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NEW AUSTRALASIAN SPECIES OF *PEPLIDIUM* AND *GLOSSOSTIGMA* (SCROPHULARIACEAE)

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Abstract

Peplidium foecundum W.R. Barker from arid central and south-eastern Australia and *Glossostigma cleistanthum* W.R. Barker from central and south-eastern Australia and New Zealand are formally named and described.

Two species, respectively from the genera *Peplidium* and *Glossostigma*, are newly described to provide names for their treatment in the forthcoming *Flora of New South Wales* (Barker et al., in press). Both species occur in central and south-eastern arid Australia, but the *Glossostigma* extends into higher rainfall areas of south-eastern mainland Australia and to New Zealand. Their evolutionary relationships, adaptations and biogeography have been dealt with previously in a paper on the subtribe Mimulinae (Barker 1982). Attention is also drawn to the recent description of a new *Peplidium* in arid Australia (Barker 1990).

Peplidium foecundum W.R. Barker, *sp. nov.*

Microcarpaea/*Peplidium* *sp. D.*: W.R. Barker, *Evolution Fl. Fauna Arid Austral.* (1982) 343-347.

P. sp. D.: W.R. Barker in Jessop & Toelken, *Fl. S. Austral.* (1986) 1289, fig. 586C.

P. humifusum auct. non Delile: Tate, *Hdbk Fl. Extratrop. S. Austral.* (1890) 153, 253.

P. maritimum auct. non (L.f.)Asch.: J. Black, *Trans. R. Soc. S. Austral.* 57 (1933) 156.

Species nova speciebus staminibus duobus fructibusque indehiscentibus affinis; a *P. maritimo* (L.f.)Asch. (syn. *P. humifusum* Delile) differt fructibus seminibusque maioribus, a ceteris corollis e calyce vix exsertibus fructibusque abundantibus.

Holotypus: W.R. Barker 3545, 16.ix.1978, South Australia. Region 2: Lake Eyre Basin. Stuart Highway, ca. 46 km by road S of Coober Pedy (29°25'S 134°48½'E). Prolific, intermixed with *Peplidium* spp. (Barker 3544, 3546) and *Limosella curdieana*. Small claypan, dried out, in gibber plain; low open shrubland. Prostrate, large-succulent-leaved herb. Corolla reduced, but 2-lipped, the upper shorter than the lower, the lips palish blue with yellow-green spot on lower side of mouth, stigma slowly irritable. AD97925247. **Isotypi:** 4 duplicates to be distributed.

Prostrate ?annual, moderately densely eglandular pubescent, with branches to c. 20 cm long. *Leaves* fleshy; petiole to 0.6 cm long; blade ovate to elliptic, to 2.5 cm long, obtuse. *Flowers* single, in most bract axils; pedicel 0-2 mm long. *Calyx* narrow cylindrical, 2-3 mm long, enlarging in fruit. *Corolla* obscure, c. 3-4 mm long, pale blue to ?white, with the lower side of the mouth yellow-green with no obvious palate; lips very short. *Stamens* 2. *Capsule* ovoid to ± globular, 3-4.5 mm long; seeds 0.7-1.4 mm long, furrowed.

P. foecundum is confined to the central arid regions of Australia, in all mainland states except Western Australia and Victoria. It grows in and beside ephemeral pools in clay to loam soils, often on gibber plains.

This species is notable amongst its congeners for its capacity to produce prolific fruits, from which is derived the specific epithet (from the Latin adjective *foecundus* meaning fruitful or bountiful). The fruits appear clustered in leaf axils, because of their being borne on axillary short shoots. It shares with *P. maritimum* a small corolla, but in *P. foecundum* the lips are not prone to spreading like all other species. This characteristic together with the abundant fruits and the low pollen-ovule ratio has led to the proposal that the flowers are at least facultatively autogamous (Barker 1982).

