

Three new species of *Phyllanthus* (Euphorbiaceae: Phyllanthaceae) for the Northern Territory, one new species for Western Australia, and notes on other *Phyllanthus* species occurring in these regions

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Abstract

Hunter, J.T. and Bruhl, J.J. Three new species of *Phyllanthus* (Euphorbiaceae: Phyllanthaceae) for the Northern Territory, one new species for Western Australia, and notes on other *Phyllanthus* species occurring in these regions. Nuytsia 11(2): 147-163 (1997). *Phyllanthus cauticola*, *P. prominulatus* and *P. sulcatus* from the Northern Territory, and *P. baeckeoides* from Western Australia are described. Notes are presented on the nomenclatural problems of previously named taxa from these regions. A key to the species of *Phyllanthus* L. from the Northern Territory and Western Australia is presented.

Introduction

The taxonomy of *Phyllanthus* L. species (Euphorbiaceae: Phyllanthaceae) has presented a problem within Australia due to the lack of a continent-wide treatment since Bentham (1873). In our revision of the Phyllanthaceae for the "Flora of Australia", new taxa have been delimited and nomenclatural issues have been highlighted (e.g. Hunter & Bruhl 1996, 1997). This paper presents full descriptions of new *Phyllanthus* species we recognize for the Northern Territory and Western Australia. Other papers dealing with new taxa and issues in other states will be presented in other Australian taxonomic journals.

Detailed coverage of affinities, phylogeny and unusual morphological features are beyond the scope of this paper and we refrain from *ad hoc* discussions of such matters. They will be dealt with after further investigations, in subsequent papers.

Methods

Sampling and Organization of Data. Significant proportions of the *Phyllanthus* specimens held by the herbaria AD, BRI, CANB, DNA, HO, MEL, NSW, PERTH and QRS, and historically important *Phyllanthus* specimens from A and GH were provisionally sorted into taxa. Close inspection of these taxa and subsequent re-sorting of specimens formed the basis for our decisions on the status of these taxa. Ten representative specimens (where available) of these taxa were chosen for detailed analysis of quantitative micromorphological characters. Macromorphological characters (qualitative and

quantitative, e.g. leaf length) were scored in all available material. Selection of the ten specimens for study was based on specimen quality in terms of the amount and number of developmental stages displayed.

A DELTA (Dallwitz 1980; Dallwitz *et al.* 1993) list of 395 characters and their states has been created by the authors for the Phyllanthaceae (Bruhl & Hunter unpublished). This was used to score attributes measured in selected specimens, together with those measured in all available material.

Fresh material was used where possible, but in most instances floral measurements were based on re-hydrated material. Mature leaves only were used for scoring leaf characters.

Terminology. For purposes of consistency across the members of the Phyllanthaceae, the perianth segments of *Phyllanthus* are referred to as sepals. Further developmental investigations need to be carried out to confirm this interpretation (Webster pers. comm.).

Terminology for seed surface characters follows that of Stearn (1992). A bordered hilum is indicated by a discoloured and often raised region surrounding the hilum. This character is most obvious in *Phyllanthus fuernrohrii* F. Muell. (see Hunter & Bruhl 1996: Figure 1A, C).

There are sometimes differences between the leaves of branches, referred to as 'branch leaves', and those on ultimate branchlets referred to as 'branchlet leaves'. Phyllanthoid branching is indicated by a reduction of the leaf that subtends a branch/branchlet to a scale-like structure, as illustrated by Webster (1970). Branch leaves exhibiting intermediate reduction in size, but still clearly laminate, are referred to as 'reduced'. Care should be taken where leaves may have fallen, to check for a leaf scar which will always be present. The term 'prominulous' is as given by Stearn (1992).

Citation. Type specimens of all relevant taxa have been seen by one or both of the authors, unless stated otherwise. Photographs of type specimens examined at BM and K are held at NE, together with photographs taken of type specimens on loan to NE.

A list of all specimens studied will be deposited at NE. An INTKEY dataset for interactive identification will be made available on completion of our study of the Australian Phyllanthaceae.

Taxonomy

1. *Phyllanthus aridus* Benth, Fl. Austral. 6: 110 (1873). *Type*: Northern Australia, Barren Shores of Brunswick Bay and Port Warrender, Vansittart Bay, N.W. Coast, A. Cunningham (*holo*: K).

Phyllanthus polycladus W. Fitzg. *nom. illeg. non P. polycladus* Urb., Symb. Antill. 1: 333 (1898) - *P. hesperonotos* Govaerts & Radcl.-Sm., Kew Bull. 51: 177 (1995). *Type*: Edkins Range, Western Australia, August 1905, W. V. Fitzgerald 1437 (*holo*: NSW).

Phyllanthus sp. C, Wheeler *et al.*, Flora of the Kimberley Region 624 (1992).

Distribution. *Phyllanthus aridus* occurs chiefly in the Kimberley region of Western Australia, but is also known from sporadic localities south of Darwin in the Northern Territory.

Notes. The name *Phyllanthus aridus* seems to have been little used within Australia, especially in recent decades. More commonly the name *Phyllanthus polycladus* W. Fitzg. (see Wheeler *et al.* 1992) has been applied to specimens referable to *P. aridus*. *Phyllanthus aridus* has priority over *P. polycladus*. In any case, the latter is a secondary homonym of *P. polycladus* Urban, a North American species with no close affinity to *P. aridus*.

