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NEW TAXA, NAMES AND COMBINATIONS IN *LINDERNIA*, *PEPLIDIUM*, *STEMODIA* AND *STRIGA* (SCROPHULARIACEAE) MAINLY OF THE KIMBERLEY REGION, WESTERN AUSTRALIA

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Abstract

Within *Lindernia* a new subgenus *Didymadenia* with 2-celled sessile glands and 4(5) angled seeds with evenly spaced transverse ribs between the angles is described, together with the new species *L. aplectra*, *L. chrysoplectra*, *L. cleistandra*, *L. eremophiloides*, *L. hypandra* and *L. tectanthera*, and the new combination *L. macrosiphonia*, based on *Rhamphicarpa macrosiphonia* FvM. The union of the Australian genus *Morgania* R. Br. with *Stemodia* gives rise to the new combination in the latter for *M. pubescens* R. Br., the new names *S. florulenta* for *M. floribunda* Benth. (non *S. floribunda* (R. Br.) Roberty), *S. glabella* for *M. glabra* R. Br. (non *S. glabra* Oersted ut Sprengel), and *S. lathraia* for *M. parviflora* Benth. (non *S. parviflora* Ait.), and the new species *S. tephropelina*. *Peplidium aithocheilum* and *Striga squamigera* are further new species described.

The following additions to the knowledge of Australian Scrophulariaceae pre-empt revisionary studies being undertaken by the author over many years. They have been produced to make names available for the forthcoming 'Flora of the Kimberley Region', and represent only the most obvious modifications to the current taxonomic knowledge of the family.

Colour of the floral parts comes from specimen annotations, supplemented by field observations in the case of the new *Peplidium* and *Stemodia* species, and by observations of those dried specimens which have apparently retained their colour. All measurements are taken from dried material.

LINDERNIA All.

Currently *Lindernia* is circumscribed to encompass the genera *Vandellia*, *Ilysanthes* and *Bonnaya* (Pennell 1935, Philcox 1968, Yamazaki 1981, 1985), which were previously separated mainly on staminal characters (e.g. Brown 1810; Bentham 1869 in Australian works). Today these former genera are still recognized at an infrageneric level. In erecting a new subgenus below, I have followed Yamazaki (l.c.) in according subgeneric rank to these former genera, thus allowing for the recognition of sections within each.

The Australian species of *Lindernia* form a distinct group in the genus by the apparently unique characteristic of the sessile glands which occur on the herbaceous parts. These sessile glands are 2-celled and have not been observed in any representative of the genus which does not occur naturally in Australia. Similarly, the seeds of this group of species differ to my knowledge from other members of the genus by their 4 or, once observed, 5 longitudinal angles and closely evenly spaced transverse ribs between them. A new subgenus is here erected.

Lindernia All. Subgen. **Didymadenia** W.R. Barker, subgen. nov.

Differt a subgeneribus alteris *Linderniae* glandibus sessilibus 2 cellulis aequalibus in partibus herbaceis et in fructibus, et seminibus longitudinaliter 4(5)-angulis costis transversis aequaliter dispositis.

Type species: L. chrysoplectra W.R. Barker

This subgenus, which is known to extend from Australia only into New Guinea (e.g., *L. scapigera* R. Br. and *L. subulata* R. Br.), has diversified greatly. It exhibits a remarkable array

of previously unrecognized modifications of the corolla and the stamens, which are surely linked to different pollination strategies, of which the species described below form only a small representation. The group is currently under revision.

The subgeneric name comes from the Greek, *didymos*, meaning twin and *aden*, gland, alluding to the 2-celled sessile glands.

L. apectra W.R. Barker, sp. nov.

L. subulata R. Br. var. *glanduligera* Specht in Specht & Mountford, Rec.Amer.-Austral. Sci. Exped. Arnhem Land 3, Bot. Pl. Ecol. (1958) 298, fig. 20.

Ad Subg. *Didymadenia* pertinens, speciebus 4 antheris bilocularibus affinis, sed sine calcaribus in filamentis inferis; in subgenere foliis anguste linearis usque subulatis *L. subulatae* R. Br. et *L. chrysoplectrae* W.R. Barker simulans, sed differt corolla parva et loculis minutis subcircularibus.

Holotypus: M.J. Clark 1208 & T.M. Orr, 17.vi.1989. Melville Island, Soldier Pt. road camp. 11°37'S 131°55'E. Weak stemmed herb; purple flower; seasonally inundated swampy area adjacent to perennial creek; open woodland, sandy clay loam. AD98931160. *Isotypus*: DNA (n.v.).

Slender, ascending to erect, annual herb, 4.5-35 cm high, fleshy-stemmed (*Pullen 9199*, *Henshall 1603*), glabrous apart from the inflorescence; stems and branches 4-ribbed through a smooth rib decurrent from either side of each leaf; internodes longer than the leaves, 1-11.5 cm long, not very short at the base. *Leaves*: basal ones subulate, c. 1 mm long; higher up narrow linear to narrow ovate-linear to subulate, (2) 4-15 x 0.5-1 (2) mm, with dilated almost amplexicaul sessile base, entire, bluntly acute. *Inflorescences* terminal racemes of c. 4-14 flowers, lax at the base, denser distally, the rachis and bracts glabrous; lower bracts like upper leaves, shortening to subulate distally; pedicels of lower flowers 1.5-3 mm long, elongating to 2.5-5 mm long in fruit, covered by sparse to moderately dense glandular hairs 0.1-1.2 mm long. *Calyx* 3-3.6 mm long in flower, enlarged in fruit, pink to dark purple or purple-brown, with indumentum similar to the pedicels; sepals 5, free apart from very base, equal, narrow triangular to elliptic, 0.6-1.1 mm wide, finely ribbed down the midline, entire, acuminate. *Corolla* 2-lipped, 5.5-7.3 mm long along the upper side, white, purple, blue-purple or mauve on the upper lip and lower lobes, white elsewhere with purple striations in the throat; upper lip 1.2-2 mm long, emarginate; lower lip longer than the upper, 1.7-3.6 mm long. *Stamens* didynamous, with 2 pairs functional anthers borne below the upper lip; anthers 0.4 x 0.2 mm, centrifixed, their 2 locules end to end, 150°-180° divergent. *Capsule* ± globular, 2.5-3.5 x 2.2-3 mm, thin-walled, yellow-brown; seeds many, oblong-ellipsoid, 0.5-0.6 x 0.3-0.35 mm, with 4(5) angles alternating with grooves and evenly-spaced transverse walls between them, the areoles so-formed $\frac{1}{3}$ - $\frac{1}{2}$ as long as wide.

Distribution & ecology

Spread across subtropical northern Australia, *L. apectra* grows on floodplains, around swamps or on escarpments, in seasonally wet situations, amongst herbs, sedges and grasses, in sand to clayey soil.

Flowers and fruits: April - August.

Notes

L. apectra is allied to the species of Subg. *Didymadenia* with four 2-locular anthers, but unlike them lacks spurs on the lower filaments. By its narrow linear to subulate leaves it is closest to *L. subulata* R. Br. and *L. chrysoplectra* W.R. Barker, but it differs from them by its small corolla and minute ± circular anther locules.

The three Western Australian specimens have much shorter glandular hairs than in the

collections from Northern Territory and Queensland. They may constitute a separate taxon.

The adjectival epithet derives from the Greek prefix *a-*, meaning without, and *plectros*, spur, indicating the lack of the characteristic spurs on the lower filaments in *Lindernia*.

Specimens examined

WESTERN AUSTRALIA. GARDNER: *A.C. Beaglehole 51746*, 31.v.1976, Gibb River – Kalumburu Mission Road 8.5 km S of Doggan River ± 190 km W of Wyndham, PERTH; *A.S. George 12430*, 19.viii.1974, Blyxa Creek, Prince Regent River Reserve, PERTH; *A.S. George 13907*, 16.viii.1975, Carson Escarpment S. of Coucal Gorge, Drysdale River National Park, PERTH.

