

NEW SPECIES OF BUCKINGHAMIA F. Muell. AND STENOCARPUS R. Br. (PROTEACEAE) FROM NORTHERN QUEENSLAND

by

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ABSTRACT

Foreman, D. B. & Hyland, B. P. M. New species of *Buckinghamia* F. Muell. and *Stenocarpus* R. Br. (Proteaceae) from northern Queensland. *Muelleria* 6(6): 417-424 (1988). — *Buckinghamia ferruginiflora* sp. nov., *Stenocarpus davallioides* sp. nov. and *Stenocarpus cryptocarpus* sp. nov. from northern Queensland are described with notes on distribution, ecology and diagnostic features.

TAXONOMY

The accounts of *Buckinghamia* and *Stenocarpus* for the Flora of Australia are being prepared jointly by us and we take this opportunity to describe a new species of *Buckinghamia* and two new species of *Stenocarpus* from northern Queensland.

BUCKINGHAMIA F. Muell.

*Buckinghamia ferruginiflora* D. Foreman & B. Hyland, sp. nov.

*Arbor* ad 30 m alta, anteridibus conspicuis nullis. *Folia* simplicia, spiralter disposita; lamina elliptico-oblonga, 9-20 cm longa, 2-6 cm lata, coriacea, glabra, acuminata, apice acuta ad ± obtusa, basin attenuata, margine integra, nervis secundariis utrinsecus 10-20, juxta marginem conjunctis. *Inflorescentiae* terminales vel axillares, racemiformis vel racemis in paniculam disposita, ferrugineo-pubescentibus. *Pedicellae* 4-6 cm longae. *Flores* bisexuales, zygomorpha. *Tepala* c. 10 mm longa, extra dense ferrugineo-pubescentia, intra glabra. *Glandula hypogyna* hipocrepiformis. *Ovarium* glabrum, stipitatum; ovula 4; stylus 7-8 mm longus; praebitor pollinis disciformus, latus, obliquus. *Folliculi* striati, late ovati, 20-28 mm longi, 15-20 mm lati. *Semina* plana, ± rhomboidea, ala marginali augusta. (Fig. 1).

TYPUS: Portion 62, Parish of Alexandra (Noah Creek), 16° 10' S., 145° 10' E., Queensland, 13.vii.1972, B. P. M. Hyland 6245 (flowering collections). (Holotypus: QRS. Isotypi: BRI, NSW).

*Tree* up to 30 m tall with stem up to 50 cm diameter at breast height, without conspicuous buttresses. *Bark* less than 2.5 cm thick, nondescript; outer and inner blazes pink to reddish, the inner blaze marked with lace-like fibrous stripes. *Heartwood* dark red. *Branchlets* terete, ferruginous-pubescent at first, soon becoming glabrous. *Leaves* simple, on coppice shoots with up to 3-4 lobes, spirally arranged; lamina elliptic-oblong, acuminate, acute to ± obtuse at the apex, attenuate at the base, 9-20 cm long, 2-6 cm wide, coriaceous, glabrous, green above and below, somewhat paler beneath; margin entire; midrib prominent on both surfaces; nerves 10-20 on either side of the midrib, looping near the margin; petiole 10-25 mm long. *Inflorescences* terminal or axillary, raceme-like or paniculate with a number of lateral raceme-like branches; 'racemes' including the peduncle up to 20 cm long; all parts of the inflorescence ferruginous-pubescent. *Bract* subtending flower pairs caducous, about 4 mm long. *Pedicels* 4-6 mm long. *Flowers* strongly perfumed, bisexual, zygomorphic in bud, less so at anthesis. *Tepals* about 10 mm long, densely ferruginous-pubescent on outer surface, appearing creamy brown, glabrous inside. *Stamens* 4, sessile near apex of tepals, about 1 mm long; anthers opening by longitudinal, confluent slits. *Hypogynous gland* horseshoe-shaped. *Ovary* glabrous, stipitate; ovules 4; style recurved, about 7-8 mm long; pollen presenter a broad, oblique disk; stigma small, ± central. *Follicles* striate, asymmetrical,

