark green above, tinged purplish below, 1–6cm x 0.5–2cm, pinnate with 5–9 broad lobes. These lobes are usually lobed again. The leaves have slender stalks which often bear 1–2 small teeth. **Flower-heads** are 2–4cm across, held singly at the ends of flower stems, 10–25cm long. One small, entire leaf is often borne about halfway along the flower stems. Ray florets (40–50) are either mauve or an unusual deep pink shade. **Fruits** are brown, 2.5–3mm x 2mm, flattened, with broad, slightly toothed wings edged with short hairs. The body has a raised margin and usually some small tubercles on the central region. The pappus is small but obvious. **In the wild** *B. procumbens* is a small scrambling plant.

Flowering period: In its natural habitat *B. procumbens* flowers from September to March, but in cultivation it continues well into May.

Cultivation and uses: This undemanding species has great horticultural potential, flowering for a long period and displaying its bright heads well. It will grow in sun or part shade although flowering is more prolific in sun, and tolerates moderate frost and even snow. It does require some water in the warmer months and will go quite limp if allowed to dry out, but recovers very quickly after watering. Even if it disappears in a dry spell its thick, fleshy roots allow it to shoot again after rain. An excellent daisy for small spaces, it is recommended for edging, rockeries, containers and for massed planting.

Propagation: Seed set is prolific and seeds germinate in 8–40 days. It regenerates naturally in the garden and in pots. Propagate also from root cuttings, side shoots or by division.

Forms:

- A form from Mt Kaputar (NSW) is 25cm high and spreads 20–30cm. The pink heads are 2.5–4cm across on flower stems to 25cm. The leaves are 2–6cm x 1–2cm, often with secondary lobes.

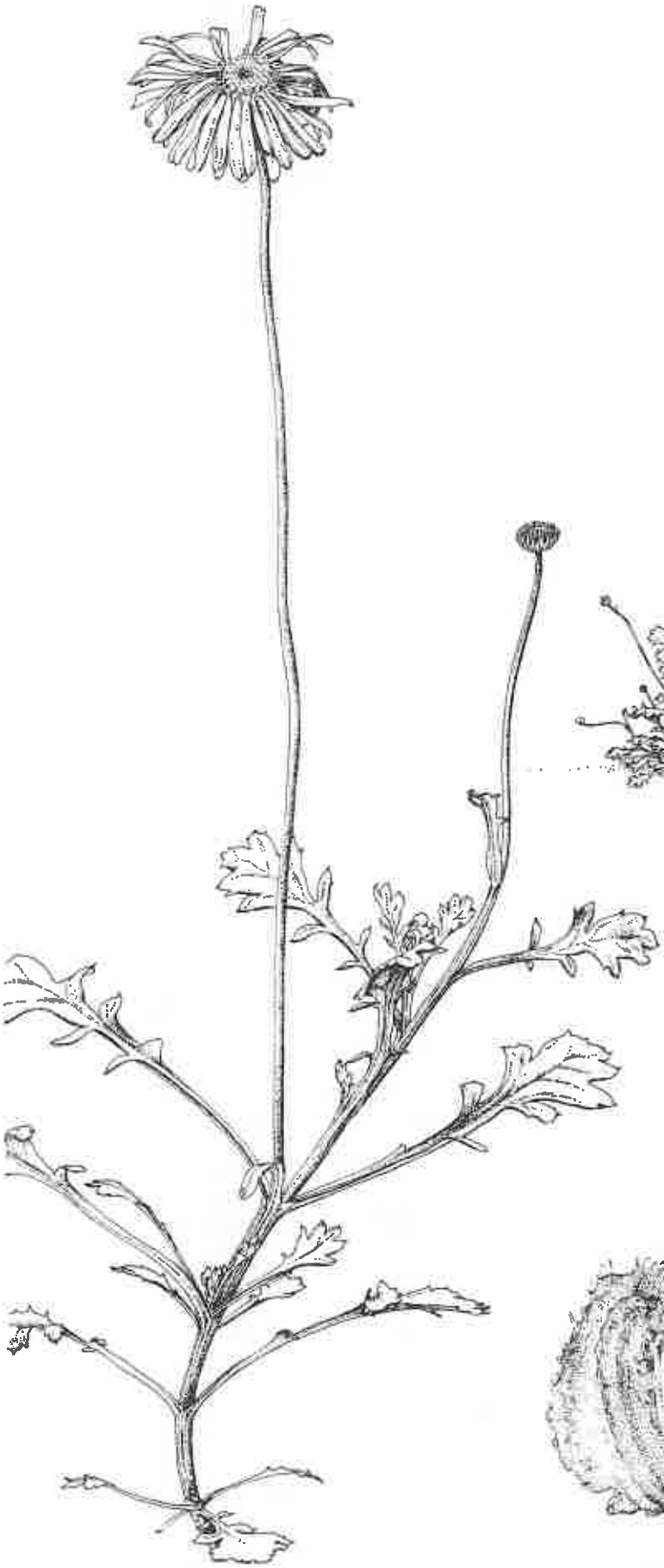
- A form from Diamond Head (NSW) is smaller and daintier, 10–15cm spreading to 10–20cm. The pale mauve heads are 1.5–2.5cm across on flower stems to 15cm. The leaves are shorter, 1–2.5cm, with fewer lobes (5–7). This form has not been trialled for long but appears easy to grow and produces many flower-heads over a long period. Forms similar to this have also been collected from the Northern Tablelands.

Similar species: ***B. formosa*** (cerise form) has heads of a similar colour, but the leaf blades are more rounded in outline, the lobes are not so deeply divided and the stalks lack the small teeth or lobes often seen on the leaves of *B. procumbens*.The flower stems are shorter (2–10cm) and the fruits have a much narrower wing.

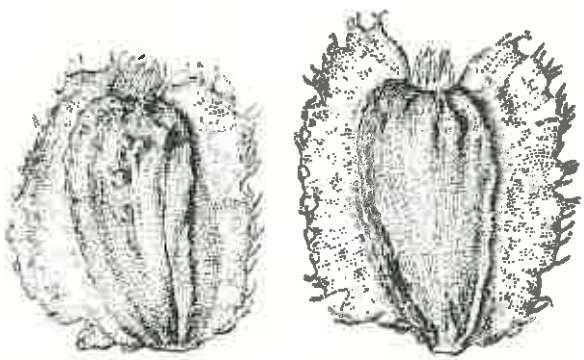
B. microcarpa might be confused with *B. procumbens* as both species may occur in the same areas. Some forms of *B. microcarpa* have similar leaves and heads on long flower stems. The heads are smaller (1.5–2.5cm across) and the fruits are much smaller (1–1.8mm long) and have no wing.

Special notes: ***B. procumbens*** **has a chromosome number of** $n = 9$ **(Smith-White *et al.*, 1970).**

Study Group members have produced colourful hybrids by crossing *B. angustifolia* var. *angustifolia* (mauve nursery form) with *B. procumbens* (Mt Kaputar). This successful hybridization may indicate that the two species are closely related.



B. procumbens — Mt Kaputar, NSW (x 1)



Fruit — Mt Kaputar, NSW (x 20)

Brachyscome ptychocarpa F. Muell.

Tiny Daisy

ANNUAL, PERENNIAL
10–30cm high
15–20cm wide
WHITE, PINK

Derivation: *ptychocarpa* — bearing winged fruits.

Dainty herb with a profusion of white or pink flower-heads held above handsome, fern-like foliage. Neat compact habit. Rare in Victoria.

Distribution and habitat: NSW, Vic. Occurs at moderately high altitudes; in New South Wales it occurs south of the Liverpool Range on the Tablelands and Central Western Slopes, and in Victoria in the north-eastern ranges. Found on damp seepage areas, in moss over granite, in moist clay soils on open slopes where water trickles over the surface, and on the banks of streams which run intermittently.

Description: In cultivation an almost glabrous perennial with an extensive system of fine roots. **Leaves** are in basal tufts, petiolate, 3–7cm long, pinnatisect with 6–9 narrow linear lobes in the upper half to two thirds. The lobes are 2–10mm x 0.5–1mm and sometimes bear one or two minute teeth. As plants develop, short thick stems (about 2cm long) are produced from the base, and a new tuft of leaves develops from which more flower stems arise. Roots may form just below the new leaf tufts. A few woolly hairs line the margin of the leaf stalk at the base. **Flower-heads** are single, 1–1.5cm across, held high above the leaves on slender flower stems 10–30cm long. The stems usually have one or two leaves along their length, the uppermost sometimes being entire. The buds are a delicate shade of pink, opening to white or pink heads. One small clump can produce many heads; up to 120 stems have been trimmed from a clump at the end of a flowering season. The number of ray florets per head is high (25–70) which gives the heads a double appearance. **Fruits** are dark brown to black, 1mm x 1mm, obovate with wide wings edged with short inrolled hairs. The faces have three longitudinal ridges, the central fold bearing a number of inrolled hairs. The ridges are quite distinct from the wings which reach no higher than the point of pappus-insertion. The pappus is white and conspicuous. **In the wild** plants are usually very small (5–15cm high). They flourish while there is adequate moisture, but die as the soil dries out.

Flowering period: In its natural habitat *B. ptychocarpa* flowers from October to April. In cultivation it begins to flower in September and continues until autumn. Frequent trimming will keep plants neat and extend the flowering period.

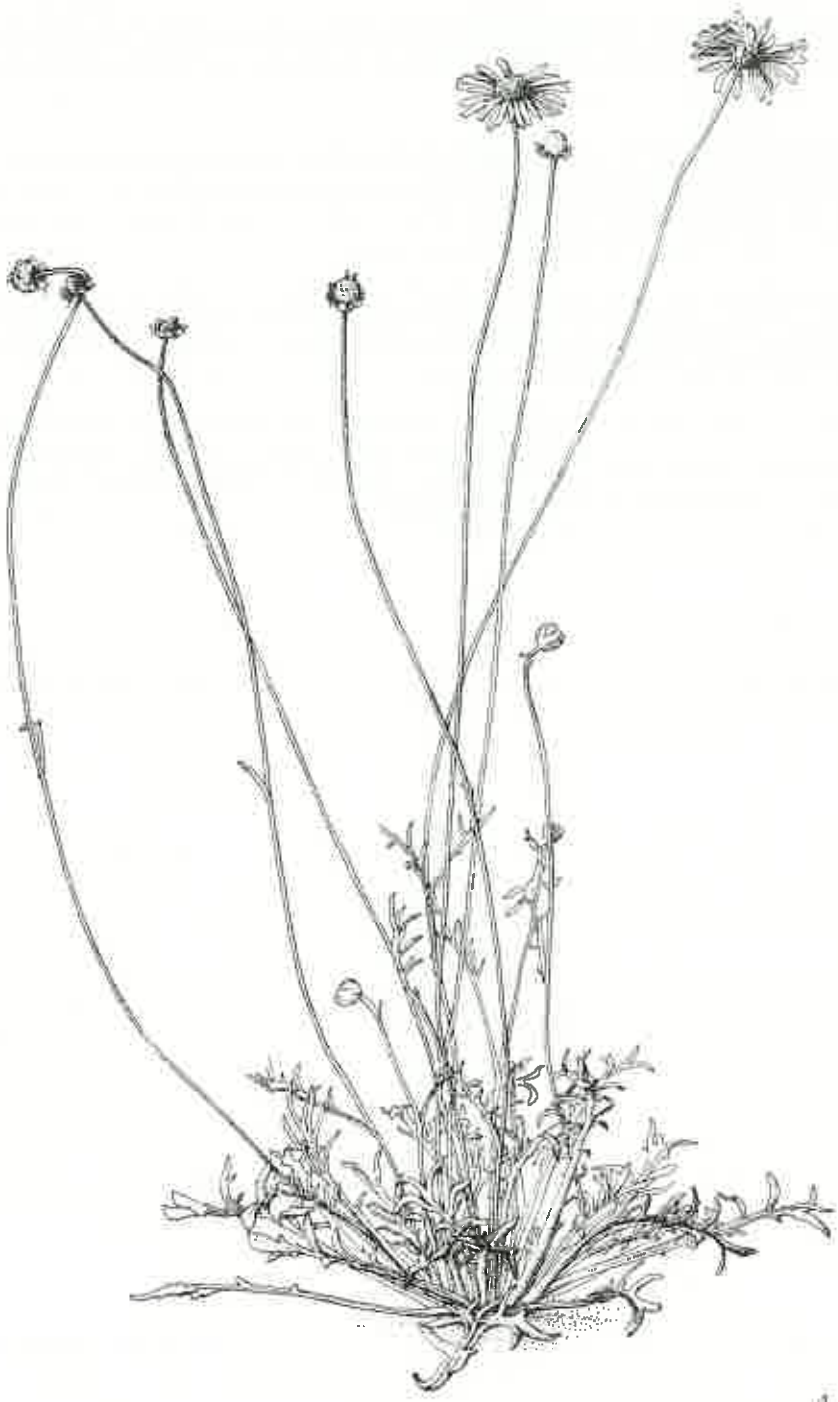
Cultivation and uses: This species does well in sun for part of the day or in light shade, but must never be allowed to dry out. It grows well in the mountains where the summers are cool. It grows and flowers well in containers even in areas with hot, dry summers. In the hottest weather, stand the containers in saucers of water. *B. ptychocarpa* is pretty when grouped in the garden or tucked into a rockery. One disadvantage is that the individual heads develop and decline very quickly. Since it is rare in Victoria the advantage gained in keeping it in cultivation far outweighs this small drawback.

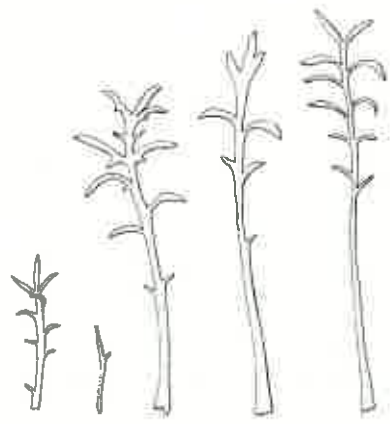
Propagation: Seed germinates well in 3–50 days. This species produces seed in abundance. Plants may also be divided successfully by two methods. Single tufts can be gently detached and grown on in the same way as seedlings, or clumps can be roughly divided with a knife and then repotted. The latter method is more sure of success.

Forms:

- A form from Gulgong (NSW) is relatively robust with leaves to 6cm and white heads on flower stems to 30cm.
- A form from Mt Canobolas (NSW) has a small, dainty habit and pink heads on flower stems to 20cm. It does not flower as profusely as other forms.
- A form from the north-eastern ranges of Victoria grows quite vigorously. It has white heads to 1.5cm across on stems 15–25cm long.

Similar species: ***B. dissectifolia*** resembles *B. ptychocarpa* in habit and fruit shape, but may be distinguished by the shape of the leaf. In *B. dissectifolia* the lobes are much broader, especially the





B. ptychocarpa — Tolmie, Vic (x 1) Fruit — Tolmie, Vic (x 20) leaf shapes

apical lobe. The fruit is longer (1.5–1.8mm) and it has two ridges at the periphery of the faces but the central ridge is absent.

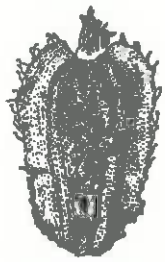
B. nivalis has a similar habit and shining green pinnatisect leaves in a basal tuft, but it only occurs in alpine areas. It has large white heads (2–4cm across) on strong stems, and the fruit is much longer (2–3mm).

B. stuartii is vegetatively close to *B. ptychocarpa*. *B. stuartii* is distinguished by the leaf lobes which are broader and are irregularly toothed or lobed again, and by the larger heads (2–3cm across). The fruits differ in that the central longitudinal ridge is absent and the pappus bristles are shorter. If a wing is present it is narrow and thick rather than broad and pale.

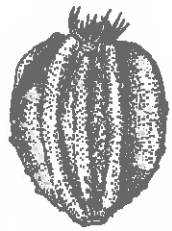
Special notes: ***B. ptychocarpa*** **has a chromosome number of** $n = 6$ **(Smith-White *et al.*, 1970). It may have a close relationship with *B. dissectifolia* and *B. stuartii* which have the same number of chromosomes, occur in similar habitats and have similar growth habits.**

Although *B. ptychocarpa* is described in the literature as an annual, some forms have behaved as perennials in cultivation. Everett (1992) notes in her description that some plants from the Central Tablelands are stoloniferous perennial herbs with leaf lobes to 10mm long, and pink to white ray florets 5–6mm long. She suggests that they could represent a new, closely related taxon.

B. dissectifolia

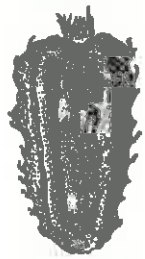


B. dissectifolia form
(south-east of Tingha, NSW)



B. ptychocarpa

B. stuartii



B. stuartii form (Emmaville, NSW)

***Brachyscome stuartii* complex (x 20)**

Brachyscome pusilla Steetz

Small Daisy

ANNUAL
10–15cm high
15–20cm wide
WHITE, MAUVE

Derivation: *pusilla* — very small.

Small annual with relatively large white or mauve flower-heads complemented by fresh green leaves.

Distribution and habitat: WA. Occurs on the coastal plains of the Perth region and along the watercourses of the Darling escarpment. The distribution extends north to the Geraldton area, inland to Bullfinch, down to the Dundas Hills, and across to Cape Arid. It grows in sands and swamps. *B. pusilla* has also been recorded as growing in the Condobolin district of New South Wales (Cunningham *et al.*, 1981), but that is probably a misidentification.

Description: In cultivation an annual with an open decumbent habit (to 15cm high) and branching stems. The main stems are often tinged red. **Leaves** are present at the base and along the stems. Basal leaves are 2–5cm x 1–2mm, some with entire margins, others with 1–3 short lobes. Stem leaves are often longer (to 6.5cm). The leaves are thick, bear sparse glandular hairs, and the apices are blunt. **Flower-heads** are white or mauve, 1.5–2.5cm across, on flower stems 4–6cm long with one or two small leaves at the lower end. **Fruits** are wedge-shaped, 1.3–1.8mm x 0.8–1mm. The faces are depressed, grey-brown, with long inrolled hairs scattered over them. The margin is raised, pale brown and edged with inrolled hairs. Two shapes of fruit are present in the head. Those at the periphery have small swollen shoulders and numerous hairs while the inner rows of fruit have fewer hairs and are usually flatter. The pappus is microscopic, crown-like and very hard to see. Fruits are broadest at the mid-point. **In the wild** plants are shorter (6–12cm), more slender, generally upright, and less floriferous than they are in cultivation.

Flowering period: September to October in its native habitat, but flowering has been extended to December when grown in containers.

Cultivation and uses: *B. pusilla* performs best in well-drained, moist soils to which nutrients have been added. It prefers an open position in full or dappled sun and protection for the roots. This species behaves like *B. iberidifolia* in many respects but the flower-heads are smaller and the germination percentage is lower. The Study Group has grown *B. pusilla* only since 1989. A form of garden origin is most attractive grouped or massed in gardens, in hanging baskets and containers.

Propagation: Seed from the wild germinates poorly in 20–90 days. Seed from Kings Park germinated very well in 5–20 days. Also propagate from cuttings.

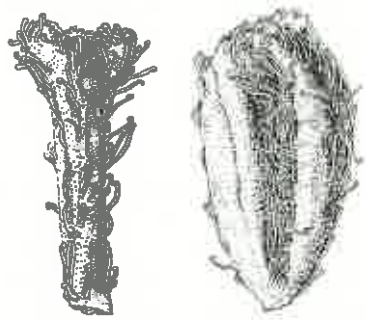
Forms:

- A form collected from the Darling Range approximately 60km north of Perth is a small decumbent annual, 10–12cm x 15–20cm, with white heads 1.5–2.5cm across on flower stems 5–6cm long. The basal leaves are 2–5.5cm x 1–2mm, some with entire margins. Stem leaves are 4–6.5cm long. The flowering period lasts two to three months but flower-heads are sparse. This form has an open habit, and seed germinates slowly and poorly.

- A form grown from seed sent to the Group from Kings Park and Botanic Garden (WA) has an open, dainty, spreading habit, 20–25cm x 15-25cm. The flower-heads are pure white, 2–3.5cm across, appearing in profusion for 2–3 months from spring to mid-summer. The leaves are 1–4.5cm x 1–2mm, entire or with a few small irregular lobes, and bear sparse glandular hairs. This is a beautiful, easily grown form and is highly recommended.

  The seed had been identified as *B. bellidioides* but so many hairs were present on it that the Study Group identified it as *B. pusilla*. The Group was advised by Kings Park staff that the seed had probably been harvested from cultivated plants. Almost 100% of the seeds germinated in 5–20 days and the resultant plants were much bigger than typical *B. pusilla*. Either harvesting seed over a few generations from cultivated plants has effected this change or else *B. pusilla* and *B. iberidifolia* (both of which are grown at Kings Park) have cross-pollinated and the seed sent is hybrid seed. If cross-pollination took place, colours other than white would have been expected to appear in the seedlings, but that was not the case. For whatever reason, from a horticultural standpoint this form is markedly superior to that from the Darling Range.

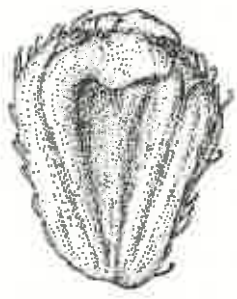
B. pusilla — Darling Range, WA (x 1)



Fruit — Darling Range, WA (x 20)

(i) fruit from periphery of head, (ii) fruit from inner rows of head (x 20)

(i)



(ii)

Similar species: ***B. bellidioides*** is said to be vegetatively identical to *B. pusilla.* The distinguishing character is that *B. bellidioides* has glabrous fruit.

B. exilis differs in that the fruit is reflexed on the receptacle at maturity, and the leaves of most forms have more lobes (3–7) and are in the shape of a hand of outspread fingers. The fruits are broadest at the apex and bear a few hairs on the shoulders.

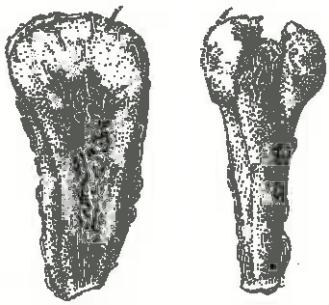
B. eyrensis has shorter ray florets (1.5–2mm), and the leaves have 3–5 deeply cut lobes. The fruits are flatter than those of *B. pusilla*.

B. iberidifolia has a taller, more branching habit, longer ray florets (6–16mm), and the stem leaves have more lobes (5–13). The fruit is broadest at the apex.

Special notes: The ***B. iberidifolia*** complex includes ***B. bellidoides, B. exilis, B. eyrensis, B. iberidifolia, B. pusilla*** and possibly one or more species as yet undescribed. Davis (1948) noted that ***B. iberidifolia*** and ***B. pusilla*** have frequently been found in the same area. Marchant *et al.* (1987) describe a similar distribution pattern for ***B. bellidoides*** and ***B. pusilla,*** and also note that ***B. bellidoides*** sometimes has blue ray florets and ***B. pusilla*** sometimes has white ray florets. It seems probable that some collections have been wrongly identified in the past.

Davis (1948) has stated that the fruit of ***B. pusilla*** does not possess the microscopic tessellations observed in the fruit of ***B. iberidifolia,*** but collections of ***B. pusilla*** made by Study Group members do exhibit tessellations on mature fruit.

B. pusilla has a chromosome number of $n = 9$ (Carter, 1978b).



B. pusilla — Kings Park, garden origin, WA (x 1) Fruit — Kings Park, garden origin, WA (x 20)

Brachyscome radicans Steetz in Lehm.

Marsh Daisy

PERENNIAL
10–20cm high
spreading
WHITE, MAUVE, PINK

Derivation: *radicans* — rooting, putting forth aerial roots.

Vigorously spreading perennial for wet positions.
Flowers well at high altitudes.

Distribution and habitat: NSW, ACT, Vic, Tas. Occurs on wet or swampy ground in lowland and montane grasslands in Tasmania, but at high altitudes in the other two States.

Description: **In cultivation** a strongly stoloniferous, hairless perennial. **Leaves** are very variable, usually 5–10cm x 2–8mm, but may be up to 15cm long. Leaves are mainly basal and sheathe the stem or stolon. The shape varies from narrow to broad linear or spathulate, and the margins are entire or irregularly lobed. Leaf tips are blunt, but the short lobes taper to a point. **Flower-heads,** 2–2.5cm across, have ray florets which are generally white, but may be mauve or pale pink. Sometimes pink buds develop to white flower-heads and white heads turn pink. Flower stems are unbranched, upright and have one or two small leaves towards the base. **Fruits** are brown, 2mm x 0.8mm, with a distinctive swollen wing, lighter in tone than the body. The wings bear a few hairs at the edge. The body has three vertical folds; the central one is less obvious and bears a few hairs. The pappus is uneven and conspicuous. **In the wild** plants grow as dense colonies on disturbed or exposed sites, in a stoloniferous network on the banks of streams or in pools, and as weak scrambling plants in the midst of vegetation. In these situations plants flower moderately well.

Flowering period: Summer.

Cultivation and uses: Although *B. radicans* produces few flower-heads at low altitudes it grows well if kept moist. In fact it will spread as vigorously as Couch Grass. In dry conditions it will die back and reappear only when the soil is thoroughly wet. Sun is preferred. *B. radicans* makes a thick ground cover for a wet spot, but its horticultural potential is limited by poor flowering. Nevertheless, it is a species with an important role in the alpine environment, particularly in its response to disturbed bogs.

Propagation: Seed germinates well in 10–60 days and plants may be easily propagated from stolons or by division.

Similar species: ***B. graminea*** also grows in swamps and produces runners, but the leaves feel thinner, are broader and never lobed. The fruits are quite different; the body is swollen, there is no wing and the pappus is minute.

B. obovata has similar leaves but they are never lobed. It may be differentiated by the fruit which is smooth, swollen and has no wings.

B. stolonifera is found only in the Kosciusko National Park at high altitudes in shallow pools. It is much smaller in all its characters. Stolons are obvious, and the fruit does not have a wing.

B. tadgellii is rhizomatous rather than stoloniferous. It maintains a compact, dense habit that gradually expands, whereas *B. radicans* spreads wantonly, sending out elongating stolons that anchor in the nearest patch of soil. The fruit is pale brown with a broad, papery wing.

Special notes: *B. radicans* has a chromosome number of $n = 13$ (Smith-White *et al.*, 1970).

B. radicans — a. Hill Lake, Vic (x 1), b. Nunniong Plateau, Vic (x 1) Fruit — Nunniong Plateau, Vic (x 20)

Brachyscome radicata Hook f.

Black-seeded Daisy

PERENNIAL
*5–20cm high
width unknown
MAUVE, WHITE

Derivation: *radicata* — possessing a tap root.

A little known perennial. In Australia it has been collected a few times only in Tasmania.

Distribution and habitat: Tas. Collections of this species have been made from the foothills of Mt Wellington and from the Middlesex Plains near Cradle Mountain. It occurs in grasslands. Also found in New Zealand in grasslands and open forest.

Description: **In the wild** it is described as a perennial with a short, stout rootstock which throws out a few stolons. The stems are sometimes glandular-hairy, erect or ascending, and may branch from the base. **Leaves** are present in a basal cluster and on the stem, and may be covered in glandular hairs. The lower leaves are oblanceolate, petiolate, 8–10cm x 2–2.5cm, coarsely toothed with 7–10 acute lobes in the upper half. The leaves decrease in size up the stem, becoming sessile and entire. **Flower-heads** are 1–2cm across with white or mauve florets. **Fruits** are almost black, slightly thickened, very hairy, and have a short pappus.