NORTHERN TERRITORY. DARWIN & GULF: *R.M. Barker 462 & C. Scarlett*, 6.v.1983, Along Winmurrumbong track, turnoff 15 km along Oenpelli road from Arnhem Highway, AD; *R.M. Barker 479*, 8.v.1983, Moline Rockhole, turnoff 9 km N of Mary River on Pine Creek – Jabiru road, AD; *M.J. Clark 1208 & T.M. Orr* (see type); *N.M. Henry 157*, 9.vi.1971, 13 m SSW Bing Bong H/S., AD; *T.S. Henshall 1603*, 3.vii.1977, 15°43'S, 134°32'E, Cox River Station, AD; *G.J. Leach 2479 & Dunlop*, Catchment of Haywood Creek, AD; *B. Rice 3128*, 14.iv.1979, Nabarlek, DNA; *D.E. Symon 7967F*, 28.vi.1972, 8 km W of Rum Bottle Creek, AD (ex ADW); *B.S. Wannan, C.J. Quinn & K. Brennan UNSW20248*, 10.v.1987, Oenpelli Rd., 15.4 km N of the Arnhem Hwy. T[urn] O[ff]. – Northern side of Winmuyurr Swamp . . . adjacent to a sandy channel (of 7J C[ree]k), AD.

QUEENSLAND. COOK: *J.R. Clarkson 3692*, 23.vi.1981, 8 km south of Koolburra on the track south from Koolburra to the Kimba Road, AD; *J.R. Clarkson 4510*, 3.vi.1982, 1.3 km ESE of Aurukun on road to Watson River, AD; *J.R. Clarkson 4737*, 26.iv.1983, 0.9 km east of the Peninsula Development Road on an IWS track leaving the main road 0.5 km N of the Laura River Crossing, AD. BURKE: *R. Pullen 9199*, 11.v.1974, Near "Westmoreland", c. 30 km E of the Q/N.T. border, far NW Queensland, AD.

L. chrysoplectra W.R. Barker, sp. nov.

Ad Subg. *Didymadeniam* *pertinans*, 4 antheris bilocularibus, filamentis inferis calcaratis et absentia rosulae foliorum latorum *L. subulatae* R. Br. affinis, sed differt foliis plerumque longioribus anguste linearibus, et pilis glandulosis in calyce pedicellisque.

Holotypus: *Y. Power 283*, 31.iii.1967, 3 mls from Belina [sic!, = Blina] T[urn] O[ff] off Fitzroy Rd., PERTH. *Isotypus*: AD99018303.

Delicate 'fleshy-stemmed' annual herb, (8) 12-28 cm tall, with slender ascending branches, glabrous apart from the inflorescence, usually with all nodes from c. 1 cm above ground level developing branches, the lower ones sometimes further branched (*Power 283*); branches 4-ribbed, by a long rib decurrent from either side of each leaf; internodes above the lowest branch on stem 2-7 cm long, shorter below. *Leaves*: basal ones unseen, caducous by flowering time; higher up narrow linear to narrow ovate-linear to subulate, 4-15 (20) x 0.5-1 mm, the shorter ones in upper parts, sessile and dilated at base, entire, with a bluntly acute, often callose apex. *Inflorescences* terminal racemes, loose through the long internodes and pedicels, the rachis glabrous, the pedicels and calyx bearing moderately dense glandular hairs 0.8-1 mm long; the lowest bract similar in shape and size to the upper leaves, shorter higher up; lowest pedicels (8) 10-15 (17) mm long, shorter above. *Calyx* 2.8-4 mm long, the sepals free almost to the base, narrow triangular-ovate, acute to acuminate, 0.7 mm wide, smooth. *Corolla* 9-10 mm long along the upper side, bilabiate, the tube white, the lips purple, possibly with white extending onto the lower lip; tube 6-8 mm long; upper lip c. 2-3 mm long, emarginate, lacking the internal lateral flaps which enclose anthers in other Australian species; lower lip c. 0.5 mm longer than the upper, spreading, the lobes c. 2-5 mm long, equal, rounded. *Stamens*: both pairs fertile; anthers with purple or ?blue walls and white pollen, aligned side by side in pairs, both pairs 2-locular, c. 1.2 x 0.2 mm, the locules end to end (divergent to 180°); filaments of even thickness throughout, purple at least distally, the connective ± equally as long as the anthers, ?white; upper filaments c. 1.2-2 mm long; lower filaments 2.5-5 mm long distal of the spur, the spur exerted from the corolla mouth, terete, c. 1.5-2.7 mm long, papillose, golden-yellow. *Style* 5.5-6 mm long, slender, straight, purple at least distally, the stigmatic flaps 2, ± equal, obtuse to truncate, sometimes one acute and slightly longer. *Capsule* a broadly ovoid to

globular, thin-walled, septifragal 2 (?young)-3.5 mm long, much (?young) to just shorter than the calyx, densely covered by blister-like sessile glands; septum emarginate; seeds not seen.

Distribution & ecology

Confined to the south-west of the Kimberley province of Western Australia, but for a single record in the adjacent Great Sandy Desert, *L. chrysoplectra* occupies seasonally wet, sandy sites in closed grassland or woodland.

Flowers: March – August; fruits not collected prior to May.

Notes

Within Subg. *Didymadenia* *L. chrysoplectra* is allied to *L. subulata* R. Br. by its 2 pairs of 2-locular anthers, its spurred lower filaments, its narrow leaves and the absence of a basal rosette of broad leaves. From *L. subulata* differs by its usually longer, narrow linear leaves, and the glandular hairs on the calyx and pedicels.

The adjectival epithet derives from the Greek *chrysos*, golden-yellow, and *plectros*, spur, referring to the prominent exerted staminal spurs.

Specimens examined

WESTERN AUSTRALIA. DAMPIER: *B.J. Carter* 59, 10.viii.1987, Bobby's Creek, 15 km NE of Beagle Bay, Dampierland Peninsula, AD, PERTH; *K.F. Kenneally* 5947, 17.iv.1977, 5 km north of Point Coulomb, (17°19'S, 122°10'E), Dampier Peninsular [sic], north of Broome, PERTH; *K.F. Kenneally* 6200, 28.iv.1977, Between Lombadina Mission and Pender Bay, Dampier Peninsular [sic], north of Broome, PERTH; *K.F. Kenneally* 8546, 8547 (p.p.), 9.vii.1982, Prior's Bore, approx. 10 km N of Great Northern Hwy, at a point 135 km E of Broome along the Broome-Derby Road, PERTH, PERTH (p.p.); *K.F. Kenneally* 9053, 18.vi.1984, Wonganut Spring, 19 km ESE of Coulomb Pt., Dampier Peninsula, W. Kimberley, PERTH; *K.F. Kenneally* 10635, 6.iv.1988, Bobby's Creek, 20.3 km N of turn off to Beagle Bay on Cape Leveque-Broome Road, Dampierland Peninsula, PERTH; *Y. Power* 253, 14.iii.1967, 25 mi E of Derby on Beef Road, PERTH; *Y. Power* 283 (see type). HALL: *A.J. Ewart* s.n., v.1927, Near Christmas Creek, PERTH. GREAT SANDY DESERT: *W.K. Harris & J.P. Scibiorski* 24, 29.iv.1982, Eremophila No. 1 Original Site. CROSSLAND 1:250,000 SE51-16 (19°47'S 125°12'E), AD.

