

***Calothamnus superbus* T.J. Hawkeswood & F.H. Mollemans
(Leptospermoideae: Myrtaceae), a new species from south-west
Western Australia**

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Abstract

Hawkeswood, T.J. & Mollemans, F.H. *Calothamnus superbus* T.J. Hawkeswood & F.H. Mollemans (Leptospermoideae: Myrtaceae), a new species from south-west Western Australia. Nuytsia 8(3): 311-318 (1992). A new 5-merous species of *Calothamnus*, *C. superbus* Hawkeswood & Mollemans, is described from sandplains in the Pigeon Rocks area, south-west Western Australia. Its affinities with the closely related species, *C. aridus* T.J. Hawkeswood, are outlined, and ecological data provided. The plant is not represented in any National Parks or Nature Reserves but its survival is probably ensured due to its isolated location.

Introduction

During 1990, an apparently undescribed 5-merous taxon of *Calothamnus* (Leptospermoideae: Myrtaceae), was located by the second author in a remote area near Pigeon Rocks, south-west Western Australia. Further research and collections have indicated that this taxon is indeed distinct and previously undescribed. The new species is described below. The terminology used in the description and general format follows that of Hawkeswood (1984a,b, 1987).

Taxonomy

***Calothamnus superbus* T.J. Hawkeswood & F.H. Mollemans, sp. nov. (Figures 1-4)**

Frutex erectus ad 2.5 m altus. Folia linearia, teretia, erecta, (10)13-15(18) cm longa, 1.2-1.6 mm lata, mucronata, glabra. Flores fasciculati vel breviter spicati. Calycis tubus pleraque 4-5 mm longis, glabris; calycis-lobi 1-1.5 mm longi. Petala 3-5 mm longa, ferruginea. Unguis staminalis 20-25 mm longus, 1.8-2.1 mm latus, glaber; filamentis marginalibus 12-17. Fructus globulus vel ± cylindraceus, 5-7 mm longus, 7-9 mm latus, glaber. Semina pleraque 1-1.4 mm longa, ferruginea.