Flowering period: Unknown.

Cultivation and uses: *B. radicata* has not been trialled in cultivation by the Study Group.

Propagation: No material has been available.

Similar species: It has been suggested by Curtis (1963) and Kirkpatrick *et al.* (1988) that ***B. sieberi*** **var. *gunnii*** (as *B. stricta)* and ***B. spathulata*** (as *B. scapiformis*) have leaves of a similar shape and may have been mistaken for *B. radicata* in the past. *B. sieberi* var. *gunnii* and *B. spathulata* belong to the *B. aculeata* complex and may be distinguished by their brown fruits which have few hairs on the faces, broad wings and a relatively large pappus.

Special notes: ***B. radicata*** **has not been included in the revision of the genus *Brachyscome* by Davis (1948), nor in the *Australian Plant Name Index* (1991). *Native Higher Plant Taxa Which are Rare or Threatened in Tasmania* (1944) describes *B. radicata* as 'rare' in the State listing and 'poorly known' in the national listing. Beuzenberg and Hair (1984) have published a list of chromosome numbers for some members of the New Zealand Asteraceae: *B. radicata* Hook f. var. *thomsonii* collected from the Doubtful River, Canterbury, has a chromosome number of $2n = 90$.**

*** refers to the dimensions of the species cited in reference material.**

Brachyscome rara G. Davis

ANNUAL
*10–35cm high
*20–50cm wide
WHITE, MAUVE

Synonym: *B. coongiensis* Munir

Derivation: *rara* — scattered or uncommon, referring to the distribution of the species.

A much-branched herb spreading from the base.
Not in cultivation.

Distribution and habitat: Qld, SA. This species has been collected in the Wilson River area of western Queensland and in the adjacent Coongie Lakes region of South Australia. Grows in heavy, cracking clay in floodplains with grasses and chenopods.

Description: In the wild an apparently annual herb with erect, branching, reed-like stems to 35cm high. Davis (1955) states that *B. rara* is microscopically glandular all over. **Leaves** are lanceolate, sessile, 2–7cm x 5–10mm, with acute tips and entire margins. **Flower-heads** are about 1.5cm across, on flower stems 2–8cm long, which may be naked or have one small leaf. The ray florets are white or mauve. The involucral bracts are oblanceolate with blunt tips. **Fruits** are brown, 1–1.5mm x 1–1.3mm, wedge-shaped and somewhat swollen. The body is bordered by two raised folds enclosing tubercles, which seem to have converged into a mass with the appearance of a coiled intestine. The tubercles almost cover the face. Margins are thick, rounded and slightly lobed. The pappus is a small white papillose rim.

Flowering period: Spring to autumn, depending on seasonal conditions.

Cultivation and uses: The Study Group has not been able to trial this species.

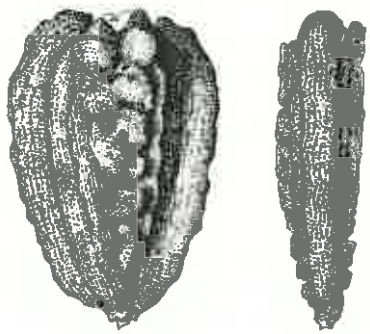
Propagation: Seed did not germinate.

Similar species: ***B. basaltica* var. *gracilis*** (Menindee, NSW) is similar to *B.* rara in the shape of the leaves and is probably closely related. It differs in having rhizomatous roots and in being perennial. Forms from Victoria and South Australia differ in that the leaves are narrow and grass-like.

Special notes: The chromosome number of *B. rara* was determined to be $n = 6$ by Watanabe and Short (1992). They observed that it seemed to have affinities with *B. basaltica* var. *gracilis*, which also has $n = 6$.

Munir (1987) described a new species *B. coongiensis*, from the Lake Eyre region of South Australia. It was established later that *B. coongiensis* Munir is synonymous with *B. rara* (Short 1990) and the conclusion was drawn that *B. rara* was probably restricted to the Cooper River drainage basin. It is an interesting point that Munir described *B. coongiensis* as a glabrous plant, whereas Davis (1955) described *B. rara* as microscopically glandular.

*refers to the dimensions of the species cited in reference material.



B. rara — Innaminka Station, SA Fruit (x 20)

Brachyscome readeri G. Davis

Southern Daisy, Reader's Daisy

ANNUAL
10–25cm high
20–25cm wide
WHITE

Derivation: *readeri* — in commemoration of F.M. Reader (about 1850 to 1911) naturalist and botanical collector.

Pleasing leafy annual with a profusion of white flower-heads and neat upright growth. Performs best in cool to mild conditions.

Distribution and habitat: NSW, Vic, SA. Occurs on seasonally wet ground in river forests in the South Western Plains of New South Wales, south from the Deniliquin-Tocumwal area and adjoining districts in Victoria, in western Victoria and south-eastern South Australia. Grows in clay soils on roadside verges and on the margins of swamps.

Description: **In cultivation** a small annual. Stems are initially erect, branching near the base as plants develop. Long septate hairs are borne at right angles to the stem. **Leaves** are produced basally and along the stem. Basal leaves are up to 7cm long, linear or oblanceolate with entire margins or 1–3 teeth. Stem leaves are 1–6cm long, pinnatisect with 5–13 lobes. Lobes are 2–4mm x 2mm with obtuse or acute tips. Leaf bases are expanded. A few long septate hairs are present along the margins but otherwise the leaves are glabrous. **Flower-heads** are white, 1.5–2.5cm across, on flower stems 5–20cm long, usually with 1–3 reduced leaves. The uppermost leaf is often entire. Septate hairs are present, less numerous towards the head and apparently disappearing as stems age. **Fruits** are dark brown to black, 1.5–2mm x 1mm, wedge-shaped, swollen, with four raised ridges joined at the top. The ridges may be smooth or develop faint tubercles in the lower half. At maturity the side ridges may be drawn into points at the apex. The pappus is stellate and centrally placed. **In the wild** this species is more ephemeral than it is in cultivation.

Flowering period: In cultivation *B. readeri* flowers for 8–12 weeks starting in late winter.

Cultivation and uses: While the soil is moist and the weather moderate this annual is good value. Growth is neat and upright, and masses of white heads are produced. Sow and plant *B. readeri* early in the season as it thrives in cool to mild weather but the onset of hot weather heralds its collapse. Plants may regenerate naturally in the following season. Use this annual for flower boxes or pots, for grouping among other plants or for massed planting.

Propagation: Seed germinates moderately well in 15–50 days.

Forms:

- A form from Ulupna Island (Vic) grows 15–25cm x 20–25cm. Stems are hairy at first, upright and quite robust. Heads are up to 2.5cm across on flower stems 12–20cm long. Fruits are 1.5–2mm x 1mm and the body bears coarse hairs.

- A form from western Victoria is smaller, 10–15cm x 10–20cm. Stems are hairy at first, stiff and held at an angle of 60° rather than being upright. Heads are 1.5–2.5cm across on flower stems 6–12cm long. Fruits are shorter, 1.2–1.5mm, and tubercles are present on the ridges.

Similar species: ***B. goniocarpa*** differs in that plants are much shorter (3–6cm) and the heads are smaller (4–6mm across). The fruit is very tuberculate and the pappus is obliquely placed.

B. gracilis has a more slender habit and the leaves are usually shorter (1–4cm). The fruit is strongly curved and a thickened wing-like structure extends above the point of pappus-insertion.

B. nodosa has a decumbent habit in cultivation and the lower leaves are shorter (2–4cm). The fruit develops large tubercles at maturity and a prominent horn at the apex. The pappus is obliquely placed.

Special notes: The chromosome number for *B. readeri* is $2n = 10$. Davis (1948) described *B. readeri* from south-west Victoria and south-east South Australia as glabrous. Members raised seedlings from seed collected in Tallageira Forest (s-w Vic) and observed that plants were septate-hairy. It is possible that the long septate hairs are lost as plants age or when specimens are pressed.

B. reederi — Ulupna Island, Vic (x 1)

Fruit — Ulupna Island, Vic (x 20)

Brachyscome rigidula (DC.) G. Davis

Leafy Daisy, Hairy Cut-leaf Daisy

PERENNIAL
5–30cm high
20–30cm wide
MAUVE, PINK, WHITE

Synonyms: *Steiroglossa rigidula* DC.
B. strongylospermoides Walp.
B. squalida Hook. f.
B. multicaulis F. Muell.
B. ciliaris (Labill.) Less. var. *robusta* Benth.

Derivation: *rigidula* — hard or stiff.

Much-branched perennial with hairy, divided leaves. Habit and performance are variable; plants may be erect or prostrate, compact or straggling.

Distribution and habitat: Qld, NSW, ACT, Vic, Tas. On the mainland it occurs in herbfields and among rocks in alpine areas or subalpine woodlands. In Tasmania it occurs on dry hills at lower altitudes.

Description: **In cultivation** a hairy perennial with erect, ascending or prostrate stems which may spread by layering. The stems are leafier at the top in most forms of alpine origin. **Leaves** are deep green, 0.8–2cm long (rarely to 3cm), deeply divided with up to 13 narrow, pointed lobes. Small glandular hairs beset the leaves and stems. The upper part of the stem usually divides to form small branchlets. **Flower-heads** are 2–3.5cm across held singly at the tips of short flower stems 2–12cm long. These stems may be bare or have one or two linear bracts. The ray florets are pink, mauve or white. **Fruits** are brown, obovate, 2.2–3mm x 1–2mm, flat and with a narrow, pale wing which may be entire or irregularly lobed. A few small hairs may be present along the edge of the wing. The pappus is conspicuous. **In the wild** *B. rigidula* is at its best. Plants are covered with flowers and present a magnificent picture when the different colours are massed between rocks. Stems may extend to 60cm in length and heads are usually 3cm in diameter.

Flowering period: Summer and autumn.

Cultivation and uses: *B. rigidula* prefers a sunny position, well-drained soil, and enough moisture to prevent drying out, but it will tolerate fairly dry conditions. It resists frost and is probably more easily grown at high altitudes. It is subject to attack by aphids, but this is easily controlled. Prune to promote flowering and maintain a compact habit. Some forms show more horticultural promise than others. Many forms are slow to grow and flower, and need at least three years in cultivation before they perform well. *B. rigidula* is useful for rockeries and is especially suitable in cold climate gardens. It can be planted individually, but is seen to best advantage when grouped or massed. Some forms make attractive container plants. It is valuable as a summer flowering species.

Propagation: About 25% of seed germinates in 6–60 days. Plants are propagated easily by division or from cuttings.

Forms:

- The Mount Hotham (Vic) form produces nice compact plants with mauve flower-heads, 2–2.5cm across, from late spring to autumn. This form grows well in the foothills of the Dandenong Ranges (Vic) and should be tested in other areas.

- Subalpine forms usually have more open habits. Flower-heads are white or pale mauve fading to off-white. Plants often sprawl and may be short-lived.

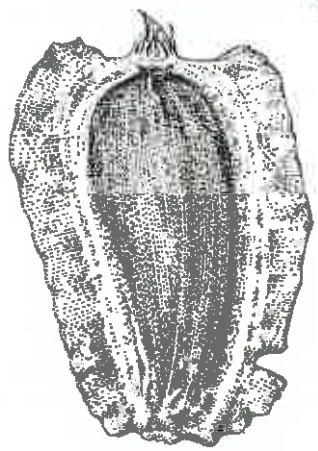
Many of the brightly coloured forms have not retained their original colours in cultivation. A regrettable tendency to fade has been noted.

Similar species: ***B. ciliaris*** has a similar habit and pinnatisect leaves. Like *B. multifida*, it is always found at lower elevations than *B. rigidula*. It may be differentiated by the fruits which are dimorphic, that is of two shapes. Fruits of the ray florets have no wing and those of the disc florets have quite wide wings.

B. rigidula (alpine form) — Falls Creek, Vic (x 1)

B. multifida is a perennial with divided leaves and many colour forms. It differs in being hairless, having a much longer flowering period (at least in cultivation), and a more robust habit. Positive identification resides in the fruit which is black, has no wing and is covered with conspicuous tubercles. *B. multifida* occurs at much lower altitudes than *B. rigidula*.

Special notes: *B. rigidula* has a chromosome number of $n = 9$ (Smith-White *et al.*, 1970; Carter, 1978a; Watanabe and Short, 1992). **It is possible that *B. rigidula* may be split into two species, one of alpine origin (probably to be known as *B. multicaulis*) and the other of subalpine origin (*B. rigidula*) (P. S. Short, pers. comm.).**



B. rigidula (subalpine form) — Snowy Gorge, Vic (x 1)

Fruit — Snowy Gorge, Vic (x 20)

Brachyscome riparia G. Davis

PERENNIAL
20–25cm high
30–40cm wide
WHITE, PINK

Derivation: *riparia* — growing on the banks of rivers and streams.

A dainty perennial with a rounded habit, masses of small heads and stiff, green leaves. New to cultivation.

Distribution and habitat: Vic. Confined to East Gippsland where it grows in the fine crevices of granite boulders in and along rivers, and in sandy patches between the rocks. Plants would be growing well below the water level when the rivers were in flood.

Description: In cultivation a perennial to 25cm high which regenerates by shooting from the base of the previous year's growth. The glandular-hairy stems are erect or ascending and are branched in the top half. **Leaves** are stiff, dark green, wedge-shaped to linear, 2–4cm x 1–5mm, with 1–7 acute or rounded teeth near the apex. The lower leaves are petiolate; the upper leaves are sessile. Glandular hairs are present on both surfaces. **Flower-heads** are 1–2.5cm across, on densely glandular flower stems 10–13cm long. Ray florets are white to pale pink. The involucral bracts are linear-lanceolate and covered with short glandular hairs. **Fruits** appear to be of two types: long and slender (3mm x 1mm) and squat (2mm x 1.5mm). The body is light brown, narrow-elliptic, flat to slightly swollen, and may bear a few tubercles. The most mature fruits have a raised fold at the periphery of the body and beyond that a broad, thin wing deeply and irregularly dissected into acute lobes. Each lobe has one or more hairs at the tip. The pappus is conspicuous and is as long or slightly longer than the notch between the wings. The bristles are of unequal lengths. **In the wild** plants are slender, 5–15cm x 5–10cm, glandular, upright and branching.

Flowering period: *B. riparia* flowers in intermittent flushes from spring to autumn.

Cultivation and uses: This species has been trialled only for a short period, but it appears to have horticultural potential. It grows and flowers well in pots and should thrive in the garden with part sun, moist soil and protected roots. As the stems elongate with age, plants may become leggy. Pruning after each flush of flowers keeps the habit neat.

Propagation: Freshly collected seed germinates in 18–25 days. Seed is produced in abundance and is shed quickly. Cuttings are very slow to strike.

Similar species: Some glandular-hairy forms of ***B. aculeata*** are vegetatively quite similar to *B. riparia*. *B. aculeata* may be distinguished by its suckering habit and the early presence of a tuft of large basal leaves. The fruit has a broad wing which is notched rather than deeply and irregularly dissected.

B. dentata includes some narrow-leaved forms which could be mistaken for *B. riparia,* but the growth habit is much more untidy and inclined to sprawl. The fruit of *B. dentata* also has a wing which is deeply and irregularly dissected, but it differs in that the faces are covered with conspicuous tubercles.

B. petrophila has broader leaves with lobed margins. The fruit is not winged.

B. sieberi* var. *gunnii resembles *B. riparia* in the wild, but the former occurs only in Tasmania and the latter is restricted to eastern Victoria. In cultivation the leaves are larger (to 7cm x 1cm), the heads are larger (to 3.5cm across), and it develops a sprawling habit with age.

Special notes: A notable feature of the fruit is the variation seen in the dissection of the wing. Even in the same head no two fruits are identical. It is also interesting that the habitat of *B. riparia* would be many metres underwater when the rivers are in flood and would be subject to strong, swirling currents for quite long periods in most years. The roots of some of the plants that remain in place to shoot again must be anchored very firmly indeed, and sufficient seed must lodge in the rock crevices in the less turbulent areas of the river flow to act as a seed bank.

***B. riparia* has a chromosome number of *n* = 9 (Watanabe and Short, 1992).**

B. riparia — Genoa River, Vic (x 1)

Fruit — Genoa River, Vic (x 20)

Brachyscome scapigera (Sieb. ex Spreng.) DC.

Tufted Daisy

PERENNIAL
10–30cm high
10–30cm wide
WHITE, MAUVE

Synonyms: *Senecio scapigera* Sieb. ex Spreng.
Brachystephium scapigerum (Sieb. ex Spreng) DC.

Derivation: *scapigera* — having a leafless stem.

Neat perennial clump of dense, deep green leaves. Mauve or white flower-heads with many ray florets are held well above the foliage.

Distribution and habitat: Qld, NSW, ACT, Vic. Occurs in moist situations in a wide variety of habitats, usually at high altitudes.

Description: In cultivation an erect, hairless perennial forming a dense tuft. **Leaves** in basal clusters are entire, oblanceolate, usually 6–15cm x 0.5–1.5cm. The midrib is prominent beneath and the bases taper to long slender stalks. A feature of this species is that the fibrous remains of old, dead leaves are said to be retained at the base of the plant. **Flower-heads** are 2.5–3cm across, borne at the tips of unbranched flower stems, 15–30cm long. These scapes may be naked or have one or two small leaf-like bracts. Thirty to fifty mauve or white ray florets make the heads appear double. **Fruits** are brown, often with a purple tinge, 2–3mm x 0.8–1.2mm, with smooth flattened faces and slightly thickened, narrow margins. The pappus is minute. **In the wild** plants form colonies in moist areas and flower more profusely than they do in cultivation.

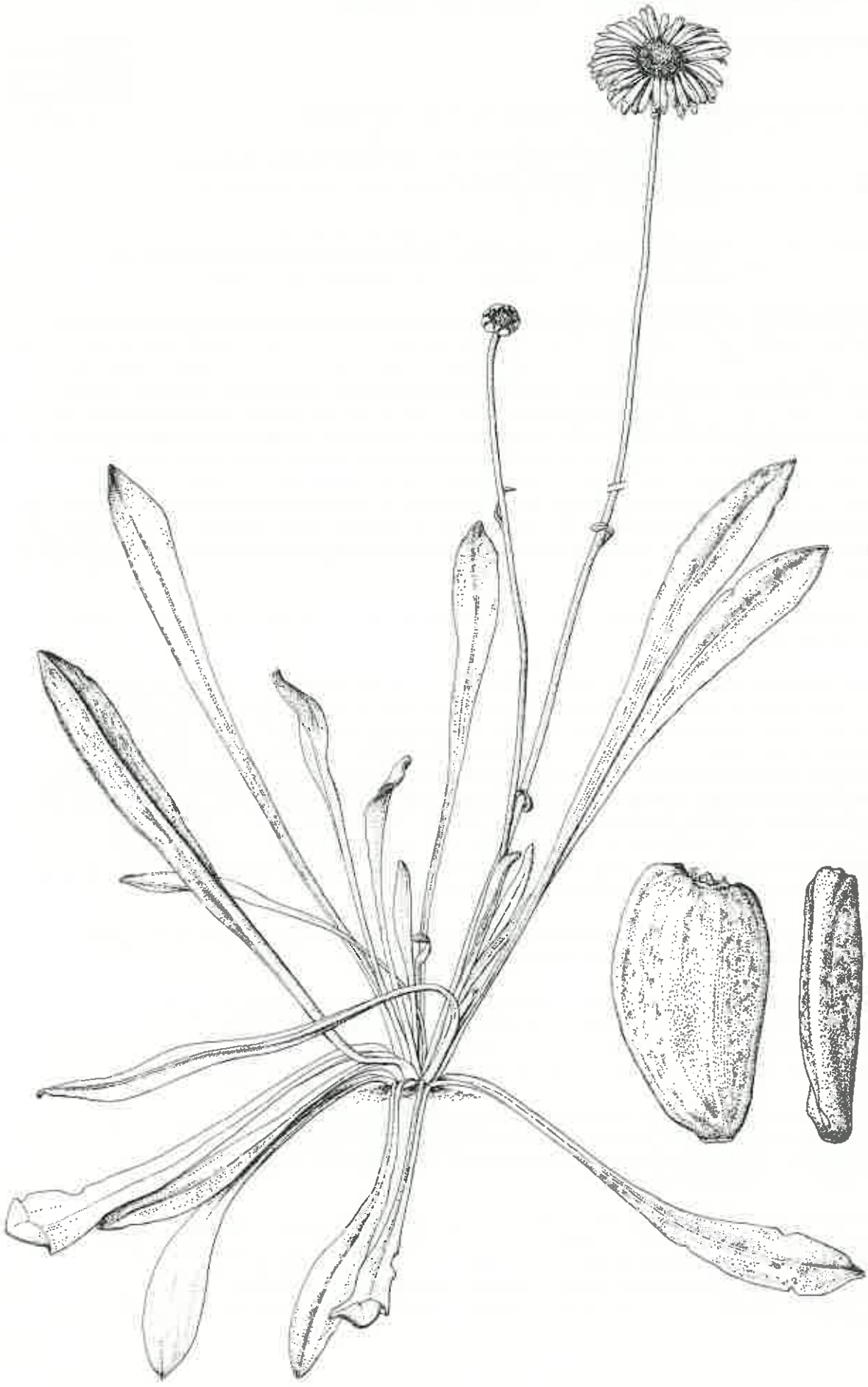
Flowering period: Summer in the alps; under cultivation *B. scapigera* flowers mostly in spring and intermittently in summer and autumn.

Cultivation and uses: *B. scapigera* will tolerate drier conditions than most species occurring in subalpine areas. It prefers moist soil, sun or semi-shade and root protection. If the soil dries out it will die back to the perennial root and shoot again after autumn rains. This species has adapted well to cultivation in gardens and containers. In a pot it gradually loses vigour and flowering is reduced, so it should be repotted every year for good results. It is frost tolerant to –5°C and has survived English winters in a cold frame. Use in rockeries, as a plant for bog or alpine gardens, and in containers. It is essential to bait for slugs and snails.

Propagation: Fresh seed germinates in 10–50 days and plants may regenerate naturally in gardens. Division of the root stock is another method of propagation.

Similar species: ***B. obovata*** resembles narrow-leaved forms of *B. scapigera*, but its habit is not as densely tufted. Also there are 4–6 leaf-like bracts on the scape compared with 0–2 for *B. scapigera*.

Special notes: ***B. scapigera*** **has a chromosome number of** $n = 9$ **(Smith-White et al., 1970).**



B. scapigera — Central Gippsland, Vic (x 1)

Fruit — Mt Buller, Vic (x 20)

Brachyscome segmentosa C. Moore and F. Muell.

Lord Howe Island Daisy

PERENNIAL
30–40cm high
30–40cm wide
WHITE

Derivation: *segmentosa* — cleft or divided, referring to the leaves.

A robust, branching perennial with lobed leaves and large white flower-heads over a long period. It may spread to one metre by layering.

Distribution and habitat: Endemic in Lord Howe Island where it occurs on Mt Gower and on The Saddle below Mt Lidgbird above 350m. Grows on moist, exposed rocky ledges.

Description: In cultivation an upright perennial with thick branching stems which may spread by layering. **Leaves** are 1–6.5cm x 0.1–2cm, pinnatisect with 5–9 broad lobes which are usually toothed at the apex. In addition, some leaves have 1–3 short linear lobes below the wedge-shaped lobes. The blade is narrowed into a stalk. There are just a few long septate hairs, mainly along the veins and at the base of the leaves. **Flower-heads** are usually 2–3.5cm across, but the diameter may be as small as 1cm or as large as 5cm, depending on the growing conditions. The heads are held singly at the tips of glabrous flower stems, 12–20cm long, with 1–2 small entire leaves in the lower half. The ray florets are white and about 30 in number. **Fruits** are brown, wedge-shaped, 1.8–2.5mm x 1–1.3mm, flattened with two raised vertical ridges joined at the top to appear horseshoe-shaped. The pappus is obvious and is placed slightly off centre. **In the wild** *B. segmentosa* is quite abundant. The plants are generally smaller, and the stems are less leafy and more inclined to trail than is the case with garden grown plants.

Flowering period: On Lord Howe Island it flowers from spring to late autumn, but in cultivation it often flowers throughout the year.

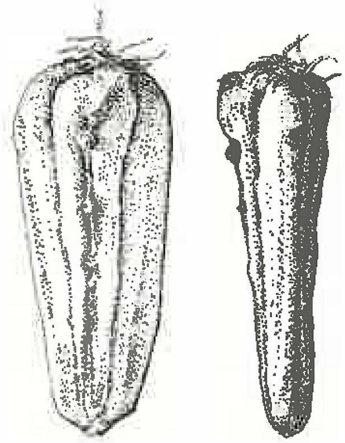
Cultivation and uses: *B. segmentosa* is one of the most tolerant species, growing well in such widely separated areas as Brisbane, south-eastern Tasmania and Adelaide. It prefers a sunny position with some overhead protection in summer. It grows in part shade, but may not flower as well. Extra watering is necessary in dry periods. It is suitable for planting in deep sand beds and for coastal planting in exposed positions, but is badly burnt by frost. *B. segmentosa* will layer quite readily and may spread to 1m, but pruning is essential to keep plants shapely. Sap-sucking insects will attack it but are easily controlled. This is one of the few *Brachyscome* species to have flower-heads that stay open at night. It lasts well as a cut flower for up to two weeks, and in that period it remains sweet-smelling, unlike a Marguerite. This is a useful shrubby perennial for the garden or rockery, in bog gardens or containers, and is suitable as an edging plant.

Propagation: Seed germinates readily in 7–20 days. This species may self-sow in the garden. Cuttings strike quickly and layered stems are easy to transplant.

Similar species: ***B. diversifolia* var. *maritima*** is closest to *B. segmentosa*. Both are robust, branching perennials with white heads, pinnate leaves and similarly shaped fruits. Variety *maritima* may be distinguished by the leaves which are usually longer (to 8.5cm) and have thicker, more leathery leaf segments. The fruit is larger (to 3mm long) and the pappus is placed more obliquely.

Special notes: Davis (1948) has noted the vegetative similarity between *B. segmentosa* and *B. diversifolia* var. *maritima* and the fact that both occur as island populations. She has speculated that fruit of *B. diversifolia* may have been carried to Lord Howe Island on the feet of a bird originally, and that it developed in isolation and now differs from the parent species.

Study Group members growing *B. segmentosa* in their gardens have observed a readiness to cross with seemingly quite unrelated species. It certainly crosses with *B. angustifolia* var. *heterophylla*, *B.* aff. *curvicarpa* and *B. formosa* and probably with *B. dentata*, *B. multifida* and *B. spathulata*. Many of these hybrids are attractive and have been registered with the Australian Cultivar Registration Authority (ACRA), e.g. *Brachyscome* 'Valencia', or have been granted protection under the Plant Varieties Act, e.g. *Brachyscome* 'Sunburst'.



B. segmentosa — Lord Howe Island (x 1)

Fruit — Lord Howe Island (x 20)

Brachyscome sieberi DC. var. *gunnii* DC.

PERENNIAL
15–30cm high
10–20cm wide
WHITE

Derivation: *sieberi* — after Franz Wilhelm Sieber (1789–1844), born in Prague. He made a private botanical collection in New South Wales in 1823.

gunnii — after Ronald Campbell Gunn (1808–81), an eminent Tasmanian botanist.

An attractive perennial with toothed leaves and white flower-heads. It has a trailing habit and spreads slowly by suckering.

Distribution and habitat: Tas. Occurs near the coast in dry coastal forest, behind dunes or on the foreshore. The species also occurs inland among rocks along rivers.