The recent publication of *Phyllanthus hesperonotos* Govaerts & Radcl.-Sm. overlooked the priority of the name *Phyllanthus aridus*. Govaerts & Radcliffe-Smith (1995: 177) state that "the species is found in the south of Western Australia", yet we have seen no specimens of *P. aridus* from southern Western Australia.

Phyllanthus aridus is a variable species that is in need of further close study, and may prove to contain more than one entity. One variant is distinguished by its linear leaves and very long pedicels (see Dunlop 8223 DNA, Aplin 5013 DNA), whereas most populations of this species possess elliptic leaves and shorter pedicels.

2. *Phyllanthus baeckeoides* J.T. Hunter & J.J. Bruhl, *sp. nov.*

A *Phyllanthus calycino* habitu dioecis, stipulis rubris ovatis, pedicellis brevioribus, fructibus et seminibus parvioribus, differt.

Typus: Merolia Station, Western Australia, 25 August 1989, A. L. Payne 2492 (*holo:* PERTH01165577) [male].

Dioecious shrubs, 0.5-1.5 m tall. *Branchlets* persistent, rounded, 2.5-7 cm long, 0.4-0.7 mm wide, glabrous. *Stipules* persistent, free, 0.7-2.1 mm long, red, ovate, chartaceous, entire or sometimes lacerate, glabrous; base truncate to cordate; apex acute to acuminate. *Branch leaves* normal. *Branchlet leaves* alternate, distichous, jointed, symmetrical, concave, held close to the stem. *Petiole* 0.4-0.8 mm long, 0.2-0.4 mm wide, glabrous. *Lamina* 2.5-14.3 mm long, 0.8-2.4 mm wide, elliptic, light-green to mid-green, obscurely veined, glabrous; base symmetrical, rounded to obtuse; apex recurved, ecaudate, rounded to retuse, mucronate; margins revolute. *Bracts and bracteoles* deciduous. *Inflorescences* indeterminate, axillary, sessile. *Male flowers* solitary; pedicels 0.8-3.5 mm long, glabrous; sepals 6, free, ascending to divergent, 2-3.9 mm long, 1.3-2.7 mm wide, white to yellow, elliptic to circular, emarginate, retuse, rounded to obtuse, glabrous; disk comprising discrete lobes, 2-3.1 mm wide, lobes lenticular; stamens 3, 1-whorled, erect; filaments completely connate, erect, terete, 1.2-2.6 mm long; anthers extrorse, erect to ascending, oblong, 0.9-1.4 mm long; locules parallel. *Female flowers* solitary; pedicels at anthesis and in fruit 2.2-2.8 mm long, 0.3-0.5 mm wide, glabrous; sepals free, 6, 1.5-3 mm long, 1.2-2.1 mm wide, elliptic, circular to ovate ascending to divergent, green to yellow, with a distinct white margin, retuse to obtuse, glabrous; disk crenate, 1.5-2.1 mm wide; styles 3, free although connate at the base, erect to ascending, red, 0.7-1.1 mm long, 0.2-0.3 mm wide, narrow-terete, glabrous; ovary 0.5-1.2 mm long, 0.9-1.9 mm wide, transversely ellipsoid, apically depressed, smooth, glabrous. *Fruit* a capsule, septicidal, transversely ellipsoid, apically depressed, 2.4-2.9 mm long, 3.7-4 mm wide, yellow-brown or green, cartilaginous, smooth, glabrous, grooved septicidally; column persistent, 'lanceolate' to obtrullate, 1.4-1.8 mm long. *Seeds* yellow to yellow-brown, prismatic, laterally compressed, 1.8-1.9 mm long, 1.3-1.5 mm wide, smooth; hilum slightly depressed, circular to ovate, cavity more or less basal. (Figure 1A-C)

Specimens examined. WESTERN AUSTRALIA [precise localities withheld]: Mt Clifford, *Severne* 360269 (PERTH); White Cliffs Station, 24 July 1988, *S. Petty* 2083 & 2084 (PERTH); Laverton, Sep. 1990, *Barret s.n.* (PERTH).