***L. cleistandra* W.R. Barker, sp. nov.**

Ad Subg. *Didymadeniam* pertinens, speciebus solum 2 antheris superis fungentibus bilocularibusque; caractere in genere unico paris laminarum intro productarum e corolla et antheras includentium *L. eremophiloidi*, *L. tectantherae* et *L. hypandrae* affinis; *L. eremophiloide* differt foliis oppositis, sepalis liberis, corolla tubo ad calycem spectato longiore labiisque longioribus, et nectario parvo, speciebus alteris differt caulibus prostratis lignosis, absentia foliorum bractearum subulatarum, et indumento longe glanduloso.

Holotypus: *K.F. Kenneally* 9780, 30.v.1986. Western Australia. Hidden Valley, 3 km N of Kununurra, N.E. Kimberley, 15°47'S 128°46'E. In sheltered seepage areas on massive outcropping sandstone. Decumbent soft-leaved herb, leaves pale green, flowers mauve, with deeper mauve tinge on throat and purple striations; the upper and lower sections of the throat white, outer corolla [sic!] whitish to pale mauve. AD99018372. *Isotypi:* PERTH, 3 other duplicates to be distributed.

Procumbent perennial herb, with short leafy branches to c. 5 cm tall arising from prostrate occasionally branched woody stem or rhizome extending for 20 cm or more; branches in dried state with rib decurrent from either side of leaf base as far as node below; indumentum lacking or consisting of dense glandular hairs 0.2-1.5 mm long over branches, leaves and inflorescence apart from the corolla. *Leaves* crowded along the branches, opposite, narrow-elliptic to spatulate, the slender petiole 5-22 mm long, gradually dilated into the blade; blade narrowly to broadly, obovate to elliptic, 8-22 x 2-21 mm, coarsely short to long-serrate in the distal $\frac{2}{3}$ - $\frac{1}{3}$, acuminate to rounded with a short to long acuminate tip. *Inflorescences* dense leafy terminal

racemes of c. 1-8 flowers, not flowering in every axil; bracts like the leaves; pedicels almost as long to longer than the bracts, 7-10 mm long in flower, elongating as much as 40 mm in fruit. *Calyx* 2-7 mm long; sepals 5, free, equal, narrow elliptic 0.5-1 mm wide, acute to acuminate, green. *Corolla* 2-lipped, 8-18 mm long along the upper side, white, pale purple or mauve on the lips, white in the throat with fine striations in parts; tube funnel shaped, 2.5-3.5 times the length of the calyx; upper lip 2-5 mm long, porrect, emarginate, produced within into 2 longitudinal flaps meeting below and enclosing the anthers and stigma; lower lip widely spreading, 8-9 mm long, the 3 lobes rounded to truncate, the mid lobe broader than the laterals. *Stamens*: the 2 adaxial fertile, their anthers 1-1.8 x 0.3-0.4 mm, 2-locular, the locules end to end, 150-180° divergent; the 2 abaxial staminodes, each thicker towards base, c. halfway along produced into a short knob-like spur, then much finer and arched outwards and forwards, terminated by 2 minute vestigial anther locules. *Stigma* unequally 2-lobed, the longer lobe narrow elliptic, narrow acute, the shorter half its length. *Capsule* broad ellipsoid, 3.5-5.5 x 2.5-4.5 mm, thin-walled, septifragal into 2 valves, yellow-brown; seeds many, narrow ellipsoid to oblong, 1.3-1.9 x 0.5-0.7 mm, straight or slightly curved, pale yellow, with 4 longitudinal angles alternating with 4 grooves, with evenly spaced transverse ribs between each angle and groove, the areoles so formed $\frac{3}{4}$ -1 times as long as wide.

Distribution & ecology

Confined to the east Kimberley, Western Australia, and the adjacent Keep River area in Northern Territory, *L. cleistandra* occupies shaded crevices on sandstone rock-faces.

Flowers and fruits: March – September.

Notes

Within Subg. *Didymadenia* *L. cleistandra* is akin to those species with only the 2 upper (adaxial) stamens functional and 2-locular and the lower pair of stamens infertile. It shares with *L. eremophiloides* W.R. Barker, *L. tectanthera* W.R. Barker and *L. hypandra* W.R. Barker a character apparently unique in *Lindernia* of the longitudinal inwardly projected corolla flaps which enclose the anthers and style end. It is closest allied to *L. eremophiloides* by its prostrate woody stems and leafy inflorescences, but it differs from that species by its spirally arranged leaves, its sepals free to the base, its longer corolla tube relative to the calyx, its longer corolla lips, the afore-mentioned corolla flaps being entire, and by its smaller nectary. From the last two species it differs by its prostrate woody stems, by the absence of subulate leaves and bracts, and by its long glandular indumentum; *L. hypandra* differs further by its resuplicate flower.

This, the following species *L. eremophiloides*, and another as yet unnamed species from Northern Territory have an unusual habitat on rock walls. The prostrate branched woody stem or rhizome presumably runs within crevices where soil and moisture persist. In this species the fruits are borne on greatly elongated pedicels which apparently occur on the underside of the plant. The white colour of the pedicels indicates their existence in poor light. This doubtless ensures that seed is shed into what soil exists in the rocky habitat.

Seasonal conditions may affect indumentum and leaf shape in this species. Most of the Kununurra material has been collected during the wet months of April and May; it is densely glandular hairy and has broadly bladed, spatulate leaves. Two later collections, *Beaglehole 54242* in early July and *Gowland 242* a 'dry season collection', have mainly narrow-elliptic leaves, although the former has a few spatulate leaves, and are glabrous or possess a few minute glandular hairs. The two Keep River specimens, both collected in the dry month of September, have narrow spatulate leaves. One is densely glandular hairy. In the other the indumentum is confined to the petioles and above the nodes, but the longest hairs are eglandular, possibly through loss of the gland tips, and only the shortest hairs are glandular.

The adjectival epithet is derived from the Greek *cleistos*, closed, and *andros*, male, describing the enclosure of the functional anthers by flaps within the corolla, unique to a few allied Australian species.

Specimens examined

WESTERN AUSTRALIA. GARDNER: *A.C. Beauglehole 54242*, 4.vii.1976, Kimberleys, 32 km WSW of Kununurra, Aboriginal Paintings area, AD, PERTH; *K. Coate s.n.*, iii.1989, Between Spillway and Stonewall Creeks off Ord River, Carr Boyd Ranges, East Kimberley, PERTH; *C. Done 642*, 3.v.1983, Hidden Valley National Park, near Kununurra, N. Kimberley, PERTH; *A.S. George s.n.*, 24.iv.1977, Hidden Valley, Kununurra, PERTH; *E.C. Glover CG97*, 11.iv.1982, Thompsons Springs 40 km S of Kununurra, just above Lake Argyle near NT Boundary, PERTH; *P. Gowland 242*, 1978, Kununurra area, DNA; *K.F. Kenneally 9780* (see type); *V. Scarth-Johnson 547*, 4.ix.-, Mountain face, Kun[un]jurra, K.

NORTHERN TERRITORY. VICTORIA RIVER: *A.S. Mitchell 320*, Keep River, 15°47'S, 129°02'E, CANB, NT; *A.S. Mitchell 378*, 23.ix.1975, Keep River, 15°47'S, 129°05'E, NT.

***L. eremophiloides* W.R. Barker, sp. nov.**

Ad Subg. *Didymadeniam* pertinens, speciebus solum 2 antheris superis fungentibus bilocularibusque; caractere in genere unico paris laminarum intro productarum e corolla et antheras includentium *L. cleistandrae*, *L. tectantherae* et *L. hypandrae* affinis, sed differt foliis alternatis, sepalis ad basem connatis, et nectario magno; etiam *L. cleistandra* differt corolla tubo ad calycem spectato brevioris labiisque brevioribus, et speciebus alteris caulibus prostratis lignosis, absentia foliorum bractearum subulatarum, et indumento longe glanduloso.

