Volume 18: 67–72
Publication date: 13 April 2015
dx.doi.org/10.7751/telopea8343

TELOPEA
Journal of Plant Systematics

The Royal Botanic Gardens & Domain Trust

plantnet.rbgsyd.nsw.gov.au/Telopea • escholarship.usyd.edu.au/journals/index.php/TEL • ISSN 0312-9764 (Print) • ISSN 2200-4025 (Online)

Epacris browniae (Ericaceae), a newly discovered shrub from the Blue Mountains, New South Wales, Australia

David Coleby

Sublime Point Bushcare Group, 11 Willoughby Road, Leura, NSW 2780, Australia.
davidcoleby@bigpond.com

Abstract

Epacris browniae (Ericaceae) is described from the Blue Mountains, 100 km west of Sydney, New South Wales. Its habitat is dry, rocky, montane heath, scrub and escarpment complex, all on Narrabeen sandstone. It is an erect, woody, virgate shrub with glabrous or almost glabrous branchlets, non-pungent trullate leaves, leaf petioles that separate from a crescentic scar at the junction with the stem, flowers that extend well down the branchlets, opening basipetally, a corolla that is shorter than the sepals and lobes longer than the corolla tube. The flowering period is late October through to early December. The habitat, known geographic distribution and conservation status are considered.

Introduction

In late October 2009 a single specimen of a morphologically distinctive *Epacris* was discovered on a southern slope in south Leura in New South Wales. By the time that this *Epacris* was confirmed as new to science it had finished flowering and a search for other plants was postponed for a year. In November 2010 three unsuccessful searches were conducted in the same locality. It was then predicted that suitable habitat might be the plateaus and slopes adjoining the Narrabeen sandstone escarpments that define the edge of the upper Blue Mountains plateau. Searching based on these criteria found this species at 25 locations in the upper Blue Mountains and voucher specimens from 15 of these locations were lodged with the National Herbarium of New South Wales (NSW). Populations at these sites ranged in size from three plants to several thousand plants.

Examination of *Epacris* collections at NSW revealed specimens of this new taxon amongst sheets of *Epacris microphylla R.Br. var. microphylla* and *Epacris microphylla var. rhombifolia* L.R.Fraser & Vickery, both somewhat similar to the new species. This assessment was based on a set of diagnostic criteria developed to recognise the new entity. Collections from the botanical subdivisions of Northern Tablelands, Central Coast, Central Tablelands, South Coast, Southern Tablelands, and Central Western Slopes (Jacobs and Pickard 1981) were surveyed. Ten sheets were found within *Epacris microphylla var. microphylla* and one within *E. microphylla var. rhombifolia.* All these occurred within the Central Tablelands subdivision. Four of these were within the area predicted on the basis of suitable habitat, while the remaining six slightly extended the predicted geographic range. This taxon is ecologically and morphologically distinct and is here described as a new species, *Epacris browniae.*

Description

Epacris browniae D.Coleby, ***sp. nov.***

Diagnosis: *Epacris browniae* D.Coleby may be distinguished from its two closest relatives, *E. microphylla R.Br. var. microphylla* and *E. microphylla var. rhombifolia* L.R.Fraser & Vickery, by its broadly trullate, concave, spreading leaves with a non-pungent mucro; it has glabrous or almost glabrous branchlets, a preference for dry, rocky habitat, flowering late October to early December; and has acrotonic new growth accompanying flowering.

Holotype: New South Wales: Central Tablelands: Blue Mountains National Park, 50 m SSE of Sunset Rock, off Kedumba Valley Road, off Tablelands Road, Wentworth Falls,. 33º 45′ 49″ S, 150º 22′ 20.9″ E, 29 Oct 2014, *D. Coleby 1429* (NSW880256). Isotypes BRI, CANB, HO, MEL.