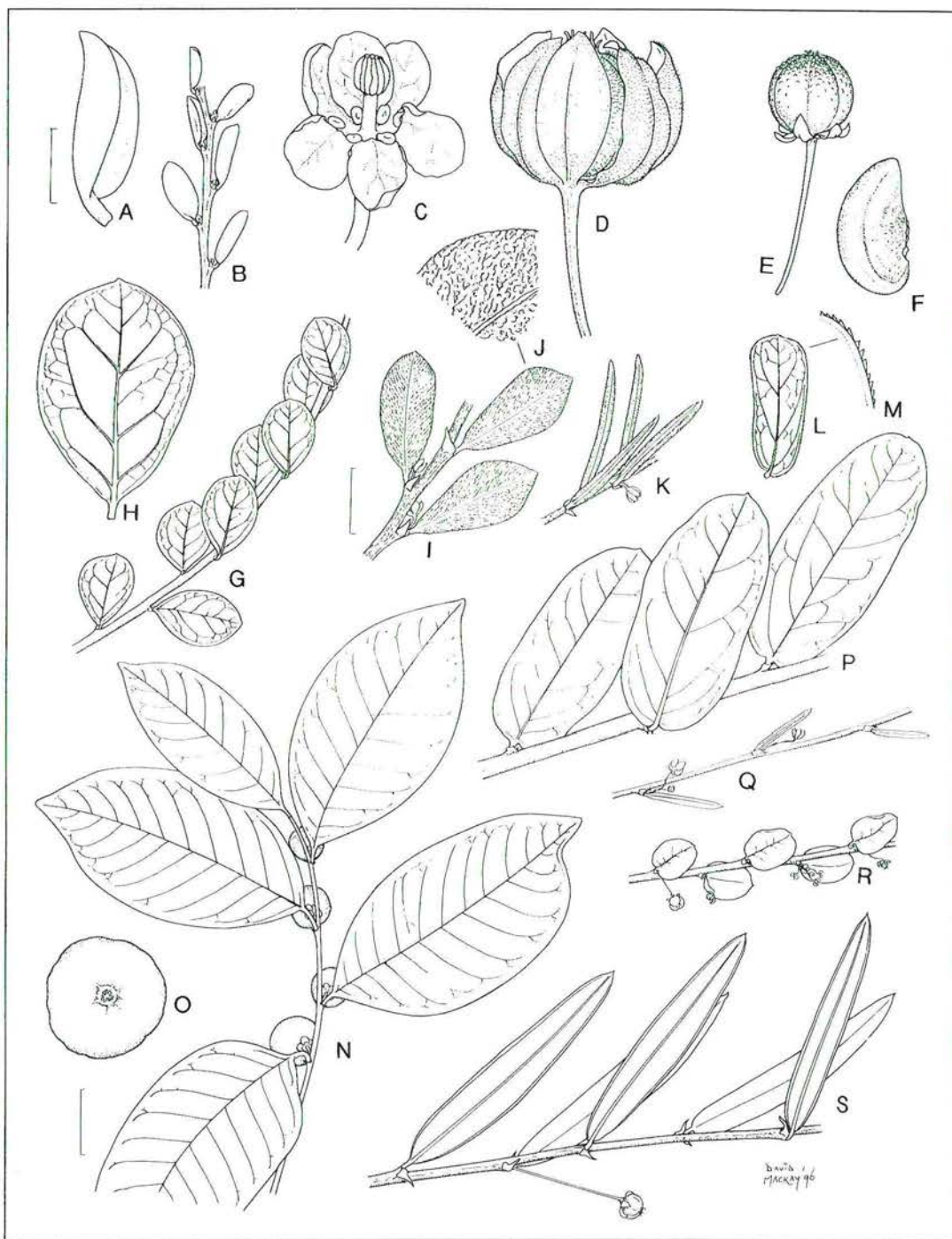


Figure 1. A-C *Phyllanthus baeckeoides* A - leaf, B - branchlet, C - male flower; D *P. carpentariae* D - fruit enclosed by sepals; E-F *P. exilis* E - fruit, F - seed; G-H *P. prominulatus* G - branchlet, H - leaf; I-K *P. scaber* I - branchlet, J - leaf detail, K - branchlet; L-M *P. sulcatus* L - leaf, M - leaf detail; N-O *P. reticulatus* N - branchlet, O - fruit; P-S *P. virgatus* - branchlets. Scale bars: A, C, D, E, H, J, M = 2 mm; B, G, I, K, L, P, Q, R, S = 5 mm; F = 1 mm; N = 1 cm; O = 4 mm. Drawn from S. Petty 2083 (PERTH) (A,B,C); V.J. Neldner 2755 (BRI) (D); G.L. Wightman 2573 & M. Clark (DNA) (E,F); M.O. Parker 739 (DNA) (G,H.); G.L. Webster 18628 (NSW) (I,J); M.E. Phillips 1418 (CBG) (K); C.R. Dunlop 6107 & J. Taylor (DNA) (L,M.); K.F. Kenneally 10468 (PERTH) (N,O); C.R. Dunlop 8673 & N.G. White (DNA) (P); J.R. Clarkson 4816 (BRI) (Q); T.A. Halliday 450 (BRI) (R); I.D. Cowie 1453 & C.R. Dunlop (DNA) (S). Drawn by D. Mackay.

Distribution. Only known from localities near Laverton.

Habitat. Known from granite outcrops, and red-lateritic and sandy-clay soils.

Flowering and fruiting period. July to September.

Conservation status. CALM Conservation Codes for Western Australian Flora: Priority One. A ROTAP code (Briggs & Leigh 1988) of 2E-W is suggested. This species is known only from a few close localities and a handful of specimens, none within a reserve.

Etymology. The specific epithet refers to the superficial resemblance of the plants in flower to *Baeckea* L., a genus in the Myrtaceae.

3. *Phyllanthus cauticola* J.T. Hunter & J.J. Bruhl, *sp. nov.*

P. exili affini sed habitu pendenti, ramulis rotundatis, laminis latioribus et sepalis masculinis majoribus differt.

Typus: Kakadu National Park [precise locality withheld], Northern Territory, April 1993, *J.T. Hunter* 1589, *J.J. Bruhl & J.L. Egan* (*holo:* DNA; *iso:* BRI, DAV, NE, PERTH).