Selected specimens examined (73 total seen)

NORTHERN TERRITORY. BARKLY TABLELAND (1 seen): *W. Holtze* 229, 1895, Powell's Creek. MEL560956. CENTRAL AUSTRALIA NORTH (1 seen): *W.R. Barker* 2825A(p.p.), 19.viii.1978, Tanami Desert; c. 4.5 km by road WSW of Kims Bore on track to Ferdies Bore; c. 30 km WNW of Mongrel Downs Homestead. AD (2 sheets; 3 dupls.). CENTRAL AUSTRALIA SOUTH (7 seen): *A.C. Beauglehole* 28003/5, 29.vii.1978, Simpson Desert, 8.9 miles W of Old Andado Homestead, 3.1 miles E of New Andado Homestead. - *P.K. Latz* 2601, 24.v.1972, Tobermorey Station. AD (2 sheets) (ex NT). - *R. Swinbourne* 804, 24.xi.1964, 10 miles SW Alice Springs. AD, CANB, NSW, MEL, NT.

SOUTH AUSTRALIA. NORTH-WESTERN (1 seen): *R. Bates* 19783, 5.vi.1989, Marla. AD. LAKE EYRE (34 seen): *D.E. Symon* 5703, 17.viii.1968, 31 km S of the Cooper crossing at Innamincka (N end of Strzelecki Creek). AD (formerly ADW); n.v.: CANB, K, L. - *F.J. Badman* 1127, 1.vi.1984, McAlpine Bore, Anna Creek Station, 7 km W of William Creek. AD; (1 dupl.). - *R. Bates* 19827, 7.vii.1989, About Copper Hills. AD. - *T.R.N. Lothian* 1374, 7.viii.1963, 9 miles (c. 14 km) N of Warrina. AD; n.v.: NSW NT. - *W.R. Barker* 3545 (see holotype). GAIRDNER-TORRENS (4 seen): *F.J. Badman* 2842, 24.vi.1989, 2 km N of Stuart Creek Opal Field, 42 km N of Andamooka. AD (2 sheets). EASTERN (4 seen): *J.Z. Weber* 2207, 6.viii.1971, 5 km W of vermin fence near Broughams' Cottage, which is on the E side of the S.A. - N.S.W. border and c. 155 km NNW of Broken Hill. AD; n.v.: CHR, NSW. MURRAY (1 specimen): *R. Bates* 10147, 14.viii.1987, 6 km N of Pine Valley Station. AD.

QUEENSLAND. GREGORY NORTH (2 seen): *P. Copley* 819, 24.vi.1981, Eastern Simpson Desert, between c. 45-75 km NW of Birdsville. AD. - *S.L. Everist* 3979, 11.vi.1949, Currawilla, about 100 miles W of Windorah; 5 Mile Paddock. BRI. GREGORY SOUTH (1 seen): *P.E. Conrick* 2312, 6.vi.1988, Barrioolah [Baryulah] Waterhole, Nappa Merrie Station. AD; n.v.: BRI. MARANO (1 seen): *Helen I. Aston* 2461, 1.ix.1983, 20 km NE of St George along the road to Surat. 29 km S of Bindle. AD (ex MEL) BRI. MITCHELL: *D. Davidson* 3506, iii.1953, 16 miles NW of Longreach. BRIU3259. WARREGO (2 seen): *C.T. White* 12080, 29.iii.1941, Eulo. NSW.

NEW SOUTH WALES. NORTH FAR WESTERN PLAINS (9 seen): *C.W.E. Moore* 8236, 5.x.1981, "Mt Mulyah", about 60 km NW of Louth. CANB. - *J. Pickard* 2381, 26.vii.1973, 11 km SW "Yancannia". NSW. - *W.E. Mulham* 1137, 18 Aug 1977, "Burrawantie". NSW. SOUTH FAR WESTERN PLAINS (2 seen) W.E. Mulham W787, viii.1974, Kincheha National Park. NSW. REGION UNKNOWN (2 seen).