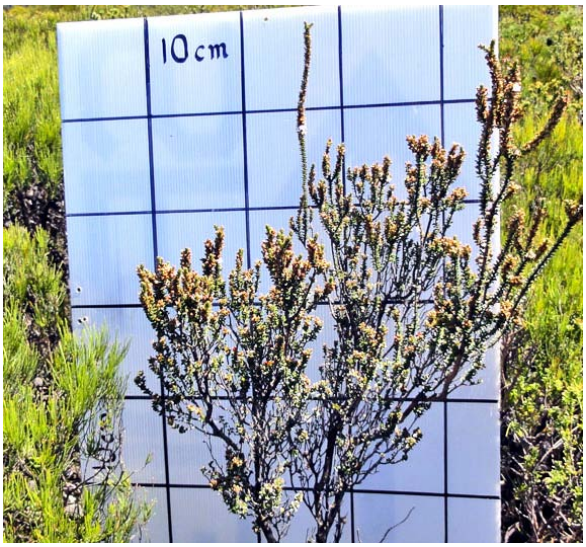
Erect, woody, virgate shrub, without a lignotuber (Fig. 1A), usually to 1 m high (Fig. 1B) but older specimens can be up to 1.8 m high and with canopy over 1 m wide (Fig. 1C); one to several stout woody stems, each up to 30 mm diam., crooked, grey-brown, with random network of longitudinal ribs on thin papery bark (Fig. 1D); stems repeatedly branch above c. 0.3 m to form canopy of smaller, erect, leafless but leaf-scarred grey-brown branches; terminal branchlets erect, rounded, glabrous or almost glabrous (Fig. 1E), brown, usually 2–5 cm long, 1–1.2 mm diam.; acrotonic new branchlets accompanying flowering (Fig. 2A). *Leaves* crowded in regular array on branchlets (Fig. 1E), becoming more distant as older branches extend, spreading at right angles to branchlet; *petiole* rigid, slightly concave, straw-coloured, fibrous, 0.7–0.8 mm wide and 0.8 mm long, held erect at 45° from a broad crescentic leaf scar on branchlet; *lamina* broadly trullate, 3–3.5 mm long, 2.5–3 mm wide, curved downwards, rigid, thick, glabrous, markedly concave, dark green and shining above, somewhat paler and duller below, with keel not significant except for a slight thickening of the lamina towards apex; base truncate to cordate (Figs 1F, 2E); margin entire, glabrous; apex rounded, obtuse, more brown than green; mucro at apex short, blunt, upturned; veins 5, parallel, visible on abaxial surface (2 often indistinct); *Inflorescence* compact, leafy, regular, spicate, basipetal (Fig. 2A); flowers solitary in leaf axils; peduncles pale straw-coloured, c. 0.5 mm wide, 2.5 mm long from axil to receptacle; bracts several, small, imbricate, with apex acute, hyaline, pale, grading in size and shape to sepals. *Sepals* glabrous, elliptical, concave, hyaline, pale green sometimes with longitudinal red-brown stripe; base cuneate; margin minutely dentate; apex acute, 2–2.2 mm long, 1–1.2 mm wide (Fig. 2D). *Corolla* white, glabrous, campanulate, 5.5–6.5 mm diam. (Fig. 2C); tube 1.8–2 mm long, 2–2.5 mm diam. at throat; lobes spreading, 2–2.5 mm long, broad and flat, with apex obtuse, rounded. *Stamens* adnate to petals for most of their length; filaments of equal length, white, triangular, c. 0.7 mm long; anthers just within or level with throat of corolla, attached to filament at mid-point, angled towards floral axis, red-brown, c. 0.7 mm long (Figs 2A, 2B). *Pistil* with ovary either apple-green or red-brown (Fig. 2D), glabrous, 5-locular, superior; style simple, cylindrical, either apple-green or red-brown (Fig. 2B), 0.35 mm diam., shorter than corolla; stigma capitate, warty, straw-coloured, 0.5 mm diam.; pollen grains silvery white. *Fruit* a capsule, brown, c. 2 mm long.

Flowering: Late October through to early December, but mainly November.

Etymology: The epithet honours the memory of Dr Elizabeth Brown (1956–2013), a research bryologist, an *Epacris* expert, and formerly the Scientific Editor of *Telopea*, who worked for nearly 24 years at the National Herbarium of New South Wales.