Monoecious *shrubs*. *Branches* rounded, 8-9.5 cm long; 0.2-0.3 mm wide, the upper parts of the branchlets are often red, papillose. *Stipules* persistent, free, 0.4-0.9 mm long, red, narrowly triangular, chartaceous, entire, glabrous to papillose; base rounded to obtuse; apex acute. *Branch leaves* normal. *Branchlet leaves* alternate, distichous, jointed, symmetrical, plane. *Petiole* 0.6-1.5 mm long, 0.1-0.4 mm wide, glabrous to papillate. *Lamina* 9.3-13.2 mm long, 3.7-4.1 mm wide, obovate, light-green to mid-green, paler below, pinnately veined, obscurely veined, glabrous to sparsely papillate; base symmetrical, obtuse to attenuate; apex erect, ecaudate, rounded to emarginate and sometimes cuspidate, mucronate; margins plane. *Bracts and bracteoles* deciduous, glabrous. *Inflorescences* unisexual or occasionally bisexual with the sexes mixed, indeterminate, axillary, sessile. *Male flowers* solitary; pedicels 0.4-0.6 mm long, glabrous; sepals 6, free, ascending, 1.8-2 mm long, 0.9-1.1 mm wide, white to yellow, elliptic to ovate, obtuse to acute, glabrous; disk comprising discrete lobes, about 1 mm wide, lobes lenticular; stamens 3, 1-whorled, erect; filaments completely connate, erect, terete, 0.7 mm long; anthers extrorse, erect to ascending, oblong to elliptic, 0.6-0.7 mm long; locules parallel. *Female flowers* solitary; pedicels at anthesis 2-2.3 mm long, 0.1-0.2 mm wide, in fruit 2.7-3.3 mm long, 0.1-0.2 mm wide, glabrous or sometimes papillate; sepals free, 6, 1.6-2.3 mm long, 0.8-1 mm wide, elliptic, at anthesis ascending and incurved, in fruit ascending, white, green to yellow, with a distinct white margin, obtuse to acute, glabrous; disk crenate, 0.6-0.8 mm wide; styles 3, free, divided for about half their length, erect to recurved, red, 0.3-0.4 mm long, about 0.1 mm wide, narrow-terete, glabrous, branches entire, linear; ovary 0.7-0.9 mm long, 0.7-0.8 mm wide, globose to ellipsoid, smooth, glabrous. *Fruit* a capsule, septicidal, globose to ellipsoid, 2-2.2 mm long, 0.9-2 mm wide, yellow-brown to green, cartilaginous, smooth, glabrous, grooved septicidally; column persistent, narrow oblong to 'lanceolate', 1.3-1.5 mm long. *Seeds* bi-coloured with the upper half red and the lower half yellow, prismatic to crescentiform, laterally compressed, 1.7-1.8 mm long, 0.5-0.8 mm wide, smooth; hilum markedly depressed, bordered, circular, cavity more or less basal.

Distribution. Known only from a small population at the type locality within Kakadu National Park, Northern Territory.

Habitat. Grows horizontally then pendulously from the sides of sandstone cliffs.

Flowering and fruiting period. April.

Conservation status. A ROTAP code (Briggs & Leigh 1988) of 2EC-Y is suggested. The species is at present only known from the type locality.

Etymology. In reference to the habit of the whole plant as it projects horizontally from sandstone outcrops.

Notes. *Phyllanthus cauticola* is unusual in having elongated fruits and seeds, characters of *Phyllanthus* in Australia that are otherwise only known from *P. exilis*. These attributes are similar to those seen in *Sauropus*, however, a floral disk confirms the inclusion of *P. cauticola* in *Phyllanthus*. The seed of *P. cauticola* is unusual in being bi-colourous, a state not seen in other members of the genus.

4. **Phyllanthus debilis* Klein ex Willd., Sp. Pl. 4: 582 (1805). *Type:* Ph. Niruri proxim Fankerb, 9 Jan[uary] 1799 (*holo:* BM).

Phyllanthus leai S. Moore, J. Linn. Soc. (Bot.) 45: 217 (1920). *Type:* North Australia, June-July 1886, T.S. Lea (*holo:* BM).

Distribution. This tropical weed has a sporadic and disjunct distribution within Australia. It is known from Darwin, and Kakadu National Park in the Northern Territory and from the Torres Strait Islands, Townsville and Mackay in Queensland.

Notes. *Phyllanthus debilis* is probably native to tropical Asia (Airy Shaw 1980). Until now *P. debilis* has not been recognized as occurring in Australia. Most collections of this species have been misidentified as *P. amarus* Schum. *Phyllanthus debilis* can be readily distinguished from *P. amarus* by the possession of six sepals rather than five.

Based on herbarium collections, *P. debilis* appears to have been introduced into Australia twice. The earliest known collection from Australia is the type specimen of *P. leai*, 1886 from Darwin. No more specimens of *P. debilis* appear to have been made until 1980, when it was again collected in Darwin.

5. *Phyllanthus eutaxioides* S. Moore, J. Linn. Soc. Bot. 45: 216 (1920). *Type:* East Coast [*sic*], R. Brown 3617 (*holo:* BM).

Phyllanthus sp. *Golden Sands*, Dunlop *et al.*, Flora of the Darwin Region 2: 233 (1995).