Description: In cultivation a glandular-hairy branching perennial with ascending stems. **Leaves** are sessile, 1–7cm x 2–10mm, mostly oblanceolate with 3–5 teeth near the apex. The upper surface is almost glabrous; the lower surface densely covered with glandular hairs. **Flower-heads** are 2.5–3.5cm across, held singly at the tips of leafy flower stems, 20–25cm long. Up to 10 leaves are borne along the flower stem, the uppermost being lanceolate and entire. The ray florets are numerous (>50), and are white with mauve reverses. Involucral bracts have acute tips, broad transparent margins and many short glandular hairs on the outer surfaces. **Fruits** are pale brown, thin, flattened, 2.8–3.2mm x 2–2.5mm, with a vertical row of small tubercles or hairs down the centre of the body. The wing is broad, papery, and has an irregularly dissected margin with small hairs along the edge. The pappus is longer than the notch between the wings and the bristles are of varying lengths. **In the wild** plants grow from 7–25cm high and the stems branch freely.

Flowering period: Spring and summer. Cultivated plants usually continue flowering into autumn.

Cultivation and uses: This species is new to cultivation, but has the potential to be a useful, long-flowering perennial suitable for coastal and inland planting. It will grow in full or part sun and prefers an open situation. Use in general garden planting, for trailing over low walls, and in containers.

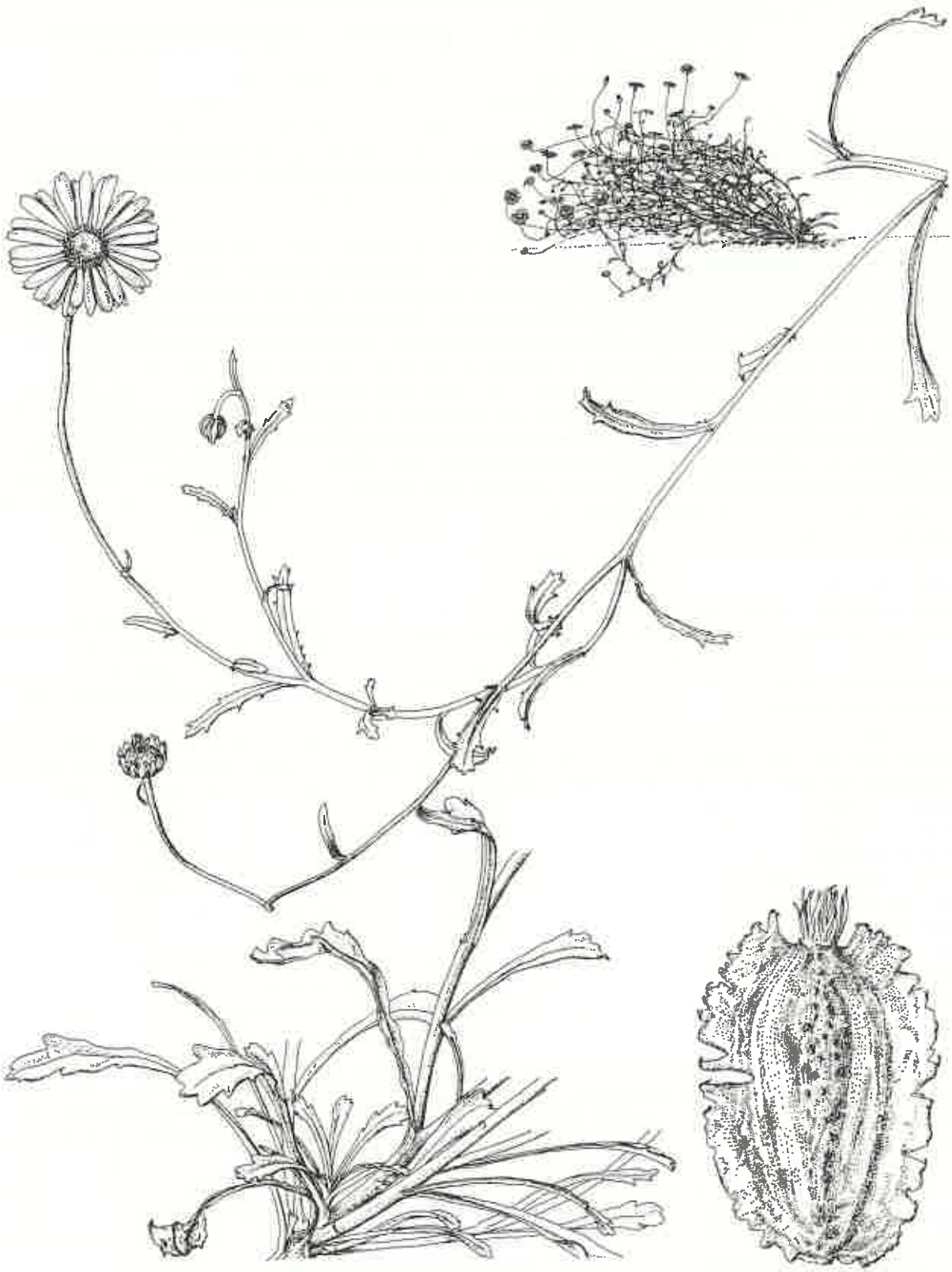
Propagation: Seed germinates in 10–30 days but seedlings grow very slowly. Propagate also from cuttings or by division.

Similar species: The species in the *B. aculeata* complex have similar fruits and are rhizomatous perennials. ***B. aculeata*** is difficult to distinguish from *B. sieberi* var. *gunnii*. Both have white ray florets, glandular-hairy involucral bracts in two rows, and neither have persistent basal clusters, but *B. aculeata* occurs only in the mainland States. Plants are taller and more open, and stems do not branch as much.

B. cunelfolia is distinct because it has a persistent basal cluster, and the fruit has a very short pappus with bristles of uneven lengths. It occurs only in South Australia. *B.* aff. *cuneifolia* occurs in western Victoria. Dense glandular hairs are present on the flower stem only immediately below the head.

B. spathulata has fleshy, spathulate leaves in a basal cluster which persists for some of the growing season, and mauve ray florets (rarely white or pink).

Special notes: The application of the name *B. sieberi* DC. is uncertain but Stace (1981) suggested that it does not apply to any members of the *B. aculeata* complex. Following cytological work and crossing experiments, however, she concluded that *B. sieberi* var. *gunnii* (as opposed to var. *sieberi*) is a member of the *B. aculeata* complex. As she stated, 'Whether it should be raised to the rank of species requires further investigtion' (Stace 1981, p. 436). Experimental crosses by Stace (1981) revealed that this taxon crosses with a form she referred to as *B.* aff. *aculeata* (Mt Gingera), suggesting that the two forms may be conspecific. The chromosome number is *n* = 9 and no polyploid forms have been found within *B. sieberi* var. *gunnii* (Stace, 1981).



B. sieberi var. *gunnii* — Midway Point, Tas (x 1)

Fruit — Midway Point, Tas (x 20)

Brachyscome smithwhitei P.S. Short & K. Watanabe

Large White Brachyscome, Large White Daisy

ANNUAL
30–40cm high
20–40cm wide
WHITE

Derivation: *smithwhitei* — in honour of Emeritus Professor Spencer Smith-White whose work on chromosome number determinations and cytological observations in Australian plants has greatly extended knowledge — especially in Brachyscome.

Attractive annual with masses of large white heads over a relatively long period.

Distribution and habitat: Qld, NSW. Occurs inland from south-western Queensland through the western plains of New South Wales. It grows in sandy loam or clay soils, in low-lying situations on flood plains and in saltbush communities.

Description: In cultivation an ascending or erect annual herb to 40cm. The stems are hairless, green or reddish and often become leafless at the base as plants develop. **Leaves** are bright green, pinnatisect, 10–15cm long at the base and reducing up the stem. The leaf lobes (7–13) are mainly linear, 2–25mm x 1–2.5mm, and may be divided again. The dilated leaf bases are stem-sheathing and bear long cottony septate hairs. **Flower-heads** are white, 3–4.5cm across, held well above the foliage on hairless stems 15–20cm long. **Fruits** are bent at the apex, brown, 2–2.5mm x 1–1.5mm, with the upper part winged. The wings extend from half to two-thirds the length of the body in the ray fruits (a shorter distance in the disc fruits) and the margins are edged with long inrolled hairs and some short glandular hairs. The body is hairless except for two tufts of long inrolled hairs at the base. The pappus is centrally placed and conspicuous. **In the wild** plants vary from 20–30cm high in good conditions to depauperate plants 3cm high, and can often be seen growing in water. Flower-heads are usually smaller (2–3cm across) and plants dry off rapidly when soil moisture disappears.

Flowering period: Spring. In cultivation plants may flower from August to December.

Cultivation and uses: *B. smithwhitei* is an attractive annual for the garden, but its tendency to sprawl makes it too untidy for pots. It likes an open position in full or part sun. Light or heavy soils are suitable, but the habit is more erect in clay. Soil moisture must be maintained. This species prefers a warm climate and will grow at the coast. *B. smithwhitei* should be massed or planted in small groups.

Propagation: Seed germinates well in 6–20 days. This species self-sows in pots and in the garden. Seed is slow to mature and remains densely packed in the head. It is ready to collect when the fruiting head elongates into a conical shape which it does after rain or overhead watering. Cuttings strike easily.

Similar species: ***B. campylocarpa*** is very similar in appearance, but the fruit is dark brown to black, uniformly curved, with prominently lobed wings and a few long hairs on each lobe. It does not have the basal tufts of hair. It occurs in south-west Queensland and South Australia. The chromosome number is $n = 5$.

B. dichromosomatica is an annual with flowers and foliage like those of *B. smithwhitei*, but the leaves are basal never cauline, the fruiting heads are hemispherical not conical, and the fruits are not curved.

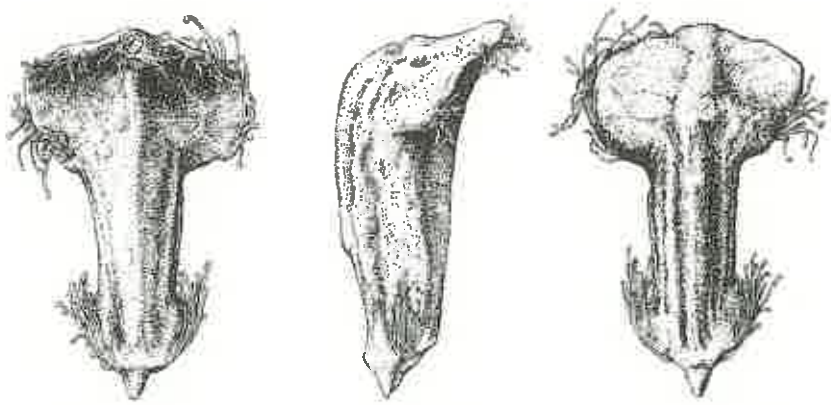
B. erlogona is vegetatively indistinguishable, but the fruit is uniformly curved. The swollen wings extend from apex to base and are edged with long inrolled hairs along their entire length. It occurs in south-west Queensland, north-west New South Wales and northern South Australia. The chromosome number is $n = 4$.

B. lineariloba is close to *B. smithwhitei* but the leaves are basal, the fruiting heads are hemispherical and the fruits are not curved.

B. nodosa is a white-flowered annual which sometimes grows in close association with *B. smithwhitei*. *B. nodosa* differs in having hairy stems. Mature fruits are quite distinctive in that they develop large tubercles on the faces and prominent horn-like projections at the apex.

B. smithwhitei — Cunnamulla, Qld (x 1)

Fruit — Cunnamulla, Qld (x 20)



Special notes: In her *Revision of the genus Brachycome* Cass., Davis (1948) misapplied the name *B. campylocarpa* to *B. smithwhitei*. *B. campylocarpa sens. str.* (meaning in the strict sense) occurs in far south-west Queensland and north-east South Australia and has a chromosome number of $n = 5$, whereas *B. smithwhitei* occurs in south-west Queensland and inland New South Wales and has a chromosome number of $n = 3$.

Other authors followed Davis. The following descriptions designated *B. campylocarpa* J. Black refer to *B. smithwhitei*:

- Leigh, J.H. and Mulham, W.E. (1965), *Pastoral Plants of the Riverine Plain*, (as 'Brachycome').
- Beadle, N.C.W. (1980), *Students Flora of North Eastern New South Wales*, Part 4, 632 (as 'Brachycome').
- Cunningham, G.M., Mulham, W.E., Milthorpe, P.L. and Leigh, J.H. (1981), *Plants of Western New South Wales*, 648 (as 'Brachycome'). The description and coloured photograph are those of *B. smithwhitei*, but the illustration of seed (fig. 64e) is that of *B. campylocarpa*.
- Jacobs, S.W.L. and Pickard, J. (1981), *Plants of New South Wales. A Census of the Cycads, Conifers and Angiosperms*, 72 (as 'Brachycome').

In other publications *B. smithwhitei* has been referred to as follows:

- *B. campylocarpa* (sp. C), Smith-White *et al. Aust. J. Bot.* 18:103, fig. 25 (1970) (as 'Brachycome').
- *B.* sp. aff. *campylocarpa*, K. Watanabe and P.S. Short, *Muelleria* 7:458, 465, 466, fig. 1F (1992).
- *Brachycome* sp. B, J. Everett in G. Harden, *Flora of New South Wales*, Vol. 3, 157, 165, (1992) (as 'Brachycome').

Polyploidy has been demonstrated in *B. smithwhitei*. It has been suggested that diploids occur in the north of the range and tetraploids in the south (Watanabe and Short, 1992).

The common names were cited by Leigh and Mulham (1965) and Cunningham *et al.* (1981) for *B. smithwhitei*. It is a moot point whether they apply to *B. campylocarpa* or *B. smithwhitei*, and could probably apply to both species equally well.

B. spathulata subsp. *glabra* — Derwent Bridge, Tas (x 1)

Brachyscome spathulata Gaudich.

Two subspecies have been recognized by Stace (1981) based on studies of cell biology. The chromosomes of each subspecies are distinctly different in their physical appearance.

KEY to the SUBSPECIES (de Candolle)

1. Leaves pubescent, shortly scabrid; mainland Australia .....subsp. *spathulata.*

2. Leaves glabrous; Tasmania .....subsp. *glabra.*

The two subspecies will be described separately.

Brachyscome spathulata Gaudich. subsp. *spathulata*

PERENNIAL
15–60cm high
10–20cm wide
MAUVE, WHITE
PINK (rarely)

Synonyms: *B. scapiformis* DC.
B. scapiformis DC. var. *puberula* DC.

Derivation: *spathulata* — spoon-shaped, referring to the shape of the leaves.

Variable perennial with conspicuous flower-heads at the tips of stems held well above the basal cluster of leaves.

Distribution and habitat: Qld, NSW, ACT, Vic. This widespread subspecies ranges from alpine herbfields to the coast. In the alps it grows in exposed situations among rocks and in sod tussock grassland. In subalpine regions it occurs in open woodland and at the coast in sheltered woodland.

Description: In cultivation a perennial which spreads slowly by suckering. Erect or curving stems, 15–60cm long, are covered with fine glandular hairs. The stems are unbranched or branch once or twice, usually near the base. **Leaves** are spoon-shaped in a basal cluster, 4–10cm x 1–3cm, usually sessile, with lobed or toothed margins. The clusters are persistent but may disappear if the plant dies back to the perennial root due to lack of soil moisture. Basal clusters appear again when there is adequate moisture. More than one cluster may form on a single rootstock. There are glandular hairs on the leaves and the undersurface is often purplish, denoting the presence of anthocyanin. This is most obvious in fresh material. **Flower-heads,** 2–5cm across (usually 3–4cm across), are terminal, solitary, and have mauve ray florets (rarely white or pink). The involucral bracts are an important distinguishing character; they are narrow (1mm wide), the tips taper gradually to a fine point and protrude markedly beyond the seed head. Flower stems are variable, 10–25cm long, and bear a variable number of leaves which reduce in size up the stem. These leaves are generally more numerous on the lower half of the stem. **Fruits** are wedge-shaped, brown, 2–4mm x 1.2–1.8mm, flattened, smooth or with a few hairs near the apex. The wing varies from slightly toothed to irregularly lobed. Tiny white hairs fringe the edges of the wings. The pappus is an obvious bundle of bristles which is longer than the notch at the apex. **In the wild** plants are often widely scattered. There is great variation of habit. Around Burrinjuck Dam (NSW) spindly plants which appear hairless to the naked eye grow to 30cm high, while robust, obviously hairy plants with flower stems to 60cm can be found in sheltered situations in the alps.

Flowering period: Subspecies *spathulata* flowers in summer in the alps, but at lower altitudes and at the coast it flowers mainly in spring. In cultivation the flowering period is spring, but some forms flower intermittently until early autumn.

Cultivation and uses: All forms of subsp. *spathulata* prefer moist, peaty soils and good root protection. Plants wilt if the soil dries out, but recover rapidly when watered. They prefer dappled sun, but will grow in full sun in cool climates although the resultant plants may be smaller. Subspecies *spathulata* withstands frost to –5°C and grows at the coast in protected positions. Bait for snails and slugs. Plant closely in pots or in the garden for a good display.

Propagation: Seed germinates well in 6–40 days. Plants will self-seed in pots and in the garden. Also propagate from cuttings or by division.

B. spathulata* subsp. *spathulata — Three Mile Dam, NSW (x 1) Fruit — Little Buller, Vic (x 20)

Forms:

- A form from the Wellington (NSW) region has mauve heads, about 2cm across. It has spindly, branching stems and very few leaves. It has been suggested that this could be a diploid or a hybrid between hexaploid and diploid forms (H.M. Stace 1984, pers. comm.).

- A form from high altitudes in the Snowy Mountains (NSW) has flower-heads about 3.5cm across with numerous fine pale mauve rays (80–150), and shiny, dark green leaves. In cultivation unbranched stems can be 60cm long.

- Alpine forms from the Snowy Mountains (NSW), Bogong High Plains, Eastern Highlands and Snowfields (Vic) are robust and shrub-like from 40–60cm high. Flower-heads 4.5–5.5cm across have mauve or dark mauve rays. There are many branching stems, and leaves are clustered towards the base of the plant. A rare form from the Kosciusko plateau has white flower-heads.

- The Tiger Hill form in the Benalla (Vic) district has mauve heads, 2–3cm across. The leaves are blue-green and the stems, 30–35cm long, branch once or twice near the base.

- The eastern coastal (NSW, Vic) forms have pale mauve heads, 2–3cm across. White and pale pink forms have also been observed. The stems are 20–25cm long and branch more freely and further up the stem than other forms.

- The Mornington Peninsula (Vic) form has blue-mauve heads, 3–4cm across. The leaves are mid-green and the stems, 35–40cm long, branch several times.

Similar species: ***B. aculeata*** is a perennial which occurs in the same situations and has similar fruit. It can be distinguished by its white flower-heads, more robust, open growth habit, and the absence of a persistent basal cluster. The leaves are narrower and without anthocyanin, and the involucral bracts are broader with less tapered tips.

B. cunelfolia is a perennial with a similar habit and fruit, but the heads are white (rarely pink), the involucral bracts are broad and blunt, and it only occurs in South Australia. The pappus bristles are very short.

B. petrophila has similar large lobed basal leaves, but the stems are not so robust and branch more often. The fruit is not winged.

B. sieberi **var.** ***gunnii*** is a perennial with similar fruit, but it has white heads and a slender, smaller habit (to 30cm). The cluster of basal leaves is not persistent and this species only occurs in Tasmania.

B. tenuiscapa **var.** ***tenuiscapa*** has a smaller growth habit. The fruit is not winged and the pappus is short.

Special notes: When the genus *Brachyscome* was revised Davis (1948) recognized about 74 species and varieties on the basis of fruit characters. She considered several species and varieties to be conspecific with *B. aculeata*. They were *B. scapiformis* DC. var. *puberula* DC., *B. scapiformis* var. *glabra* DC., *B. sieberi* DC., *B. sieberi* var. *gunnii* DC. and *B. cunelfolia* Tate. She listed them as synonyms of *B. aculeata*. They all have fruit with a relatively similar appearance and Davis held the view that the differences in leaf shape and habit were due to the age of the specimens studied and the various environments in which they were growing.

Later cytological work by Smith-White *et al.* (1970) and work on the biosystematics of the *B. aculeata* complex led Stace (1981) to conclude that *B. spathulata* Gaudich. (synonym *B. scapiformis* DC.) (New South Wales, Victoria and Tasmania) should be reinstated as a separate species. (It is now known to occur also in Queensland. A collection from Bald Rock Creek, 10km north of Wallangarra is housed at the National Herbarium in Melbourne.) One character used by Stace to distinguish *B. spathulata* from *B. aculeata* is the persistent nature of the cluster of basal leaves in the former species. In cultivation it has been observed that the basal cluster disappears when there is inadequate moisture in the soil. Stace observed plants growing in 15cm pots containing 1:1 peat and sand, which were maintained in an enclosed glasshouse. It is unlikely that the experimental plants ever experienced dry conditions. When the two species are grown together under garden conditions the basal cluster of leaves in *B. aculeata* is lost relatively quickly, whereas that of *B. spathulata* is retained for some months.

Burbidge (1974) drew Stace's attention to the fact that the name *B. spathulata* Gaudichaud (1826) had priority over the name *B. scapiformis* DC. (1836). Stace (1981) recognized two subspecies: subsp. *spathulata* (mainland Australia) and subsp. *glabra* (Tasmania).

Subspecies *spathulata* in the ACT is described and illustrated by Burbidge and Gray (1970) as *B. scapiformis*, and by Costin *et al.* (1979) in *Kosciusko Alpine Flora* as *B.* sp. Some *B. spathulata* forms are polyploids, that is they have more than two sets of chromosomes. Plants with four or more sets of chromosomes are often larger and more robust than plants having only two sets. The base chromosome number of this species is $x = 9$, but in different forms the chromosome number varies; $n = 9$, 18, 27, 36 and 45. It is thought that this polyploidy may be the reason for the variable nature of this species and the cause of much past confusion in identification. For instance, Costin *et al.* (1979) note that in the Kosciusko feldmark there is a small form to 15cm high (diploid) and a more robust form to 50cm high (hexaploid) in the heaths and tall alpine herbfields.

Brachyscome spathulata Gaudich. **subsp.** *glabra* (DC.) Stace

Blue Daisy

PERENNIAL
15–30cm high
5–20cm wide
MAUVE, WHITE (rarely)

Synonym: *B. scapiformis* var. *glabra* DC.

Derivation: *glabra* — without hairs, referring to the leaves which are almost hairless.

Variable perennial with mauve or white flower-heads held above a basal cluster of leaves.

Distribution and habitat: Tas. Scattered from sea level to 1500m. Occurs in marshy places and in crevices on steep rocky slopes.

Description: In cultivation a variable perennial with a similar appearance to that of subsp. *spathulata* except that the stems are almost glabrous at the base and are usually shorter (to 25cm). The habit depends on the form selected. **Leaves** are obovate, 2–6cm x 2–10mm, form a basal cluster, are sessile although the blade is quite narrow, and are toothed or lobed in the upper half. Leaves are dark green, shining, hairless or with a few glandular hairs. **Flower-heads** are 2–4cm across, with mauve or sometimes white ray florets. The involucral bracts have acute purplish tips and glandular hairs on the outer surfaces. Flower stems are variable, 7–25cm long, almost glabrous towards the base but densely covered with small glandular hairs just below the head. Stem leaves (7–17) are sessile, reduce in size up the stem and may be lobed or entire. **Fruits** are brown, obovate, 2.5–3mm x 2–2.2mm, with a few small tubercles at the top of the body. The wing is broad, irregularly toothed and fringed with small hairs. The pappus is conspicuous and fills the apical notch. **In the wild** plants are scattered and do not form extensive colonies.

Flowering period: Spring and early summer.

Cultivation and uses: Subspecies *glabra* prefers moist peaty soil, protection for the roots and a situation in dappled shade. Group plants together for the best results.

Propagation: Seed germinates within 22–60 days, or propagate by division.

Forms:

- The Derwent River form has mauve heads 2–2.5cm across. The habit is spindly, the deep green, shining leaves are sparse and small (1–2.5cm x 1–10mm), and the stems (to 30cm long) branch in the lower third.

- The Mount Rufus form has beautiful white heads, 3.5–4cm across, on sturdy stems, 15–20cm long. There is a basal cluster of shining green leaves. This is an especially good form for pot culture.

Similar species: ***B. aculeata*** is a perennial with fruit of similar appearance but it is not found in Tasmania. It has a more robust habit, is much hairier, and the basal cluster of leaves is not persistent.

B. tenuiscapa* var. *tenuiscapa is another perennial with a persistent basal rosette occurring in Tasmania. The fruit is the distinguishing character; it is smaller (to 2.2mm long), dark brown to black, and has no wing.

Special notes: Stace (1981) has compared the physical appearance of the chromosomes of subsp. *glabra* from Ben Lomond (Tas) with those of subsp. *spathulata* from Meadow Flat (NSW) and Mt Buffalo (Vic). Chromosomes of subsp. *glabra* are larger and have other distinguishing characters. Very good cross-compatibility exists between the two subspecies. The chromosome number of subsp. *glabra* is $n = 9$ (Stace, 1981).

B. spathulata subsp. *glabra* — Mt Rufus, Tas (x 1)

Brachyscome stolonifera G. Davis

Spreading Daisy, Kosciusko Daisy

PERENNIAL
2–7cm high
spreading
WHITE, PINK (rarely)

Derivation: *stolonifera* — bearing stolons.

Dwarf stoloniferous perennial with a tuft of glossy green leaves and relatively large white flower-heads on short, sturdy stems. Useful for wet situations.

Distribution and habitat: NSW. Endemic in the Kosciusko National Park where it occurs in shallow pools at high altitudes.

Description: In cultivation a hairless perennial, spreading by means of short stolons. **Leaves** are entire, linear, blunt-tipped, 2–5cm x 1–2mm. They grow in a small basal tuft 2–4cm across. One to four leafy stolons, 2–5cm long, radiate from the tuft and can root at the tips where they contact the soil. **Flower-heads** are 2–4cm across on short, stout stems, 4–7cm long. The erect stems bear one leafy bract or are naked, and often have a reddish tinge. The ray florets are usually white, rarely pink. **Fruits** are reddish brown, 2mm x 1mm, thickened in the centre, with narrow wavy margins. Hairs are scattered over the central area and along the edges of the margins. The pappus is silky-white and so conspicuous that it can be seen without magnification. **In the wild** the plants may be as little as 2cm high and the heads only 1–2cm across. *B. stolonifera* was described as recently as 1949 and it is easy to understand how it has been overlooked in the past.

Flowering period: Summer.

Cultivation and uses: The horticultural potential of this species is limited by its size. *B. stolonifera* tolerates frost, likes full or part sun and a moist situation. It could be used in a small bog garden or shallow pool and is undergoing trials as a container plant.