Glossostigma cleistanthum W.R. Barker, *sp. nov.*

G. spathulatum auct non Wight & Arn. ex Arn., partly: J. Black, *Fl. S. Austral.* (1926) 510.

G. submersum auct. non Petrie: ?Petrie, *Trans. N. Zeal. Inst.* 23 (1890) 401, partly (*Petrie WELT60049* appears to have been part of the type collection of *G. submersum* which otherwise comprises many sheets of *G. diandrum*).

G. sp.: W.R. Barker in Jessop, *Fl. Cent. Austral.* (1981) 332, fig. 431C.

G. sp. A: W.R. Barker, *Evolution Fl. Fauna Arid Austral.* (1982) 344, 346, 347; W.R. Barker in Jessop & Toelken, *Fl. S. Austral.* (1986) 1280, fig. 581D.

Species nova staminibus duobus *G. diandro* affinisissima, non solum differt a speciebus omnibus differt floribus cleistogamis et fructibus sessilibus, sed etiam a *G. elatinoides* lobis tribus calycis et a *G. trichodes* FvM. et *G. drummondii* Benth. staminibus duobus.

Holotypus: *W.R. Barker* 3558, 23.ix.1978. South Australia. Region 7: Eyre Peninsula. South extremity of main north-south ridge of Carappee Hill, ca. 7 km by road ENE of Darke Peak, ca. 100 m N of road. (33°26½'S 136°16'E). Prolific in occasional rockholes. In dark brown silt sometimes with *Limosella curdieana* (*Barker* 3560); within 20 m of pool with *Glossostigma* sp. (*Barker* 3559). On slopes of mountain with granite outcropping; ephemeral pools in depressions in granite. Creeping herb, submerged in ca. 10 cm water, but

in view of heavy rains over prior 2 days, possibly formerly exposed. Cleistogamous. Fruits hard, downturned in silt. Material fixed in ethanol. AD97930260. **Isotypi:** 5 duplicates to be distributed.

Small, glabrous, creeping, aquatic or terrestrial, cleistogamous, ephemeral or ?short-lived perennial herb, sometimes forming dense mats. *Leaves* in spaced pairs, 4-45 mm long, with the mid vein apparent throughout the lower side, sometimes obscure on drying, the thin flat, white to pale green petiole gradually dilated into a more or less thick, narrow obovate or oblong, obtuse, porrect, green or reddened blade (0.15-) 0.3-1 times longer and 1-3 times broader than the petiole. *Pedicels* usually 0-0.5 mm long, shorter than the leaves, downturned in fruit, rarely 5-9 mm long and erect. *Calyx* urceolate, green, enlarging to 1.5-3 mm long in fruit, never opening. *Corolla* rudimentary. *Stamens* 2, included. *Stigmatic lobe* narrow elliptic. *Seeds* 0.3-0.8 mm long.

G. cleistanthum is widely distributed though rare across central and south-eastern mainland Australia and in New Zealand. It grows in wet-montane to arid regions, in silt in rock pools, in clay on creekbeds, on swamp margins or river flats or in dams, and flowers and fruits whether exposed or submerged.

This species is distinguished from its congeners by its flowers which never open, its rudimentary corolla, and its usually sessile or subsessile flowers and fruits. The specific epithet derives from the first characteristic, coming from the Greek *cleistos*, meaning closed, and the Latinized adjectival form of the Greek *anthos*, flower. The proposal that the flowers are cleistogamous is supported not only by observation, but also by an extremely low pollen-ovule ratio (Barker 1982).

G. diandrum (L.)Kuntze is its closest ally, sharing with it the single pair of stamens. In rare instances *G. diandrum* also has cleistogamous flowers, but these tend to be stalked and occur on plants with normal flowers as well.