Distribution. *Phyllanthus eutaxioides* is restricted to the Darwin Region and the Gove Peninsula of the Northern Territory.

Notes. Although the name *P. eutaxioides* is valid, it seems not to have been used within Australia other than in Moore's original designation. Dunlop *et al.* (1995) have referred to this species as *P. 'Golden Sands'* in the "Flora of the Darwin Region". *Phyllanthus eutaxioides* is variable and appears to have three variants: one (e.g. DNA 24813; DNA 24814) has larger stipules and leaves than the type variant, and a disc that is more inflated; another (e.g. DNA 5731; DNA 9440; MEL 226369) differs from the type variant in being papillose to scabrous on the stems and leaves. In both these variants the anther filaments are not fully fused, while they are in the type variant. For illustrations of *P. eutaxioides* see Dunlop *et al.* (1995) [*as P. 'Golden Sands'*]. Further studies of this complex are warranted.

Although *Phyllanthus eutaxioides* is restricted to the Darwin region and the Gove Peninsula within the Northern Territory, the type specimen locality is given as 'East Coast'. It appears that this was a mistaken locality, as Robert Brown, at the time of collecting this specimen, was in the Gulf of Carpentaria or part of Antrim's [Arnhem] Land (Dawson 1958).

6. *Phyllanthus exilis* S. Moore, J. Bot. 64: 97 (1926). *Type*: Grootte Eylandt, February 1925, S. Moore 109 (*holo*:K).

Phyllanthus sp. aff. *virgatus*, Dunlop *et al.*, Flora of the Darwin Region 2: 233 (1995).

[*Phyllanthus trachygynae* auct. non Benth., Wheeler *et al.*, Flora of the Kimberley Region 622 (1992).]

Distribution. *Phyllanthus exilis* is a common species from the west coast of the Kimberley region of Western Australia to the Gulf country in Queensland.

Notes. *Phyllanthus exilis*, while a valid name, has not been used within Australia since its original publication. Most commonly specimens of *P. exilis* have been determined as *P. trachygynae* Benth. (Wheeler *et al.* 1992) which is a synonym of *P. virgatus* Forst. f.

Intriguingly both the name and description of *P. trachygynae* by Bentham (1873) indicate that its ovary is warted. However, the lectotype of *P. trachygynae* does not have a warted ovary and neither do any of the collections that otherwise conform to the type description. By contrast, specimens of the vegetatively similar *P. exilis* do have warted ovaries. Indeed, until we examined the ovary, fruits and seeds of type specimen of *P. exilis*, we were unable to determine to which species the type belonged. The fruit and seed are illustrated in Figure 1E,F. For further illustrations see Wheeler (1992) [as *P. trachygynae*] and Dunlop *et al.* (1995) [as *P. sp. aff. virgatus*].

7. *Phyllanthus lacerosus* Airy Shaw, Kew Bull. 35: 386 (1980). *Type*: black clay plain, Negri-Stirling area, 17°10' S 129°15' E, Northern Territory, 3 May 1974, Dunlop 3567 (*holo*:K).

Phyllanthus sp. A, Jacobs & Harden, Flora of New South Wales 1: 397 (1990)

Phyllanthus sp. A, Wheeler *et al.*, Flora of the Kimberley Region 623 (1992).

Notes. Independently, James & Harden (1990) and Wheeler (1992), treated *P. lacerosus* under *Phyllanthus* sp. A. The distribution of *P. lacerosus* indicates that it is not naturalized (as suggested in Wheeler 1992), but native. Hunter & Bruhl (1997) present a full description along with notes on distribution and synonyms. For illustrations see Wheeler (1992) [as *P. sp. A*] and James & Harden (1990) [as *P. sp. A*].

8. *Phyllanthus prominulatus* J.T. Hunter & J.J. Bruhl, *sp. nov.*

P. virgato affini a quo ramis angularibus as ellipsoideis, brevioribus, venis foliorum manifeste prominulis, sepalis femineis fructiferus brevioribus differt.

Typus: Kapalga [precise locality withheld], Northern Territory, G.M. Wightman 20 (*holo*:DNA).