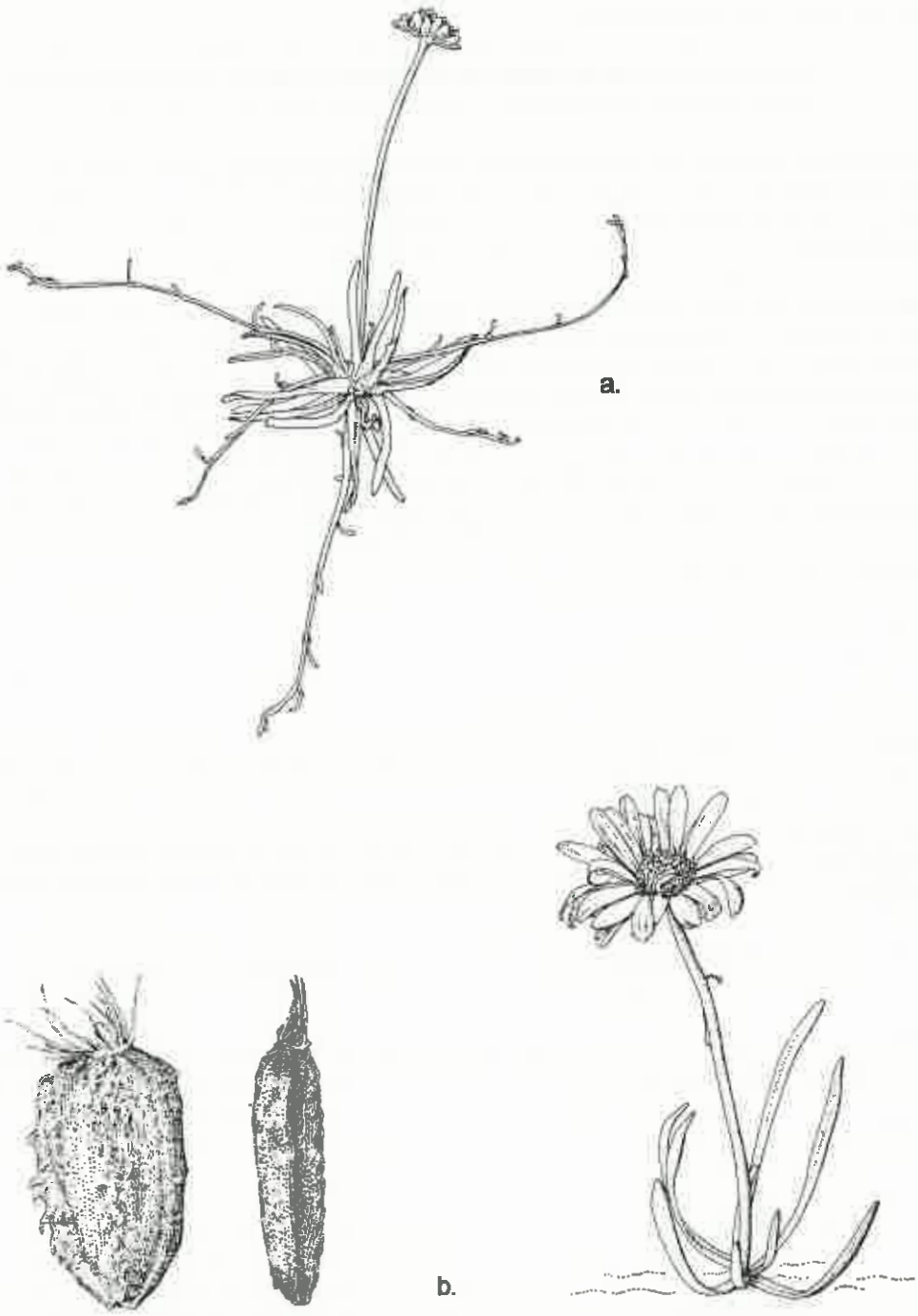
Propagation: Seed germinates in 10–40 days, but is not generally available. It is easily propagated by division.

Similar species: ***B. obovata*** often grows with *B. stolonifera* and small specimens are vegetatively almost identical. It is easily differentiated by its fruit which is large, smooth, obovate, and has a minute pappus.

B. radicans is a much larger, more robust plant than *B. stolonifera,* and it spreads vigorously. The fruit has a distinctive swollen wing.

B. tadgellii is observed more frequently growing with *B. obovata* than with *B. stolonifera. B. tadgellii* is a more vigorous rhizomatous plant than *B. stolonifera* and has a much larger flowering scape (12–20cm long). The basal tuft usually has one or more irregularly lobed leaves. The fruit also differs; it has a wide wing.

Special notes: ***B. stolonifera*** **has a chromosome number of** $n = 15$ **(Smith-White *et al.*, 1970).**



B. stolonifera — a. Betts Creek, NSW (x 1) [Illustrated from ADSG Herbarium]
b. Spencers Creek, NSW (x 1) [Illustrated from print]
Fruit — Spencer s Creek, NSW (x 20)

Brachyscome stuartii Benth.

Stuart's Daisy

PERENNIAL
15–20cm high
15–20cm wide
MAUVE, WHITE, PINK

Derivation: *stuartii* — in honour of Charles Stuart (1802–77), botanist, gardener and plant collector.

Small, tufted plant with attractive divided foliage and many mauve, white or pink heads held conspicuously above the leaves.

Distribution and habitat: Qld, NSW. Occurs from south-eastern Queensland to the North Coast, Northern and Central Tablelands, and the North Western Slopes of New South Wales as far south as Bathurst. Grows on swampy ground or in mossy beds among granite outcrops, usually not far from rivers or streams.

Description: In cultivation a tufted perennial. **Leaves** are in a basal tuft, deep green, almost hairless, 5–10cm long, pinnatisect with 6–11 lobes which may be entire or irregularly toothed and lobed. The lobes are 3–10mm x 0.5–3mm. **Flower-heads** are white, mauve or pink, 2–3cm across, held at the tips of slender flower stems 15–25cm long. The heads appear double because they have 40–80 ray florets. **Fruits** are dark brown to black, wedge-shaped, 1–1.9mm x 0.8–1mm, with two conspicuous longitudinal ridges on each side of the faces which are flattened and often bear a few tubercles. The pappus bristles are short. The margins are smooth and there are usually no wings. Specimens collected in some areas do have short thick wings, sometimes irregularly and shallowly toothed. It is thought that these may be examples of intermediates between *B. stuartii* and *B. dissectifolia* (see forms and special notes). **In the wild** plants are smaller and often form large colonies in seepage areas among rocks.

Flowering period: In cultivation in temperate climates it flowers from spring to early autumn.

Cultivation and uses: *B. stuartii* is an attractive plant flowering profusely over a long period, but it often collapses over summer. In view of this regrettable tendency it may be better to regard it as an annual for garden planting. If plants remain alive into the second year they have usually been grown in shade or semi-shade and are much less vigorous. This species tolerates frost to –5°C. Self-sown seedlings arise each year when groups of plants are established. *B. stuartii* flowers best in moist conditions in sun or dappled shade. It grows well in a rockery or as an edging plant, but is probably most suitable as a bog plant or for planting in a container.

Propagation: Seed germinates readily in 7–50 days. Also propagate from division.

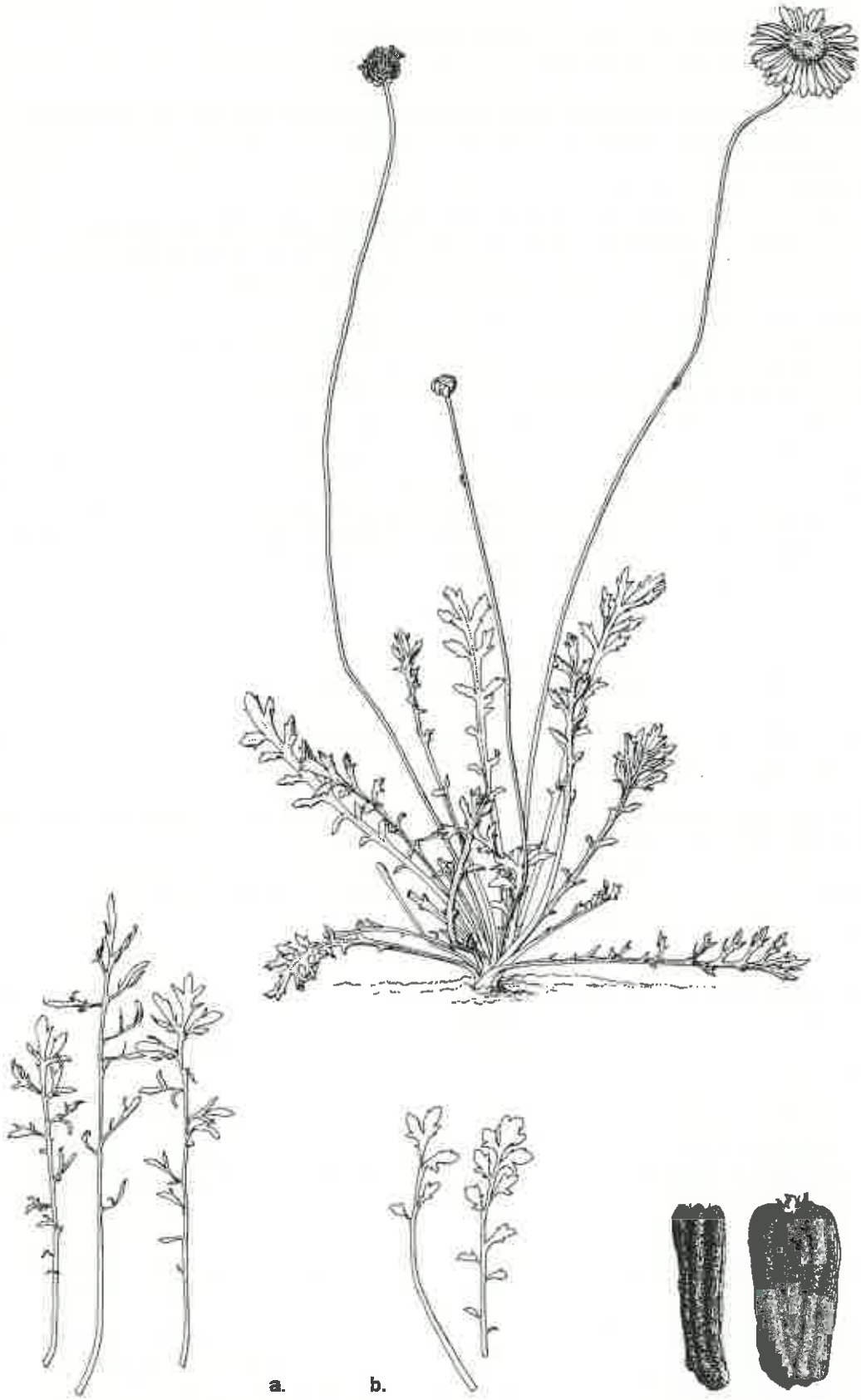
Forms:

- A form from Emmaville (NSW) has seed which is black, thickened, 1.3–1.5mm x 0.6–0.8mm, with two raised folds enclosing tuberculate faces. The unusual features are that the pappus bristles are conspicuous, and some fruits have a thick narrow wing which is fringed with inrolled hairs. In some cases the wing is irregularly dissected into acute lobes, while in others the margin of the wing is almost entire.

Similar species: ***B. dissectifolia*** also has flower-heads held well above a basal cluster of foliage, but in this species the leaves are usually oblanceolate and the margins may be entire, toothed or pinnatisect — sometimes all three on the one plant. The leaves are generally shorter (to 7cm). The fruits are similar, but *B. dissectifolia* has a broad entire wing edged with hairs. The pappus bristles are longer and more conspicuous.

B. ptychocarpa differs from *B. stuartii* in having smaller heads (to 1.5cm across), shorter leaves (to 7cm) and much narrower lobes. The fruit has a raised central ridge as well as two peripheral ridges, and the broad pale wing is edged with hairs.

Special notes: ***B. stuartii*** **may be closely related to** ***B. dissectifolia*** **and** ***B. ptychocarpa.*** **All have broad convex receptacles and shed their seed quickly. Smith-White *et al.* (1970) determined chromosome numbers of $n = 6$ for these species. They observed specimens with fruit characters intermediate between *B. dissectifolia* and *B. stuartii.* This may explain the appearance of the narrow wing found on the fruit collected from Emmaville (NSW).**
Members have reported that *B. stuartii* hybridizes with *B.* aff. *curvicarpa* in their gardens.



B. stuartii — Tingha, NSW (x 1) Leaf shapes — a. Inverell, NSW, b. Torrington, NSW (x 1)
Fruit — garden origin (x 20)

Brachyscome tadgellii Tovey and P. Morris

PERENNIAL
12–15cm high
spreading
WHITE

Synonyms: *B. nivalis* var. *alpina* (F. Muell. ex Benth.) G. Davis.
B. cardiocarpa var. *alpina* F. Muell. ex Benth.

Derivation: *tadgellii* — in honour of A.J. Tadgell (1863–1949), naturalist, amateur botanist and untiring collector of Australian plants. He was the first collector of *B. tadgellii* on Mt Hotham at 1800m in December 1913.

Compact clump of fresh green, shining, strap-like leaves, gradually extending in size by suckering. Large white flower-heads are held well above the foliage.

Distribution and habitat: NSW, Vic, Tas. Occurs in the Australian Alps in New South Wales and Victoria in moist situations at about 1500m. In Tasmania it occurs from lower altitudes, about 1100m, in marshy sedgeland. These habitats are all snow covered in winter.

Description: In cultivation a small dense clump. **Leaves** are narrow, usually 4–5cm (up to 8cm) x 2–6mm, linear to narrowly obovate, stalkless and fleshy. The leaves are generally entire, but some have one or more irregular lobes, 3–5mm x 1–2mm. The midrib is prominent in the upper surface and the apex is blunt. The leaves form a basal tuft and are stiff and upright. **Flower-heads,** 2.5–3cm across, are held on sturdy scapes, 12–20cm long. There are short glandular hairs on the scapes, more numerous just below the head, and they bear 3–9 small leaf-like bracts. About 50 white ray florets give the heads a striking appearance. **Fruits** are brown, 2–2.2mm x 1.8–2mm, and have a paler brown, broad wing, sometimes slightly swollen adjacent to the body. A few hairs are present along the edge of the wing. The body has a thickened margin which stands out from the wing, and a central ridge bearing a few hairs. The pappus is large, uneven and white. **In the wild** plants flower more generously and the heads are often up to 4cm across.

Flowering period: *B. tadgellii* in alpine habitats flowers from January to March, but plants in cultivation flower earlier, from November to January.

Cultivation and uses: *B. tadgellii* tolerates drier conditions than other alpine brachyscomes. It has survived in an exposed, regularly watered sand mound in a mallee area of the south-eastern region of South Australia. In this case a mulch of granite rock as well as deep sand was provided. Plants grow vigorously in pots when they receive water and nutrients regularly. *B. tadgellii* is best suited as a garden plant for cool temperate or montane climates. The removal of dead heads generates a longer flowering period. This species is useful for alpine and bog gardens, and containers.

Propagation: Seed germinates very well in 6–40 days. In late summer or autumn plants produce copious seed which may be sown immediately. Division of the rootstock is a simple procedure.

Forms:
- Dargo High Plains (Vic) form makes a neat clump and flowers well in cultivation.

Similar species: ***B. nivalis*** has pinnate or bipinnate leaves in the majority of forms. A rare form may have a number of entire leaves. The fruits are of a similar shape and appearance but the wings are broader and less swollen in the case of *B. nivalis*.

B. obovata often grows in association with *B. tadgellii*. It differs in that the leaves are all entire, the flower stems are almost hairless, the fruit has no wing and only a small, inconspicuous pappus.

B. radicans is a stoloniferous alpine plant. The fruit is very similar in appearance but the wing is less broad, more swollen and the pappus bristles are not as long as those of *B. tadgellii*. The main difference between the two species is that *B. radicans* spreads vigorously.

B. stolonifera is found in similar habitats. It is much smaller in all its characters. The leaves are always entire, and the flower stems are often leafless or bear one leaf-like bract. The fruit has no wing.

B. tadgellii — Lankeys Plains, Vic (x 1)

Fruit — Lankeys Plains, Vic (x 20)

Brachyscome tatei J. Black

PERENNIAL
10–20cm high
20–35cm wide
WHITE, MAUVE

Derivation: *tatei* — to commemorate Ralph Tate (1840–1901), a geologist and the first Professor of Natural History at the University of Adelaide.

Interesting perennial with thick, fleshy leaves and pretty flowers for much of the year. Likes alkaline conditions.

Distribution and habitat: SA, WA. Widespread in the scrub along the top of the limestone cliffs of the Great Australian Bight from Fowler's Bay to Eucla.

Description: **In cultivation** a branching perennial with thick, minutely glandular stems and compact, semi-prostrate habit. The stems become woody with age. **Leaves** are sessile, spoon-shaped or obovate, thick, 2–5cm x 1–2cm, and covered with microscopic glands. The margins are usually shallowly lobed and the bases slightly stem-clasping. **Flower-heads,** 2–2.4cm across, appear double due to the many ray florets (30–70). The rays age to white. The heads are displayed to advantage above the foliage on flower stems 3–9cm long. **Fruits** are 1.5–2mm x 1mm, brownish-black with lighter margins and no wings. Short, stiff hairs are present in the centre of the body and the pappus consists of a ring of minute teeth. **In the wild** plants are very much smaller (to 8cm high) and more straggly. The heads are smaller and the flower stems shorter. Plants flower most of the year.

Flowering period: Spring to early winter in cultivation.

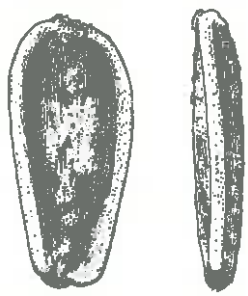
Cultivation and uses: *B. tatei* prefers well-drained, alkaline soil and an open, partly sunny situation. Although it receives little rain beside the Bight it appreciates extra water in summer. On the other hand it resents wet feet and cold, wet weather. The foliage should be kept as dry as possible. Success has been achieved by placing pots under the eaves in winter and hand watering occasionally. Pruning is essential when plants become leggy and at this point a few precautionary cuttings should be taken. Frosts burn the foliage. This species does well in exposed coastal conditions. Treat with iron chelates if the foliage turns yellow. *B. tatei* makes a pretty, long-flowering container plant. It could be grouped in the garden or rockery in a warm position. A posy of fresh flowers lasts at least four days.

Propagation: Seed germinates moderately well in 7–40 days, but the seedlings may need protection in cold, wet weather. Cuttings root readily in the open.

Similar species: ***B. parvula*** has a similar fruit, but is unlikely to be confused with *B. tatei* because the habit is so different and the stems are soft and thin.

B. tatei — cliffs of Gt. Aust. Bight, SA (x 1)

Fruit — cliffs of Gt. Aust. Bight, SA (x 20)



Brachyscome tenuiscapa Hook. f.

Two varieties of this species have been recognized by Davis (1948) based on the appearance of the leaves and fruit.

KEY to the VARIETIES

1. Leaves usually somewhat fleshy and forming a basal rosette, up to 3cm long and 6mm broad. Fruit dark brown .....var. *tenuiscapa.*

2. Leaves rather rigid and macroscopically hairy, up to 10.5cm long, 1.8cm broad; dead remains of previous leaves persisting as fibrous strands around the base of the plant. Fruit black .....var. *pubescens.*

The two varieties will be described separately.

Brachyscome tenuiscapa Hook. f. var. *tenuiscapa*

PERENNIAL
10–20cm high
6–10cm wide
WHITE, MAUVE

Synonyms: *B. scapiformis* DC. var. *tenuiscapa* Benth.
B. alpina Morris

Derivation: *tenuiscapa* — with a slender stem.

Dainty alpine perennial with a small basal rosette of toothed leaves lying flat on the ground. Relatively large white or mauve flower-heads on slender stems. Plants spread slowly by suckering.

Distribution and habitat: NSW, Vic, Tas. Occurs in permanently damp seepage areas in the highlands, usually colonizing bare patches in grassland and alpine herbfields.

Description: **In cultivation** a small rhizomatous perennial with glandular hairs on leaves and stems. **Leaves** form a basal rosette and are spoon-shaped with toothed or wavy margins, 2–3cm x 5–10mm. **Flower-heads** are 2–3cm across, white or mauve, held singly at the tips of flower stems 8–22cm long. Involucral bracts have obtuse to subacute tips. Small leafy bracts (1–13) appear on the erect, unbranched flower stems. **Fruits** are dark brown to black, 1.5–2.2mm x 0.8–1.3mm, wedge-shaped, smooth, and slightly thickened at the margins. The pappus is white and very short. **In the wild** the colonies of var. *tenuiscapa* can be quite extensive and produce many flower-heads.

Flowering period: In cultivation this variety flowers in November and December. In the alps it flowers in January and February.

Cultivation and uses: This variety neither grows nor flowers well in warm temperate climates. It can be nursed along in containers, but the short flowering period barely repays the effort needed to keep it alive. It is a beautiful species in alpine or montane conditions and prefers a cool root run.

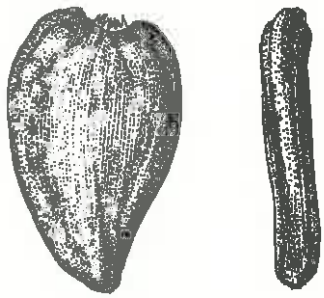
Propagation: Fresh seed germinates in 9–40 days, but is not readily available. Rosettes can be divided and transplanted.

Similar species: ***B. scapigera*** is an alpine perennial with very similar fruits, but the leaves are hairless and entire, and the basal cluster is more upright.

Some of the smaller forms of both varieties of ***B. spathulata*** may superficially resemble var. *tenuiscapa*, but plants are larger, the involucral bracts are narrower and their tips more acute. The fruits are winged and the pappus is obvious.

Special notes: **The mainland forms of this variety are more robust than the Tasmanian forms; there are more leaf bracts and the basal leaves are wider and more regularly toothed.**

B. tenuiscapa var. *tenuiscapa* — Kosciusko, NSW (x 1)



Fruit — Kosciusko, NSW (x 20)

Brachyscome tenuiscapa Hook. f. var. *pubescens* (Benth.) G. Davis

Mountain Daisy

PERENNIAL
10–20cm high
20–40cm wide
MAUVE

Synonym: *B. decipiens* Hook. f. var. *pubescens* Benth.

Derivation: *pubescens* — downy, with soft, fine hairs.

Tufted perennial with mauve flower-heads held on stems above the basal cluster of toothed leaves. Plants spread by suckers to form large colonies.

Distribution and habitat: Qld, NSW, Vic, Tas. (This variety has been recorded only once in Tasmania.) Occurs in open forest on well-drained soils and on granite outcrops.

Description: In cultivation a perennial spreading by suckers. Stems and leaves are covered with small glandular hairs. **Leaves** are spoon-shaped, 3–13cm x 0.8–2cm, toothed towards the apex of the blade and tapering at the base. **Flower-heads** are mauve, 2–3cm across, held singly on slender, upright stems, 15–20cm long, usually bearing one small stem leaf. **Fruits** are smooth and black, 1.5–2.2mm x 0.8–1.3mm, wedge-shaped and slightly thickened on the margins. The pappus is white and very short or absent. **In the wild** the fibrous remains of the old leaves often persist around the bases of plants.

Flowering period: This variety blooms in spring in its natural habitat, but in cultivation it flowers from spring to autumn with a lull from December to February.

Cultivation and uses: Variety *pubescens* is sturdier and more easily grown than var. *tenuiscapa*. Although still rare in cultivation it has potential as an unusual suckering plant that spreads quite quickly. A cool temperate climate suits it best. Plants prefer sun in winter, dappled shade in summer, and an enriched soil. The roots should be protected and kept moist by deep mulch. If the soil dries out plants will die back and regenerate after autumn rains. It is frost tolerant to –5°C, and susceptible to slug and snail attack. Trim if growth becomes untidy, then add nutrients and water well. Variety *pubescens* is an attractive rockery or container plant. In cool climates it could be tried as a ground cover in light shade under trees.

Propagation: Seed germinates in 16–40 days. The black fruits are conspicuous in the heads and so collecting seed is simple. Clumps are easily divided for transplanting.

Similar species: ***B. decipiens*** is a perennial with single flower-heads on stems arising from a rosette of leaves. Variety *pubescens* was formerly thought to be a variety of *B. decipiens*, but the leaves of the latter are glabrous. The scapes are also glabrous. The fruits are longer (3–4mm) and have scattered white hairs on the body.

Special notes: The chromosome number of *B. tenuiscapa* var. *pubescens* is $n = 9$ (Smith-White *et al.*, 1970).

B. tenuiscapa var. *pubescens* — New England, NSW (x 1)

Brachyscome tesquorum J. Black

PERENNIAL
30–40cm high
35–45cm wide
MAUVE, WHITE

Derivation: *tesquorum* — of waste ground or desert.

Stiff, upright perennial with corky bark and an abundance of white or mauve flower-heads. Useful for hot climates.

Distribution and habitat: SA, NT. Occurs on rocky slopes, limestone outcrops, sandplains, watercourses and road drains.

Description: **In cultivation** an erect perennial. Branching stems are thick, stiff and corky at the base. **Leaves** are stalkless, oblanceolate, 1–2.5cm x 2–8mm, entire or with 2–9 linear teeth. Short brown glandular hairs cover both surfaces. The leaves are stiff and held at acute angles to the stems. **Flower-heads** are 1–2cm across on short stems 4–5cm long. There are 40–50 mauve or white ray florets. Each head develops quickly and turns brown rapidly. **Fruits** are grey maturing to brown, 1.5–2mm x 0.5–0.8mm, narrowly obovate, with broad, sloping margins. Two vertical ridges enclose the somewhat sunken faces. There are scattered hairs on the margins and more hairs arising from tubercles on the faces. The pappus is either absent or microscopic. **In the wild** plants grow as unsightly, woody plants to 40cm. In hard conditions they will die back to the perennial root and shoot again from the base when there is sufficient moisture.

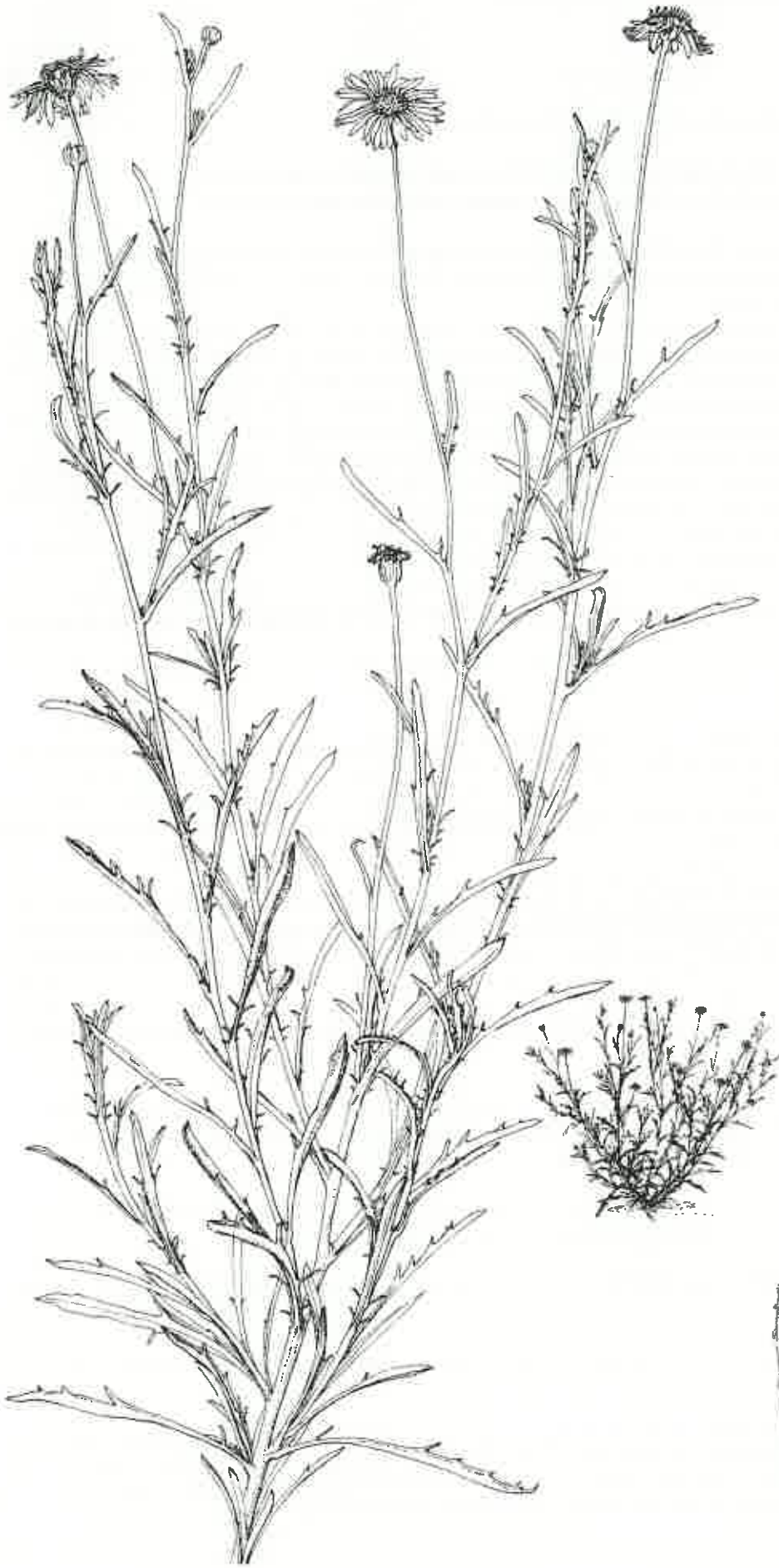
Flowering period: In the wild *B. tesquorum* flowers from winter to late spring, but in cultivation the flowering period is longer.