Other specimens examined: New South Wales: Central Tablelands: Centennial Glen, Blackheath, *G. D'Aubert 683 & G. Tague,* 13 Mar 1996 (NSW); Narrow Neck Peninsula, Katoomba, *J.M. Powell 267*, 20 Aug 1975 (NSW); track to Anvil Rock, Blackheath, *P.C. Jobson 5486*, 22 Mar 1998 (NSW); Warragamba [Wollangambe] River, Mt Wilson, *N. Gregson s.n.*, 1 Aug 1906 (NSW440677); Mt Wilson, *J.H. Maiden s.n.*, Oct 1899 (NSW440678); Mt Victoria, *R.H. Cambage 4095*, 1 Aug 1914 (NSW); Mt Banks, *W. McReadie s.n.*, Sep 1961 (NSW440972); Du Faurs Rocks to Wollangambe Creek, *L.A.S. Johnson s.n.,* 23 Sep 1949 (NSW441163); Zig Zag, Lithgow, *E.J. McBarron 9227*, 31 Aug 1964 (NSW); Little Switzerland Road, Kings Tableland , *T.A. James 243* & *R. Coveny,* 26 Oct 1982 (NSW); Blue Mountains National Park, bushland between Cliff View Road and Willoughby Road, Leura, *D. Coleby s.n.*, 16 Oct 2009 (NSW797757); Moya Point, Leura, *D. Coleby 1431*, 4 Nov 2014 (NSW); Scout Trail near Inspiration Point, Leura, *D. Coleby 1432*, 4 Nov 2014 (NSW); southern undercliff flank of Butterbox Point, *D. Coleby 1433*, 5 Nov 2014 (NSW); southern flank of Mt Hay, *D. Coleby 1434*, 5 Nov 2014 (NSW); 100 m S of Lincoln's Rock, Kings Tableland, *D. Coleby 1435*. 12 Nov 2014 (NSW); trail 150 m N of W end of Hordern Road, Wentworth Falls, *D. Coleby 1436*. 12 Nov 2014 (NSW); Kedumba Walls, Kings Tableland, Wentworth Falls, *D. Coleby 1437*, 12 Nov 2014 (NSW); 30 m NW of Princes Rock, Wentworth Falls, *D. Coleby 1449*, 14 Nov 2014 (NSW); 100 m SW of carpark at Anvil Rock, *D. Coleby 1450*, 17 Nov 2014 (NSW); Upper Shipley Plateau, W of Centennial Glen, *D. Coleby 1451*, 17 Nov 2014 (NSW); 250 m NW of Castle Cliff Trig Point, Castle Head, *D. Coleby 1452*, 18 Nov 2014 (NSW); Sir H Burrell Drive, Wentworth Falls Lookout, *D. Coleby 1453*, 21 Nov 2014 (NSW); 150 m NNW of Fletchers Lookout, Wentworth Falls, *D. Coleby 1454*, 21 Nov 2014 (NSW); summit of Flagstaff Hill, Bell, *D. Coleby 1455*, 22 Nov 2014 (NSW).

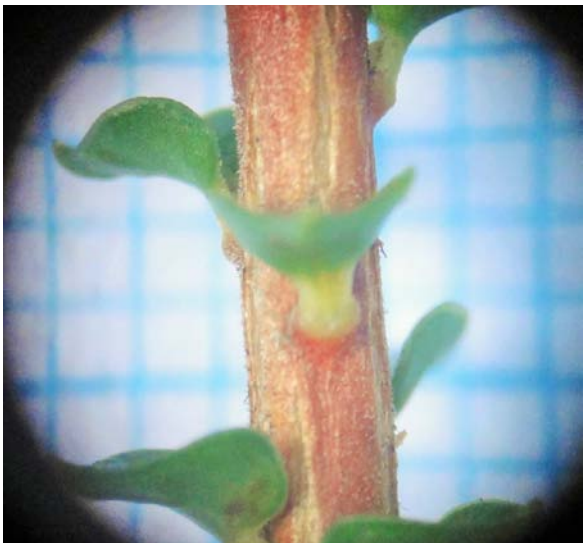
A



B

C

D



E

F

Fig. 1. *Epacris browniae*. **A.** Habit, lignotuber not present; **B.** Habit, in situ; **C.** Habit, in situ, shrub with broad canopy; **D.** Woody stems; **E.** Detail of branchlet and leaves, showing almost glabrous branchlets, spreading leaves and leaf scars; **F.** Detail of leaves, concave, showing adaxial and abaxial surfaces.