Monoecious herb. *Branchlets* persistent, angular to ellipsoid, slightly winged, 0.6-1.7 cm long, 0.3-0.6 mm wide, glabrous. *Stipules* persistent, free, 0.5-0.7 mm long, red-brown, ovate to triangular, chartaceous, entire, glabrous; base cordate to amplexicaul; apex acute to acuminate. *Branch leaves* normal. *Branchlet leaves* alternate, distichous, jointed, brown when dry or remaining green, symmetrical, plane to concave. *Petiole* 0.3-0.8 mm long, 0.1-0.4 mm wide, glabrous. *Lamina* 5-8.8 mm long, 2.4-4.8 mm wide, elliptic, circular to obovate, light-green, paler below, pinnately veined, adaxially prominently veined, abaxially prominulous, glabrous; base symmetrical, rounded to obtuse; apex erect, ecaudate, obtuse to rounded, mucronate; margins plane, thickened; midrib abaxially raised with 4-8 raised parallel lateral veins per side, with marginal loops. *Bracts and bracteoles* deciduous, glabrous. *Inflorescences* at least sometimes bisexual with the sexes mixed, indeterminate, axillary, sessile. *Male flowers* solitary or sometimes clustered, 2-5 per cluster; pedicels 0.4-1.2 mm long, glabrous; sepals 6, free, ascending to divergent, 0.3-0.7 mm long, 0.2-0.5 mm wide, the margins are sometimes lobed once on each side (hastate), white to yellow, elliptic, circular, to ovate, obtuse and acute, glabrous; disk comprising discrete lobes, 0.2-0.4 mm wide, lobes lenticular; stamens 2-3, 1-whorled, erect; filaments free to connate for about half their length, erect, terete, 0.1-0.3 mm long; anthers extrorse, divaricate, elliptic to circular, 0.1-0.2 mm long. *Female flowers* solitary or sometimes clustered, 1-2 per cluster; pedicels jointed, at anthesis 0.3-1.1 mm long, 0.1-0.2 mm wide, in fruit 1-2.7 mm long, 0.1-0.2 mm wide, glabrous; sepals free, 6, 0.3-0.5 mm long, 0.2-0.3 mm wide, elliptic to ovate, at anthesis ascending to divergent, in fruit divergent to reflexed, white, green to yellow, with a distinct white margin, obtuse to acute, glabrous; disk crenate, 0.4-0.6 mm wide, glabrous; styles 3, free, divided for half or more of their length, divergent to recurved, yellow to green, 0.2-0.3 mm long, 0.1-0.2 mm wide, narrow-terete, glabrous, branches linear; ovary 0.2-0.5 mm long, 0.3-0.7 mm wide, transversely ellipsoid and apically depressed, smooth, glabrous. *Fruit* a capsule, septicidal, transversely ellipsoid and apically depressed, 0.8-0.9 mm long, 1.5-1.8 mm wide, yellow-brown, red-brown to green, cartilaginous, smooth, glabrous, grooved septicidally; column persistent, angular-ovoid to 'lanceolate', 0.3-0.5 mm long. *Seeds* pallid-brown to red-brown, prismatic, laterally compressed, 0.6-0.7 mm long, 0.5-0.7 mm wide, granulate; hilum slightly depressed, circular to ovate, cavity more or less basal. (Figure 1G,H)

Selected specimens examined. NORTHERN TERRITORY [precise localities withheld]: Munmalary Station, P.K. Latz 3890 (DNA); Kapalga, G.M. Wightman 20 (DNA); Berry Springs, M.O. Parker 739 (DNA); Hayward Creek, I.D. Cowie 1202 & G.J. Leach (DNA).

Distribution. Known from a few isolated localities within Kakadu National Park and around Darwin, Northern Territory.

Habitat. Known from sedgeland and damp places within savanna woodland.

Flowering and fruiting period. April to May.

Conservation status. A ROTAP code (Briggs & Leigh 1988) of 2EC-N is suggested.

Etymology. The specific epithet refers to the obviously prominulate veins on the leaves.

Notes. The *Phyllanthus virgatus* complex is morphologically similar to *P. prominulatus*, from which it can readily be distinguished by its distinctive, delicate and prominulous leaves.

9. *Phyllanthus scaber* Klotzsch, Pl. Preiss 1: 179 (1845). *Type:* In litore rupestri promontorii Cape Riche, 18 Nov[ember] 1840, Preiss 1200 (*holo:* K). (Figure 1I-K)

Phyllanthus scaber Klotzsch var. *angustifolius* Muell. Arg., Prodrum 15: 372 (1866). *Type*: In Nova-Hollandia austro occident, ad King George's Sound (Cuming qui misit anno 1860, in hb. DC.) (*holo*: G-DC).

Phyllanthus scaber Klotzsch var. *pallidiflorus* Muell. Arg., Prodrum 15: 372 (1866). *Type*: Ad King George's Sound Novae-Hollandiae (Cuming qui misit anno 1860, in hb. DC.) (*holo*: G-DC).

Phyllanthus maitlandianus Diels, Bot. Jahrb. Syst. 35: 338 (1904). *Type*: Hab. In distr. Irwin pr. Chapman River ad latera vallis umbrosa in calcareis humosis flor. m. Sep. Diels 4131 (*holo*: n.v., presumed destroyed at B).

Distribution. *Phyllanthus scaber* has a disjunct distribution predominantly along the western and southern coasts and islands of Western Australia.

Notes. This species shows much morphological variation. In general, though, the most common variation is in leaf size and shape. Some specimens have wide leaves and others have very narrow leaves. The latter have often been identified as *Phyllanthus maitlandianus*. The narrowness of the leaves is not a constant character, however, as there is much variation between specimens, and even within a single collection. We therefore treat *Phyllanthus maitlandianus* as a synonym of *P. scaber*.

10. *Phyllanthus sulcatus* J.T. Hunter & J.J. Bruhl, *sp. nov.*

P. urinaria affini sed caulibus ellipsoideis brevioribus, ramulis brevioribus, fructu minus verrucato, seminibus parvioribus, et depressione extra hilum adest differt.

Typus: 15 km S of Kakadu National Park Headquarters, Jabiru, Burdulba River area flats, Northern Territory, 13 May 1988, A.A. Munir 5614 (*holo*: AD; *iso*: DNA, NE).

[*Phyllanthus urinaria* auct. non L.: Wheeler *et al.*, Flora of the Kimberley Region 622 (1992); Forster & Henderson, Queensland Vascular Plants: Names and Distributions 116 (1993).]