Cultivation and uses: In temperate climates this species does not appear to have any horticultural merit. The habit is untidy, the speed with which the heads turn brown is regrettable and plants suffer intense aphid attack. Reports from South Australian members indicate that it may perform better in warm climates and alkaline soils. Full sun seems to be necessary.

Propagation: Seed germinates in 20–70 days in autumn or spring. Seedlings must be protected from cold, wet weather as they will rot very quickly if the leaves remain moist for long. Self-sown seedlings may be transplanted and cuttings will strike.

Similar species: ***B. blackii*** is also a branching, corky-stemmed perennial to 40cm and the fruit is very like that of *B. tesquorum* in appearance, although it is not as hairy and is usually smaller (to 1.5mm long). The main difference is that *B. blackii* has pinnatifid or bipinnatifid leaves with crowded dentate lobes, whereas *B. tesquorum* has leaves which are either entire or have a few narrow teeth. *B. blackii* has a more attractive habit; it forms a rounded bush, is extremely sticky and has an overpowering smell.

Special notes: ***B. tesquorum*** **has a chromosome number of** $n = 9$ **(Smith-White *et al.*, 1970). It is noted in *Flora of Central Australia* (1981) that specimens from southern regions of South Australia may form a distinct species.**



B. tesquorum — Kings Canyon. NT (x 1)

Fruit — Kings Canyon, NT (x 20)

Brachyscome tetrapterocarpa G. Davis

ANNUAL
20–35cm high
20–35cm wide
WHITE

Derivation: *tetrapterocarpa* — having four-winged fruit.

Branching annual with white heads and lobed leaves.
Suitable for inland planting in wet situations.

Distribution and habitat: Qld. Occurs in inland areas from Mt Howitt, 100km south of Windorah, as far north as Winton. Grows on grey or red silty clay on roadside verges, in water channels on open grasslands or on flood plains.

Description: **In cultivation** a branching, hairy annual with erect and ascending stems. **Leaves** are sessile, 1–6cm long, irregularly lobed with 7–11 lobes. The lobes vary in shape from 1mm long at the leaf base to 7mm x 3mm at the apex. Basal leaves are only present on young plants. Stems and leaves are densely beset by glandular and septate hairs. **Flower-heads** are 1.5–2.5cm across, held singly at the tips of flower stems 12–20cm long, with 2–3 leaves near the base. **Fruits** are pale to dark brown, broadly oblong, 2.5–3mm x 2mm. The body is smooth with two rather thick wings at the side (lateral wings) and two thin, narrow wings down the centre of the body on both faces (dorsal and ventral wings). The lateral wings are incurved with margins entire or undulate and edged with a few inrolled hairs. The dorsal and ventral wings are also edged with inrolled hairs. The pappus is small and white. **In the wild** *B. tetrapterocarpa* grows most prolifically after floods. In good conditions plants grow to 30cm x 30cm with robust ascending stems. In full bloom it is an eye-catching species.

Flowering period: Spring in its natural habitat, but flowering may be extended to autumn in cultivation.

Cultivation and uses: This species is relatively new to cultivation and has been trialled only in containers. It produces many heads, but the stems break easily and the habit becomes untidy. It is probably not a subject for cool temperate gardens where its performance compares poorly with that of other white annuals such as *B. pusilla* and *B. halophila*. *B. tetrapterocarpa* seems best suited to moist, open positions in inland gardens.

Propagation: About 20% of seed germinates in 15–25 days. Seed develops rapidly after flowering, but it is quickly shed. Seed collected from cultivated plants has not proved viable so far. The very hairy seedlings need protection over winter or sowing should be delayed until cold, wet weather has passed.

Similar species: ***B. chrysoglossa*** has a similar growth habit, but the ray florets are yellow and the fruit does not have four wings.

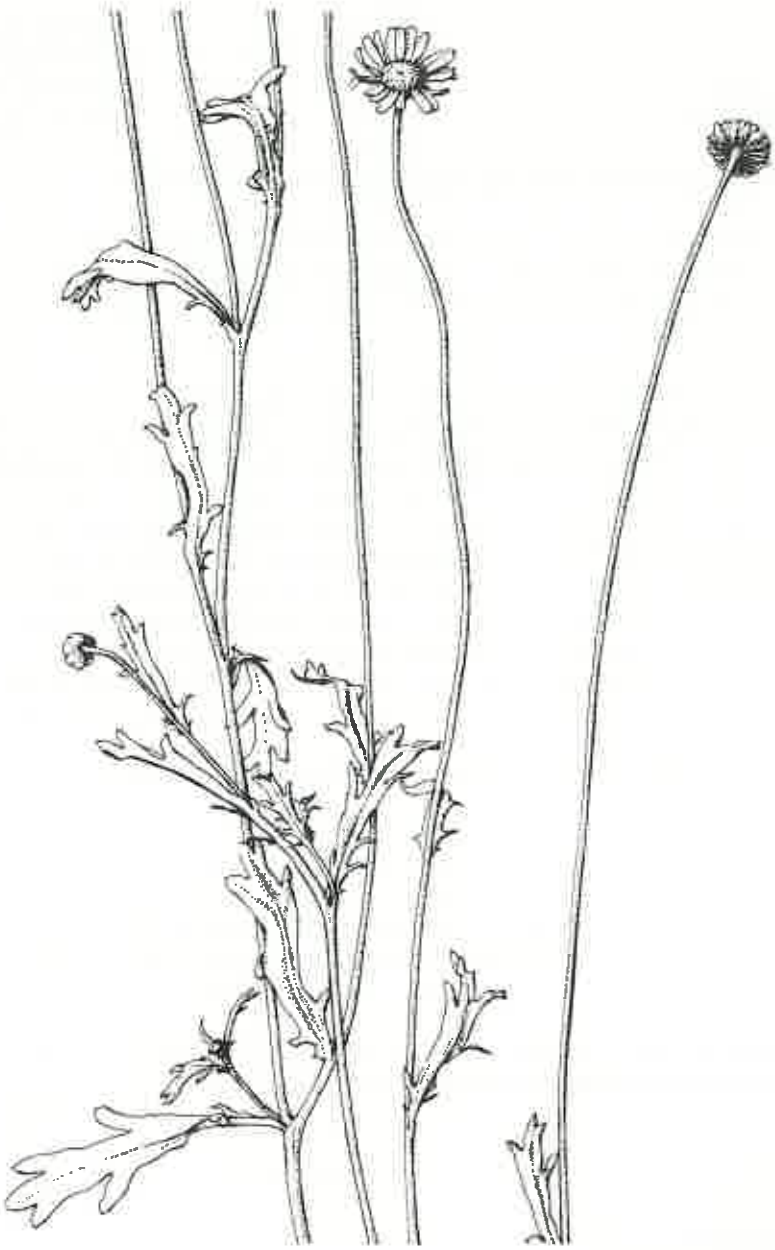
B. curvicarpa is vegetatively very close to *B. tetrapterocarpa*. The fruit is the distinguishing feature; it is strongly curved, bears hairs on the body, and has only two wings. *B.* aff. *curvicarpa* differs in that the ray florets are yellow and the fruit does not have four wings.

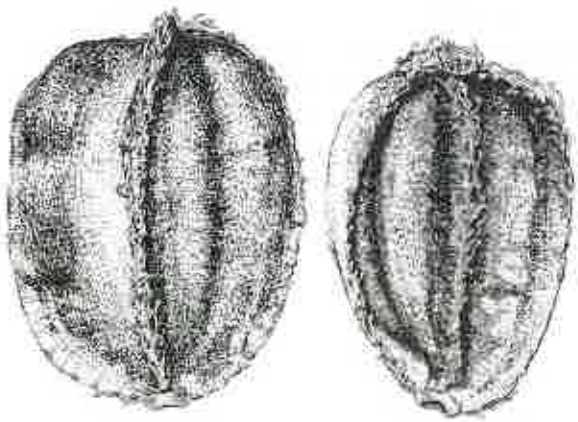
B. dentata in some forms is vegetatively very similar to *B. tetrapterocarpa*, but the fruit has large tubercles over the body and two flat, irregularly dissected wings.

B. papillosa has fruit with large, leaf-like tubercles and only two flat, very broad wings. It is confined to New South Wales.

Special notes: ***B. tetrapterocarpa*** **is a member of the** ***B. dentata*** **complex and has a chromosome number of** $n = 4$.

When a specimen of ***B. tetrapterocarpa*** **from Kingsborough Lane, north of Aramac in Queensland, was found to have been wrongly identified as** ***B. curvicarpa*****, all the specimens under** ***B. curvicarpa*** **in the Queensland Herbarium were re-examined (Morrow, 1964). A number of specimens were identified as** ***B. tetrapterocarpa*****. It was concluded that the ranges of the two species, while close, did not overlap.**





B. tetrapterocarpa — Eromanga, Qld (x 1)

Fruit — Eromanga, Qld (x 20)

Brachyscome trachycarpa F. Muell.

Smooth Daisy, Inland Daisy

PERENNIAL
20–40cm high
25–35cm wide
WHITE, MAUVE

Derivation: *trachycarpa* — rough fruit.

Slender, branching perennial with woody base and variable habit.

Distribution and habitat: Qld, NSW, Vic, SA, WA. (*B. trachycarpa* has been found halfway between Mt Ragged and Victoria Springs, but that is the first and only record of the species for Western Australia.) Occurs in grassland, open woodland and mallee. The soils vary from sands to black or grey clays.

Description: In cultivation a branching perennial with a woody rootstock. The stems bear sparse glandular hairs which are more numerous on the younger plants. **Leaves** are either linear, 1–3.5cm x 1–1.5mm, or lobed with 1–6 linear lobes. Leaves are sessile and glabrous, but may be glandular when young. **Flower-heads** are 1–2cm across, held at the tips of fine flower stems 4cm long, bearing 1–3 small entire leaves. The ray florets are white or mauve. Queensland forms have twice as many ray florets as the mallee forms. **Fruits** are brown, narrowly wedge-shaped, 1.8–2.2mm x 0.6–0.8mm, with tubercles tipped with inrolled hairs on each face. The margin is smooth, wingless, and the pappus is a ring of minute bristles. **In the wild** plants are variable. On the black soil plains of Queensland, plants are dense with an erect habit and have a permanent tuft of leaves at the base. On the lighter soils of the Gawler Ranges in South Australia, plants are taller, more open and straggling, and have no basal tuft.

Flowering period: In its natural habitat *B. trachycarpa* flowers most of the year. In cultivation it flowers from mid-spring to autumn.

Cultivation and uses: *B. trachycarpa* likes well-drained soil, a sunny open position, and extra watering in dry conditions. Protect the roots with rocks. If the roots dry out the plant will die back and shoot again from the woody taproot when the soil is moist enough. *B. trachycarpa* grows best in warm temperate climates. Group or mass this species for general planting. The habit is too untidy for containers, but plants are quite attractive in rockeries, among grasses and trailing over walls.

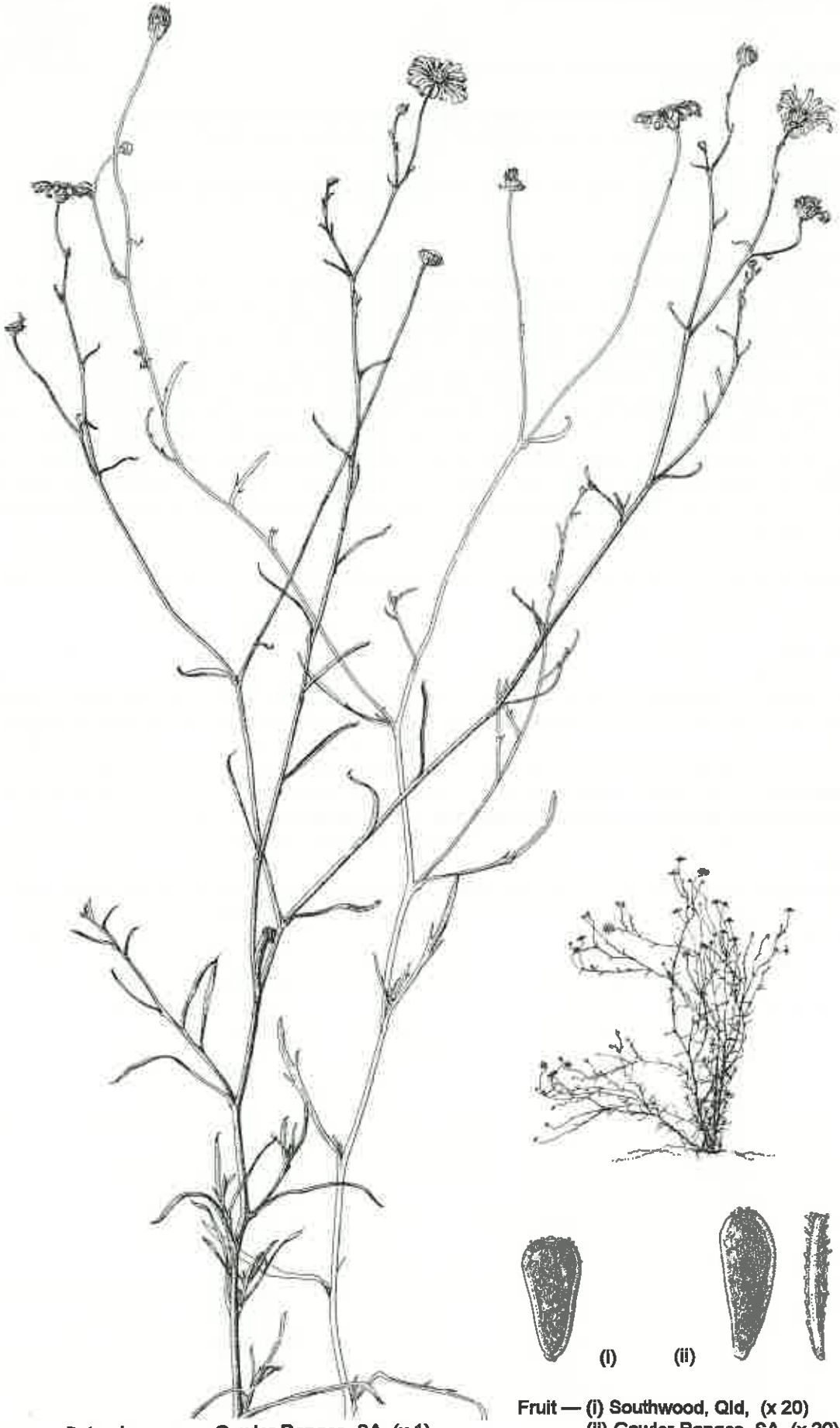
Propagation: Seed germinates moderately well in 13–30 days. It self-seeds in pots once established. Seedlings need some protection in cold weather. Also propagate from cuttings.

Forms:

- There is a form on the Nuyts Archipelago (SA) with a compact habit and thick, fleshy leaves.

Similar species: ***B. tesquorum*** is also a woody perennial with masses of small flowers, but the leaves are hairy and irregularly toothed.

Special notes: ***B. trachycarpa*** **has a chromosome number of** $n = 27$ **(Carter, 1978a). Carter observed that** ***B. trachycarpa*** **showed two levels of polyploidy, 4x and 6x, and predicted that the tetraploids would almost certainly be apomictic and have sterile pollen.**



B. trachycarpa — Gawler Ranges, SA (x 1)

Fruit — (i) Southwood, Qld, (x 20)
(ii) Gawler Ranges, SA (x 20)

Brachyscome uliginosa G. Davis

Small Swamp Daisy, Heathland Daisy

PERENNIAL
10–25cm high
5–8cm wide
WHITE, MAUVE

Derivation: *uliginosa* — growing in marshes.

Delightful little daisy which brightens the heathlands, but unsuited to horticulture. A plant for the specialist.

Distribution and habitat: Vic, SA. Occurs in swampy heathland, drier heathland and heathy woodland.

Description: **In cultivation** a small, glabrous, herbaceous perennial. **Leaves** are obovate, 4–9cm x 5–10mm, in a basal cluster. They are thin, dark green tinged red or even dark plum red where exposed to salt-laden air. The margins are usually entire though a few may be irregularly lobed. **Flower-heads,** 2–2.5cm across, have mauve or white ray florets and are held singly on relatively sturdy unbranched flower stems 10–20cm long. These stems are either naked or have 1–3 small leaves. Only 3–4 stems are sent up from each basal cluster. **Fruits** are brown, 2mm x 1.2–1.5mm, oval, flat, with smooth faces and a thick wing edged with small hairs. The pappus is white, small but obvious. **In the wild** this pretty little perennial only catches the eye when it flowers. Before it flowers, the clusters resemble the leaves of *Goodenia geniculata* with which it is associated. When it has finished flowering the basal clusters die back. The flower stems may be up to 30cm long and the heads to 3cm across. This species grows much better in its natural habitat than in cultivation, which could indicate that it benefits from a mycorrhizal association.

Flowering period: August to October in coastal heathlands, a little later inland.

Cultivation and uses: *B. uliginosa* does not respond well to cultivation. It is too small and too transitory.

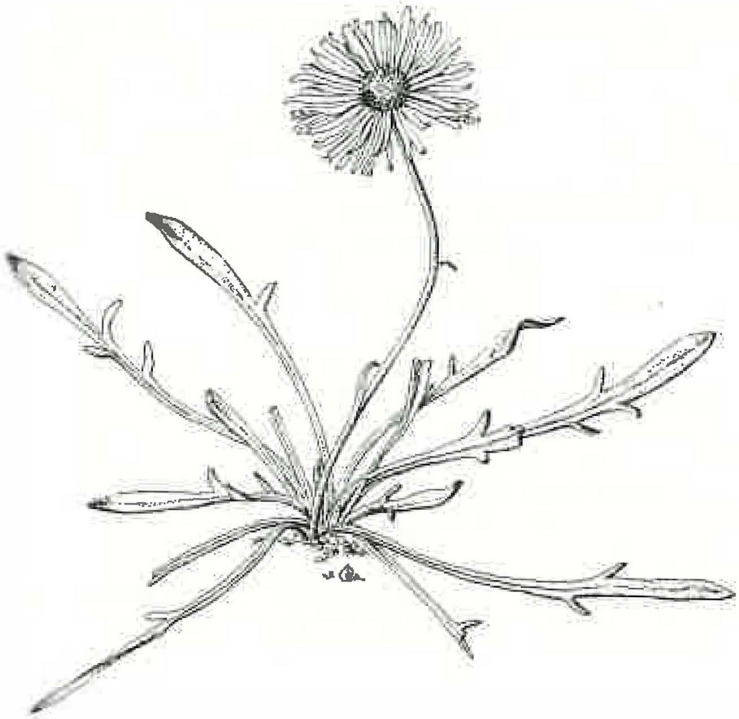
Propagation: Seed germinates in 20 days–4 months. Germination rate and percentage germination improve if seed is stored at 4°C before sowing. Summer is the best time for sowing *B. uliginosa.*

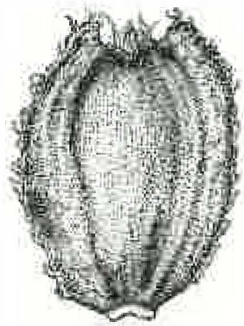
Similar species: ***B. cardiocarpa*** also grows in swamps, but it is much taller and has long grass-like leaves.

B. radicans is another swamp lover but its vigorous stoloniferous habit readily distinguishes it.

B. scapigera is said to bear a close vegetative appearance, but the leaves are all entire and the fruits are not winged. *B. scapigera* also forms solid clumps while *B. uliginosa* grows as small, single clusters.

Special notes: ***B. uliginosa*** **has a chromosome number of** $n = 9$ **(Smith-White *et al.*, 1970).**





B. uliginosa — Edenhope, Vic (x 1)

Fruit — Anglesea, Vic (x 20)

Brachyscome whitei G. Davis

Spreading Daisy

ANNUAL
15–20cm high
30–35cm wide
MAUVE, PINK

Derivation: *whitei* — after C.T. White (1890–1950), Government Botanist in Queensland from 1917 until his death.

Attractive annual with pale green leaves and unusual 'white-eyed' flower-heads at the tips of ascending stems.
Habit and form are better in the wild than in cultivation.

Distribution and habitat: Qld, NSW. Occurs on red sandplains, on sand dunes and in open woodland.

Description: In cultivation a weak hairy annual with branching slender stems. Hairs on the stems vary from a few glandular hairs to many septate hairs. **Leaves** are soft, thin and occur at the base and along the ascending stems. Basal leaves are 3.5–7cm x 0.8–1.5cm, stalked, wedge-shaped or elliptical. The margins are deeply lobed or toothed at the apex. Basal leaves are sparse in cultivation. The stem leaves are similar in shape, but diminish in size up the stem. Near the head, leaves may be bract-like and stalkless. Leaf surfaces vary in degree of hairiness. **Flower-heads,** 2–3cm across, are held on flower stems 8–25cm long. Heads open white and develop colour later. The distinctive white ring around the disc centre and the number of ray florets (30–50) make this a very attractive flower-head. **Fruits** are black, 1.5–1.8mm x 1–1.5mm, obovate and thickened. Large tubercules on the body converge to present a bladder-like appearance. Long white inrolled hairs are present on the tubercles. The wing is broad, papery and often has transverse markings. Long inrolled hairs fringe the edge of the wing. The pappus is conspicuous and longer than the notch between the wings. **In the wild** *B. whitei* only reaches a height of 15cm. The relatively large heads are held neatly above a conspicuous cluster of pale green foliage to make this an outstanding plant.

Flowering period: It flowers from late winter to spring in its natural habitat, but in temperate climates it flowers from late spring to mid-summer.

Cultivation and uses: *B. whitei* has proved difficult to grow in temperate climates. Plants are hard to propagate, short-lived and the habit is untidy. It should be trialled in hot areas because there is no doubt it is an attractive species. The Study Group should persevere with it.

Propagation: Seed germinates in 1–6 months, but germination percentages are low. Seed is shed quickly and should be collected when only a few black fruits are seen in the head.

Similar species: *B. whitei* is unlikely to be mistaken for any other brachyscome. The fruit has a very distinctive appearance — quite different from that of any other species.

Special notes: *B. whitei* has a chromosome number of $n = 5$ (Smith-White *et al.*, 1970; Watanabe and Short, 1992).

B. whitei — Enngonia, NSW (x 1)

Fruit — Enngonia, NSW (x 20)

Brachyscome xanthocarpa D. Cooke

ANNUAL
10–12cm high
2–5cm wide
WHITE, MAUVE-PINK

Derivation: *xanthocarpa* — yellow fruit.

A tiny annual with white or mauve-pink flower-heads and lobed leaves.

Distribution and habitat: SA. This species has a very restricted distribution on the central Eyre Peninsula. It occurs in small colonies on sand dunes or under mallee scrub in limestone soils.

Description: In cultivation an erect or ascending annual herb to 12cm high. Stems are few, branch from the base and usually become reddish. Hairs are present but decrease in number up the stem. **Leaves** are oblanceolate at the base, lobed or with entire margins, 0.5–2cm x 1–5mm, glabrous above and hairy beneath. The basal leaves soon wither. Stem leaves are few, pinnate, 4–8mm x 1–5mm, decreasing in size up the stem. **Flower-heads** are 1cm across and have fine white or pale mauve-pink ray florets. Relatively long flower stems, 4–8cm long, are usually naked but may have one tiny leaf on the upper half. **Fruits** are wedge-shaped, 1.5–2mm x 0.5–0.7mm, with a smooth pale green margin. The faces have central depressions covered with large yellow tubercles, the apical one bearing a few stiff hairs. The pappus is obvious, white, with uneven bristles. **In the wild** *B. xanthocarpa* grows sparsely in scattered colonies. It is short-lived and sheds its seed quickly.

Flowering period: Spring.

Cultivation and uses: This species is poorly known in cultivation and has no horticultural potential. It has been grown to the flowering stage in cultivation, but plants proved susceptible to over-watering. It is adequately protected in the Hincks Conservation Park, but survival outside the park cannot be guaranteed.

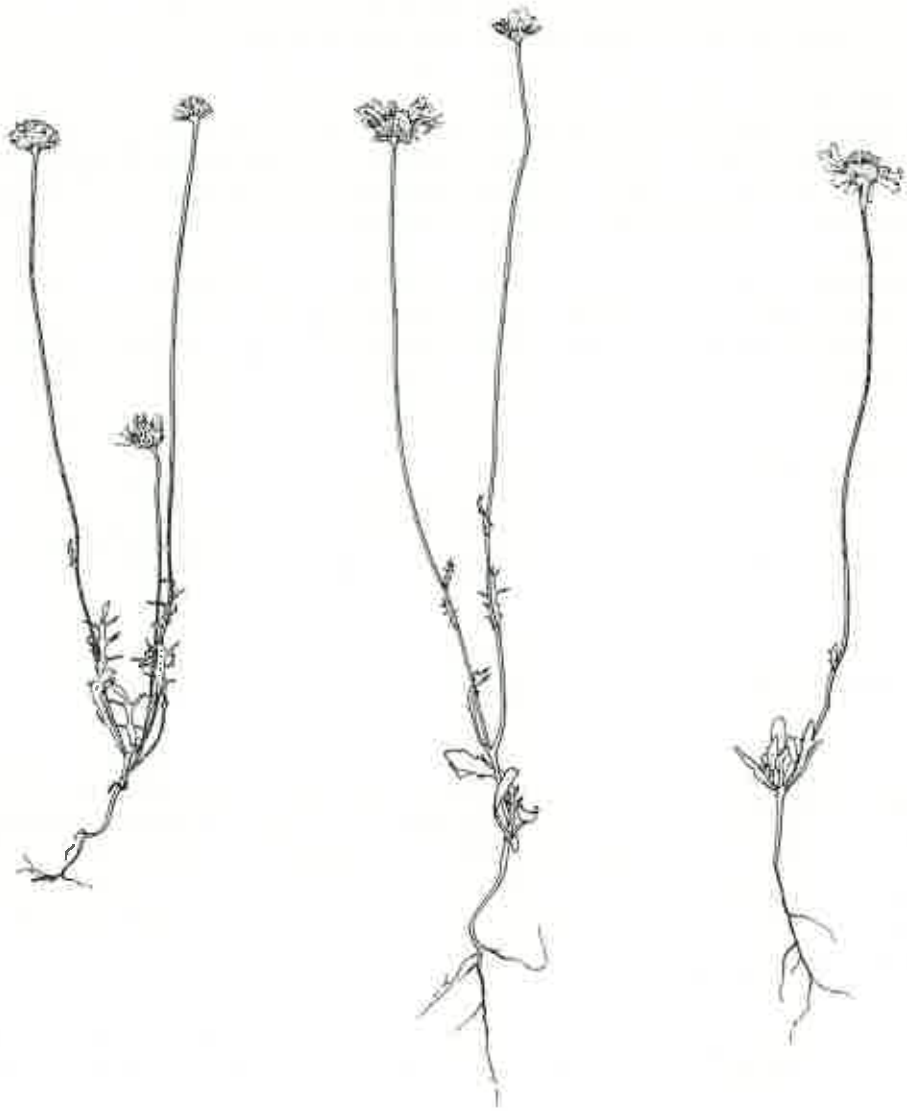
Propagation: Seed germinates in about 40 days, but the percentage germination is poor and seed is not available.