Holotypus: *K. Menkhorst 480*, 6.vii.1989. Western Australia. Bungle Bungle Massive [sic!] above Picaninny Gorge. 17°26'S 128°24'E. Pendulous herb on cliff face; corolla mauve with purple & red streaks on largest lobe, throat white. AD98931152. *Isotypi* (n.v.): DNA, PERTH.

Perennial herb, with pendulous (*Menkhorst 480*) leafy branches 6-33 cm long arising from a branched woody stem or rhizome, in the dried state with a fine rib decurrent from leaf base to several nodes below; indumentum on herbaceous parts of tiny glandular hairs 0.01-0.05 mm long, in some parts moderately dense in patches, in others sporadic or absent. *Leaves* alternate and spirally arranged, rarely (once seen) opposite, the slender petiole 5-12 mm long, gradually dilated into the blade; blade elliptic-linear to narrow elliptic, 12-40 x 2-8 mm, entire, narrowly acuminate with a long narrow tip. *Inflorescences* moderately dense leafy racemes of c. 6-50 flowers, not always flowering in consecutive axils; bracts like the leaves; pedicels c. half as long as the bracts, 10-25 mm long, hardly elongating in fruit. *Calyx* 5-7 mm long; sepals 5, free except in basal 1/8-1.3, equal, narrow ovate, 1-1.5 mm wide, long acuminate, green. *Corolla* 2-lipped, 7-11 mm long along the upper side, mauve or pink-lavendar, with purple and red streaks on lowest lobe, the throat white; tube funnel shaped, 0.9-1.3 times length of the calyx; upper lip 1.2-1.5 mm long, porrect, emarginate, produced within into 2 longitudinal flaps meeting below and enclosing the anthers and stigma and bearing a single tooth halfway along margin; lower lip widely spreading, 3-4.5 mm long, the 3 lobes rounded to shallowly emarginate, the mid lobe more than twice width of laterals. *Stamens*: the 2 adaxial fertile, their anthers c. 1.1 x 0.4 mm, 2-locular, the locules end to end, c. 180° divergent; the abaxial staminodes, each proximally thick, bearing on one side towards apex a curved vestigial filament and tiny anther. *Stigma* 2-flapped; ovary with a large nectary at the base. *Capsule* broad ovoid-ellipsoid, c. 4-4.5 x 3.2-3.4 mm, thin-walled, septifragal into 2 valves, yellow-brown; seeds not seen.

Distribution & ecology

Known only from Piccaninnie Gorge in the Bungle Bungle massif of the eastern Kimberley, Western Australia, *L. eremophiloides* grows in damp crevices on shaded cliff faces.

Flowers: known in April and July; fruits in July.

Notes

L. eremophiloides is perhaps unique in *Lindernia* in its alternate, spirally arranged leaves. Within Subg. *Didymadenia* it differs from other species by the fusion of the sepals for up to a third of their length. It is closely allied to *L. cleistantra*, but differs from it not only by its leaf arrangement, but also by its shorter corolla tube relative to the calyx length, by its shorter corolla lips, possibly by the marginal tooth on each of the longitudinal flaps within the upper corolla lip, and by its large nectary. It shares differences from the other species with *L. cleistantra*.

The adjectival epithet is derived from the resemblance of this species to members of the Australian genus *Eremophila*.

Specimens examined

WESTERN AUSTRALIA. HALL. *M.I. Blackwell 115*, 4.iv.1985, 254, 6.iv.1985, 276, iv.1985, Piccaninny Creek Gorge, 15 km SE of Bungle Bungle Outcamp, Bungle Bungle Range, PERTH (3 sheets); *K. Menkhorst 480* (see type citation above); *K.F. Kenneally 9285B*, 12.vii.1984, Piccaninny Creek Gorge, 15 km SE of Bungle Bungle Outcamp, AD98510077, PERTH (2 sheets); *E.L. Robertson s.n.*, 11.vii.1989, Picanninny Gorge, Bungle Bungle, AD99018373; *A.S. Weston 14715*, 5.iv.1985, Piccaninny Gorge, Bungle Bungle Massif, Osmond Ranges, PERTH.

***L. hypandra* W.R. Barker, sp. nov.**

Ad Subg. *Didymadeniam* pertinens, 3 speciebus novis *L. cleistantrae*, *L. eremophiloidi* et *L. tectantherae* antheris styloque in pari laminarum intro productarum e corolla incluso, sed differt corolla resupinata per stamina fungentia laminasque interiores corollae in positione infera, labium superum corollae integrum et inferum lobo medio profunde fisso.

Holotypus: *K.F. Kenneally 7726*, 14.i.1982. Western Australia. Mitchell Plateau Airfield, Mitchell Plateau, N. Kimberley. 14°48'S 125°49'E. Growing at Airfield swamp. Erect rosetted herb. Leaves pale green, flowers pale mauve, fruit red. AD98814011. *Isotypi*: PERTH, 2 other duplicates to be distributed.

Erect annual, or possibly perennial, herb 12-28 cm high, glabrous or almost so, with many slender erect scapiform branches arising from a basal rosette of leaves or a single erect scapiform stem above 2-3 pairs of basal leaves; branches with a rib decurrent from either side of each leaf to the node below; internodes between the basal leaves 1-3 mm long, higher up 80-130 mm long. *Leaves* at base of plant elliptic to subspathulate, 3-35 x 1.5-15 mm, entire, obtuse to rounded at apex, sometimes with scattered glandular hairs 0.02-0.1 mm long, with 3-7 veins arising from the base; leaves on the scapiform branches subulate, 1-2 x 0.5 mm; acute. *Inflorescence* simple, terminating each branch, lax by the sidely spaced internodes, with 1-10 flowers single, rarely in pairs, at the nodes; bracts opposite, subulate and similar in size to the leaves below; pedicels longer than internodes, in flower 10-42 mm long, erect, bent below the calyx (?orienting the flower horizontally), in fruit angled obliquely downward, 16-42 mm long. *Calyx* 1.4-2 mm long; sepals 5, free, narrow elliptic, 0.5-0.6 mm wide, acuminate, incompletely red-striated. *Corolla* 2-lipped, resupinate, 7.8-10.5 mm long along the adaxial (upper) side, from dried material pale mauve on the upper lip, sometimes also on the lobes of the lower lip, white elsewhere; tube 4-5 times length of the calyx; upper lip 1.2-1.5 mm long, entire, slightly recurved; lower lip spreading, c. 4.5-6 mm long, within the tube on either side behind the lowest lobe bearing a longitudinal flap enclosing the anthers and style, the mouth ringed by scattered white linear eglandular hairs c. 0.2 mm long, the lateral lobes rounded, the mid lobe longer than the laterals, with a deep cleft c. 1.4-2 mm deep. *Stamens*: the 2 adaxial (upper) ones short stout staminodes, the free distal part c. 0.3 mm long; the 2 abaxial (lower) ones 0.6-1.2 x 0.3 mm, 2-locular, the locules end to end, 150°-180° divergent. *Style* terminated by 2 broad stigmatic flaps. *Capsule* globular, 3.5-5 mm in diameter, thin-walled, dark brown; seeds (only young seen) many, obovoid to ellipsoid-oblong, 0.5-0.8 x 0.3-0.45 mm, pale yellow

to (?youngest seed) darkish brown, with 4 angles alternating with 4 grooves, with equally spaced transverse ribs between the ribs and grooves, the areoles so formed c. ½ as long as wide.

Distribution & ecology

Known only from two collections from the Mitchell Plateau, northern Kimberley, Western Australia, *L. hypandra* has been once recorded from a swamp.

Flowers: known from August and January, fruits in January.

