A new species and a new combination among the Proteaceae represented in the Perth Region

B. L. Rye

Western Australian Herbarium, George Street, South Perth, Western Australia 6151

Abstract

Rye, B. L. A new species and a new combination among the Proteaceae represented in the Perth Region. Nuytsia 5(1): 25-30 (1984). In preparation for the "Flora of the Perth Region", the new combination *Banksia seminuda* (A. S. George) Rye (syn. *B. littoralis* R. Br. var. *seminuda* A. S. George) is made and the new species *Hakea lasianthoides* Rye (syn. *H. lasiantha* R. Br. var. *angustifolia* Benth.) is described. *Hakea lasianthoides* differs from its closest relative, *H. lasiantha*, in the shorter appressed indumentum on the young growth, the similar rather than differential colour of the hairs on the pedicel and calyx and the more elongated thinner leaves. It also differs in its flowering period, geographical distribution and, apparently, in habitat.

Introduction

This paper provides a new combination, *Banksia seminuda*, and describes a new species, *Hakea lasianthoides*, so that the names can be used in the proposed "Flora of the Perth Region". Both species occur in, but are not confined to, the Perth Region, the boundaries of which are shown in Marchant & Perry (1981).

Following Cronquist (1981: 608), the conspicuous outermost floral whorl of the Proteaceae is referred to here as the calyx; the corolla is considered to be reduced to the nectary gland(s). In *Hakea*, the typical indumentum consists of three-celled T-shaped or Y-shaped hairs, the basal cell immersed in the epidermis, the second cell forming a short stalk, while the terminal cell is elongated and attached at or near the centre (Johnson & Briggs 1975). Hence the hairs appear bifid or like a pair of hairs. The measurements given here for hairs refer to the total length of the terminal cell only if the hairs are appressed and straight, that is T-shaped. Where the cells are Y-shaped, the length of the arms of the terminal cell are stipulated.

Species treatments

Banksia seminuda (A. S. George) Rye, comb. et stat. nov.

Banksia littoralis R. Br. var. *seminuda* A. S. George, Nuytsia 3: 408-410 (1981).

Type: Nanga Brook, south of Dwellingup, Western Australia (32°49'S, 116°04'E), 15 May 1973, *A. S. George* 11655 (holo: PERTH; iso CANB, K, MEL, NSW, PERTH).

Discussion. This taxon is adequately described and illustrated by George (1981) in his recent revision of *Banksia*. George (pers. comm.) treated *B. seminuda* as a variety of *B. littoralis*, because he was unable to separate them by fruit characters and the floral differences were less than are usually found between pairs of closely related *Banksia* species. However, he now considers them to be distinct species. Floral characters alone are quite sufficient to distinguish *B. seminuda* from *B. littoralis* and leaf dimensions are also usually sufficient for identification. In the field the two species are readily distinguished by their bark. They are also distinct in their habit,