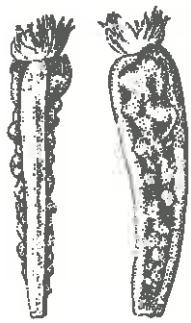
Similar species: ***B. breviscapis*** is a small annual occurring along the western coast of the Eyre Peninsula. It differs from *B. xanthocarpa* in that the flower-heads are inconspicuous, having very short ray florets less than 1mm. The fruits have long inrolled hairs along the margin.

B. exilis grows in a similar habitat on Eyre Peninsula. It is of comparable height and has white ray florets, but the fruit does not have an obvious pappus. When it is mature the fruits are reflexed on the receptacle, unlike those of *B. xanthocarpa* which are quickly shed.

B. goniocarpa also grows in this area and is another tiny white daisy, but the fruits are retained in the head for a long time. Individual fruits are black and angular in shape, and the stellate pappus is set obliquely.

Special notes: In botanical journals the ray florets are described as 'white to lilac'. Only white ray florets have been observed by Study Group members, although a few plants had pale pink buds. It is possible that the ray florets of these specimens have changed colour when dried.





B. xanthocarpa — Eyre Peninsula, SA (x 1)
Fruit — Eyre Peninsula, SA (x 20)

[Illustrated from ADSG Herbarium]

Brachyscome sp. (Darling Downs)

Parsley-leaf Daisy

PERENNIAL
25–35cm high
25–50cm wide
PINK

A dainty perennial producing masses of pink flower-heads which fade with age and hot weather. To date this species has not been described in a botanical journal.

Distribution and habitat: Qld. Occurs in the Darling Downs district. Collections have been made by Study Group members from the Barakula Forest which is north of Chinchilla, from west of Dalby, and near Billa Billa Station between Moonie and Goondiwindi. There are herbarium specimens of the same species collected from the Bybera, Inglewood and Milmerran districts. Grows in red soils on ridges under acacias, casuarinas and eucalypts, and on roadside verges.

Description: In cultivation a dense, rounded perennial with upright, branching glabrous stems. **Leaves** are glabrous, petiolate, 1.5–5.5cm x 1–2cm, pinnatisect with 4–6 blunt lobes, each lobe 10–15mm x 2–5mm. The petiole is narrow and 2–2.5cm long. **Flower-heads** are 1.5–2.5cm across, held singly on flower stems 12–22cm long, which may be naked or have one entire leaf near the base. The buds are pink; the ray florets are pink or white with pink reverses, which often gives a pink tinge to the head. The ray florets may fade in hot weather. **Fruits** are black, obovate, 1.2–1.5mm x 0.8–1mm, slightly swollen, with tuberculate faces. The tubercles are tipped with inrolled hairs. The margin is smooth and black and edged with a number of similar hairs. As the fruit matures there are fewer hairs present. The pappus is a ring of very short bristles. **In the wild** this species is very distinctive with its long, stiff flower stems and bright pink heads. It grows under some overhead cover and forms little bushes 30cm high.

Flowering period: In cultivation this entity flowers throughout the year in subtropical climates. It flowers from spring to autumn in cool temperate climates.

Cultivation and uses: This unnamed species has only been trialled since 1990. It has proved most amenable to cultivation, growing and flowering in profusion in morning sun or dappled shade, and in moist well-drained soils. Plants grow quickly and need to be pruned often to keep the flowers developing and to maintain a neat habit. It is suitable for subtropical to cool climates, but has not been trialled in cold climates. This is an excellent species for gardens, planted singly or in groups. It makes a pretty container plant.

Propagation: Seed germinates in 7–20 days. Soaking seed overnight in water has resulted in excellent germination. Seed is produced in abundance. Also propagate from cuttings.

Similar species: ***B. microcarpa*** is closest to *B.* sp. (Darling Downs) and has been confused with it in the past. The fruits are very similar in appearance and size, but *B. microcarpa* has a slightly longer pappus. Other distinguishing characters are that the leaves and stems are hairy to some degree, the leaves are pinnatifid rather than pinnatisect, and the heads are usually mauve or white rather than pink.

B. multifida* var. *multifida is also a perennial with black, tuberculate fruit and it occurs in the same area as *B.* sp. (Darling Downs). It differs in that the fruit is much larger (2–2.5mm x 0.8–1mm) and the pinnatisect leaves have narrow-linear lobes.

Special notes: To date no chromosome number determination has been made on this entity. In members' gardens it has been observed to cross readily with other species.

B. sp. (Darling Downs) — Barakula Forest, Qld (x 1) Fruit — Moonie Highway, Qld (x 20) leaf shapes

Comparison of Species in the *Brachyscome aculeata* Complex

Species	Distribution	Plant Size	Basal Leaf Cluster	Flower-head Size	Flower-head Colour	Involucral Bracts	Features
B. aculeata	QLD, NSW, ACT, VIC	30–60cm x 10–30cm	not persistent	2–4cm	white	elliptical, glandular, outer bract tips acute, inner tips obtuse	suckers in cultivation, stems glandular-hairy,
B. cuneifolia	SA	15–30cm x 10–20cm	persistent	2–3cm	white (pink rarely)	elliptical or oblanceolate, almost glabrous, tips obtuse	suckers, lower stems almost glabrous, very short pappus
B. aff. *cuneifolia*	VIC	20–30cm x 15–30cm	not persistent	2–3.5cm	white	oblanceolate, sparsely glandular, tips obtuse	spreads slowly by suckering, lower stems almost glabrous
B. sieberi var. *gunnii*	TAS	15–30cm x 10–20cm	not persistent	2.5–3.5cm	white	lanceolate, glandular, broad scarious margin, tips acute	stems branch frequently, stems glandular-hairy
B. spathulata subsp. *spathulata*	QLD, NSW, ACT, VIC	15–60cm x 10–20cm	persistent	2–4cm (to 5cm)	mauve, (white, pink rarely)	narrow lanceolate, very glandular, tips acuminate	suckers slowly, stems glandular-hairy
B. spathulata subsp. *glabra*	TAS	15–30cm x 5–20cm	persistent	2–4cm	mauve (white rarely)	narrow linear, very glandular, tips acuminate	suckers slowly, lower stems almost glabrous

Dimension in brackets represents infrequent maximum

Comparison of Alpine Brachyscomes

Species	Habit	Leaf Size	Leaf Margin	Flower-head Size	Flower-head Colour	Flower Stem Length	Flower Stem Leaf No.	Fruit Size	Fruit Pappus	Fruit Wing	Features
B. aculeata	suckers	1–6cm x 1–10mm	toothed or lobed near apex	2–4cm	white with mauve or pinkish reverses	15–30cm	3–4	3–4mm x 2–3mm	present	present	glandular stems, basal leaf cluster not persistent
B. decipiens	flat rosette	5–10cm (to 20cm) x 1.5–3cm	entire or toothed	2–3.5cm	white mauve	10–20cm	0–1	3–4mm x 1.3–1.8mm	very short	absent	limp leaves, hollow stems
B. graminea	runners	1–15cm x 1–10mm	entire or 1–2 blunt lobes (rarely)	1.5–2cm	mauve white	5–8cm	1–2	2mm x 1.5mm	minute or absent	absent	blunt leaves
B. nivalis	tuft, suckers	5–15cm x 1–2cm	pinnate or bipinnate	2–4cm	white or blue (rarely)	15–30cm	0–3	2–3mm x 1–2.5mm	present	present	divided leaves
B. obovata	erect tuft	5–15cm (to 25cm) x 2–7mm	entire	2–3cm	white with mauve reverses	10–30cm	4–6	2–2.5mm x 1–1.5mm	short	absent	usually grows in water
B. radicans	vigorously stoloniferous	5–10cm (to 15cm) x 2–8mm	entire or irregularly lobed	2–2.5cm	white mauve pale pink	7–11cm	1–2	2mm x 0.8mm	present	present	spreads rapidly and can grow in water
B. rigidula	bushy perennial, may layer	1–2cm (to 3cm) x 1–1.5cm	pinnate	2–3.5cm	white mauve pink	2–12cm	0–2	2.2–3mm x 1–2mm	present	present	habit and leaves like *B. multifida*
B. scapigera	dense tuft	6–15cm x 0.5–1.5cm	entire	2.5–3cm	white mauve	15–30cm	0–2	2–3mm x 0.8–1.2mm	minute	absent	dead leaves persist at base
B. spathulata subsp. *spathulata*	basal leaf cluster, suckers	1–10cm x 1–3cm	lobed, uppermost entire	2–4cm (to 5cm)	mauve (white, pink rarely)	10–25cm (to 60cm)	variable	2–4mm x 1.2–1.8mm	present	present	basal leaf cluster persists for some time
B. spathulata subsp. *glabra*	basal leaf cluster, suckers	1–6cm x 2–10mm	lobed or toothed	2–4cm	mauve (white rarely)	7–25cm	7–17	2.5–3mm x 2–2.2mm	present	present	basal leaf cluster persists for some time
B. stolonifera	spreads by stolons	2–5cm x 1–2mm	entire	2–4cm	white (pink rarely)	4–7cm	0–1	2mm x 1mm	present	absent	all characters small except head
B. tadgellii	neat clump, suckers	4–5cm (to 8cm) x 2–6mm	entire or irregularly lobed	2.5–3cm	white	12–20cm	3–9	2–2.2mm x 1.8–2mm	present	present	dense tuft
B. tenuiscapa var. *tenuiscapa*	small rosette, suckers	2–3cm x 5–10mm	toothed	2–3cm	white mauve	8–22cm	1–13	1.5–2.2mm x 0.8–1.3mm	short	absent	leafy flower stem

Dimensions in brackets represent infrequent maxima

Comparison of Species in the *Brachyscome dentata* Complex

Species	Distribution	Annual or Perennial	Plant Size	Flower-head Size	Flower-head Colour	Fruit Size	Fruit Features
B. chrysoglossa	NSW*, VIC*	perennial	20–30cm x 30–50cm	1.5–2cm	yellow	2–2.5mm x 1.5–2mm	brown fruit, hairs on body, irregularly lobed wing
B. curvicarpa	QLD, NSW	annual	15–25cm x 20–50cm	2–2.5cm	white, mauve	1.8–2.2mm x 1.5–2mm	black fruit, hairs on body, wings folded inwards
B. aff. *curvicarpa*	QLD*	annual, perennial	20–30cm x 10–30cm	1.5–2cm	yellow	1.8–2mm x 1.5–2mm	brown fruit, hairs on body, wings folded inwards
B. dentata	QLD, NSW, ACT, VIC, SA, NT	perennial	15–50cm x 10–50cm	2.5–3.5cm	white, yellow fading to white	2.5–4mm x 2–3mm	brown fruit, large finger-like tubercles on body, irregularly and deeply lobed wing
B. papillosa	NSW	perennial	30–40cm x 30–50cm	2–2.5cm	white, mauve	2.5–3.5mm x 2–3mm	brown fruit, large leaf-like tubercles on body, entire or undulating wing
B. tetrapterocarpa	QLD	annual	20–35cm x 20–35cm	1.5–2.5cm	white	2.5–3mm x 2mm	pale to dark brown fruit, four wings

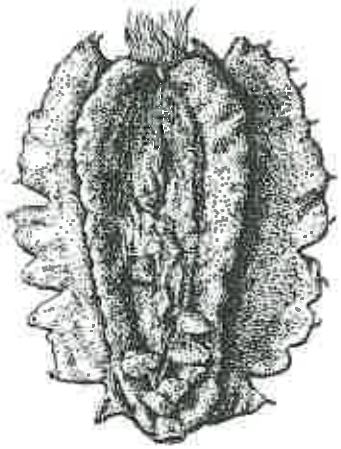
* distribution may change following revision

Comparison of Species in the *Brachyscome diversifolia* Complex

Species	Distribution	Plant Size (height x width)	Stem Leaves Length	Flower-head Diameter	Flower Stem Length	Fruit Size	Pappus Shape and Placement	Chromosome Number Determination
B. diversifolia var. *diversifolia*	NSW, ACT, VIC TAS, SA	10–50cm x 20–50cm	1–4cm	1.5–6.5cm	10–30cm	2–3mm x 0.8–1.5mm	upright, oblique	polyploid, base chromosome number $x = 4$, $n = 16$, $2n = 24$
B. diversifolia var. *maritima*	TAS	40–50cm x 40–60cm	2–8cm	2.5–4.5cm	10–15cm	2–3mm x 0.8–1.5mm	upright, oblique	not determined
B. diversifolia var. *dissecta*	QLD, NSW	35–45cm width unknown	unknown	approx. 2.5cm*	unknown	unknown	—	$n = 4$
B. goniocarpa	VIC, SA, WA	3–6cm x 2–5cm	0.5–1.5cm	4–6mm	2–3cm	1.5mm x 0.8–1mm	stellate, oblique	$n = 4$, $2n = 8$
B. gracilis	NSW, VIC	10–20cm x 8–30cm	1–4cm	1.5–2.5cm	8–18cm	1–2mm x 0.8–1mm	upright, central	$2n = 8$
B. aff. *gracilis*	VIC	20–25cm x 35–50cm	1–4.5cm	2–3.5cm	20–25cm	1.5–1.8mm x 0.8–1mm	stellate, central	$2n = 24$
B. nodosa	QLD, NSW	10–15cm x 20–25cm	2–4cm	2–2.5cm	5–18cm	1.5–2mm x 1.8–2mm	stellate, oblique	$2n = 6$
B. readeri	NSW, VIC, SA	10–25cm x 20–25cm	1–8cm	1.5–2.5cm	5–20cm	1.5–2mm x 1mm	stellate, central	$n = 5$, $2n = 10$

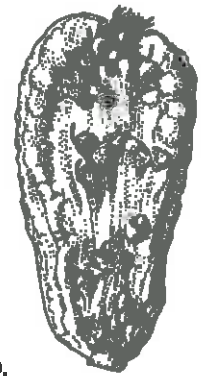
* refers to dimensions cited in the literature

B. angustifolia var. *angustifolia*



B. angustifolia var. *heterophylla*
(Tea Gardens, NSW)

a.



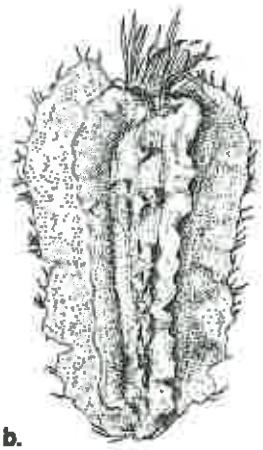
b.

B. angustifolia forms
a. (Barrington Tops, NSW) b. (Schutts Track, NSW)

Brachyscome angustifolia complex (x 20)

B. formosa

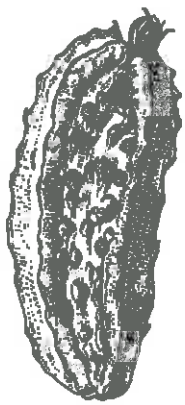
a.



b.

B. aff formosa Entity 1
a. Sydenham Inlet, Vic b. Moondarra Dam, Vic

a.



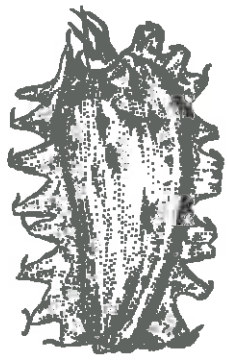
b.

c.

B. aff. formosa Entity 2
a. Mt Stanley, Vic b. Warby Range, Vic c. Neville, NSW

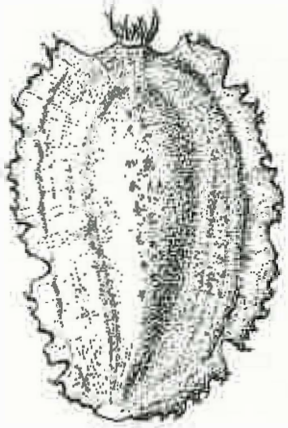
B. procumbens
Mt Kaputar, NSW

a.



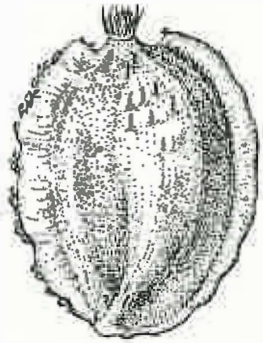
b.

B. procumbens forms
a. Tia Falls, NSW b. Diamond Head, NSW

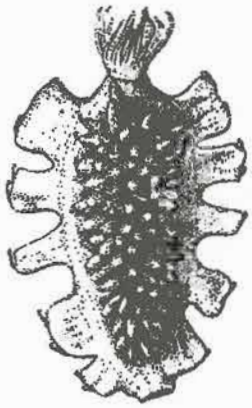


B. chrysoglossa

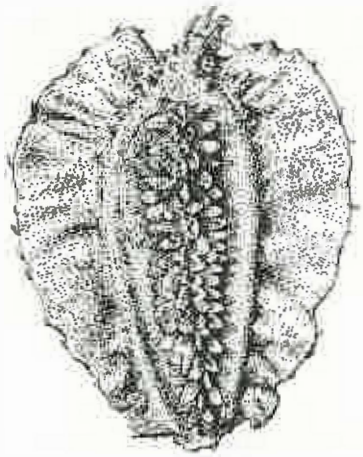
B. curvicarpa



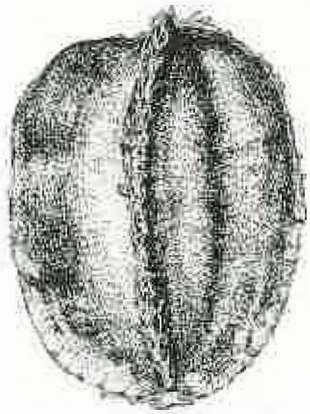
B. aff. curvicarpa



B. dentata



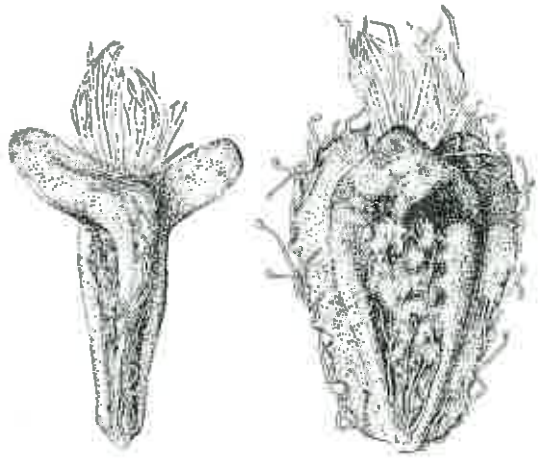
B. papillosa



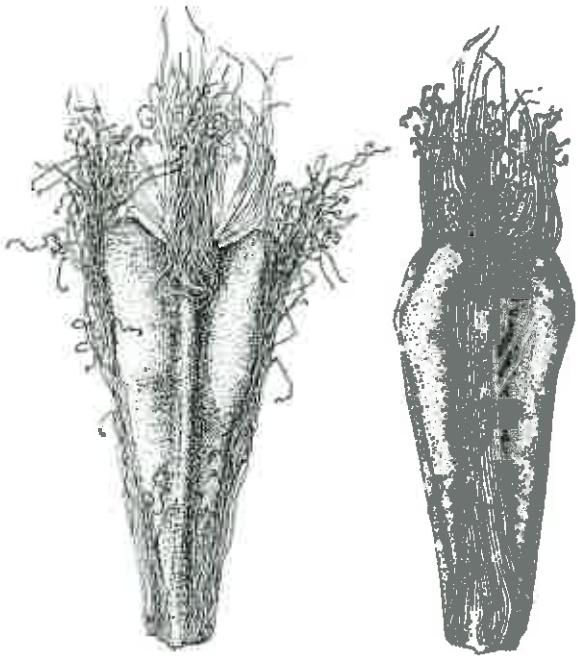
B. tetrapterocarpa

Brachyscome dentata complex (x 20)

Brachyscome oncocarpa complex (x 20)

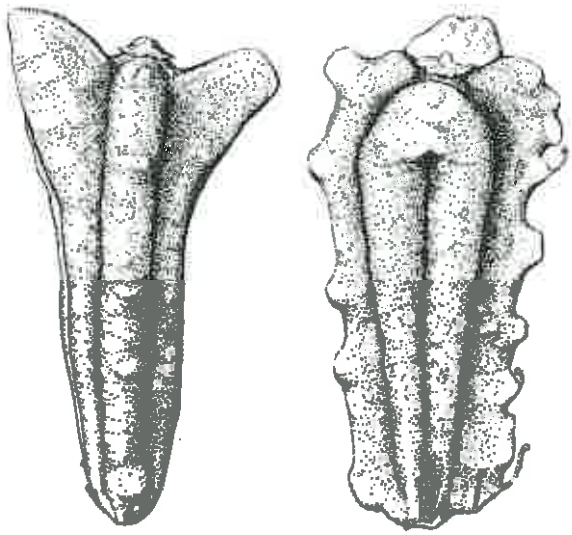


B. cheilocarpa

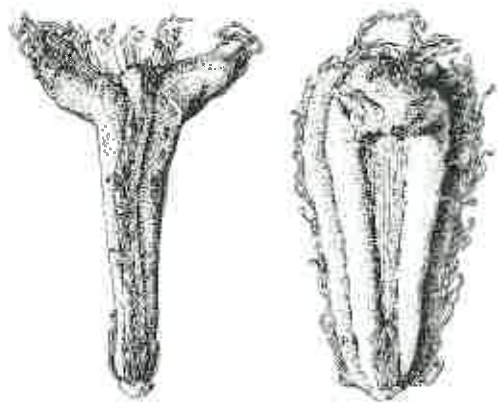


B. ciliocarpa (WA)

B. ciliocarpa (eastern Australia)



B. halophila



B. oncocarpa

Brachyscome Cultivars

Many brachyscome cultivars are now available in nurseries. The profusion of flower-heads allied with the long flowering period has stimulated great interest in these cultivars. Some have arisen as chance seedlings in gardens, some have been produced as attractive by-products in experimental hybridizations, and some have been bred in Australia and overseas for colour, flower size, habit and increased reliability. The genus lends itself to such activities because many species hybridize with surprising ease. New cultivars are appearing continually. Brief descriptions of those currently available are listed below.

***Brachyscome* 'Amethyst'** — see *B. multifida* 'Amethyst'

Brachyscome 'Blue Haze' PVR

(*B. angustifolia* x *B. multifida* 'Breakoday')

Compact, low growing plant (15–20cm x 35–50cm) with blue-mauve flowers, 2.5–3.5cm across, from spring to early winter. Foliage is intermediate between *B. angustifolia* and *B. multifida*. *B.* 'Blue Haze' is slower growing and not as vigorous as *B. multifida* and does not perform as well in gardens. Not suitable for subtropical conditions. Prefers a warm, sunny situation and does well in hanging baskets. Originated from a breeding program undertaken in Australia.

Brachyscome 'Betty Campbell'

[*B. angustifolia* var. *heterophylla* (nursery origin) x *B. formosa* (Pilliga Posy)]

Handsome, low growing perennial (15–20cm x 40–60cm) which spreads by suckering. Pale pinkish mauve flower-heads, 2.5–3cm across, from spring to autumn. Foliage is intermediate between the two parents. Moist, well-drained conditions in sun or dappled shade are most suitable. May die back during long dry periods but shoots again when the soil is moist. An attractive plant for gardens, hanging baskets or containers. Arose from experimental hybridizations carried out by the Study Group to explore the relationship between *B. angustifolia* and *B. formosa*. *B.* 'Betty Campbell' was named in memory of a Study Group member who made a great contribution to the Group as a botanical illustrator.

***Brachyscome* 'Bright Eyes'** — see *B. multifida* 'Bright Eyes'.

***Brachyscome* 'Breakoday'** — see *B. multifida* 'Breakoday'.

Brachyscome 'Happy Face'

(*B. formosa* 'Pilliga Posy' x *B. segmentosa* seedling)

Dense, compact plant (15–20cm x 25–30cm) with intense, purple-pink flowers, 3.5–4.5cm across, from spring to winter. Attractive, rich green foliage occasionally tinged purple due to anthocyanin, which is also present in its parent, *B. formosa*. May not be suitable for subtropical conditions. Prefers good drainage in well composted soil to which nutrients have been added. Plant in dappled shade in gardens or tubs. Originated from a breeding program in Australia.

Brachyscome 'Just Jayne' PVR

[*B. angustifolia* var. *heterophylla* x *B. multifida* (white Barakula Queensland form)]

Compact perennial (15–20cm x 30–50cm) which spreads by suckering. The leaves are mid-green, deeply divided with narrow lobes. Flower-heads are white to very pale pink and are 2.5–3cm across. 'Just Jayne' prefers moist, well-drained soil in sun or dappled shade. It is suitable for subtropical climates where the peak flowering period is autumn and an easterly aspect is preferred. This plant is prone to suffer from iron deficiency. Treat with iron chelates. It makes an attractive rockery plant or small ground cover. This cultivar arose as a chance seedling in a garden south of Brisbane.

Brachyscome 'Lavender Mist' PBR application
(described as a selection of *B. ascendens*)

Dense ground-covering perennial (25–30cm x 0.5–1m) with erect and ascending stems. The leaves are deep green with toothed margins. Flower-heads are 3–4cm across, dark to mid-mauve, produced on long stems for most of the year. The heads remain open at night as they do in *B. ascendens*, the species from which this cultivar was derived. 'Lavender Mist' appears easy to grow in most climates, is suitable for sunny situations or dappled shade and is frost tolerant. Royalties for plants purchased have been donated to the Australian Network for Plant Conservation (ANPC) for research into endangered plants.

Brachyscome 'Lemon Drops' PVR
[*B.* aff. *curvicarpa* x *B. multifida* (low compact white form)]

A reasonably compact, low growing plant (15–20cm x 40–50cm) with lemon flowers, 2–2.5cm across, from spring to early winter. Foliage is closer to that of *B.* aff. *curvicarpa* than to *B. multifida*. *B.* 'Lemon Drops' is fast growing and performs well in elevated inland climates. It may not be suitable for subtropical conditions. Plant in sunny, warm situations in gardens, tubs and hanging baskets. Originated from a plant breeding program carried out in Australia.

Brachyscome 'Lemon Twist' PBR
(*B.* aff. *curvicarpa* x *B. multifida* var. *dilatata*)

Dense, low, compact plant (15 x 40–50cm) with strong lemon-coloured flowers from spring to early winter. Foliage is intermediate between *B.* aff. *curvicarpa* and *B. multifida* var. *dilatata*. Much hardier than *B.* 'Lemon Drops' in both cooler and warmer climates. Plant in sun to dappled shade in gardens, tubs and hanging baskets. 'Lemon Twist' was derived from a plant breeding program carried out in Australia.