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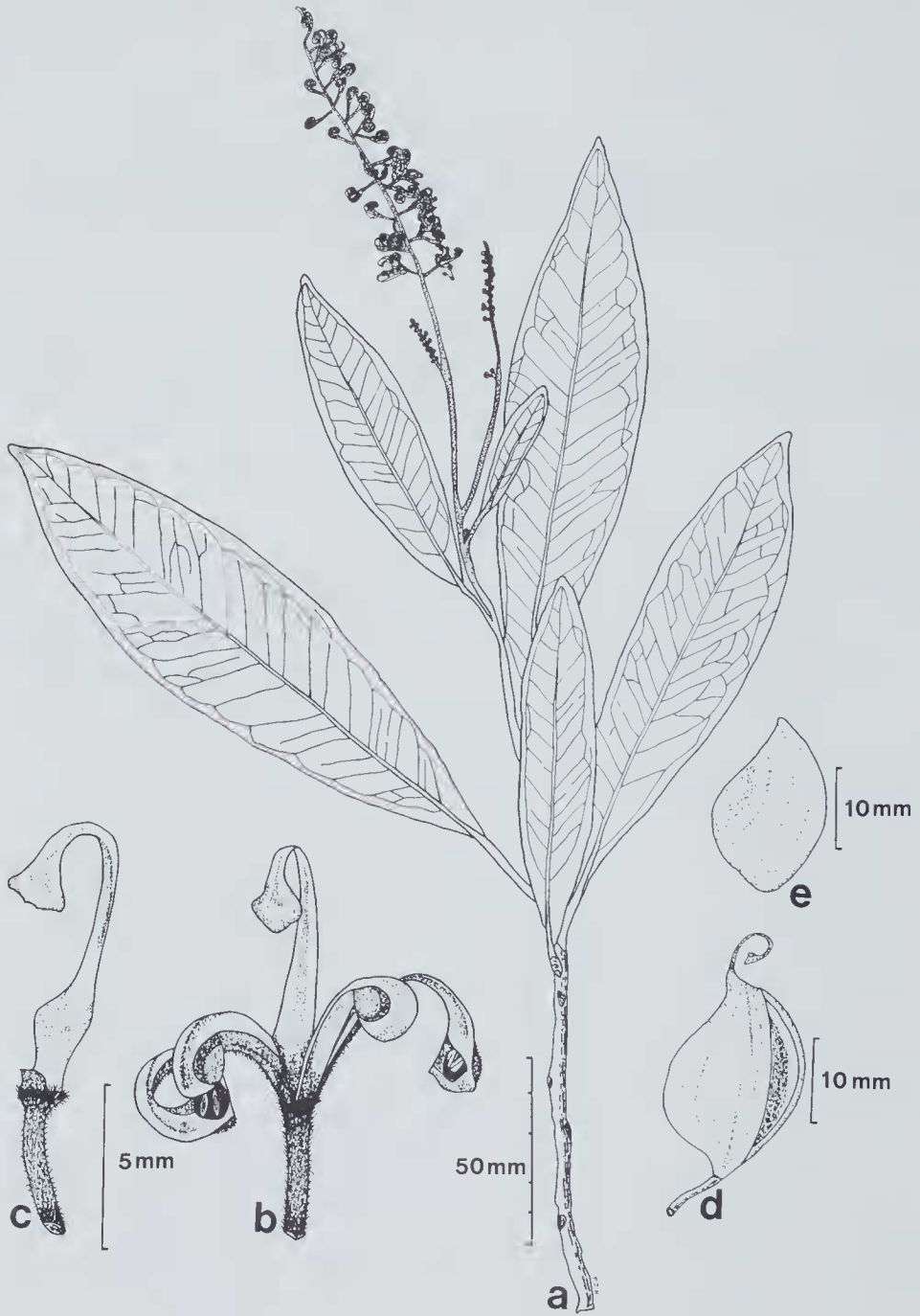


Fig. 1. *Buckinghamia ferruginiflora*. a — habit study; b — flower; c — carpel; d — fruit; e — seed. a-e, from B. Hyland 6245.