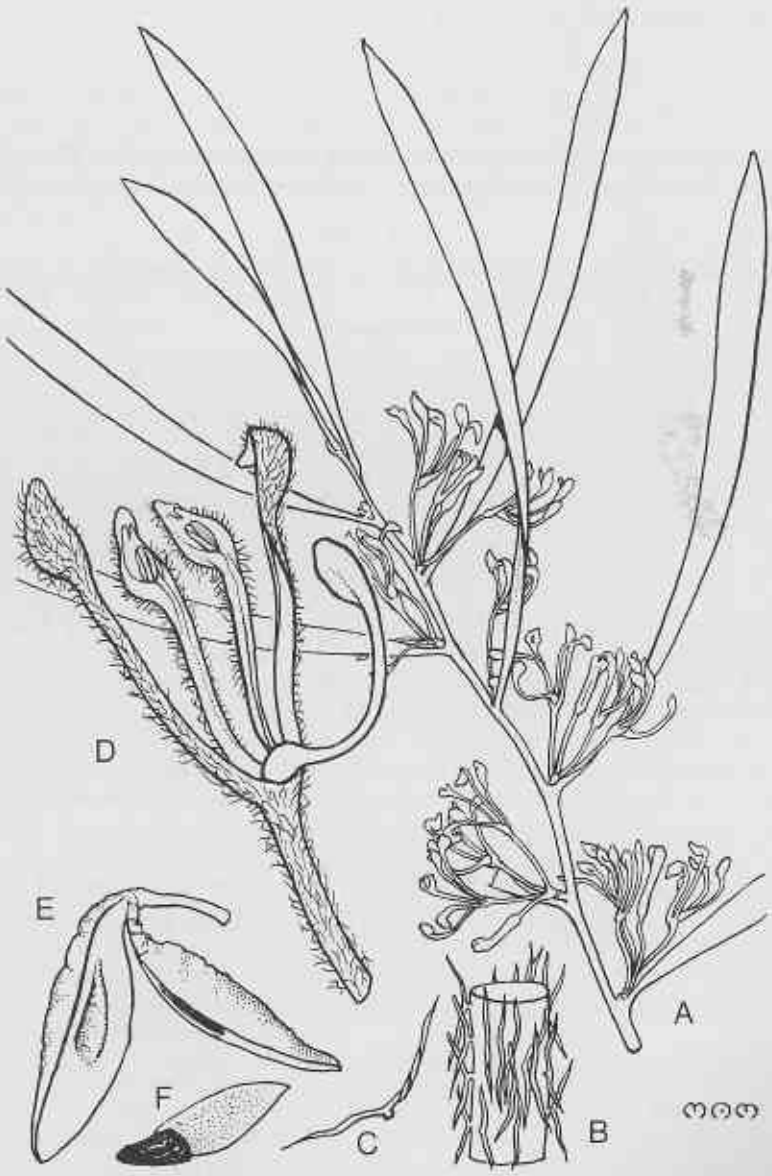

Figure 1. *Hakea lasianthoides*. A—Flowering branch (x1.5). B—Portion of young stem (x20). C—Stem hair (x30). D—Flower (x7). E—Dehisced follicle (x1.5). F—Seed (x1.5).

Drawn from several PERTH specimens.

although in exposed coastal locations the normally tall, straight-trunked *B. seminuda* has a more stunted habit, which is less readily distinguished from that of *B. littoralis*. The bark and habit differences are illustrated by photographs in George (1981: 406).

Further evidence that the two *Banksia* taxa are distinct species, rather than just variants of a single species, is their failure to hybridize in mixed stands. S. D. Hopper (pers. comm.) conducted a thorough survey of two mixed populations in the Two Peoples Bay area but found no hybrids. A number of other mixed populations are known, although the species generally occupy different habitats. *B. littoralis*, commonly known as Swamp Banksia, typically occurs in winter-wet depressions whereas *B. seminuda*, known as River Banksia, occurs along watercourses.

Both species have long flowering seasons, which overlap considerably. George (1981: 410) suggested that a difference between the two taxa in the orientation of the calyx limb may relate to their having different pollinators. However, it is more likely that the pollen is deposited on different positions on the same pollinators. Either way, the floral difference might provide an effective barrier to cross-pollination.

Hakea lasianthoides Rye, sp. nov. (Figure 1)

Hakea lasiantha R. Br. var. *angustifolia* Benth. Fl. Austral. 5: 502 (1870). *Type: Drummond* 21 (holo: presumably K-n.v.; iso: MEL-n.v., probable isotype also at PERTH).

Hakeae lasianthae R. Br. affinis a qua surculis juvenilibus indumento breviore appressoque, colore pilorum pedicellorum colori pilorum calycis simili, foliis tenuioribus magis elongatis, anthesi serotina differt.

Typus: Bow River, Western Australia, "Shrub several feet high on damp ground", November 1912, *S. W. Jackson* s.n. (holo: PERTH; iso (n.v.): K, CANB).

Related to *Hakea lasiantha* R. Br. but differs in the shorter and appressed indumentum on the young shoots, the similar rather than differential colour of the hairs on the pedicels and calyx, the thinner more elongated leaves and the later flowering time.