Notes

The flower of *L. hypandra* is resupinate. Not only is the upper or adaxial lip of the corolla entire and the lowest or abaxial lobe emarginate, the reverse of the situation typical in the genus, but the presence of longitudinal flaps extending from behind the lowest lobe of the corolla to enclose the fertile anthers and style borne on the lower side of the throat points to a relationship to *L. cleistandra*, *L. eremophiloides* and *L. tectanthera* with the reverse arrangement of the enclosure of the upper or adaxial anthers by similar flaps from behind the upper lip. It shares other diagnostic characters of the habit, stamens and capsule with these two species. Its habit is similar to *L. tectanthera*, with which it may occur sympatrically.

The adjectival epithet comes from the Greek prefix *hypo-*, beneath, and *andros*, male, alluding the evidence in the position of the anthers for the flower of this species being resupinate.

Specimens examined

WESTERN AUSTRALIA. GARDNER: *A.C. Beauglehole 58853 & E.G. Errey, 22 & 23.viii.1978*. King Edward River, ± 50 km NE of Mitchell River Homestead. AD, PERTH; *K.F. Kenneally 7726* (see type).

***L. macrosiphonia* (FvM.) W.R. Barker, comb. nov.**

Rhamphicarpa macrosiphonia FvM., Proc. Linn. Soc. N.S.Wales, Ser.2, 6 (1892) 473. *basionym*.

[*Bradshawia* FvM., l.c., 473, *nom. prov.*]

This species is remarkable for its white, extremely long, ± salverform corolla. Mueller (1892) was not happy about his placement of the plant in *Rhamphicarpa*, a genus with salverform corollas in the tribe of semiparasites, the Gerardiaceae. However, he did consider it to constitute an allied genus, which he provisionally called *Bradshawia*. Hansen (1975) excluded the species from *Rhamphicarpa* without explanation. It clearly does not belong to the semiparasitic tribes of Scrophulariaceae, as indicated by its drying green and lack of evidence of parasitic 'haustoria' and its corolla aestivation. Superficially it bears no resemblance to any species of *Lindernia*, although Yamazaki (e.g, 1985) has segregated his Indo-Chinese genus *Scolophyllum* with a similarly long-tubed corolla. The possession by this Australian species of 2-celled sessile glands, as well as its resemblance to species of Subg. *Didymadenia* in the stamens, pistil, pollen, capsules and seed, points clearly to its placement in that subgenus. The remarkable corolla matches that typical of hawk-moth pollination.

***L. tectanthera* W.R. Barker, sp. nov.**

Ad Subg. *Didymadeniam* pertinens, 2 antheris superis solum fungentibus bilocularibusque et pari laminarum intro productarum e corolla et antheras includentium *L. cleistandrae*, *L. eremophiloidi* et *L. hypandrae* affinis, sed a duobus his differt duratione annua, ramis erectis e rosula basali foliorum exorientibus, inflorescentiis scapiformibus multifloris, corolla brevior lobis inferis emarginatis labioque supero recurvato, capsulis ovoideis et seminibus parvissimis, ab illo corolla non resupinata antheris laminisque corollae post labium brevius adaxiale.

Holotypus: R.M. Barker 284, 25.iv.1983. Western Australia. Kimberley Region. 15°41'S 128°05'E. 23.3 km along King River road which is [= turns off] 6.7 km E of Wyndham on the Great Northern Highway. Common in grey clay depression on side of track. Erect herb, leaves prostrate, stems square, reddish near base. Flowers: lobes mauve, white in throat with striations on side and bottom, 2 yellow longitudinal areas to side of throat. Mixed with RMB 285. AD98504068. *Isotypi*: 5 duplicate sheets to be distributed.

Erect, sometimes possibly scandent, glabrous annual herb, 8-40 cm tall, with many slender scapiform branches arising from a basal cluster, sometimes almost a rosette of leaves, sometimes with only a single stem with leaves spaced in pairs at the base of the plant; main branches sometimes further branched in upper parts in the axils at one or two consecutive nodes below the terminal inflorescence, with a fine rib decurrent from either side of each leaf to the node below; the lowest 2-several internodes 0.5-3 mm long, distally much longer than the leaves, 15-140 mm long. *Leaves* at the base spatulate, 6-22 mm long, with the petiole 1-5 mm long, the blade ovate to obovate, sometimes narrowly so, 3-15 x 1.5-8 mm, entire, shallowly coarsely sinuate, or shortly coarsely serrate in the distal ½, obtuse to acuminate; those higher up occasionally like the lower leaves in robust, possibly scandent, plants, distally subulate, 1-4 mm long. *Inflorescence* terminal racemes, sometimes apparently paniculate owing to lateral branches, with c. 1-10 widely spaced flowers; bracts subulate like the distal leaves; pedicels longer than the internode above, in flower erect to ascending, 5-28 mm long, in fruit downturned obliquely, 15-40 mm long. *Calyx* 2-3.2 mm long; sepals 5, equal, free apart from the very base, ovate-elliptic, 0.3-0.8 mm wide, finely ribbed, often reddened, long acuminate. *Corolla* 2-lipped, 6-8 mm long along the upper side, blue, purple or mauve on the upper lip, often also on the lower lobes, white elsewhere; tube funnel-like, 2.5-4.5 times the length of the calyx, with white linear eglandular hairs surrounding the mouth c. 0.2 mm long; upper lip recurved, 1-1.5 mm long, shallowly emarginate, produced within on either side into 2 longitudinal flaps enclosing the anthers and style end; lower lip widely spreading, 4-6.5 mm long, the lobes shallowly broadly emarginate, the mid lobe wider than the laterals. *Stamens* with adaxial or upper 2 anthers functional, 0.8-1 x 0.25-0.3 mm, with 2 locules end to end, 170°-180° divergent, with 2 abaxial staminodes proximally thick, porrect, near the apex often bearing a short to long, filiform filament vestige which is either arched forward or reflexed and is terminated by a minute anther vestige. *Style* with 2 equal obovate flap-like stigmas. *Capsule* (no mature seen) ovoid-elliptic or broadly so, 3.2-4 x 2.5-2.8 mm, thin-walled, yellow-brown; seeds (immature seen) many, broad obovoid to oblong-ellipsoid, 0.3-0.35 x 0.2-0.25 mm, pale yellow, with 4 longitudinal angles, concave between, with a few obscure transverse ribs between the angles, the areoles so formed much wider than long.

Distribution & ecology

Restricted to the northern Kimberley, Western Australia, apart from one record from the Dampier Peninsula in the south-west of the region, *L. tectanthera* is recorded from seasonally wet sites in sand, gravel or clay with dense herbage or grasses.

Flowers and fruits: January – August.

Notes

L. tectanthera shares with *L. cleistantra*, *L. eremophiloides* and *L. hypandra* the character unique in the genus of longitudinal flaps within the corolla which enclose the anthers and style end, as well as the 2 adaxial or upper stamens with functional 2-locular anthers and a pair of staminodes behind the abaxial or lower corolla lip. It differs from the first two species by its annual duration, its erect branches arising from a basal rosette of leaves, its scapiform floriferous inflorescences, its shorter corolla with emarginate lower lobes and a recurved upper lip, its ovoid capsules and its much smaller seeds; from *L. eremophiloides* it differs further in its

opposite leaves, free sepals and small nectary. From the third species it differs by its normally oriented corolla with the anthers and corolla flaps associated with the shorter, adaxial lip.

The species as here constituted is variable in habit and possibly capsule shape, but particularly in the nature of the staminode. A further 8 collections not included in the above description have glandular hairy pedicels and may represent a distinct taxon. Field studies are needed to clarify these problems.

The adjectival epithet has the same meaning as *cleistandra*, and comes from the Latin words *tectus*, covered, and *anthera*, anther.