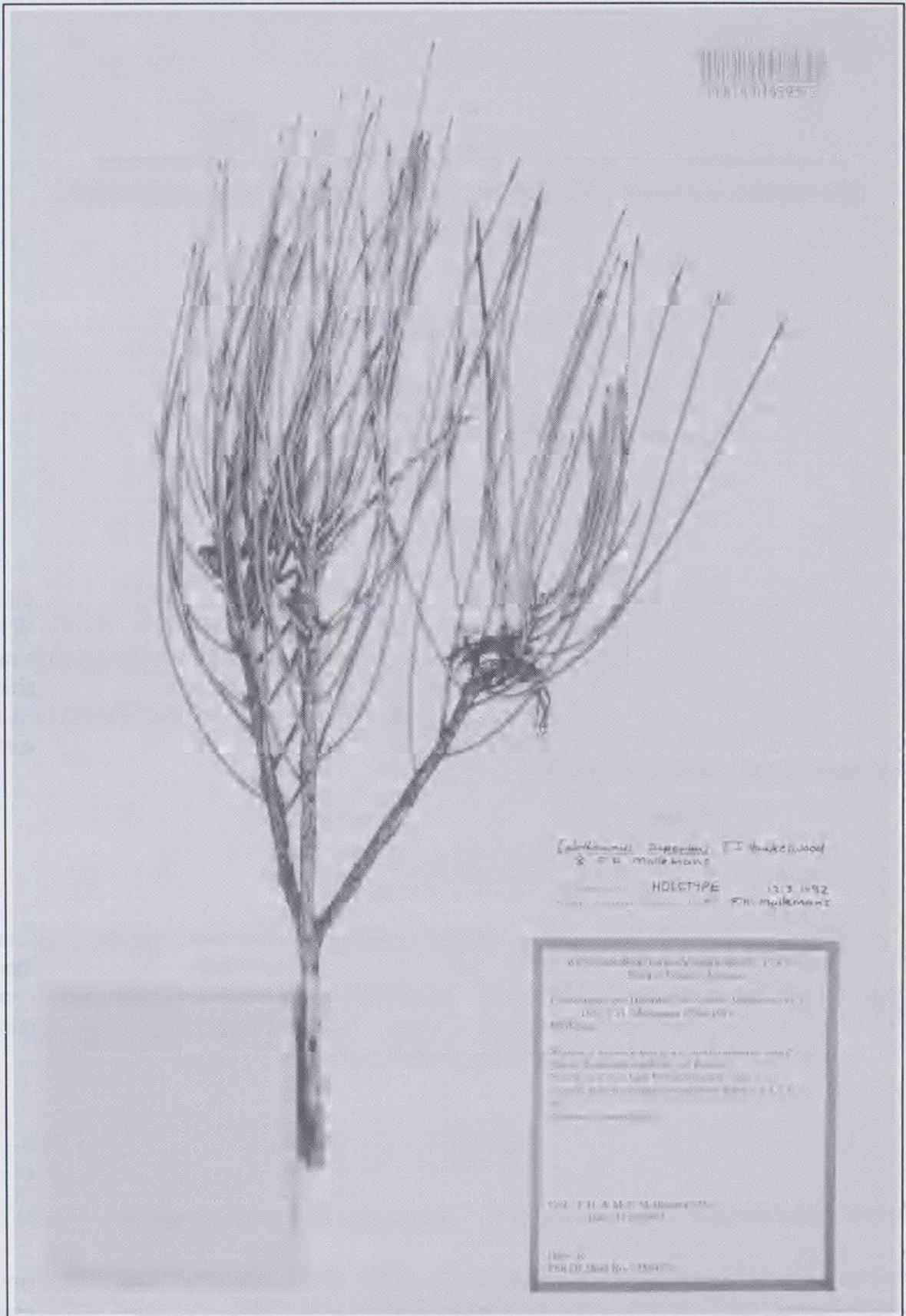


Figure 1. *Calothamnus superbus* T.J. Hawkeswood & F.H. Mollemans - Holotype (F.H. & M.P. Mollemans 3078).



Figure 2. Habit of *Calothamnus superbus* T.J. Hawkeswood & F.H. Mollemans in mixed shrubland and heath near Pigeon Rocks. (Photo: F.H. Mollemans).

Typus: Track from Emu Fence, east towards Pigeon Rocks Tank & west of Clampton Mineral Prospect (precise locality withheld), alt. c. 510 m; abundance uncommon; 11 July 1990, F.H. & M.P. Mollemans 3078 (holo: PERTH). (Figure 1)

Erect, wide, compact to spreading, multi-stemmed, diffuse branching, straggly to somewhat compact, glabrous *shrubs* to 2.5 metres high, with thick stems and hard grey bark, often splitting at or near the bases of the trunks. Young *branches* mostly glabrous. *Leaves* sessile, linear, terete, erect, rigid, (10)13-15(18) cm long, 1.2-1.6 mm wide, glabrous, rough, pungent, narrowed into a thin, sharp, straight apex 4-7 mm long, bright pale green to yellowish-green; oil glands very prominent and exerted into the epidermis, giving rise to the rough leaf surface. *Flowers* 2-5 (mostly 3) arranged in a cluster or 5-8(10) in a loose spike amongst leaves on younger branches. *Calyx-tube* narrow campanulate to almost cylindrical, 4-5 mm long, glabrous; oil glands prominent; rhachis usually dilated at the base of the calyx-tube; *calyx-lobes* deltoid, mostly acute, concave, 1-1.5 mm long, glabrous; margins thin, scarious, partially ciliate. *Petals* obovate, concave, obtuse, 3-5 mm long, thin, mostly glabrous, but with a few simple, scattered hairs, orange-brown; margins thin, glabrous. *Staminal claws* \pm equal, free, 20-25 mm long, 1.8-2.1 mm wide, glabrous, orange-red in lower half to two-thirds, pink-red in upper portion; marginal *filaments* 12-17; *anthers* linear, 1-1.4 mm long, brown. *Style* slender 15-25 mm long, glabrous, pink-red, stigma small, often persistent in young fruit. Summit of *ovary* densely pubescent. *Fruit* globular or depressed globular to almost cylindrical (rarely), 5-7 mm long, 7-9 mm wide, smooth or with irregular bulges, ribs and/or striations, mostly truncate or very shortly 5-lobed (calyx-lobes persistent in young fruit and usually absent in older, worn fruit). Fertile *seeds* linear-oblong, 1.0-1.4(1.5) mm long, angular, cuneate, often obliquely truncate, glabrous; testa dark reddish-brown. *Ovulodes* similar to fertile seeds, mostly 1.0-1.2 mm long, slightly paler in colour, usually obliquely truncate, glabrous.