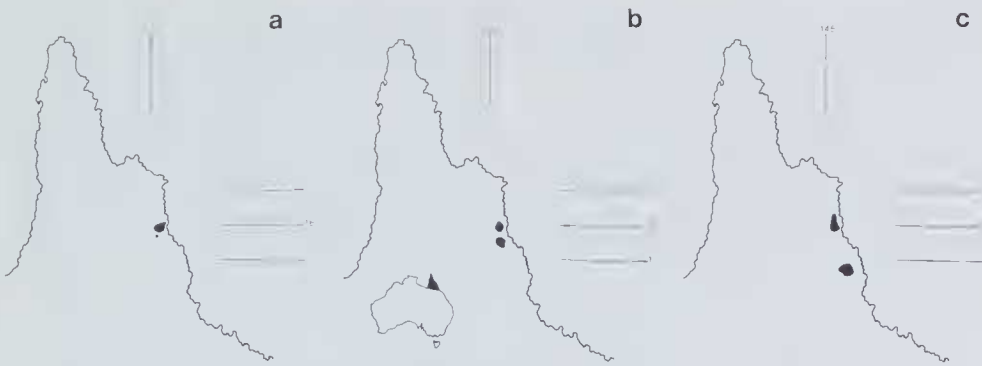


Fig. 2. Distribution maps of: a— *Buckinghamia ferruginiflora*; b — *Stenocarpus davallioides*; c — *Stenocarpus cryptocarpus*.

broadly ovate, opening along their upper margins, 20-28 mm long, 15-20 mm wide, containing up to 4 seeds. *Seeds* flat,  $\pm$  rhomboidal in outline with a narrow marginal wing, dappled cream and brown in colour. *Germination* epigeal; cotyledons asymmetrical,  $\pm$  obovate, obscurely 3-veined.

REPRESENTATIVE SPECIMENS EXAMINED (Total number examined 9):

Queensland — Noah Creek, 16° 10' S., 145° 25' E., 7.xi.1978, *B. Gray 1088* (MEL, QRS); National Park Reserve 164, Noah Creek, 16° 08' S., 145° 25' E., 24.ix.1985, *B. Gray 4164* (MEL, QRS); Portion 62, Parish of Alexandra, Noah Creek, 19.xii.1972, *B. Hyland 6614* (QRS); Roaring Meg Creek, 16° 10' S., 145° 10' E., 25.viii.1985, *G. Sankowsky 411*; (QRS); Timber Reserve 165, Roaring Meg Creek, 1 km up from Falls, 16° 03' S., 145° 19' E., 11.xi.1984, *G. & N. Sankowsky s.n.* (QRS).

DISTRIBUTION: (Fig. 2a):

North-eastern Queensland, mostly in the vicinity of Noah Creek.

ECOLOGY:

In rainforest or gallery forest at altitudes up to 350 metres. Flowering June to November; fruiting November to December.

NOTES:

*Buckinghamia ferruginiflora* differs from *B. celsissima* F. Muell. in having the outside of the flowers and inflorescence densely ferruginous-pubescent. The style in *B. ferruginiflora* is only 7-8 mm long while in *B. celsissima* it is 15-20 mm long. The inflorescence in *B. ferruginiflora* is rather open while in *B. celsissima* it is quite dense.

STENOCARPUS R. Br.

*Stenocarpus davallioides* D. Foreman & B. Hyland, sp. nov.

*Arbor* ad 40 m alta, anteridibus exignis. *Folia adulta* simplicia vel pinnata vel bipinnatisecta vel tripinnatisecta, spiraliter disposita, primum ferrugineo-pubescentia deinde  $\pm$  glabrescentia, chartacea ad coriacea; margine integro; folia simplicia, lamina lanceolata, 5-13 cm longa, 1-2.5 cm lata, apice acuminata ad acuta, basin attenuata, juxta basin 3-nervis, nervis 2 secundariis longitudinalibus conspicuis, petiolo ad 1-2 cm longo; folia composita cum lamina 8-20 cm longa, petiolo 2-4.5 cm longo. *Folia juvenilia* at regenerata tripinnatisecta et anguste divisa; lamina ad 42 cm longa; petiolus ad 10 cm longus. *Inflorescentiae* axillares umbellatae, omnibus partibus ferrugineo-puberulis, cum floribus ad 15; pedunculus 1.5-4.0 cm longus. *Pedicelli* 6-12 mm longi. *Flores* eburneo-virides, bisexuales,  $\pm$  zygomorphi. *Tepala* 8-12 mm longa. *Glandula hypogyna* hippocreperiformis. *Ovarium* ferrugineum-pubescente, stipitatum; ovula 5-8; stylus 3 mm longus, praebitor pollinus disciformis, latus, obliquus. *Folliculi* sicci, anguste oblongi, 6.5 cm longi, 3-6 mm lati. *Semina* plana, angusto-oblonga, ala terminali; nucleus seminis 7.5 mm longus  $\times$  2.5-3 mm latus. (Fig. 3).