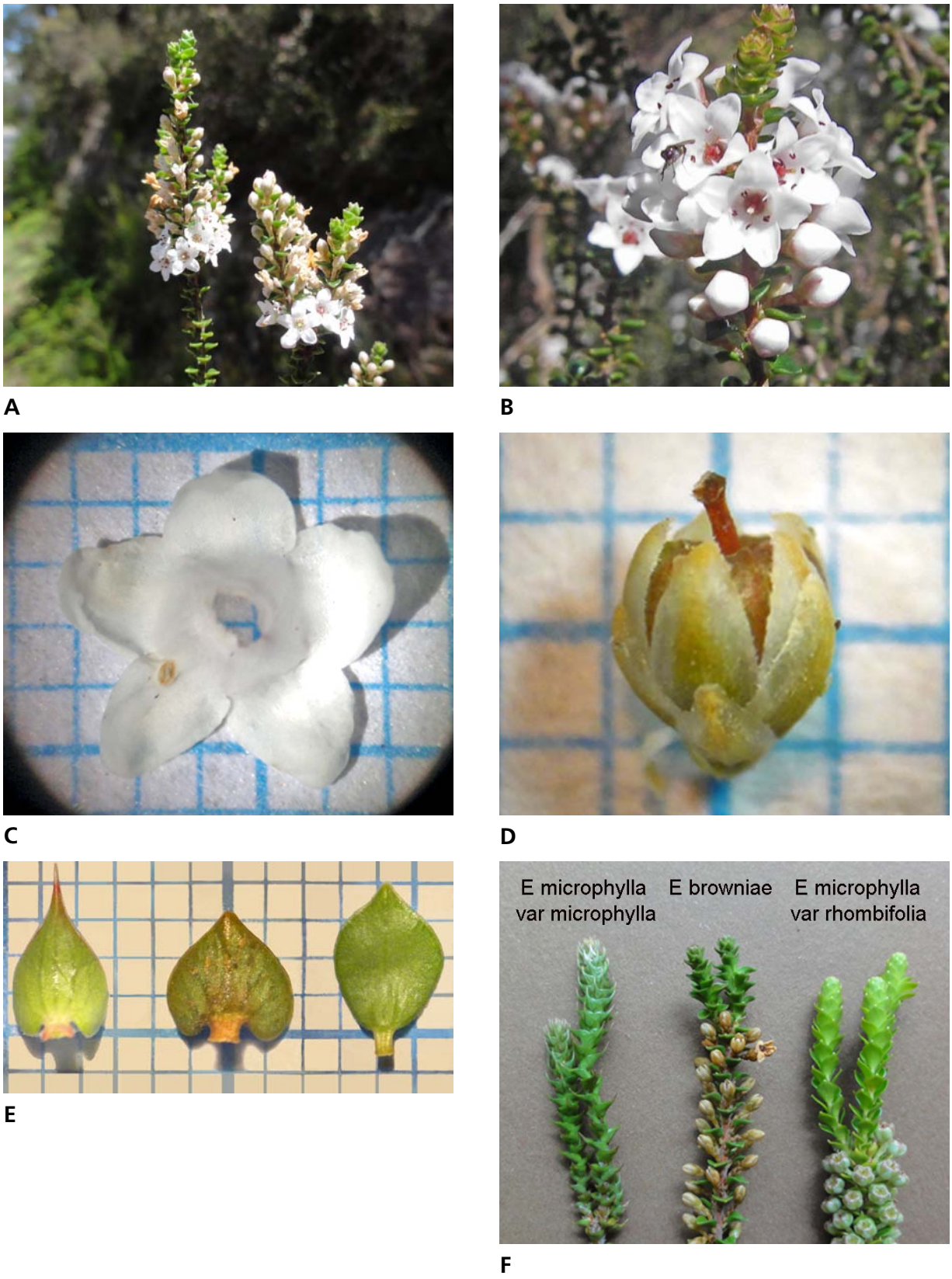


Fig. 2. *Epacris browniae*. **A.** Habit, showing basipetal inflorescenes and acrotonic new branchlets accompanying flowering; **B.** Detail of inflorescence and flowers, showing red or green ovaries and styles; **C.** Detail of corolla, showing how slightly rolled petals reduce diameter of flower from 6.5 to 5.5 mm (Scale = 1 mm); **D.** Old flower, with corolla discarded, with some bracts and minutely dentate sepals remaining, both exhibit either green or red longitudinal stripes; (Scale = 1mm). **E.** Detail of leaves, showing abaxial leaf surfaces of *E. microphylla var. microphylla* (left), *E. browniae* (centre) and *E. microphylla var. rhombifolia* (right) (Scale = 1 mm); **F.** Acrotonic new growth of *E. microphylla var. microphylla* (left), *E. browniae* (centre) and *E. microphylla var. rhombifolia* (right) (photographed 16 Dec 2014).

Morphologically similar species: *Epacris browniae* differs from nine other *Epacris* species in New South Wales whose corollas are shorter than the sepals and the lobes of the petals are longer than the corolla tube length. The principal differences are that the leaves of *E. browniae* are neither acute nor acuminate, as with *E. microphylla var. microphylla*, nor are the branchlets villous, but rather almost glabrous, that is, if the hairs are present, then they are very short and sparse, and may be confined to the upper parts of leaf axils. Furthermore, leaves of *E. browniae* are markedly concave (Figs 1E, 1F, 2E), thick, spreading, and slightly decurved, whereas leaves of *E. microphylla var. microphylla* are flatter, acuminate and recurved; leaves of *E. microphylla var. rhombifolia* are pale, flat, thin, imbricate and rhomboid (Fig. 2E), but with a small, blunt recurved mucro.

Epacris browniae exhibits basipetal flowering in late spring (mainly in November) at the same time as the plant is putting on acrotonic new growth. In the Blue Mountains, *E. microphylla var. microphylla* flowers in late winter (July–September), well before the acrotonic phase of new growth in spring. In the Blue Mountains, *E. microphylla var. rhombifolia* flowers in mid-spring (October–November) accompanied by acrotonic new growth. This flowering time differs from the flowering time of this species at other locations, such as Mt Baw Baw, in the Victorian high country, where it has been observed to flower in January (R. Crowden, pers. comm.). The photograph taken in mid-December 2014 (Fig. 2F) shows all three species after flowering.