Specimens examined

WESTERN AUSTRALIA. DAMPIER: *K.F. Kenneally 8547* (p.p.), 9.vii.1982, Prior's Bore, approx. 10 km N of Great Northern Hwy, at a point 135 km E of Broome along the Broome-Derby Road, PERTH (p.p.). GARDNER: *R.M. Barker 284* (see type); *A.C. Beaglehole 54298*, 32 km WSW of Kununurra Aboriginal Paintings area, PERTH; *A.C. Beaglehole 58944* & *E.G. Errey, 22* & 23.viii.1978, King Edward River. \pm 50 km N.E. of Mitchell River Homestead, AD, PERTH; *J.V. Blockley 904*, 12.viii.1968, Near Argyll Lagoon, S. of Kununurra, PERTH; *G.W. Carr 3129* & *A.C. Beaglehole 46887*, 7.vii.1974, Lake Argyle Road, between Dead Horse Springs and Spillway Creek turn-offs, PERTH; *A.S. George 12434*, 19.viii.1974, Blyxa Ck., Prince Regent River Reserve, PERTH; *K.F. Kenneally 2007*, 14.viii.1974, E2 Prince Regent River Reserve, CANB, PERTH; *K.F. Kenneally 7029*, 4.ii.1979, Mitchell Plateau (adjacent to Airfield) N.W. Kimberley, AD, PERTH; *K.F. Kenneally 7715*, 14.i.1982, Mitchell Plateau Airfield, Mitchell Plateau, N. Kimberley, PERTH; *K.F. Kenneally 7747*, 15.i.1982, 9 km NW of Mitchell River Falls, Mitchell Plateau, N. Kimberley, PERTH; *K.F. Kenneally 8049*, 21.iv.1982, Airfield, 3 km N of CRA mining campsite, Mitchell Plateau, PERTH; *K.F. Kenneally 8231*, 5.v.1982, Racecourse swamp, 3 km S of township Kununurra, N. Kimberley, AD, PERTH; *M. Lazarides 8686*, 23.iii.1978, Ashton Range, 42 km SSE of Theda HS., north-eastern Kimberleys, PERTH; *J.H. Willis s.n.*, 21.v.1984, Napier Broome Bay - West Bay, road to disused Truscott Air Base, ca. 1 km from coast, AD.

PEPLIDIUM Delile

In earlier treatises involving Australian members of Subtrib. Mimulinae (Barker 1981, 1982), it was doubted whether *Peplidium* should be separated at a generic level from *Microcarpaea*. The subsequent discovery that the latter has multiporate operculate pollen (Barker, unpubl.), unique in the family and distinct from the tricolporate pollen of *Peplidium*, indicates that the best course is to maintain generic separation of the two, although the question raised in Barker (1982) on the cladistic relationship remains unanswered.

P. aithocheilum W.R. Barker, sp. nov.

P. muelleri ssp. B: W.R. Barker in Jessop, Fl.C.Austral. (1981) 331.

P. muelleri auctt. non Benth.: e.g., J. Black, Fl. S. Austral. (1926) 510 (excl. var. *longipes*).

Speciebus duobus nominatis *Peplidii* affinis staminibus duobus, sed differt ab ambo corolla rosea usque brunnei-rosea, a *P. maritimo* (L.f.) Asch. (syn. *P. humifuso* Delile) differt corolla maiore de fructu crescenti caduca, et a *P. muelleri* Benth. duratio annua, floribus solitariis, et corolla parviore.

Holotypus: *W.R. Barker 5928*, 23.viii.1989, Stuart Highway, adjacent to Pootnoura Railway Siding, by road ca. 64.5 km S of Cadney Park and ca. 84.5 km NNW of Coober Pedy; ca. 500 m N of turnoff and ca. 300 m NE of yards, AD99021123. *Isotypi*: 2 to be distributed.

Prostrate annual herb, aquatic in shallow water with floating leaf rosettes terminating short to long leafless branches, or (most plants seen) terrestrial and prostrate, with branches radiating from a small rootstock, 0.5-10 cm long; indumentum of eglandular hairs c. 0.05-0.3 mm long, dense in younger parts on the branches and petioles, sometimes on the leaf blades and calyces, particularly the tube angles and margins, ?arser on older parts. *Leaves* with petioles 0.05-0.2 cm long; blade circular to broadly obovoid, 0.2-0.3 x 0.2-0.3 mm, rounded at the apex.

Flowers in terminal racemes, 1 (2: *Royce 6971*) in the axils of leaf-like bracts; pedicels 0.5-1.5 mm long, elongating to 0.9-1.8 mm in fruit. *Calyx* cylindrical to campanulate, 1.5-1.7 mm long; teeth 0.1-0.2 mm long, rounded to truncate. *Corolla* pink-white to mid pink, the tube as long as the calyx, the 2-lipped limb spreading, 1-1.2 mm long, the red-brown palate comprising 2 bumps behind the lower lip. *Anthers* 2, 0.4 x 0.3 mm, pale yellow. *Stigma* red-brown, fringed with white. *Capsule* exserted from the enlarged persistent calyx, broadly ovoid, 1.8 x 1.6-1.8 mm, surmounted by a persistent style and old corolla, thick-walled, dehiscing around the base and then loculicidally and sometimes septicidally from the base towards the apex; seeds many, obliquely obovoid, rarely obloid-ellipsoid?, 0.35-0.45 x 0.2-0.35 mm, angular longitudinally, mid to dark brown, rounded to obtuse at the point of attachment, truncate distally, finely reticulate from fine longitudinal ribs with similar transverse walls, the areoles c. 1.5-2 times as long as wide.

Distribution & ecology

Widespread across northern and central arid Australia in Western Australia, Northern Territory and South Australia, *P. aithocheilum* occupies seasonally inundated waterholes in creek beds or swamps or on flood plains, in sandy to clayey soils.

Flowers and fruits: February - September, with one flowering collection in mid January.

Notes

P. aithocheilum shares with its two named congeners the possession of a single pair of stamens. It differs from both by its pink to brown-pink corolla, from *P. maritimum* (L.f.) Asch. by its larger corolla which is readily shed from the developing fruit, and from *P. muelleri* Benth. by its annual duration and its solitary flowers.

The adjectival species epithet derives from the Greek *aithos*, meaning reddish-brown, and *cheilos*, lip, alluding to the distinctive colour of the palate on the lower corolla lip.

Specimens examined

WESTERN AUSTRALIA. DAMPIER: *R.D. Royce 6971*, 11.v.1962, Kallyeeda Stn., Fitzroy River, PERTH. ASHBURTON: *R.J. Chincock 4656*, 15.ix.1979, 20.7 km ENE of Prenti Downs, AD. AUSTIN: *W.E. Blackall 4128*, 11.ix.1939, Between Leonora & Malcolm, PERTH. GIBSON DESERT: *A.S. George 9009*, 27.vii.1967, ± 7 miles W of Dovers Hills, northern Gibson Desert, PERTH.