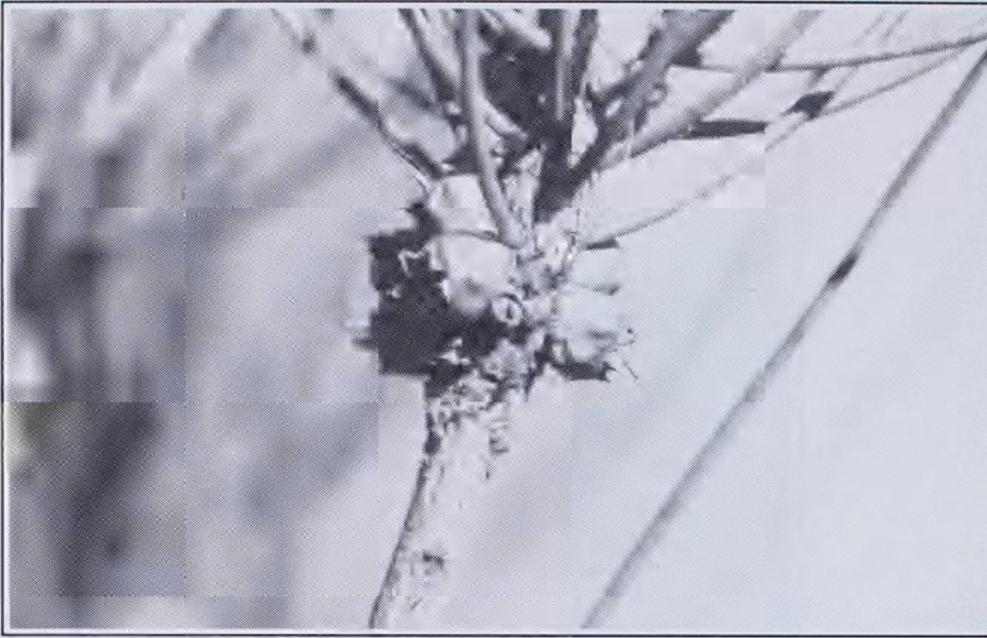


Figure 3. Close-up of a branch of *Calothamnus superbus* T.J. Hawkeswood & F.H. Mollemans in mixed shrubland and heath near Pigeon Rocks showing a cluster of young fruiting capsules. (Photo: F.H. Mollemans).

Other specimens examined. WESTERN AUSTRALIA: Pigeon Rocks (Clamptons Vermin Fence track, east of vermin fence), 12 July 1991, *F.H. Mollemans* 3812 (PERTH); Pigeon Rocks (Clamptons Vermin Fence track, east of vermin fence), 13 July 1991, *F.H. Mollemans* 3813 (PERTH).

Distribution. Known only from two sites in the Pigeon Rocks area (29°52'S, 118°39'E), south-west Western Australia (Figure 4). *C. superbus* occurs c. 100 km south of the most southerly known occurrence of *C. aridus*, and the northernmost distribution of *C. gilesii* is sympatric with that of *C. superbus*. The sympatric distribution of *C. superbus* and *C. gilesii* caused initial confusion during the return collection trip in July 1991 (because of morphological resemblance), however, it was determined during a 3 km transect on foot along Clamptons Vermin Fence track that *C. gilesii* and *C. superbus* are not sympatric at the local scale as they do not grow together.

Habitat. Grows in pale yellow brown sand with scattered ferruginous pebbles of laterite in mixed sandplain heath with *Acacia* (Mimosaceae), *Grevillea* (Proteaceae) and *Allocasuarina* (Casuarinaceae) or in pale yellow brown sand in mixed shrubland and heath with *Grevillea* (Proteaceae), *Melaleuca* (Myrtaceae) and *Boronia ternata* (Rutaceae).

Flowering and fruiting period. Flowering in July 1990 when the initial collection was made, but plants were in fruit in July 1991; this taxon is therefore thought to flower opportunistically depending on rainfall.