Erect *shrub* or *small tree* to 5 m tall. *Young shoots* ferruginous, covered by a mixture of ferruginous and colourless hairs; hairs closely appressed, straight, to c. 1 mm long. *Leaves* usually lacking a well defined petiole, often bluish green (in dried material), linear to narrowly obovate (rarely almost elliptic), often curved, 40-120 x 3.5-13 mm, thinly coriaceous, often retaining sparse hairs on the upper surface, 2 or more main veins arising in the lower half of the leaf and converging with the midrib at the apex; mucro usually 1-2 mm long, broad, black in the upper part, innocuous. *Flowers* several, in condensed racemes in the upper leaf axils; *peduncle* c. 1 mm long; *involucral bracts* early deciduous, golden brown, hairy near the apex or ciliate on the upper margin; rachis c. 2 mm long. *Pedicels* 4-10 mm long; hairs of the same shape and colour as those on the calyx but less dense and shorter. *Receptacle* fairly straight. *Calyx* white (rarely cream or ferrugineous in the upper part), 6-10 mm long, densely hairy on the outside, glabrous inside; *claw* 5.5-8 mm long, each sepal c. 0.3 mm broad; *limb* with a recurved apex in the bud, 2-3 x c. 1 mm, the subterminal concavities 1.1-1.4 mm long; hairs Y-shaped, colourless (very rarely mixed with ferruginous hairs), the spreading arms 0.5-1 mm long. *Anthers* 0.5-0.7 mm long. *Nectary* horseshoe-shaped. *Ovary* c. 1 mm long, distinctly stipitate. Style 5-7 mm long; *stigmatic disk* lateral, 1-1.5 x 0.6-1 mm. *Follicle* 25-33 x 7-9 mm, almost straight; outer surface somewhat chartaceous and wrinkled, sometimes shed. *Seed body* black, c. 8 x 4 mm; *wing* up to 15 mm long (including the decurrent portion), c. 5 mm broad, acute, narrowly decurrent at least part way along the shorter side of the seed body.

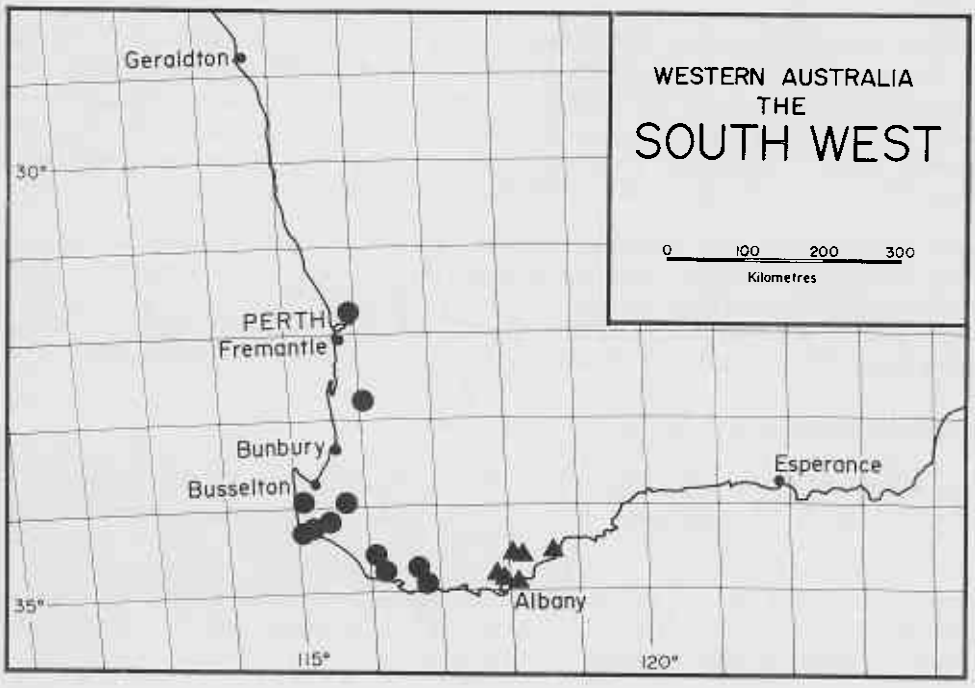

Figure 2. Distributions of *Hakea lasianthoides* ● and *H. lasiantha* ▲.

Other PERTH *specimens examined.* WESTERN AUSTRALIA: Near Augusta, *A. M. Ashby* 2373; Forest Grove—Alexandra Bridge, *R. J. Cranfield* 938; West of Nannup, *A. R. Fairall* 829; Northcliffe, *A. R. Fairall* 862; Pemberton, Jan. 1936, *C. A. Gardner* s.n.; Bow River, Nov. 1912, *S. W. Jackson* s.n.; Bow River, Dec. 1912, *S.W. Jackson* s.n.; Coronation Rd, Warren district, *M. Page* 15; East of Bullsbrook, 24 Aug. 1981, *F. Phillips* s.n.; Nannup—Busselton, *R. D. Royce* 2395; Cowaramup, *R. D. Royce* 5782; Pemberton district, *F. M. C. Schock* 45; Brockman Hwy, *E. M. Scrymgeour* 1224; Nannup, Sept. 1926, *A. C. Shedley* s.n.; Nannup, 20 Aug. 1951, *J. B. Sobott* s.n.; Pemberton, Nov. 1934, *T. N. Stoate* s.n.; Dwellingup, Sept. 1935, *T. N. Stoate* s.n.; Near Cranbrake Pool (sic.), *A. Strid* 21768; Near Walpole, *F. W. Went* 131; West of Manjimup, *D. J. E. Whibley* 5108; North of Walpole, *P. G. Wilson* 6352.