Habitat and environment: *Epacris browniae* is an upland species that favours dry, rocky, windy outcrops in the Blue Mountains of New South Wales, in plateau communities such as Scrub, Montane Heath, and Blue Mountains Escarpment Complex (BMCC 2002). It does not grow in association with trees nor in swamps, soaks, bogs, fens or any other wet places.

Epacris browniae appears to be limited to Triassic Narrabeen sandstones of the upper Blue Mountains. The strata have been uplifted and weathered to form high cliffs and wide steep gorges with undulating plateaus and ridges. These sandstones weather to free-draining, sandy, depauperate siliceous soils of low phosphorous and clay content, typically yellow podsols and earths, lithosols and colluvial scree (BMCC 1997). *Epacris browniae* occupies the highest parts of this terrain where soils are thin and rocky.

Drainage patterns for *E. browniae* are characterised by fast run-off and relatively poor moisture retention in the surface soil, although there is probably significant moisture retention and seepage through cracks in the Narrabeen Sandstone. Rainfall in the upper Blue Mountains averages 1402 mm a year at Katoomba (BMCC 1997), but some sites for *E. browniae*, especially on cliff tops along Kedumba Walls to Wentworth Falls and Leura, may receive considerably more rain as a consequence of orographic lifting, and plants may be up to 2 m tall. Plants along the Mt Hay Road are, on average, shorter, thinner, less woody and more wiry than elsewhere.

Fires occur regularly, although it is unusual for any one location to be burnt more often than once in 10–20 years. Almost all of the sites (See Geographic Distribution, below) where *Epacris browniae* was found have not been burnt in the last 40 years (G. Meade, pers. comm.). This low fire frequency (Bradstock et al 2009) enables both re-seeders and re-sprouters in the plant community to re-establish. (Bradstock 2010, DECCW 2010a). Multiple size and age classes of *E. browniae* are present at many sites, indicating that recruitment has occurred in the absence of fire.