Conservation status. 2V using the criteria of Briggs & Leigh (1988). *Calothamnus superbus* is not represented in any National Park or Nature Reserves but its isolated location should afford a significant degree of protection from land clearing, residential development and illicit flower collection at least in the near future. However, at one of the sites where *C. superbus* was found (*Mollemans* 3812), there was evidence of a recent fire so that bushfires may prove to be a possible

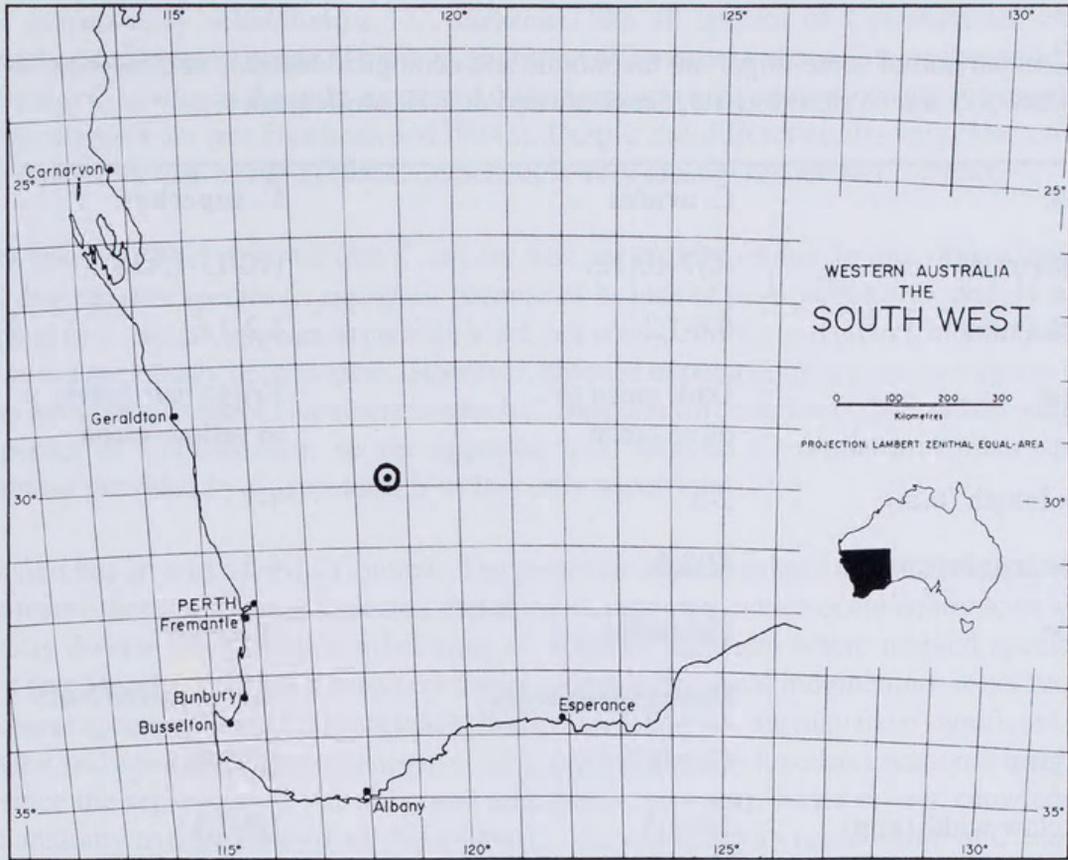


Figure 4. Distribution of *C. superbus* T.J. Hawkeswood & F.H. Mollemans.

and serious threat especially considering the small size of known *C. superbus* populations, viz. only about 25 plants were counted by Mollemans at the first site (*Mollemans* 3812) and about 18 at the other site (*Mollemans* 3813). The degree of susceptibility of *C. superbus* to fires is not known and perhaps fires and their effects should be closely monitored in the future.

Etymology. The specific epithet *superbus*, from Latin, meaning impressive or exalted, refers in part to the distinctive pale green to yellow-green, erect foliage of this species and to the plants prominence in the localized area within which it occurs.

Discussion

There are about twenty 5-merous species of *Calothamnus*, and *C. superbus* is most closely related to *C. aridus* T.J. Hawkeswood (Hawkeswood 1984a). A comparison of some taxonomic and ecological features of these two species is provided in Table 1.

Morphological differences. *C. superbus* and *C. aridus* can be clearly distinguished on the basis of the four leaf characters given in Table 1. Differences in the morphology and size of the calyx-tube, petal pubescence, width of the staminal claws and the number of filaments per staminal claw also distinguish *C. superbus* from *C. aridus*. Of these characters, leaf size (length and width), pubescence of calyx-tube and the number of marginal filaments per staminal claw are the most important. Fertile seed size differences are also highly significant (Table 1).