NORTHERN TERRITORY. CENTRAL AUSTRALIA NORTH: *W.R. Barker 2825 (p.p.)*, 19.viii.1978, Tanami Desert, ca. 4½ km by road WSW of Kims Bore on track to Ferdies Bore; ca. 30 km WNW of Mongrel Downs Homestead, AD; *A.C. Beaglehole 50500*, 16.v.1976, Tanami Desert Wildlife Sanctuary; near Chilla Well Bore; ca. 390 km N.W. of Alice Springs, AD; *A.C. Beaglehole 58070* & *E.G. Errey 1770*, 5.viii.1978, Stirling Creek, 30 km SW of Barrow Creek, Stuart Highway, AD; *C. Dunlop 2457*, 20.i.1972, Central Mt. Wedge H/S., AD; *T.S. Henshall 3422*, Mt. Allan. Lake edge near homestead, AD; *P.K. Latz 2523*, 20.v.1972, Cockroach Waterhole, Manners Ck. Stn., AD; *P.K. Latz 4068*, 21.vii.1973, 14m S Rabbit Flat, AD, PERTH; *P.K. Latz 5595*, 3.vii.1974, Stirling Swamp, AD; *P.K. Latz 8382*, 30.v.1980, Rabbit Flat Road House, AD; *D.J. Nelson 333*, 20.vi.1962, Tomahawk Soak, 13 m. N.E. Utopia H.S., CANB, NSW, NT. CENTRAL AUSTRALIA SOUTH: *A.C. Beaglehole 28003/5*, 29.vii.1978, Simpson Desert, 8.9 miles W. of Old Andado Homestead, 3.1 miles E. of New Andado Homestead, AD, NT; *R. Buckley 1655*, ANU26555, 21.viii.1976, Flats S of 1st dune S. of Andado 180 m, CANB; *Kempe 27*, 1885, Between the Finke River and Charlotte Waters, MEL; *P.K. Latz 5031*, 28.iv.1974, Curtin Springs Stn., AD (2 sheets).

SOUTH AUSTRALIA. NORTH-WESTERN: *W.R. Barker 6111*, 30.viii.1989, Ca. 11.7 km along E-W shotline track W of railway line which intersect at a point ca. 12 km by road along the Stuart Highway SSE of Marla Roadhouse, AD; *H. Basedow 301*, vii.1926, Musgrave Ranges, NSW, PERTH. LAKE EYRE BASIN: *F.J. Badman 1114*, 1.vi.1984, McAlpine Bore, Anna Creek Station, 7 km W of William Creek, AD; *W.R. Barker 3544*, 3546, 16.ix.1978, Stuart Highway, ca. 46 km by road S of Coober Pedy, AD; *W.R. Barker 5928* (see type).

STEMODIA L., nom. conserv.

Morgania R. Br., Prodr. (1810) 441

Differences between members of the Australian genus *Morgania* and the Australian representatives of *Stemodia* have been misconstrued (Barker 1981,b; 1986); Bentham's (1869) fruit characters are imaginary, both groups of species having the same mode of dehiscence. Furthermore, the Australian species of *Stemodia* show no correlated differences from their congeners in the Americas. As a result the Australian genus *Morgania* is here reduced to synonymy under *Stemodia*. The several species first placed by Brown (1810) and Bentham (1848, 1869) under *Morgania* are transferred for the first time to *Stemodia*, and a new species common in the Kimberley region is described.

S. florulenta W.R. Barker, comb. nov.

Morgania floribunda Benth. in T.L. Mitchell, *J. Trop. Austral.* (1848) 384, (non *S. floribunda* (R. Br.) Roberty which is based on *Herpestis floribunda* R. Br.), replaced synonym.

Note: The adjectival epithet is from the Latin *flos*, flower and *-ulentus*, abundant, thus maintaining the reference in the replaced epithet to the prolific flowering of this species through the development of more than one flower in each bract axil, diagnostic amongst the Australian species.

S. glabella W.R. Barker, nom. nov.

Morgania glabra R. Br., Prodr. (1810) 441, (non *S. glabra* Oerstedt ut Sprengel), replaced synonym.

Note: The adjectival Latin epithet, derived from *glaber*, glabrous and *-ellus*, a suffix denoting the diminutive, describes more accurately than the replaced epithet the subglabrous nature of the plant which may bear tiny glandular and/or eglandular hairs on the calyx and bracteoles.

S. lathraia W.R. Barker, nom. nov.

Morgania parviflora Benth., Fl. Austral. 4 (1869) 489 (non *S. parviflora* Ait.), replaced synonym.

Note: The adjectival epithet comes from the Greek, *lathraios*, meaning stealthy, alluding to the difficulty in seeing the plant amongst its common grass and herb associates.

S. pubescens (R. Br.) W.R. Barker, comb. nov.

M. pubescens R. Br., Prodr. (1810) 441, *basionym*.

S. tephropelina W.R. Barker, sp. nov.

S. grossa auctt. non Benth.: e.g., Kenneally, Checklist Vasc. Pl. Kimberley W. Austral. (1990, as 1989) 60, 94, ?p.p.

Intra species indumento solum eglanduloso extra inflorescentiam, *S. pubescentem* (R. Br.) W.R. Barker et *S. lythrifoliam* FvM. ex Benth., differt calyce indumento glanduloso seminisque papillois, ab hoc indumento densiore foliisque latioribus, ab illo floribus saepe pedicellatis; intra species indumento glanduloso extra inflorescentiam differt seminis papillois, a *S. viscosa* Roxb. (*S. flaccida* W.V. Fitzg. inclusa) et *S. grossa* Benth. foliis semper oppositis pilisque flexuosis longis, et a *S. debilis* Benth. sepalibus subaequalibus foliisque sessilibus.

Holotypus: W.R. Barker 2757, 10.viii.1978. Northern Territory, Victoria River District. Ca. 300 m W of second to eastern-most crossing of Companion Creek by road to Victoria River Downs; ca. 8½ km by road NW of junction at Top Springs roadhouse with Wave Hill-Katherine road (16°30'S, 131°44'E). Altitude 150-200 m. Forming prolific population in open small to broad (30 m square) depressions in grey (sand-)stony clay plain covered by dense tussock grassland with occasional lone small trees. Low perennial with branches prostrate and finally erect to ascending to erect. A month after unusual rains (normally dry season), possibly

explaining few larger-leaved plants. Dead remains of taller plants from previous wet season rarely apparent (some collected). Foliage with sweet light minty scent. Corolla tube green-yellow all around, lower side of mouth mid-yellow to base of lobes, lobes very pale blue behind, mid-blue in front. Tube rather closed, upper lobes erect, lower at 45°. Anthers yellow, stigma white. Colour, black and white photo's taken. Cutting taken. Cytological material taken. AD97925154. *Isotypi*: 9 or more duplicates to be distributed.

Lightly \pm mint-scented, apparently short-lived perennial herbs, c. 4-30 cm tall; branches arising extensively from the nodes at ground level, procumbent to ascending, sometimes rooting on the prostrate parts; indumentum on the branches, leaves, rachis and bracts, shortly villous, consisting of flexuose multicelled simple eglandular and/or glandular hairs 0.4-0.8 mm long overtopping moderately dense, very short glandular hairs c. 0.1 mm long, on the pedicels, bracteoles and sepals at the lower nodes as on the other parts, grading in distal parts to densely glandular pubescent, the hairs 0.15-0.2 mm long. *Leaves* opposite, sessile, narrow elliptic-obovate to narrow oblong, on the main branches 0.6-4 x 0.2-1 cm, with cuneate to rounded or auriculate base, serrate with the teeth in the distal half scattered along the margins, acute. *Inflorescences* open racemes up to 20 cm long of up to c. 20 flowers arranged singly in the bract axils, sometimes paniculate through the presence of axillary racemes; bracts like upper leaves, the lower ones usually longer than the subtended flower, the distal ones or those on short axillary inflorescences as long or shorter than the flower; pedicel 1-10 mm long; bracteoles \pm opposite at the summit of the pedicel, triangular-linear to linear, shorter than the sepals. *Sepals* triangular-linear, \pm equal, 4-5.5 mm long. *Corolla* with lips mid blue at the front, pale blue behind, and greenish-yellow tube grading to mid yellow at the base of the lower lobes, 9.5-11 mm long along the upper side, the mouth narrow, upper lobes upcurved, lower lobes decurved, not overlapping. *Capsule* included in the persistent calyx, ovoid, 3-3.5 x 1.6-1.8 mm; seeds oblong-ellipsoid, 0.25-0.4 x 0.15-0.2 mm, yellow-brown to dark brown, minutely papillose.