Distribution and habitat. Extends from Bullsbrook (near Perth) to Bow River on the south coast (Figure 2), usually recorded from damp habitats in forests or woodlands.

Flowering time. Late August to January.

Discussion. Both the isotype of *Hakea lasiantha* var. *angustifolia* at MEL (Marchant pers. comm.) and the probable isotype at PERTH lack flowers but match *H. lasianthoides* in their stems and leaves. A new name was chosen for the taxon rather than a new combination because the specific epithet *angustifolia* had already been used.

Hakea lasiantha and *H. lasianthoides* appear to be allopatric (Figure 1), the former extending from Albany north to the Stirling Range and east to Cheyne Beach. The separation between the known ranges of the two species is c. 85 kilometres. Although both species have long flowering periods lasting about 5 months, they show little or no overlap, *H. lasiantha* flowering from early April to August and *H. lasianthoides* from late August to January. In any given year there is probably no overlap in flowering time. As far as can be determined from the available details on herbarium specimens and limited field observations by A. Strid (pers. comm.), the species also occupy distinct habitats. *Hakea lasianthoides* occurs in wooded areas in winter-wet depressions or along watercourses whereas *H. lasiantha* occupies drier more exposed sites, generally in heathlands.

The most reliable morphological differences between the two *Hakea* species are in the indumentum. In *H. lasiantha,* the young shoots are very densely covered by Y-shaped hairs with arms 0.5-2 mm long. The stems usually retain the dense indumentum in the flowering region, appearing ferruginous and furry. In *H. lasianthoides,* the stems in the flowering region are grey and not conspicuously hairy, the hairs differing from those of *H. lasiantha* in being appressed, smaller and less dense. The pedicels of *H. lasiantha* have a mixture of ferruginous and colourless hairs and are noticeably darker than the calyx, which has only colourless hairs or very few ferruginous hairs. In *H. lasianthoides,* all pedicel and calyx hairs are colourless, except in the northernmost population at Bullsbrook, where a mixture of ferruginous and colourless hairs occurs on both the pedicel and calyx. The Bullsbrook specimen is unique in that the calyx is two-coloured, the ferruginous hairs mainly on the limb and the colourless hairs mainly on the claw.

Hakea lasianthoides almost always has more elongated leaves than *H. lasiantha,* as can be seen from the measurements made of the longest leaf on 18 specimens of each species (Table 1). The ratio of leaf length to breadth was useful in separating the two species, with most *H. lasiantha* specimens having ratios of 3.6-5.8 whereas most *H. lasianthoides* specimens had ratios of 6.5-24.5. Only one specimen of each species fell within the range (as given above) of the other species. The leaves of *H. lasiantha* also tend to be much thicker than those of *H. lasianthoides* but this difference is not easy to quantify.

Table 1. Ranges of measurements of the longest leaf from each PERTH specimen of *Hakea lasiantha* and *H. lasianthoides.*

	Hakea lasiantha		*Hakea lasianthoides*	
	Total	Excluding extremes*	Total	Excluding extremes*
Length (mm)	36-84	41-69	42-120	50-116
Breadth (mm)	7-19.5	7.5-16.5	3.5-10	4-9
Length/breadth	2.7-9.2	3.6-5.8	5.6-29.4	6.5-24.5

* Range excluding the highest measurement and the lowest measurement.

Although *Hakea lasiantha* and *H. lasianthoides* show differences in several other characters, their ranges of variation overlap. The flowers of *H. lasiantha* tend to be slightly longer and usually appear much thicker and more furry (mainly because of the thicker longer indumentum) than in *H. lasianthoides*. The fruits also tend to be shorter and thicker in *H. lasiantha*.

Hakea lasianthoides and *H. lasiantha* show obvious morphological similarities and are not as readily distinguished as most pairs of related *Hakea* species. Nevertheless, they are treated here as distinct species, rather than just as subspecies of *H. lasiantha*, because they can be reliably distinguished on morphological criteria and because they appear to be good biological species. Even if they were not geographically separated, their flowering time difference would presumably prevent hybridization.

Acknowledgements

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