Brachyscome 'Maureen'
[*B. angustifolia* var. *heterophylla* (mauve-pink, nursery origin) x *B. formosa* 'Pilliga Posy']

Charming perennial (15–20cm x 30–60cm) which spreads by suckering. Foliage is closer to *B. angustifolia* var. *heterophylla* than to *B. formosa* 'Pilliga Posy'. Vibrant pink flower-heads, 2–3cm across, appear from spring to autumn. This cultivar grows well in temperate and elevated inland climates but has not been trialled in subtropical areas. Best conditions for 'Maureen' are moist, well-drained soils in part sun or dappled shade. Arose from experimental hybridization carried out by the Study Group to examine relationships between species. *B.* 'Maureen' is named for the founder of the Australian Daisy Study Group.

Brachyscome 'Pink Happy Face' PVR
(*B. formosa x B. segmentosa* seedling)

Dense, compact plant (15–20cm x 30–40cm) with large, mauve-pink flowers, 3.5–5cm across, from spring to early winter. Attractive, large, mid-green foliage is closer to that of its parent *B. formosa*. Prefers good drainage in well composted soil to which nutrients have been added. Plant in dappled shade in gardens or tubs. Originated from a plant breeding program carried out in Australia.

Brachyscome 'Pink Haze' PVR
[*B. multifida* var. *dilatata* x *B. multifida* (low compact white form)]

Dense, low, compact plant (10–15cm x 50–75cm) with mauve-pink flowers in profusion from spring to early winter. Typical *B. multifida* foliage. Much hardier than other pink-flowered *B. multifida* types. Performs well in subtropical and elevated inland regions. In subtropical districts it grows better in semi-shade than in full sun. Makes an excellent ground cover and is suitable for hanging baskets. Arose from a plant breeding program carried out in Australia.

Brachyscome 'Strawberry Mousse' PVR
(thought to be *B. angustifolia* x *B. formosa*)

Dense low growing perennial (10–15cm x 0.6–1m) with large, bright pink flower-heads, 3–4cm across, from spring to autumn. Spreads by suckering. Leaves are spoon-shaped with deeply lobed margins. It is recommended for temperate and inland climates, but it is not reliable in subtropical areas. *B.* 'Strawberry Mousse' grows well in full or part sun in well-drained soil, and tolerates moderate frosts. This cultivar makes a good ground cover and is attractive in containers and hanging baskets. Arose as a chance seedling in a nursery in southern Victoria.

Brachyscome 'Sunburst' PVR

Compact perennial (30–35cm x 50–60cm) with bright green lobed leaves closer to those of *B. segmentosa*. Yellow-brown buds open to yellow daisies, 2.5–3cm across, which fade to cream. The effect of the three colours on the plants is most attractive. *B.* 'Sunburst' flowers throughout the year although most flowers are produced in the warmer months. Regular trimming maintains the compact habit. This cultivar grows well in subtropical and inland climates. *B.* 'Sunburst' arose as a chance seedling in the garden of a Study Group member in a suburb south of Brisbane.

Brachyscome 'Toucan Tango' (Commercial synonym: 'Ultra') PVR
(*B. rigidula* x *B. multifida* seedling)

Neat dense perennial (10–15cm x 15–20cm) with violet-blue daisies, 2.5–3cm across, which fade with age. It flowers from late winter to late autumn. Plants are moderately frost tolerant. In subtropical districts this cultivar grows well for some months but may succumb to fungal attack. This cultivar originated from breeding trials in Germany.

Brachyscome 'Valencia' ACRA
(thought to be *B. angustifolia* var. *heterophylla* and *B. segmentosa*)

Attractive perennial (20–30cm x 40–80cm) with large mauve-pink daisies, 2.5–5cm across, from spring to autumn. *B.* 'Valencia' grows best in moist well-drained soil in full sun or dappled shade. It will grow in shade but then does not flower so prolifically. It has been trialled in most climates and seems to be reliable in all. This cultivar is recommended for the garden or for hanging baskets. *B.* 'Valencia' arose as a chance seedling in a Study Group member's garden south of Brisbane.

N.B. Members living in subtropical areas have suggested that many of the above cultivars should be regarded as annuals in their climate, notably those with *B. angustifolia* or *B. multifida* in their parentage, Cuttings strike easily over the warmer months and are then ready to be planted out in autumn.

Glossary

Achene: a dry, one-seeded fruit which does not open to disperse its contents
Acuminate: tapering gradually to a point. Fig. 7A
Acute: sharply pointed, the tip angle less than 90 degrees. Fig. 7E
Agamospermy: (adj. agamospermous) reproduction which occurs without fertilization (excluding vegetative reproduction).
Alpine: above an elevation of 1800-2200m. Above the snow gums, where snow lies on the ground for more than 4 months of the year.
Annual: a plant which completes its life cycle within twelve months.
Anthocyanin: a water soluble pigment often present in plant cells. Anthocyanin is capable of producing purple colouration in leaves, stems and flowers.
Apical: of the apex or attached at the apex or top.
Apomixis: (adj. apomictic) reproduction which occurs without fertilization (including vegetative reproduction).
Ascending: spreading horizontally, then curving upwards. Fig. 3A
Axil: the angle between 2 structures e.g. the leaf and the stem which bears it.
Basal cluster: attached or grouped at the base.

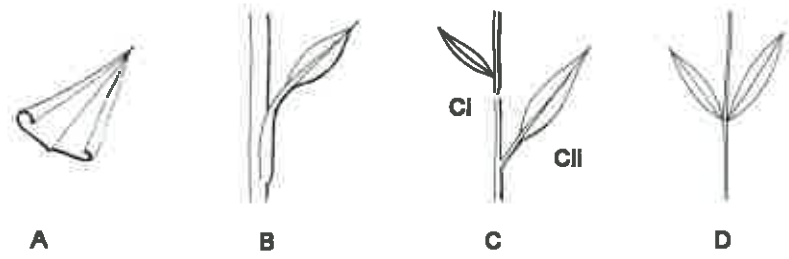


Fig. 2. Leaf margins and leaf arrangements. A, inrolled; B, decurrent; C, alternate (i, sessile; ii, petiolate); D, opposite.

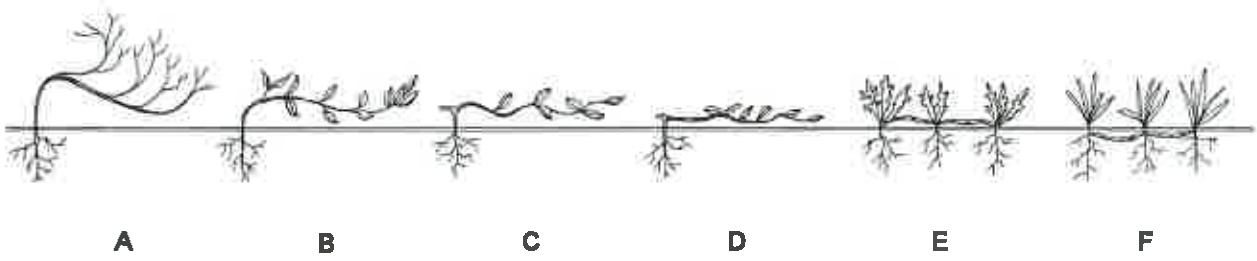


Fig. 3. Plant growth forms. A , ascending; B, decumbent; C, procumbent; D, prostrate; E, stoloniferous; F, rhizomatous.

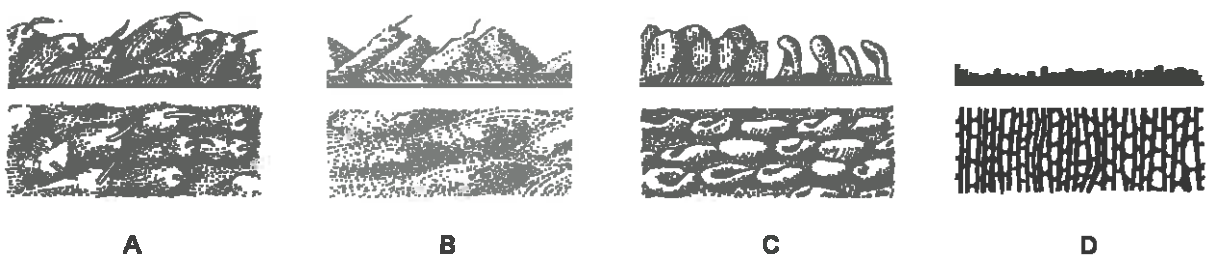


Fig. 4. Fruit Surface patterns. A, tuberculate ; B, tuberculate; C, leaf-shaped tubercles (as in *B. papillosa*); D, tessellations (as in *B. iberidifolia*).

Bifid: divided in two, usually for about half the length. Fig. 8E
Biosystematics: classification of plants through the study of the form, growth and hybridization of living populations, under both natural and artificial environments.
Bipinnate: describing a pinnate leaf having the primary leaflets further divided into pinnae. Fig. 6G
Biseriate: arranged in 2 rows or whorls.
Blade: the flattened part of the leaf.
Bract: a modified leaf at the base of a flower-head or flowering structure.
Bristle: a straight stiff hair (smooth or with minute teeth).
Calcareous: having a high proportion of free limestone.
Cauline: borne on the aerial part of the stem cf. radical.
Chromosome: a thread-like structure in the nucleus of cells which carries the genetic information.
Chromosome number: the number of chromosomes in the nucleus of a cell. See Meiosis.
Complex: a related group.
Confluent: blending together.
Conspecific: belonging to the same species.
Cotyledons: the primary leaves of an embryo, becoming the seed leaves.
Cuneate: wedge-shaped. Fig. 5J
Cytodeme: a population differing in some distinctive cytological feature from other populations.
Cytology: the study of cells.
Decaploid: having 10 basic sets of chromosomes.
Decumbent: having branches growing horizontally but turning up at the ends. Fig. 3B
Decurrent: describing the base of the leaf when it is prolonged down the stem as a narrow wing or raised ridge. Fig. 2B
Depauperate: impoverished.
Dimorphic: of two different kinds (in respect to shape and/or size) usually of leaves or fruit.
Diploid: having 2 basic sets of chromosomes. This is the normal complement which is referred to as *2n*.
Disc floret: a small, one-seeded tubular flower. Fig. 1C
Dissected: deeply divided, cut into many segments.
Divided: refers to leaves which have lobes or segments.
Dorsal: the back, away from the central axis, or related to the back, outer or upper surface.
Eglandular: without glands.
Elliptic: shaped like a flattened circle. Fig. 5D
Endemic: confined to a particular geographical area in its natural occurrence.
Entire: having a smooth margin. Fig. 6A
Entity: a unit, single being or taxon.
Ephemeral: short-lived, responding to advantageous conditions.
Fertilization: the fusion of male and female cells in sexual reproduction.
Fibrous: in reference to root systems, having numerous fine roots.
Filiform: thread-like.
Fruiting head: a receptacle holding fruit.
Gene: a self-duplicating segment of a chromosome which determines one or more characters of an organism.
Gene pool: a collective term for all the genes of a particular population.

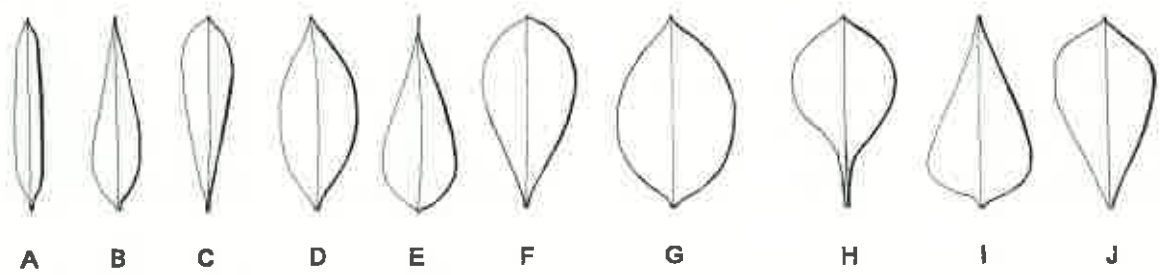


Fig. 5. Leaf shapes. A, linear; B, lanceolate; C, oblanceolate; D, elliptic; E, ovate; F, obovate; G, orbicular; H, spathulate; I, obcuneate; J, cuneate.

Genetic: relative to the factors of heredity and inheritance.
Genus: (pl. genera) a group of closely related species.
Germination percentage: the proportion of seed which germinates expressed as a percentage.
Germination rate: the time rate of germination. A slow germination rate refers to seed which takes a long time to germinate.
Gibber plain: a flat desert area covered with stones.
Glabrous: smooth, almost without hairs.
Gland: a secretory structure within or on the surface of a plant.
Glandular hair: hair tipped with a gland. Fig. 8B
Habit: the general appearance of a plant including size, shape and growth.
Haploid: having one basic set of chromosomes, i.e. half of the normal chromosome complement. The number is termed *n*.
Herb: a plant which does not produce a woody stem.
Herbfield: a community of herbs, e.g. grasses and ephemeral plants.
Heteromorphic: capable of having several different external shapes.
Hexaploid: having 6 basic sets of chromosomes.
Hybrid: an offspring of two plants of different species.
Inbreeding: describing the sexual reproduction process whereby the female cells of a plant can be fertilized by male cells from the same plant. These plants are referred to as self-compatible.
Indehiscent: of a mature fruit which does not open spontaneously to release seed.
Indumentum: surface covering, usually hairs.
Inrolled: rolled inwards. Fig. 2A
Involucre: (adj. involucral) the ring of bracts surrounding the base of a flower. Fig. 1B
Karyotype: the entire chromosomal complement of a plant or cell.
Lanceolate: lance-shaped. Fig. 5B
Lateral: attached to the side.
Ligule: strap-shaped floret. Fig. 1A
Linear: with parallel sides and very narrow in relation to length. Fig. 5A
Lobe: a part of a leaf, often rounded. Not divided more than half way to the mid-rib. Fig. 6C
Loess: (adj. loessal) a deposit of fine silt or dust thought to have been transported to its present situation by wind.
Lyrate: lyre-shaped; deeply lobed, with a large terminal lobe and smaller lateral lobes. Fig. 6B
Macroscopic: visible to the naked eye.
Meiosis: the process of chromosome division which results in the formation of haploid cells each having half the original complement of chromosomes.
Mesic: describing an environment characterized by a moderate amount of water.
Morphology: refers to the external structural features of a plant, especially from the aspect of shape and degree of differentiation.
Mucronate: terminating in a sharp short point. Fig. 7B,C
Mycorrhiza: (adj. mycorrhizal) a mycorrhizal association is one between particular fungi and roots of plants. This usually results in a mutually beneficial exchange of nutrients.
Node: the part of the stem where leaves or branches arise.
Nutrients: essential chemicals required for plant growth.
Obcuneate: wedge-shaped with the widest part at the base. Fig. 5I

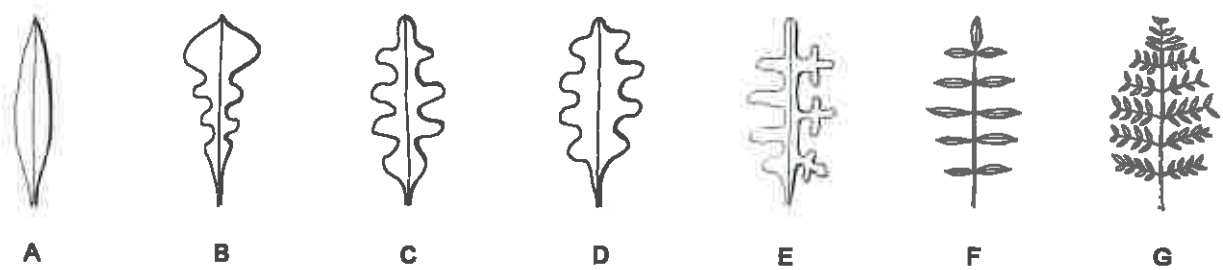


Fig. 6. Leaf shapes. A, entire; B, lyrate; C, lobed; D, pinnatifid; E, pinnatisect; F, pinnate; G, bipinnate.

Oblanceolate: lance-shaped, with the broadest part beyond the centre. Fig. 5C
Oblong: length a few times greater than width, sides almost parallel and the ends rounded.
Obovate: egg-shaped with the widest part beyond the centre. Fig. 5F
Obtuse: blunt or rounded. Fig. 7D
Opposite: of paired structures, arising at the same level but on different sides. Fig. 2D
Orbicular: flat and more or less circular. Fig. 5G
Outbreeding: describing the sexual reproduction of plants within species, where female cells in one plant cannot normally be fertilized by male cells from the same plant. Pollen must come from another plant in the same species. These plants are referred to as self-incompatible.
Ovate: egg-shaped, with the widest part below the centre. Fig. 5E
Papillose: describing a surface bearing minute rounded protuberances, papillae.
Pappus: a tuft of hairs, bristles or scales at the apex of a fruit.
Peduncle: (adj. pedunculate) the stalk of a flower.
Pendent: drooping, hanging downwards.
Perennial: a plant which lives for at least two growing seasons.
Pericarp: the wall of a fruit.
Peripheral: distant from the centre.
Persistent: remaining attached to the plant beyond the usual time of falling.
Petiolate: born by a petiole, cf. sessile. Fig. 2Cii
Petiole: the stalk of a leaf.
Pilose: with long, soft, weak hairs.
Pinnate: a compound leaf with leaflets arranged on either side of an axis. Fig. 6F
Pinnatifid: pinnately lobed, reaching about halfway to the mid-rib. Fig. 6D
Pinnatisect: pinnately divided almost to the midrib. Fig. 6E
Polymorphic: of several different kinds, shapes or sizes.
Polyploid: having more than 2 basic sets of chromosomes.
Procumbent: spreading along the ground without rooting at the nodes but not as close to the ground as prostrate. Fig. 3C
Promiscuous: sexually active, likely to fertilize other species.
Prostrate: lying flat on the ground. Fig. 3D
Protuberance: a swelling or bulge.
Provenance: of seed or species, the geographic origin or source.
Pubescent: covered with fine hairs.
Radical: of leaves, arising from near the base of a plant.
Radicle: the primary root emerging from the seed.
Ray floret: a small one-seeded, strap-shaped flower (resembling a petal), present in the outer ring of a flower-head in Asteraceae. Fig. 1A
Receptacle: the expanded tip of a flowering stem to which the florets are attached, and which is surrounded by a ring of bracts.
Reflexed: describing a structure that is bent sharply backwards.
Reproduction: the means by which new individuals are produced. In sexual reproduction male and female cells are involved and in asexual reproduction they are not.
Rhizome: (adj. rhizomatous) an underground stem growing horizontally. Fig. 3F
Rootstock: a short, erect, swollen structure at the junction of the root and shoot systems of a plant.

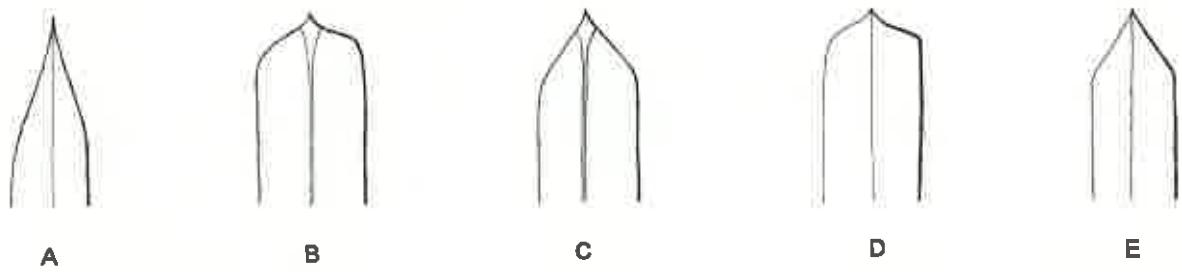


Fig. 7. Leaf apices. A, acuminate; B, mucronate obtuse; C, mucronate acute; D, obtuse; E, acute.

Rosette: a group of leaves radiating from a central point and which lie flat on the ground.
Runner: common name for a stolon.
Scandent: climbing, usually applied when special climbing organs are not developed.
Scape: a flowering stem with radical leaves.
Scarification: physical or chemical abrasion of the hard outer coating of fruit.
Scarious: dry and membranous, usually not green.
Secondary lobes: further lobing on primary lobes.
Secretory: of a gland, a structure which exudes a fluid under specific stimuli present within or on the surfaces of plant tissue.
Septate: of hairs divided by internal transverse partitions. Fig. 8A
Sessile: without a stalk. Fig. 2Ci
Spathulate: spoon-shaped; broad at the tip and narrowed towards the base. Fig. 5H
Species: (sp.) the basic unit of classification of living organisms.
Stellate: of hairs, star-shaped. Fig. 8D
Stolon: a long, horizontal stem running above the ground, able to root at the nodes. Fig. 3E
Stratification: treatment of seed to break dormancy by chilling under moist conditions.
Subacute: less acute.
Subalpine: the zone in a mountainous area above 1500m, but below the treeless alpine zone.
Subspecies: (ssp. or subsp.) a sub-grouping within a species used to describe variants that have been geographically isolated.
Succulent: juicy or fleshy.
Suckers: shoots sent out from the parent plant below the soil which often appear at some distance from the parent plant.
Synonym: (syn.) a name by which a species may have once been known, but which has since been superseded.
Syntype: all specimens of a type-series in which no holotype has been designated. A holotype is the individual plant chosen to serve as the basis for naming and describing a new species.
Taxon: (pl. taxa) a group or category in a system of classification, e.g. species, genus.
Terete: needle-like, more or less narrow-cylindrical.
Terminal: at the apex or end.
Tessellated: checkered or marked in a pattern of squares or rectangles. Fig. 4D
Tetraploid: having 4 basic sets of chromosomes.
Toothed: with a more or less regularly incised margin.
Translucent: transmitting light but not transparent.
Tubercle: a small wart-like outgrowth. Fig. 4A,B,C
Variety: (var.) a sub-grouping at a level below subspecies.
Ventral: the front of a structure.
Vestiture: a covering, usually hairs.
Viable: capable of living. In reference to seed, capable of germinating.
Wandoo: an open woodland of *Eucalyptus wandoo* and associated eucalypts occurring in the wheatland area of Western Australia.
Wing: an expansion of the fruit, or a thin flange of tissue extending beyond the normal outline of the structure.
Woolly: densely covered in long, soft, matted (usually curly) hairs. Fig. 8C

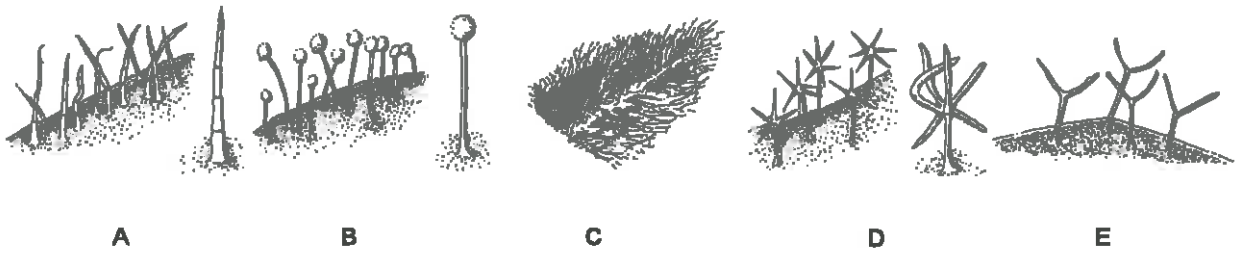


Fig. 8. Hair types. A, septate hairs; B, glandular hairs; C, woolly hairs; D, stellate hairs; E, bifid hairs.

References and Further Reading

Adolphi, K., Seybold, S. and Johnson, L.A.S. (1989). Proposal to conserve 8878 *Brachycome* Cass. (Asteraceae). *Taxon* 38: 511–513.

Anderberg, A.A. (1991). Taxonomy and Phylogeny of the tribe Gnaphalieae (Asteraceae). *Opera Botanica* No. 104.

Australian Daisy Study Group (1987). *Australian Daisies for gardens and floral art.* (Lothian: Melbourne.)

Australian Nature Conservation Agency (June 1993). *Threatened Australian Flora.*

Australian Plant Study Group (1990). *Grow What Where.* (Penguin Books Austr. Ltd.: Melbourne.)

Australian Systematic Botany Society (1981). *Flora of Central Australia* J.P. Jessop (ed). (Reed: Sydney.)

Baines, J.A. (1981). *Australian Plant Genera.* (Surrey Beatty & Sons: Sydney.)

Barker, W.R. and Greenslade, P.J.M. (eds) (1982). *Evolution of the Flora and Fauna of Arid Australia.* (Peacock Publications in association with the Australian Systematic Botany Society and ANZAAS: Frewville, South Australia.)

Beadle, N.C.W. (1960). *Students Flora of North Eastern New South Wales.* Part IV (University of New England: Armidale.) *Brachycome,* pp. 629–633.

Beadle, N.C.W., Evans, O.D. and Carolin, R.C. (1962). *Flora of the Sydney Region.* edn. 3 (Reed: Sydney.) *Brachycome,* pp. 450–452.

Benson, D. and McDougall, L. (1994). Ecology of Sydney plant species Part 2: Dicotyledon families Asteraceae to Buddlejaceae. *Cunninghamia* 3(4): 800–1004.

Bentham, G. (1866). *Flora Australiensis* Vol. 3 (Lovell Reeve & Company: London.) *Brachycome,* pp. 508–521.

Beuzenberg, E.J. and Hair, J.B. (1984). Contributions to a chromosome atlas of the New Zealand flora — 27 Compositae. *New Zealand J. Bot.* 22: 353–356.

Black, J.M. (1965). *Flora of South Australia* edn. 2 Part IV (Govt. Printer: Adelaide.) *Brachycome,* pp. 850–857.

Bremer, K. (1994). *Asteraceae. Cladistics and Classification.* (Timber Press: Portland, Oregon.)

Briggs, J.D. and Leigh, J.H. (1988). Rare or threatened Australian plants. *Special Publication No.* 14 (Australian National Parks and Wildlife Service: Canberra.)

Brummitt, R.K. (1993). Report of the Committee for Spermatophyta: 38. *Taxon* 42: 687–697.

Burbidge, N.T. (1982). A revision of *Vittadinia* A. Rich. (Compositae) together with reinstatement of *Eurybiopsis* DC. and description of a new genus, *Camptacra. Brunonia* 5. *B. dentata* p. 2.

Burbidge, N.T. and Gray, M. (1970). *Flora of the Australian Capital Territory.* (Australian National University Press: Canberra.) *Brachycome,* pp. 361–365.

Carter, C.R. (1978a). The cytology of *Brachycome.* II. The subgenus *Metabrachycome*: a general survey. *Aust. J. Bot.* 26: 699–706.

Carter, C.R. (1978b). Taxonomy of the *Brachycome linearioba* complex (Asteraceae). *Telopea* 1: 387–393.

Cassini, H. (1816). *Brachyscome. Bull. Sci. Soc. Philom. Paris* 1816: 199.

Cassini, H. (1825). *Brachycome.* In Cuvier, F. (ed.), 'Dictionaire des sciences naturelles dans lequel on traite méthodiquement des différents êtres de la nature', vol. 37, pp. 464, 491–492.

Conabere, Elizabeth and Garnet, J.R. (1987). *Wildflowers of South-eastern Australia.* (Greenhouse Publications: Melbourne.)

Cooke, D.A. (1986). *Brachycome* Cass. In Jessop, J.P. and Toelken, H.R. (eds) *Flora of South Australia* part III, edn. 4. (Govt. Printer: Adelaide.) pp. 1445–1458.