Table 1. Comparison of some important taxonomic and ecological features of *Calothamnus aridus* T.J. Hawkeswood and *C. superbis* T.J. Hawkeswood & F.H. Mollemans

Character	<i>C. aridus</i>	<i>C. superbis</i>
Leaf length (mm)	(5)7-10(12)	(10)13-15(18)
Leaf width (mm)	0.6-1.2	1.2-1.6
Leaf colour	Dark green to olive green	Bright pale green to yellow-green
Leaf apex length (mm)	2-3	4-7
Calyx-tube length (mm)	(2)2.5	4-5
Calyx-tube	Pubescent	Glabrous
Petals	Densely pubescent	Few scattered hairs
Petal margins	Ciliate	Glabrous
Staminal claw width (mm)	1.0-1.5	1.8-2.1
Number of marginal filaments per staminal claw	10-12	12-17
Fertile seed length (mm)	1.5-2.0	1.0-1.4(1.5)
Habitat	Red sand, <i>Triodia-Eucalyptus</i> woodland; <i>Triodia</i> sandplain	Yellow sand, mixed heath, sandplain

Fruit size has been important in delineating and differentiating other *Calothamnus* taxa (Hawkeswood 1984a,b, 1987), but this character is not so readily applicable in distinguishing *C. superbis* and *C. aridus*. The two known populations of *C. superbis* have variable fruit size with many fruits larger than those of *C. aridus*, but there is an overlap in size range of fruits of the two species, so this character, if used in isolation, is not reliable in differentiating the two taxa.

Non-flowering *C. superbis* plants resemble those of *C. gilesii* F. Muell but the fruit of the latter species are not depressed-globular in shape. In addition, the fruits of *C. gilesii* are much larger than those of *C. superbis*, and *C. gilesii* is not so tall or broad in habit, nor does it have the superb ascending leaves of *C. superbis*.

Ecological differences. *Calothamnus superbis* and *C. aridus* have the most inland distribution of any species in the genus. However, the habitats in which they occur are quite different (Table 1) and the soil type and other environmental factors may have been important in the evolution and genetic integrity of these two species.

Possible evolutionary relationships. *C. superbus*, like all species of *Calothamnus*, other than *C. aridus*, lacks pubescent petals. This is an important difference between *C. superbus* and *C. aridus*, and maintains *C. aridus* as the only species of *Calothamnus* which possesses petals covered in short, appressed, simple hairs (see Hawkeswood 1984a). Despite this difference, it is very clear, on the basis of other characters (see Table 1) that *C. superbus* is very closely related to *C. aridus*.

Hawkeswood (1984a), noted that *C. aridus* was not closely related to any other *Calothamnus* species. But the new species *C. superbus*, because of its lack of petal pubescence and its very close relationship to *C. aridus*, appears to provide a link between *C. aridus* and other *Calothamnus* species which has not previously been evident. However, absence of petal indumentum is only one common character among a number of characters in which *C. superbus* (in common with *C. aridus*) differs from other species of *Calothamnus*, so the apparent link between *C. aridus* and other species of *Calothamnus* provided by *C. superbus* is in fact only superficial.

C. aridus has an arid zone distribution. The presence of petal indumentum in this species and its absence from other *Calothamnus* species, including *C. superbus*, which occur nearer to or within the floristically diverse transitional rainfall zone of Western Australia where marked speciation has occurred (see Hopper 1979), suggests two things. Firstly, that petal indumentum is not required by *Calothamnus* species growing in marginal to higher rainfall areas, but may have significant adaptive value in the arid zone. Petal pubescence in *C. aridus* probably developed as a response to developing aridity since the separation of Australia and Antarctica. Secondly, based on our knowledge of the floristic anatomy and distribution of *Calothamnus*, the evolutionary relationship of *C. superbus* to *C. aridus* and to other members of the genus appears to be comprised of a number of lineages arising from a common ancestor, which reflect evolution in response to local and regional influences. Determination of the actual arrangement of lineages in *Calothamnus* would require a detailed cladistic analysis (e.g. Weston *et al.* 1984), which is beyond the scope of this paper. However, in a hypothetical cladogram it is likely that *C. superbus* and *C. aridus* would form a common clade, which is generally removed from all other species of *Calothamnus* presently known, apart perhaps for a tenuous link with *C. gilesii*.

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