TYPUS: State Forest Reserve 143, North Mary Logging Area, 16° 30' S., 145° 15' E., Queensland, 4.ix.1975, *B. Hyland 8374* (flowering and fruiting collections). (Holotypus: QRS. Isotypi: BRI, MEL).

*Tree* up to 40 m tall with stem up to 160 cm diameter at breast height, slightly buttressed. *Bark* flaky, thin, nondescript; blaze turning orange on exposure. *Heartwood* pink to dark red. *Branchlets* terete, ferruginous-pubescent at first, soon becoming glabrous. *Adult leaves* simple, pinnate, bipinnatisect or tripinnatisect, spirally arranged, ferruginous-pubescent at first, soon becoming glabrous or with some hairs persistent on the undersurface near the midrib and main nerves, chartaceous to ± coriaceous, margin entire, midrib well defined, reticulations barely visible: *simple leaves* — lamina lanceolate, acuminate to acute at apex, attenuate at base, 5-13 cm long, 1-2.5 cm wide, with two well defined longitudinal nerves arising near the leaf base; petiole 1-2 cm long; *pinnate, bipinnatisect or tripinnatisect leaves* — lobes lanceolate, acuminate; lamina 8-20 cm long; petiole 2-4.5 cm long. *Juvenile and coppice leaves* — tripinnatisect, more finely divided than adult leaves; lamina up to 42 cm long; petiole up to 10 cm long. *Inflorescences* axillary, borne towards the ends of branchlets, umbellate with up to 15 (commonly about or less than 12) flowers, peduncle 1.5-4 cm long, all parts of the inflorescence ferruginous-puberulous, becoming sparsely so. *Pedicels* 6-12 mm long. *Flowers* creamy green, bisexual, ± zygomorphic. *Tepals* 8-12 mm long, sparsely ferruginous-puberulous outside, glabrous inside. *Stamens* 4, about 1 mm long, sessile, opening by longitudinal slits. *Hypogynous gland* horseshoe-shaped. *Ovary* ferruginous-pubescent, stipitate; gynophore sparsely ferruginous-puberulous; ovules 5-8; style recurved, about 3 mm long (excluding pollen presenter), glabrous or with a few scattered ferruginous hairs; pollen presenter a broad, oblique disk; stigma small, central. *Follicles* glabrous, dry, narrow-oblong, attenuate at both ends, up to 6.5 cm long, 3-6 mm wide, opening lengthwise down one side, then becoming flattened, containing up to 8 seeds. *Seeds* flat, narrow-oblong, with a terminal wing; seed nucleus 7.5 mm long, 2.5-3 mm wide. *Germination* epigeal; cotyledons ± spathulate.

REPRESENTATIVE SPECIMENS EXAMINED (Total number examined 29):

Queensland — Thornton Peak, 21.ix.1937, *L.J. Brass & C.T. White 304* (BRI); Thornton Peak, 16° 10' S., 145° 20' E., 14.xi.1973, *T.G. Hartley 14061* (BRI, QRS); State Forest Reserve 143, North Mary Logging Area, 16° 30' S., 145° 15' E., 24.v.1973, *B. Hyland 6743* (MEL, QRS); South-West ridge of Thornton Peak, 16° 11' S., 145° 20' E., 27.ix.1984, *A.K. Irvine 2315* (MEL, QRS); Upper Daintree River, 15.vi.1967, *I. Olsen NSW 121587* (BRI); Gold Hill near China Camp, 16° 03' E., 145° 12' E., vii.1973, *L.J. Webb & J. Tracey 10901* (BRI).