Costin, A.B., Gray, M., Totterdell, C.J. and Wimbush, D.J. (1979). *Kosciusko Alpine Flora.* (CSIRO : Melbourne and William Collins: Sydney.) *Brachycome,* pp. 231–232, 361–363.

Cunningham, G.M., Mulham, W.E., Milthorpe, P.L. and Leigh, J.H. (1981). *Plants of Western New South Wales.* (Soil Conservation Service of New South Wales.) *Brachycome,* pp. 647–643.

Curtis, W.M. (1963). *The Student's Flora of Tasmania,* Part II. (Govt. Printer: Tasmania.) *Brachycome,* pp. 292–299.

Davis, G.L. (1948). Revision of the genus *Brachycome* Cass. Part I. Australian species. *Proc. Linn. Soc. New South Wales* 73: 42–241.

Davis, G.L. (1949). Revision of the genus *Brachycome* Cass. III. Description of three new Australian species, and some new locality records. *Proc. Linn. Soc. New South Wales* 74: 145–152.

Davis, G.L. (1955). Supplementary notes on the genus *Brachycome* Cass. *Proc. Linn. Soc. New South Wales* 79: 203–210.

Davis, G.L. (1959). Two new Australian species of *Brachycome* Cass. *Muelleria* 1: 111–113.

Davis, G.L. (1963). Generative apospory and diploid parthenogenesis in *Brachycome ciliaris* var. *lanuginosa. Aust. J. Sci.* 26: 90.

Davis, G.L. (1964). Embryological studies in the Compositae. IV. Sporogenesis, gametogenesis, and embryogeny in *Brachycome ciliaris* (Labill.) Less. *Aust. J. Bot.* 12: 142–151.

Eichler, H. (1965). 'Supplement to J.M. Black's Flora of South Australia'. (Govt. Printer: Adelaide.) *Brachyscome heterodonta,* p. 298.

Elliot, W.R. and Jones, D.L. (1980). *Encyclopaedia of Australian Plants suitable for cultivation* Vol. 1. (Lothian: Melbourne.)

Elliot, W.R. and Jones, D.L. (1982). *Encyclopaedia of Australian Plants suitable for cultivation* Vol. 2. (Lothian: Melbourne.) *Brachyscome,* pp. 370–377.

Elliot, W.R. and Jones, D.L. (1984). Supplement to *Encyclopaedia of Australian Plants suitable for cultivation.* (Lothian: Melbourne.) *Brachyscome,* pp. B 151–152.

Everett, J. (1992). *Brachycome.* Cass. In Harden, G.H. (ed) *Flora of New South Wales.* Vol. 3 (New South Wales University Press: Kensington.) pp. 155–167.

Forbes, S.J. and Ross, J.H. (1988). *A Census of the Vascular Plants of Victoria* edn. 2. (National Herbarium of Victoria: Melbourne.)

George, A.S. (1971). The plants seen and collected in north-western Australia by William Dampier. *The Western Australian Naturalist* 11: 173–178.

Green, J.W. (1985). *Census of the Vascular Plants of Western Australia.* (Western Australian Herbarium, Dept. of Agriculture: Perth.)

Grieve, B.J. and Blackall, W.E. (1975). *How to Know Western Australian Wildflowers* Part IV. (University of Western Australia Press: Perth.) *Brachycome,* pp. 802–805.

Jacobs, S.W.L. and Pickard, J. (1981). *Plants of New South Wales. A Census of the Cycads, Conifers and Angiosperms.* (National Herbarium of New South Wales: Sydney.) *Brachycome,* pp. 72–73.

Jessop, J.P. (1981). *Brachycome* Cass. In Jessop, J.P. (ed), *Flora of Central Australia* (Australian Systematic Botany Society: Reed, Sydney.) *Brachycome heterodonta* p. 369–370.

Kyhos, D.W., Carter, C.R. and Smith-White, S. (1977). The Cytology of *Brachycome linearifoba*. 7. Meiosis in natural hybrids and race relationships. *Chromosoma (Berlin)* 65: 81–101 .
Kirkpatrick, J, Gilfedder, L. and Fensham, R. (1988). *City Parks and Cemeteries. Tasmania's remnant grasslands and grassy woodlands.* (Tasmanian Conservation Trust: Hobart.) *Brachycome,* pp. 50–52.
Launceston Field Naturalists Club (1961). *Guide to Flowers and Plants of Tasmania* M. Cameron (ed). (A.H. and A.W. Reed: Sydney.)
Leigh, J., Boden, R. and Briggs, J. (1984). *Extinct and Endangered Plants of Australia.* (Macmillan: Melbourne.)
Leigh, J. and Mulham, W.E. (1965). *Pastoral Plants of the Riverine Plain.* (Jacaranda Press: Melbourne.)
Marchant, N.G., Wheeler, J.R., Rye, B.L., Bennett, E.M., Lander, N.S. and Macfarlane, T.D. (1987). *Flora of the Perth Region.* Part II. (Western Australian Herbarium, Dept. of Agriculture: Perth.) *Brachycome,* pp. 662–664.
Marks, A.F. and Adams, N.M. (1973). *New Zealand Alpine Plants.* (A.H. and A.W. Reed: Sydney.)
Morrow, J.C. (1964). Distribution of *Brachycome curvicarpa* and *B. tetrapterocarpa* in Queensland. *Proc. Soc. Qld.* 74(3): 27–28.
Mott, J.J. (1972). Germination studies on some annual species from an arid region of Western Australia. *J. Ecol.* 60: 293–304.
Munir, A.A. (1987). A new species of *Brachycome* (Asteraceae) from the Lake Eyre Region, South Australia. *J. Adelaide Bot. Gard.* 11(1): 51–54.
Pollination '82 (1982). *Proceedings of a Symposium held at the Plant Cell Biology Research Centre* E.G. Williams, R.B. Knox, J.H. Gilbert and P. Bernhardt (eds). (School of Botany Univ. of Melb.: Parkville.)
Rogers, K.C. (1980). *Across Mountain and Plain.* (Balmsdale Field Naturalists Club.)
Ross, J.H. (1990). *A Census of the Vascular Plants of Victoria* edn. 3. (Conservation, Forests and Lands: Victoria.)
Ross, J.H. (1993). *A Census of the Vascular Plants of Victoria* edn. 4. (Conservation, Forests and Lands: Victoria.)
Scarlett, N.H., Wallbrink, S.J. and McDougall, K.M. (1992). *Field Guide to Victoria's Native Grasslands.* (Victoria Press: Melbourne.)
Sharr, F.A. (1988). *Western Australian plant names and their meanings. A Glossary.* (University of Western Australia Press: Perth.)
Short, P.S. (1988). Two new species of *Brachyscome* Cass. (Compositae: Astereae), with a note on the orthography of the generic name. *Muelleria* 6: 389–398.
Short, P.S. (1990). A note on *Brachyscome rara* G.L. Davis (Asteraceae). *J. Adelaide Bot. Gard.* 13: 63–64.
Short, P.S. (1994). Australian Compositae. *Compositae Newsletter* 24: 6–35.
Short, P.S. and Watanabe, K. (1993). Two new species of *Brachyscome* Cass. (Asteraceae: Astereae) from eastern Australia. *Aust Syst. Bot.* 6: 335–342.
Smith-White, S. (1982). Summary and redintegration. In Barker, W.R. and Greenslade, P.J.M. (eds), *Evolution of the Flora and Fauna of Arid Australia.* (Peacock Publications in association with the Australian Systematic Botany Society and ANZAAS, South Australian Division: South Australia.) pp. 371–379.
Smith-White, S. and Carter, C.R. (1970). The cytology of *Brachycome linearifoba*. 2. The Chromosome species and their relationships. *Chromosoma (Berlin)* 30: 129–153.
Smith-White, S., Carter, C.R. and Stace, H.M. (1970). The cytology of *Brachycome*. I. The subgenus *Eubrachycome*: a general survey. *Aust. J. Bot.* 18: 99–125.
Solbrig, O.T., Anderson, L.C., Kyhos, D.W., Raven, P.H. and Rüdenberg, L. (1964). Chromosome numbers in Compositae V. Astereae II. *Aust. J. Bot.* 51(5): 513–519.
Stace, H.M. (1981). Biosystematics of the *Brachyscome aculeata* complex (Compositae: Astereae). *Aust. J. Bot.* 29: 425–440.
Stanley, T.D. (1986). *Brachyscome.* In Stanley, T.D. and Ross, E.M., *Flora of South-eastern Queensland* Vol. 2. (Queensland Dept. of Primary Industries: Brisbane.) pp. 507–513.
Stearn, W.T. (1973). *Botanical Latin* edn. 2 (David and Charles: Newton Abbott, England.)
Tasmanian Flora Advisory Committee (1994). *Native Higher Plant Taxa which are Rare or Threatened in Tasmania.*
Turner, B.L. (1970). Chromosome numbers in the Compositae. XII. Australian species. *Amer. J. Bot.* 57: 382–389.
Waddell, W. (1976). *Wildflower Diary.* Native Plants Preservation Society of Victoria.
Watanabe, K., Carter, C.R. and Smith-White, S. (1975). The cytology of *Brachycome linearifoba*. 5. Chromosomes and relationships and phylogeny. *Chromosoma (Berlin)* 52: 383–397.
Watanabe, K., Carter, C.R. and Smith-White, S. (1976). The cytology of *Brachycome linearifoba*. 6. Asynchronous chromosome condensation and meiotic behaviour in *B. linearifoba* A (*n* = 2) x *B. campylocarpa* A (*n* = 4). *Chromosoma (Berlin)* 57: 319–331.
Watanabe, K. and Smith-White, S. (1987). Phyletic and evolutionary relationships of *Brachycome linearifoba* (Compositae). *Pl. Syst. Evol.* 157: 121–141.
Watanabe, K., Short, P.S., Kosuge, K. and Smith-White, S. (1991). The cytology of *Brachyscome* Cass. (Asteraceae: Astereae). II. Hybridization between *B. goniocarpa* (*n* = 4) and *B. dichromosomatica* (*n* = 2). *Aust. J. Bot.* 39(5): 475–478.
Watanabe, K. and Short, P.S. (1992). Chromosome number determinations in *Brachyscome* Cass. (Asteraceae: Astereae) with comments on species delimitation, relationships and cytogeography. *Muelleria* 7(4): 457–471.
Willis, A.J. and Groves, R.H. (1991). Temperature and Light Effects on the Germination of Some Native Forbs. *Aust. J. Bot.* 39: 219–228.
Willis, J.H. (1964). The Compositae or Daisy Family. *Aust. Plants Supplement.* (The Society for Growing Australian Plants; Sydney.)
Willis, J.H. (1972). *A Handbook to Plants in Victoria* Vol. 2. (Melbourne Univ. Press: Carlton.) *Brachycome,* pp. 663–676.
Zimmer, G.F. (1963). *A Popular Dictionary of Botanical Names and Terms with their English Equivalents.* (Routledge, Kegan and Paul Ltd.: London.)

Australian Daisy Study Group

The Australian Daisy Study Group is one of a number of Study Groups formed from members of the Association of Societies for Growing Australian Plants (ASGAP). Each group exists to investigate a genus, or a closely related group of genera, particularly with regard to their propagation and garden cultivation. In June 1981 Maureen Schaumann founded the Brachyscome/Helipterum Study Group. At that time she was advised to concentrate only on two genera since the Asteraceae family was considered too large for comprehensive study. The genus *Brachyscome was* chosen because the majority of the species are perennial. The second genus, *Helipterum* (now split into a number of new genera including *Hyalosperma, Leucochrysum, Rhodanthe* and others), was selected for its importance to floral art, cut flower exports, and also because species are mainly annual and could become important for garden culture..

These aims were formulated:

- to collect all species in the two genera
- to identify the species correctly
- to evaluate the horticultural potential of each species
- to determine optimal conditions for cultivation
- to study seed dormancy and the means of overcoming it
- to study seed viability and life span
- to determine the best methods of propagation
- to promote the growth of rare and endangered species in the Asteraceae
- to extend the range of everlasting species available for cut flowers and for floral art.

After some years of work, the enthusiasm of the members increased to the point where they pressed for the inclusion of a number of other genera such as *Celmisia, Craspedia, Helichrysum* (now split into several new genera including *Bracteantha, Chrysocephalum, Ozothamnus* and others), *Olearia* and *Waitzia.* Many species within these genera have since proved their merit in the garden or for floral art. The emphasis, however, remains on the two original genera as it has not been possible for the Study Group to explore the almost one thousand species in detail.

The name of the Group has been altered to the Australian Daisy Study Group to embrace this wider field of study. The Group comprises seventy-five members, most of whom have contributed in some way to this book.

The Study Group Editorial Committee

Beth Armstrong Dip. A.P.A. Member of SGAP Maroondah. Keen traveller, propagator and gardener whose interest in native plants extends beyond daisies.

Judy Barker B.Sc. Editor of *Australian Brachyscomes, Australian Daisies for gardens and floral art,* and the ADSG Newsletter (1988–). Past president of SGAP Waverley. Enjoys lecturing, gardening and propagating from seed.

Bev Courtney Past secretary of SGAP Peninsula. Enjoys gardening, propagation and garden design. Interested in ecology, evolution, bush regeneration and all aspects of the natural world. Actively involved in local conservation.

Natalie Peate M.Sc. Co-author of the *Grow What Where* series. Past president of the Nursery Industry Association of Victoria and of the Australian Region of the International Plant Propagators' Society. Particularly interested in the horticultural development of Australian plants and enthusiastically involved in breeding Australian daisies.

Alf Salkin M.Sc. Author of a booklet on the history, flora and birds of the Waverley Valley Reserve. Former teacher of environmental science, foundation president of SGAP Waverley, Honorary Life Member of SGAP Vic. Enthusiastic conservationist, bushwalker, lecturer, photographer, propagator, gardener, and deeply involved in all aspects of banksias.

Esma Salkin B.A. (Hons.) Joint author with Alf of the booklet on the Waverley Valley Reserve. Leader of the Australian Daisy Study Group (1988–95), and Honorary Life Member of SGAP Vic. Shares Alf's enthusiasm for conservation, gardening, lecturing, photography and propagation. Her special interest is the history of the cultivation of Australian plants.

Maureen Schaumann Founder and first Leader of the Australian Daisy Study Group, past secretary of SGAP Waverley. Editor of ADSG Newsletter (1981–87). Keenly interested in bushwalking, propagation, gardening and floral art, especially in the drying and preserving of Australian plant material.

Gloria Thomlinson Past president of SGAP Shepparton and Districts. Botanical artist for *Australian Brachyscomes* and *Australian Daisies for gardens and floral art.* Contributed botanical drawings to *Growing Trees for Farms, Parks and Roadsides, Australian Plants for European Gardens,* SGAP Vic Newsletter and ADSG Newsletter. Enthusiastic propagator and gardener whose artistic interests cover a very wide range including drawing, painting and landscaping.

Index

Accepted names are in roman type. Synonyms and misapplied names are in *italic type*. Principal page references are in **bold type**. Drawings and diagrams are in *italic type*. Other references refer to pages on which the species is mentioned.

A

alpine brachyscomes
  fruits, *159*
  table, 249

B

Bellis
  aculeata, 34
  ciliaris, 68
  graminea, 126
bog gardens, 28
Brachycome
  Curved-seed, 80
  diversifolia
    var. humilis, 100
  Dwarf, 138
  Large White, 58
Brachyscome
  aculeata, **34**, *35*, 76, 90, 172, 204, 210, 218, 220
    aff. aculeata, 36
    complex. *See* complexes
  alpina, 230
  angustifolia, 82, 116
    var. angustifolia, **38**, *39*, 126, 176, 184
    var. heterophylla, **40**, *41*, *43*
  ascendens, 36, **44**, *45*, 142, 166
  basaltica
    var. basaltica, **48**, *47*, *49*, 126, 197
    var. gracilis, **48**, *51*, 62
  bellidioides, **52**, 108, 110, 130, 192
  billardieri, 34, 68
  blackii, **54**, *55*, 234
  breviscapis, **56**, *57*, 92, 120, 138, 140, 244
  calocarpa, 88
  campylocarpa, **58**, *59*, *61*, 106, 124, 212, 214
    complex. *See* complexes
  cardiocarpa, 50, **62**, *63*, 240
    var. alpina, 226
  cheilocarpa, **64**, *65*, 74, 128, 170
  chrysoglossa, **66**, *67*, 80, 90, 172, 236
  ciliaris, 54, **68**, *69*, 90, 154, 200
    var. brachyglossa, 68
    var. ciliaris, 68
    var. lanuginosa, 68
    var. lyrifolia, 68, **70**, *71*
    var. robusta, 200
    var. subintegrifolia, 68
  cilliocarpa, **72**, *73*, *75*, 128, 170
  clementii, 74
  colina, 180
  coongiensis, 197
  cuneifolia, 34, **76**, *77*, *79*, 210, 218
    aff. cuneifolia, 34, 76, 210
  curvicarpa, **80**, *81*, *83*, 90, 172, 236
    aff. curvicarpa, 44, 66, 80, 90, 172, 236
  debilis, **84**, *85*, 136
  decipiens, **86**, *87*, 232
    var. pubescens, 232
  dentata, 36, 66, 80, **88**, *89*, *91*, 172, 204, 236
    complex. *See* complexes
  dichromosomatica, 56, 58, **92**, *93*, 106, 120, 138, 170, 212
    var. alba, 56, **92**, 140
    var. dichromosomatica, 64, **92**, 140
  dimorphocarpa, 68
  discolor, 144
  dissectifolia, **96**, *97*, *99*, 160, 186, 224
  diversifolia
    complex. *See* complexes
    var. dissecta, **103**
    var. diversifolia, **100**, *101*, *103*
    var. humilis, 102
    var. maritima, **104**, *105*, 208
  drummondii, 68
  eriogona, 58, 94, **106**, *107*, 140, 212
  exilis, 52, **108**, *109*, 110, 130, 136, 176, 178, 192, 244
    var. scabrida, 108
  eyrensis, 52, 108, **110**, *111*, 130, 192
  formosa, 40, **112**, *113*, 184
    aff. formosa, 40
      Entity 1, 42, **114**, *115*, 182
      Entity 2, 42, **114**, *117*
  glandulosa, **118**, *119*, 180
  goniocarpa, **120**, *121*, 124, 162, 198, 244
    var. eriogona, 106
  gracilis, 120, **122**, *123*, 162, 198
    aff. gracilis, 102, **122**, *125*
  graminea, 40, 46, **126**, *127*, 176, 194
  halophila, 74, **128**, *129*, 170
  heterodonta, 66, 88, 90
  heterophylla, 40
  iberidifolia, 52, 108, 110, **130**, *131*, *133*, 190, 192
    'Little Blue Star', 130
    'Purple King', 130
    'Purple Splendour', 130
    'Red Star', 130
    'Wreath Brachyscome', 130
    complex. *See* complexes
    var. alba, 132
    var. diffusa, 132
    var. divergens, 132
    var. glandulifera, 132
    var. huegeliana, 132
    var. major, 132
  Large White, 212
  latisquamea, **134**, *135*
  leptocarpa, 70, 84, 106, **136**, *137*
  linearifolia, 38, 62, 92
    var. heterophylla, 40
  lineariloba, 56, 58, 94, 106, **138**, *139*, 140, 212
    complex. *See* complexes
  lissocarpa, 178
  lyrifolia, 70

marginata, 88
var. chrysoglossa, 66, 90
var. marginata, 90
melanocarpa, 44, 116, **142**, *143*, 146, 166, 182
microcarpa, 42, 116, 142, **144**, *145*, *147*, 166, 184, 246
muelleri, **148**, *149*, 150
muelleroides, 148, **150**, *151*
multicaulis, 200, 202
multifida, 70, 90, 142, 202
aff. multifida, **156**, *157*
var. dilatata, 103, 152, **154**, *155*
var. multifida, **152**, *153*, 246
neglecta, 108
nivalis, 96, **160**, *161*, 188, 226
var. alpina, 160, 226
var. nivalis, 160
nodosa, 120, 124, **162**, *163*, 198, 212
nova-anglica, 44, 142, 146, **166**, *167*, 182
obovata, **168**, *169*, 194, 206, 222, 226
oncocarpa, 74, **170**, *171*
complex. *See* complexes
pachyptera, 138
papillosa, 82, 90, **172**, *173*, 236
parvula, 40, 126, **174**, 228
var. lissocarpa, **178**, *179*
var. parvula, **174**, *175*, *177*
perpusilla, **180**, *181*
var. perpusilla, 180
var. tenella, 118, 180
petrophila, 44, **182**, *183*, 204, 218
Piliga Posy, 40, 116
piligaensis, 116
procumbens, 40, 42, 44, 116, 146, **184**, *185*
ptychocarpa, 96, 160, **186**, *187*, 224
pusilla, 52, 110, 130, **190**, *191*
radicans, 168, **194**, *195*, 222, 226, 240
radicata, **196**
rara, 46, 50, **197**
readeri, 102, 124, 148, 162, **198**, *199*
rigidula, 70, 154, **200**, *203*
riparia, 182, **204**, *205*
scapiformis, 196, 216
var. glabra, 220
var. puberula, 216
var. tenuiscapa, 230
scapigera, 86, 168, **206**, *207*, 230, 240
segmentosa, 82, 104, 116, **208**, *209*
sieberi
var. gunnii, 36, 78, 90, 196, 204, **210**, *211*, 218
smithwhitei, 58, 94, 106, 162, **212**, *213*
sp. (Darling Downs), 146, 154, **246**, *247*
sp. aff. campylocarpa, 214
sp. aff. goniocarpa, 124, 164
sp. aff. melanocarpa, 116
spathulata, 36, 78, 196, 210, 230
subsp. glabra, *215*, **220**, *221*
subsp. spathulata, 182, **216**, *217*
squalida, 200
stolonifera, 168, 194, **222**, *223*, 226
stricta, 34, 196
strongylospermoides, 200
stuartii, 82, 96, 160, 188, **224**, *225*
tadgellii, 160, 168, 194, 222, **226**, *227*
tatei, **228**, *229*
tenella, 180
tenuiscapa
var. pubescens, **232**, 233
var. tenuiscapa, 102, 218, 220, **230**, *231*
tesquorum, 54, **234**, *235*, 238
tetrapterocarpa, 82, 90, 172, **236**, *237*
Tinker Bell, 116
trachycarpa, 70, 176, **238**, *239*
uliginosa, 62, **240**, *241*
whitei, **242**, *243*
xanthocarpa, 56, 120, **244**, *245*
Brachyscome features
cotyledons and first seedling leaves, 5
disc and ray florets, 4
flower-head, 3
fruit, 5
growth habit, 3
involucral bracts, 4
leaves, 3
receptacle, 4
Brachyscomes in gardens
New South Wales
Canberra, Australian National Botanic Gardens, 17
Kanwal, 16
Orange, 16
Queensland
Algester, 14
Bundaberg, 14
Macgregor, 15
Maleny, 15
South Australia
Adelaide Plains
Fitzroy, 24
Hope Valley, 24
Auburn, 25
Coonalpyn, 25
Valley View, 25
Tasmania
Murdunna, 23
Victoria
Ballarat, 18
Emerald, 18
Fairhaven, 18
Frankston, 19
Metung, 19
Mount Buller, 20
Mount Waverley, 20
Shepparton, 20
South Oakleigh, 21
Upper Lurg, 22
Vectis, 22
Yarrawonga, 23
Western Australia
Albany, 26
Perth, Kings Park and Botanic Garden, 26
Brachystephium
leucanthemoides, 100
scapigerum, 206
breeding systems, 29

C

chromosome numbers
determinations, 2, 31
table of, 31
Chrysanthemum
leucanthemum, 102
classification of brachyscomes, 3

complexes
B. aculeata, 36, 78
fruits, *37*
table, 248
B. angustifolia
fruits, *252*
B. campylocarpa, 58, 106
fruits, *95*
B. dentata, 66, 82, 90, 172, 236
fruits, *253*
table, 250
B. diversifolia, 102, 124
fruits, *165*
table, 251
B. iberidifolia, 52, 110, 132, 192
fruits, *53*
B. linearifoba, 56, 94, 140
fruits, *141*
B. oncocarpa, 72, 170
fruits, *254*
B. stuartii
fruits, *189*
cultivation of Brachyscomes
mulching, 12
nutrients, 12
pests and diseases, 13
pruning, 12
soil types, 12
cytology, 2

D

Daisy
Basalt, 46
Black-seed, 142
Black-seeded, 196
Blue, 142, 220
Bushy Cut-leaf, 68
Ciliate-fruited Daisy, 72
Climbing, 134
Coast, 174
Curved-seed, 80
Cut-leaf, 152, 154
Dookie, 122
Downy, 136
Dwarf, 120, 138
Field, 86
Finger-leaved, 108
Forest, 144
Fringed, 68
Grass, 126
Grassland, 38
Hairy Cut-leaf, 200
Hard-headed, 138
Hawkesbury, 152
Heathland, 240
Hill, 34
Inland, 238
Knobby-fruit, 162
Kosciusko, 222
Large White, 58, 212
Large-headed, 100
Leafy, 200
Lobe-seed, 88
Lord Howe Island, 208
Marsh, 194
Mossgiel, 172
Mountain, 232
New England, 166
Ox-eye, 102
Parsley-leaf, 246
Pilliga, 112
Rayless, 180
Reader's, 198
Rock, 182
Rocky, 152
Showy, 72
Slender, 108
Small, 174, 190
Small Hairy, 136
Smooth, 238
Snow, 160
Southern, 198
Spreading, 222, 242
Sticky, 118
Stiff, 38
Stuart's, 224
Swamp, 46, 62, 96, 240
Swan River, 130
Swollen-fruited, 170
Tall, 100
Tall White, 88
Tiny, 180, 186
Tufted, 206
Variable, 68
Weak, 84
Yellow-tongue, 66

F

fertilization, 29
first collections of *Brachyscome*, 1

G

grassland species, 28
ground covers, 28

H

hanging baskets, 27
hybridization, 30
species likely to cross, 30
species likely to come true, 30
hybrids
'Alba', 158
'Amethyst', 156, 255
'Betty Campbell', 255
'Blue Haze', 255
'Breakoday', 158, 255
'Bright Eyes', 158, 255
'Evan', 158
'Happy Face', 255
'Just Jayne', 255
'Lavender Mist', 256
'Lemon Drops', 82, 256
'Lemon Twist', 82, 256
'Maureen', 256
'Minima', 158
'Pink Happy Face', 256
'Pink Haze', 256
'Roulette', 158
'Strawberry Mousse', 257
'Sunburst', 82, 257

'Toucan Tango', 257
'Valencia', 257
'White Surprise', 158

L

Leucanthemum
vulgare, 102

O

origin of the name *Brachyscome*, 1

P

pollination, 29
polyploidy, 32
in B. aculeata, 36
in B. ciliaris, 70
in B. decipiens, 86
in B. dentata, 90
in B. melanocarpa, 142
posies, 28
propagation
cuttings, 11
division, 11
layering, 11
natural regeneration, 11
seed, 7
Pyrethrum
diversifolium, 100, 102
Hairy New Holland, 102

R

relationships between species, 30
revision of *Brachyscome* by Davis, 1

S

seed
dormancy, 9
pretreatment, 9
heat, 9
smoke, 9
storage, 9
stratification, 9
Senecio
scapigera, 206
Siphiosperma
collinum, 180
glandulosum, 118
perpusillum, 180
spelling of the name *Brachyscome*, 1
Steiroglossa
humilis, 100
linearifoba, 138
rigidula, 200
subgenera
Eubrachycome, 1
Metabrachycome, 1
superspecies, 2

Notes

Notes