Geographic distribution: *Epacris browniae* inhabits the northern end of Kings Tableland southeast from Wentworth Falls (especially along Kedumba Walls and including other sites along the cliff line to Leura) and the whole of the high plateau north from Leura to Mt Hay (and including other sites, e.g. at Mt Banks, Mt Wilson and Mt Tomah). The western limit appears to lie between Clarence and Narrow Neck (Katoomba). The eastern limit appears to be Lawson Ridge. Known populations occur between elevations of 800 m and 1100 m. Further searches of suitable habitat may extend this geographic range, but the evidence suggests that the species is endemic to the upper Blue Mountains.

Conservation status: The conservation status of *Epacris browniae* is yet to be established. Potential threats include weeds (currently absent), feral animals (goats) and human activities (trampling and collecting). With a limited geographic distribution, altitudinal range and climatic envelope, any increased fire frequency associated with climate change (or hazard reduction burning) may adversely affect this species. Anthropogenic climate change and high frequency fire are both recognised as Key Threatening Processes under the NSW Threatened Species Conservation Act 1995. *Epacris browniae* is currently best classified as 'Poorly Known' and an interim ROTAP code of 2KCi is recommended (*sensu* Briggs and Leigh 1996).

Acknowledgments

In matters relating to the searches, ready cooperation was received from Geoffrey Luscombe (former Regional Manager) and Glenn Meade (Regional Operations Coordinator) of the Greater Blue Mountains World Heritage Area and their NPWS staff at Katoomba and Blackheath. Ross Day, Dr Ian Baird and Lyndal Sullivan conducted several strenuous surveys and identified remote geographic locations. Mike Purtell, Brian Marshall, Peter Ridgeway, Jill Dark, Rae Druitt, Xuela Sledge and Michael Hensen were enthusiastic participants in several 'Emu Parades'. Suzanne Lollback and Helen Drewe gave generous support for a survey of Hassans Walls, Lithgow. Dr Steve Douglas assisted in the initial preparation of this paper and guided in matters of protocol. I received considerable and ongoing assistance from staff of the National Herbarium of New South Wales (NSW), including the late Dr Elizabeth Brown, Doug Benson, and Clare Herscovitch, but especially from Dr Peter Wilson (who acted as my mentor throughout). Dr Ron Crowden confirmed *E. browniae* as a new species, and encouraged publication of its description. An unnamed referee corrected many of my taxonomic and other mistakes. I also acknowledge the significant editorial amendments of Dr Barry Conn, Scientific Editor of *Telopea*, in bringing this paper to publication.

References

Bradstock RA (2010) A biogeographic model of fire regimes in Australia: current and future implications, *Global Ecology and Biogeography* 9: 145–158

Bradstock RA, Cohn JS, Gill AM, Bedward M, Lucas C (2009) Prediction of the probability of large fires in the Sydney region of south-eastern Australia using fire weather, *International Journal of Wildland Fire* 18: 932–943

BMCC (1997) *Environmental Management Plan Stage 2: Local Environment Study: Study Area 2: Katoomba, Leura, Wentworth Falls* (Blue Mountains City Council, Katoomba)

BMCC (2002) *Native vegetation mapping of Geographic Planning Areas 1 to 5. Blue Mountains City Council local government area* (Blue Mountains City Council, Katoomba)

Briggs JD, Leigh JH (1996) *Rare or threatened Australian plants, fourth revised edition* (CSIRO Publishing, Collingwood)

DECCW (2010a) *Vegetation, fire and climate change in the Greater Blue Mountains World Heritage Area*, DECCW 2010/941 (Department of Environment, Climate Change and Water, Hurstville)

DECCW (2010b) *NSW climate impact profile: the impacts of climate change on the biophysical environment in New South Wales* (Department of Environment, Climate Change and Water, Hurstville)

Jacobs SWL, Pickard J (1981) *Plants of New South Wales: a census of the cycads, conifers and angiosperms* (Government Printer, Sydney)

Manuscript received 4 January 2015, accepted 25 March 2015