DISTRIBUTION: (Fig. 2b):

North-eastern Queensland, restricted to areas around Mt Lewis and Thornton Peak.

ECOLOGY:

In rainforest at altitudes from 660 m to 1260 m. Flowering appears to be particularly prolific in November but buds at various stages of development can be found during February, April, May, July and October; fruiting February to October.

NOTES:

The specific epithet refers to the finely divided fern-like foliage of juvenile plants and of coppice shoots on adult plants, which shows a remarkable resemblance to the leaves of some *Davallia* species.

Apart from *Stenocarpus davallioides* there are two other species occurring in northern Australia which have highly dissected juvenile or coppice leaves, viz. *S. cunninghamii* R.Br. and *S. salignus* R.Br.. The simple adult leaves of *S. davallioides* are more like those of *S. salignus* than those of *S. cunninghamii*. However, *S. davallioides* differs from both these species in having a mixture of simple, pinnate,

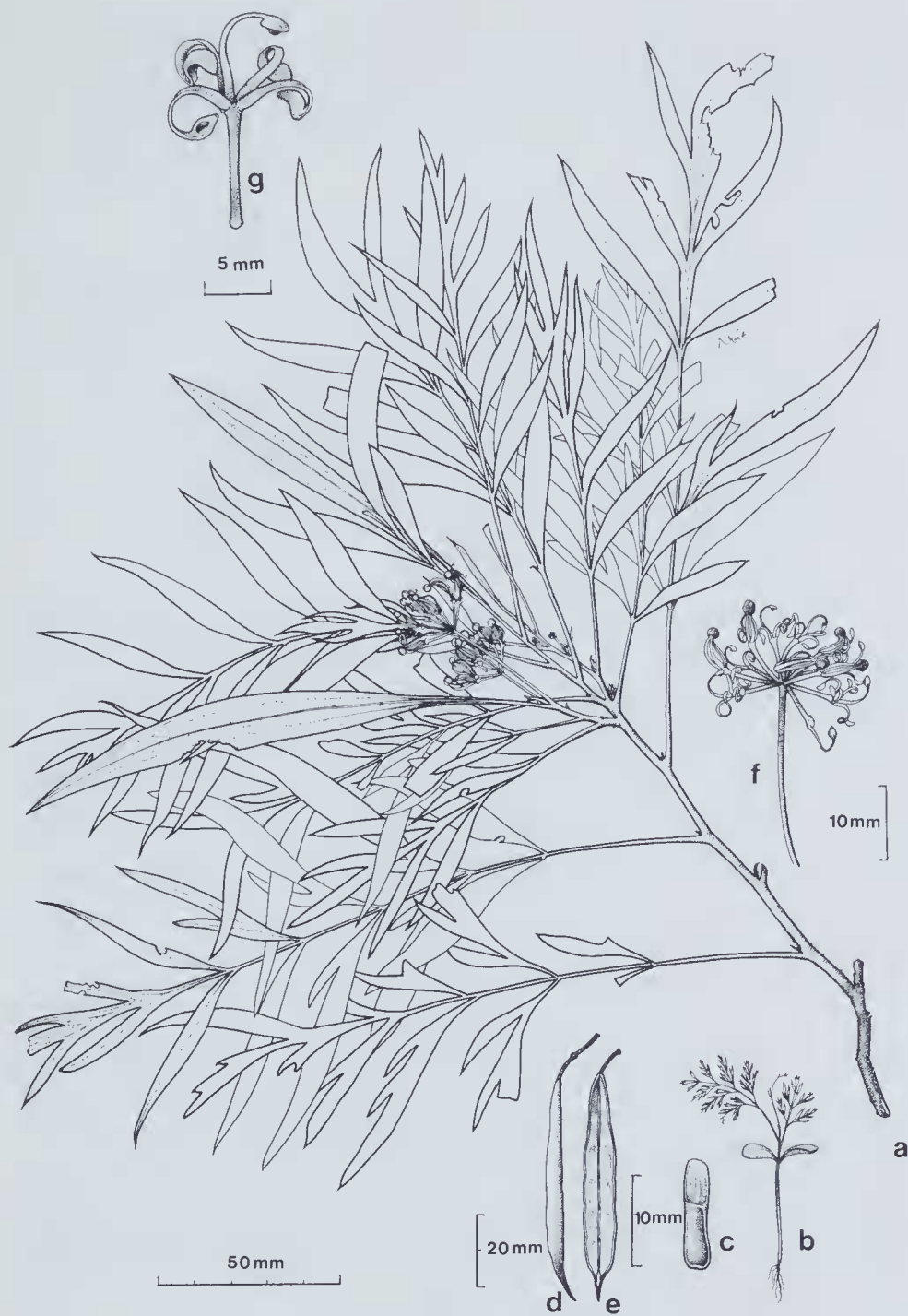


Fig. 3. *Stenocarpus davallioides*. a — habit study; b — seedling; c — seed; d — fruit; e — dehiscent fruit; f — enlargement of inflorescence; g — enlargement of flower. a, f-g, from B. Hyland 3174 RFK; b, from A. Irvine 1666; c-e, from A. Irvine 1543.



bipinnatisect and tripinnatisect adult leaves as well as having the juvenile and coppice leaves much more finely divided than those of either *S. cunninghamii* or *S. salignus*. Among other differences one of the more obvious ones appears to be the fewer number of flowers per umbel in *S. davallioides* compared with the other species mentioned. The fruits of all three species are narrow-oblong and attenuate at the ends, with their dimensions overlapping considerably.