Selected specimens examined (58 total seen)

SOUTH AUSTRALIA. LAKE EYRE (2 seen): *Hj. Eichler 17236*, 3.ix.1963, Between Coober Pedy and Kulgera. C. 30 km N of the turnoff to Mabel Creek Homestead. AD. GAIRDNER-TORRENS (1 seen): *R. Bates 237*, viii.1978, Mt. Finke. AD. FLINDERS RANGES (4 seen): *E.C. Foster 191*, 12.ix.1987, Arkaroola Station, Mawson Plateau. AD. EASTERN (3 seen): *R.J. Chinnock 1268*, 29.ix.1973, Cathedral Rock near Plumbago. AD; (2 dupls.). EYRE PENINSULA (21 seen): *J.Z. Weber 3258*, 28.ix.1972, Childara Rockhole, 60 km W of Lake Everard Homestead. Gawler Range. AD, MEL; n.v.: CANB, CHR, NSW, BRI, FI. - *W.R. Barker 3591*, 25.ix.1978, Gawler Ranges; c. 4 km by road NNE of Hiltaba Homestead on road to Lake Everard Homestead; low hill c. 0.8 km E of road. AD; (1 dupl.). - *W.R. Barker 3608*, 26.ix.1978, Mt. Hall, c. 23 km NW of Port Kenny; upper slopes c. 100 m W of summit. AD; (3 dupls.). - *W.R. Barker 3647, 3649*, 28.ix.1978, Pine Hill, c. 200 m NW of Lincoln Highway, c. 58 1/2 km direct WSW of Whyalla. AD; (1 dupl.). NORTHERN LOFTY (1 seen): *R. Bates 18631B*, 4.vi.1989, Along railway N of Terowie. AD. MURRAY (7 seen): *W.R. Barker 4597*, 24.iv.1983, Walker Flat, 150 m N of common ground on E. side of ferry crossing, Murray River. AD; (1 dupl.). - *W.R. Barker 3793 & R.M. Barker*, 11.ix.1979, River Murray, S bank opposite Isle of Man (Newena Island), ca. 1.25 km NW of Nelwood Homestead. AD; (1 dupl.).

NEW SOUTH WALES. SOUTHERN TABLELANDS (2 seen): *J. Thompson 1947*, 28.i.1974, Diggers Creek Reservoir, Kosciuszko National Park. NSW. SOUTH WESTERN PLAINS (3 seen): *E.J. McBarron 4708*, 14.vii.1950, Bulgandry Reserve, Bulgandry. NSW.

VICTORIA. NORTHERN PLAINS (6 seen): *H.I. Aston 523*, 8.ii.1960, Kow Swamp, W of Gunbower. MEL. EASTERN HIGHLANDS (1 seen): *A.C. Beauglehole 36614 & E.W. Finck*, 29.i.1971, East Gippsland; Native Cat Plain, MEL.

NEW ZEALAND. NORTH ISLAND. SOUTH AUCKLAND (1 seen): *P. Lynch s.n.*, iii.1972, Lake Rotoehu, CHR243916. SOUTH ISLAND. CANTERBURY (1 seen): *R. Mason 9367*, 27.iii.1962, Lake Heron, Ashburton County, CHR. OTAGO (2 seen): *D. Petrie s.n.*, s.dat., Waiholo Lake, WELT60049. SOUTHLAND (1 seen): *R. Mason 12794 & E.M. Chapman*, 25.ii.1973, 8 m [iles] NW of Riversdale, by Mataura River, CHR.

CULTIVATED or ADVENTIVE (2 seen). *H.C. Jones s.n.*, 24.xi.1978, From aquarium tanks W.R.C. [?Water Resources Commission] Griffith, probably originally from Grafton area [The reference to Grafton is probably erroneous considering the limit of distribution of the species is far to the south in A.C.T.-Griffith area]. NSW144630. - *A.H.S. Lucas s.n.*, ii.1916, Bot[anic] Gardens, Sydney. SYD, NSW144625.

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