[*Phyllanthus leai* auct. non S. Moore: Dunlop *et al.*, Flora of the Darwin Region 2: 231 (1995).]

Monoecious *annual herb*, to 0.3 m tall. *Branchlets* persistent, ellipsoid to flattened, ribbed, 1-4 cm long, 0.2-0.4 mm wide, glabrous to papillose in longitudinal rows. *Stipules* persistent, free, 0.4-1.7 mm long, cream to pink, lanceolate, ovate to triangular, membranous, with a distinct white margin, entire to lacerate, glabrous; base truncate, rounded, cordate to sagittate; apex acute. *Branch leaves* reduced leaf-like to scale-like with the branches bearing modified leaves that are broadly ovate in appearance but are not reduced in size, upper branches are subtended by scales, pallid-brown, glabrous. *Branchlet leaves* alternate, distichous, jointed, symmetrical, plane. *Petiole* 0.2-0.7 mm long, 0.1-0.4 mm wide, glabrous. *Lamina* 5.2-12 mm long, 1.7-6 mm wide, oblong to ovate, mid-green, paler below, pinnately veined, abaxially prominulous, glabrous to glabrescent with younger leaves sometimes scabrous along the major veins; base sometimes \pm oblique, rounded to cuneate; apex erect, ecaudate, acute, obtuse or rounded, mucronate, with a small callous; margins serrate to serrulate, plane; midrib abaxially raised with 3-7 lateral veins with marginal loops. *Bracts and bracteoles* deciduous, glabrous. *Inflorescences* unisexual, branchlets with distal males, indeterminate, axillary. *Peduncles* only on female flowers, 0.2-0.9 mm long at anthesis, otherwise sessile. *Male flowers* at least sometimes clustered, 1-2 per cluster; pedicels 0.1-0.4 mm long, glabrous; sepals 6, free, ascending to divergent, 0.3-0.8 mm long, 0.2-0.5 mm wide, white

to yellow, elliptic, ovate to obovate, rounded to acute, glabrous; disk comprising discrete lobes, 0.2-0.5 mm wide, lobes lenticular; stamens 3, 1-whorled, symmetrical, erect; filaments completely connate, erect, terete, *c.* 0.1 mm long; anthers extrorse, erect, connate, oblong to elliptic, 2-3 mm long; locules parallel. *Female flowers* solitary, sessile at anthesis; pedicels present only in fruit, jointed; sepals free, 6, 0.5-1 mm long, 0.2-0.4 mm wide, lanceolate to triangular, at anthesis ascending to divergent, in fruit divergent to reflexed, white, yellow-brown to green, with a distinct white margin, rounded to acute, glabrous; disk crenate, 0.4-0.6 mm wide; styles 3, free, divided for about half or less of their length, erect to ascending, white to yellow, 0.1-0.4 mm long, 0.1-0.2 mm wide, narrow-terete, glabrous, branches entire, linear; ovary 0.4-0.7 mm long, 0.6-1.4 mm wide, transversely ellipsoid, apically depressed, often red in colour, colliculate, glabrous. *Fruit* a capsule, septicidal, transversely ellipsoid, apically depressed, 1.1-1.4 mm long, 1.9-2.4 mm wide, red-brown to red, cartilaginous, verrucate towards the apex, glabrous, grooved septicidally; column persistent, angular-ovoid to broadly barrel shaped, 0.3-0.7 mm long. *Seeds* yellow to black, prismatic, laterally compressed, 0.7-1.2 mm long, 0.5-0.9 mm wide, prominently sulcate; hilum markedly depressed, centrally constricted, cavity more or less basal or sometimes slightly displaced towards the centre, extra-hilum lateral depression present. (Figure 1L,M)

Selected specimens examined. QUEENSLAND: 12.4 km N of Mareeba, along road to Mt Malloy, *D. Halford* Q335B (BRI); Norman River Crossing on Normanton-Croydon road, near Glenore homestead, 18 km out of Normanton, *V.J. Neldner* 2420 & *T.D. Stanley* (BRI).

NORTHERN TERRITORY: 15 km S of Kakadu National Park Headquarters, Jabiru, Burdulba River area, *A.A. Munir* 5614 (AD); Mary River, *C.R. Dunlop* 8381 & *B.A. Wilson* (DNA); 10 miles [16 km] W of Borrooloola, *N. Henry* 61 (DNA); Alligator River, *C.R. Dunlop* 6107 & *J. Taylor* (DNA); 'Westmoreland', 30 km E of the Q/NT border, for NW Queensland, *R. Pullen* 9191 (MEL); 30 km N of Cape Crawford, *J.T. Hunter* 1539, *J.J. Bruhl* & *J.L. Egan* (NE).

Distribution. Known from Darwin in the Northern Territory, east across the Gulf country to Cooktown in Queensland.

Habitat. Occurs in periodically inundated areas such as the margins of swamps, lagoons, dams, stream and river flats.

Flowering and fruiting period. March to September.

Etymology. In reference to the distinctly furrowed seeds.