***Stenocarpus cryptocarpus* D. Foreman & B. Hyland, sp. nov.**

*Arbor* ad 25 m alta, anteridibus. *Folia adulta* simplicia, alterna; lamina plerumque elliptica, nonnumquam ± oblonga vel obovata, 9-14 cm longa, 3.3-7.5 cm lata, coriacea, atro-ferruginosa ad ferrugino-tomentosa, glabrescentia, apice acuta ad rotundata, et obtusa mucronata, margine integro; nervis secundariis utrinsecus 5-9; petiolus gracilis, 3-8 cm longus. *Folia juvenilia* atque regenerata plerumque bipinnata; lamina ad 115 cm longa; petiolus ad 15-20 cm longus. *Inflorescentiae* axillares, umbellatae, cum floribus ad c. 20; pedunculus 5.5-9.5 cm longus, omnibus partibus atro-ferrugineis ad ferrugineo-puberulis, floribus ad c. 20; pedunculus 5.5-9.5 cm longus. *Pedicelli* 10-17 mm longi. *Flores* eburnei, bisexuales, ± zygomorphi. *Tepala* 20-30 mm longa. *Glandula hypogyna* ± oblonga, apice obliquo, c. 4 mm longa, adnata ad basem gynophori. *Ovarium* ferrugineo-pubescent, stipitatum; ovula 7-11; stylus 15-18 mm longus; praebitor pollinis disciformus, latus, obliquus. *Folliculi* sicci, anguste oblongi, ad extremia attenuati, 10-13 cm longi, 1.4-1.8 cm lati. (Fig. 4).

TYPUS: State Forest Reserve 310, Swipers Logging Area, 17° 22' S., 145° 47' E., Queensland, 13.iii.1969, B. P. M. Hyland 2199 R. F. K. (flowering collection). (Holotypus: QRS. Isotypi: BRI).