Distribution and ecology

Occurring in subtropical northern Western Australia and Northern Territory, *S. tephropelina* is confined to clay soils, often the grey cracking type; it grows in open tussock grass plains with scattered trees, sometimes seasonally inundated, and often in depressions.

Flowers and fruits: April - September (October).

Notes

In the absence of a natural infrageneric classification of *Stemodia* in Australia *S. tephropelina* is compared with the densely tomentose Australian species. From the species with solely eglandular indumentum on the vegetative parts, *S. pubescens* (R. Br.) W.R. Barker and *S. lythrifolia* FvM. ex Benth., it differs by its glandular hairy calyx and papillose seeds; from the former it is also distinguishable by its much denser indumentum and broad leaves, and from the latter by its often pedicellate flowers. Relative to species with glandular indumentum on the vegetative parts it differs by its papillose seeds; from *S. viscosa* Roxb. (including *S. flaccida* W.V. Fitzg.) and *S. grossa* Benth. it is also distinct by its consistently opposite leaves and flexuose long hairs, and from *S. debilis* Benth. it can be further separated by its subequal sepals and sessile leaves.

The adjectival epithet comes from the Greek *tephros*, ash-coloured, and *pelinos*, pertaining to clay, alluding to the habitat of this species.

Selected specimens examined (34 collections seen)

WESTERN AUSTRALIA. FITZGERALD: *W.V. Fitzgerald* 893, v.1905, Isdell River near Graces Knob, PERTH. DAMPIER: *R.J. Cranfield* 6434, 18.iv.1988, 3 km SE of Brooking Gorge, AD, PERTH; *Froggat s.n.*, 1887, King's

Sound, MEL77576; *K.F. Kenneally 9789*, 1.vi.1986, Track to Barnett River Gorge off Gibb River Road, Central Kimberley, AD, PERTH. GARDNER: *R.M. Barker 263*, 23.iv.1983, Below Dumas Lookout area c. 18 km N of Kununurra on Weaber Plains road, AD; *C.A. Gardner 7294*, 29.v.1944, 70 chain peg N. of Carlton Reach, Ord River, PERTH; *C.A. Gardner 7343*, 5.vi.1944, Ord River, above the gorge, PERTH.

NORTHERN TERRITORY. VICTORIA RIVER: *W.R. Barker 2757* (see type); *R.A. Perry 2084*, 6.vi.1949, 47 miles S.W. of Birrimbah Outstation, AD, BRI (2 sheets), CANB, NT, PERTH; *R.A. Perry 2277*, 27.vi.1949, 42 m. W. Wavehill Police Station, BRI, CANB (2 sheets), CANB, NT, NSW. DARWIN AND GULF: *D.H. Benson 1005*, 21.vii.1974, Stuart Hwy. between Daly Waters and Larrimah, NSW; *Prof. W. Baldwin Spencer s.n.*, vii-viii.1911, Roper River, NSW148589. BARKLY TABLELAND: *P.K. Latz 9326*, 17.vii.1982, 18°05'S, 133°59'E, Junction Stockroute Reserve, AD.

STRIGA Lour.

S. squamigera W.R. Barker, sp. nov.

Affinis *S. orobanchoidi* Africae Indiaeque foliis squamiformibus in basi caulium, sed differt corolla parviore et bracteis foliisque caulis superi linearibus; a speciebus Australiensibus Malesianis differt foliis inferis squamiformibus et habitu multicauli.

Holotypus: *J.R. Clarkson 6556*, 2.vi.1986. Western Australia, Kimberley District; Barred Creek north of Broome. Travertine outcrop north of the creek mouth (17°40'S 122°11'E). Windswept rugged limestone rock outcrop. An erect herb. Flowers pink, tips of K [calyx?]-lobes dark wine. Material in spirit collection. Only a few plants seen usually in the shelter of rocks. Many plants fasciated. AD98702359. *Isotypi*: BRI, PERTH.

?Annual herb 10-30 cm tall, with several stems, rarely 1, arising from the base, the stems simple or branched in upper nodes, erect; indumentum absent from the basal nodes, densely hirsute-scabrous, the hairs eglandular, 0.2-0.5 mm long, spreading on the branches and the upper leaves, tending to antrorse on the bracts, bracteoles and calyx. *Leaves* opposite, sessile, scale-like over much of the stem, broadly triangular, c. 2 mm long, obtuse, narrow ovate-linear to linear at the upper few nodes, 0.5-1.8 x 0.1-0.25 cm, entire, bluntly acute. *Inflorescences* spikes 7-18 or more cm long, simple, consisting of c. 20-50 flowers, opposite at the basal few nodes, mostly alternate; bracts like upper leaves, longer than the calyx at the base, shorter higher up; bracteoles 2, opposite, at the apex of the pedicel, ovate-linear, $\frac{2}{3}$ - $\frac{7}{8}$ the length of the calyx; pedicels 0.8-1.2 mm. *Calyx* tubular, 4.2-5.5 mm long; lobes c. $\frac{1}{2}$ - $\frac{2}{5}$ as long as the calyx, narrow triangular, with wine-red acute apices. *Corolla* pink to mauve, 8-8.5 mm long along the upper side, eglandular and glandular pubescent externally, the mouth tomentose; upper lip recurved, \pm truncate; lower lip 2-3 times as long, 2.5-3 mm long, the lobes obuse to truncate. *Capsule* included in the persistent calyx, ellipsoid-oblong, 4-5 x 2.5 mm long; seeds ellipsoid-oblong to obovoid, sometimes broadly so, 0.25-0.4 x 0.15-0.25 mm, dark brown, twisted, finely longitudinally ribbed.

In his précis of the genus *Striga* Benth (1835, 1846) grouped the species on the presence or absence of scale-like leaves. This species shares with *S. orobanchoides* Benth. of Africa and India the presence of scale leaves. It differs from this species by its smaller corollas and the presence of linear upper leaves and bracts. The other Australian species (Bentham l.c.; 1869) and those from the Malesian region (Backer & Bakhuizen van den Brink 1965; Miquel 1856; Pennell 1943) differ in their single stems (branched above ground level), and the absence of scale leaves.

Distribution & ecology

Known only from a few scattered localities in northern subtropical Western Australia and Northern Territory, *S. squamigera* is recorded once from woodland on yellow sandy slope, twice from rocky sites, and once from gravelly red sand.

Flowers and fruits: recorded from late April to early June.

Notes

S. squamigera is apparently allied to *S. orobanchoides* of Africa and India by the presence of scale-like leaves which in this species are confined to the basal parts of the stems. It differs from it by its smaller corolla and the linear upper stem leaves and bracts. From the Australian and Malesian species it differs by the scale leaves and its multistemmed habit.

The adjectival epithet derives from the Latin *squama*, scale and *-gerus*, bearing, alluding to the distinctive lower leaves of this species.

Specimens examined

WESTERN AUSTRALIA. DAMPIER: *J.R. Clarkson 6556* (see type). GARDNER: *R.M. Barker 280*, 24.iv.1983, Pack Saddle Plain, at the end of the road, 23.1 km from Kununurra, AD. HALL: *T.E.H. Aplin et al. 1362*, 25.iv.1985, ca. 200 km N of Halls Creek on road to Kununurra (16°45'S 128°18'E), PERTH.

NORTHERN TERRITORY. BARKLY TABLELANDS: *R.M. Barker 193*, 20.iv.1983, 11.4 km N of Elliot on Stuart Highway, AD; *T.S. Henshall 993*, 30.v.1975, Newcastle Waters Stn., AD. LOCALITY DOUBTFUL: *Anon. (Herb. R. Tate)*, s. dat., Near Mt Sonder [of Central Australia, replaced by Tate after ruling out Mt Saunders, in Arnhem Land], AD97014238.

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