*Tree* up to 25 m tall with stem up to 40 cm diameter at breast height, buttressed. *Bark* nondescript, flaky; dead bark layer thin, dark brown; subrhynchidome cream; outer blaze cream, granular; inner blaze cream with oak grain. *Branchlets* terete, dark ferruginous to ferruginous-pubescent, becoming glabrous. *Adult leaves* simple, alternate; lamina mostly elliptical, or sometimes ± oblong or obovate, acute to rounded, ending in a blunt point at apex, attenuate at base, 9-14 cm long, 3.3-7.5 cm wide, coriaceous, dark ferruginous to ferruginous-tomentose, becoming ± glabrous or some hairs persistent along the midrib and main veins, drying dull yellowish-green above, brownish beneath or slightly darker than above; margin entire; midrib well defined on both surfaces; nerves straight, looping towards the margin, visible but not very prominent on both surfaces; reticulations rather sparse, not well defined; petiole slender, dark ferruginous to ferruginous-tomentose, becoming glabrous, 3-8 cm long. *Juvenile and coppice leaves* mostly bipinnate, with a few pinna pinnate, pinnatifid or pinnatisect; lamina up to 115 cm long, ferruginous-tomentose, becoming glabrous, leaflets variable in size and shape, the apex acuminate to acute, the base often oblique; petiole up to 15 cm to 20 cm long. *Inflorescences* axillary, borne towards the end of branchlets, umbellate with up to about 20 flowers (commonly about 16), peduncle 5.5-9.5 cm long; all parts of the inflorescence dark ferruginous to ferruginous-puberulous, becoming sparsely so. *Pedicels* 10-17 mm long. *Flowers* cream, strongly perfumed, bisexual, ± zygomorphic. *Tepals* 20-30 mm long, ferruginous-pubescent outside, glabrous on inside. *Stamens* 4, about 2-2.5 mm long, sessile, opening by longitudinal slits. *Hypogynous gland* ± oblong, apex oblique, about 4 mm long, fused to the base of the gynophore for most of its length. *Ovary* ferruginous-pubescent, stipitate; gynophore glabrous, 10-13 mm long; ovules 7-11; style curved, about 15-18 mm long, glabrous; pollen presenter a broad, oblique disk; stigma small, central. *Follicles* (description based on a few old follicles collected from the ground) glabrous, dry, narrow-oblong, attenuate at the ends, 10-13 cm long, 1.4-1.8 cm wide, opening lengthwise down one side, becoming flattened. *Seeds* not seen.

REPRESENTATIVE SPECIMENS EXAMINED (Total number examined 19):

State Forest Reserve 755, Russell River Catchment, Bartle Frere, 17° 23' S., 145° 45' E., 18.xii.1968, S.J. Dansie s.n. (QRS); Cooper Creek, 16° 10' S., 145° 24' E., 28.viii.1985, B. Gray 4136 (QRS); State Forest Reserve 755, Boonjee Logging Area, 17° 25' S., 145° 45' E., 4.xii.1972, B. Hyland 6592 (MEL,



Fig. 4. *Stenocarpus cryptocarpus*. a — habit study; b — enlargement of flower; c — juvenile leaf. a-b, from A. Irvine 1242; c, from A. Dockrill 788.

QRS); Tree Reserve 165, Monkhouse, Rossville Logging Area, 15° 43' S., 145° 19' E., 22.xi.1983, B. Hyland 12869 (QRS); McDowall Range, 16° 05' S., 145° 17' E., 17.iv.1969, B. Hyland 2233 R.F.K. (QRS).

DISTRIBUTION: (Fig. 2c):

In two restricted areas of north-eastern Queensland, namely Boonjee and the area from McDowall Range to the east coast.

ECOLOGY:

In rainforests at altitudes from 10 m to 1000 m. Flowering December to April; fruiting (?) August to November.

NOTES:

The specific epithet refers to the fact that despite long and careful searching it has not been possible to collect adequate mature fruit of *S. cryptocarpus* to complete its description.

The relationships of *S. cryptocarpus* are difficult to determine at the present time, but it does not appear to be closely related to other species occurring in north Queensland. The rather broad, penniveined adult leaves show little, if any, affinities to taxa allied to *S. salignus*.

Superficially the flowers of *S. cryptocarpus* resemble those of *S. reticulatus*, being about the same dimensions and colour but differing in a number of ways, including having long hairs on the inside surface of the tepals. The fruit of *S. reticulatus* is flattened and  $\pm$  semi-circular in shape, which is quite different from the narrow-oblong fruit of *S. cryptocarpus*.

The relatively long bipinnate coppice and juvenile leaves of *S. cryptocarpus* are quite distinctive.

#### ACKNOWLEDGEMENTS

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