Notes. *Phyllanthus urinaria*, a pan-tropical species, is morphologically similar to *P. sulcatus*, and specimens of the latter have been misidentified as *P. urinaria* (Wheeler *et al.* 1992). *Phyllanthus sulcatus* can, however, be distinguished by branchlet, fruit and seed characters (Table 1). Dunlop *et al.* (1995) have presented a description referable to *P. sulcatus* as *P. leai*, which is a synonym of *P. debilis* (see discussion above). *Phyllanthus sulcatus* and *P. urinaria* are the only two Australian species of *Phyllanthus* that have pedunculate female flowers. For illustrations see Wheeler *et al.* (1992) [as *P. urinaria*] and Dunlop *et al.* (1995) [as *P. leai*].

Table 1. Comparison of selected characters for *Phyllanthus sulcatus* and *P. urinaria*

	<i>P. sulcatus</i>	<i>P. urinaria</i>
Branchlets	Ellipsoid to flattened	Rounded to angular
Branchlet length	1-4 cm	6.5-16.5 cm
Stipules	With a white margin	Without a white margin
Inflorescences	Always unisexual	Sometimes bisexual
Female flowers	Solitary	1 or 2 per axil
Female sepal margin	With a white margin	Without a white margin
Female sepal shape	Lanceolate to triangular	Elliptic to ovate
Fruit sculpturing	Sparsely warted	Densely warted
Seed length	0.7-1.2 mm	1.4-1.9 mm
Seed width	0.5-0.9 mm	1-1.5 mm
Hilum	Markedly depressed	Slightly depressed
Hilum constriction	Present	Absent
Extra-hilum depression	Present	Absent

11. *Phyllanthus virgatus* G. Forst., Fl. Ins. Austral. Prodr.: 65 (1786). *Type*: Tahiti, *Banks & Solander* (?lecto or holo: BM n.v.). (Figure 1P-S)

Phyllanthus simplex Retz., Obs. Bot. 5: 29 (1789). *Type*: none cited.

Phyllanthus minutiflorus Muell. Arg., Linnaea 34: 75 (1865) - *Phyllanthus simplex* Retz. var. *minutiflorus* (Muell. Arg.) Domin, Beit. Fl. Pflanz. Aust. 877 (1927). *Type*: Upper Victoria River, *F. Mueller* (?syn: K), Upper River Victoria, *F. Mueller* (?syn: K), River Victoria, near the Main Camp, May 1856, *F. Mueller* (?syn: K), Victoria River, Arnhem Land, 1863, *F. Mueller* (?syn: G-DC).

Phyllanthus beckleri Muell. Arg., Linnaea 34: 74 (1865). *Type*: Clarence River, *Beckler* 668 (n.v., location unknown).

Phyllanthus filicaulis Benth., Fl. Austral. 6: 111 (1873) - *P. simplex* Retz. var. *filicaulis* (Benth.) Domin, Beit. Fl. Pflanz. Aust. 876 (1927). *Type*: New England, *C. Stuart* (holo: K).

Phyllanthus trachygynae Benth., Fl. Austral. 6: 103 (1873). *Type*: Port Darwin, *Shultz* 668 (here designated lecto: K); *Shultz* 112 (syn: K, n.v.), 660 (syn: K), 788 (syn: K).

Phyllanthus simplex Retz. var. *leiospermus* Benth., Fl. Austral. 6: 111 (1873) - *Phyllanthus simplex* subvar. *leiospermus* (Benth.) Domin, Beit. Fl. Pflanz. Aust. 876 (1927) as *biospermus*. *Type*: Narran River, *Mitchell* (n.v., location unknown).

Phyllanthus minutiflorus Muell. Arg. var. *gracillimus* Benth., Fl. Austral. 6: 112 (1873). Type: Moreton Bay, July 55, F. Mueller (holo: K).

Phyllanthus eboracensis S. Moore, J. Linn. Soc. (Botany) 45: 216 (1920). Type: Cape York, Daemel (holo: K).

Phyllanthus simplex Retz. var. *myrtifolius* Domin, Beit. Fl. Pflanz. Aust. 876 (1927). Type: Nordost-Queensland: Mischwälder bei Cairnes, auf Sand, XII 1909, Domin (n.v., location unknown).

Phyllanthus simplex Retz. var. *pinifolius* Domin, Beit. Fl. Pflanz. Aust.: 877 (1927). Type: Qld: Sandsfeinhügel der Dividing Range bei Pentland, II 1910, Domin (n.v., location unknown).

Phyllanthus sp. B, Wheeler *et al.*, Flora of the Kimberley Region 624 (1992).

Distribution. The pan-tropical *Phyllanthus virgatus* is one of the most widespread and common Australian *Phyllanthus* species (Table 2), occurring from the Kimberleys in Western Australia, through northern and arid Australia, to as far south as Sydney in New South Wales.

Table 2. Distribution of Northern Territory and Western Australian species of *Phyllanthus* within Australia based on the regions adopted by Hnatiuk (1990)

Taxon	Distribution
* <i>P. amarus</i> K. Schum. & Thom	4, 25, 43, 45, 53, 55, 44, 59, 60
<i>P. aridus</i> Benth.	1, 2, 4, 25, 26
<i>P. baeckeoides</i> J.T. Hunter & J.J. Bruhl	10, 15
<i>P. calycinus</i> Labill.	16, 17, 18, 19, 20, 21, 22, 23, 24, 36, 39, 40
<i>P. carpentariae</i> Muell. Arg.	25, 26, 27, 43, 44, 46, 45, 49, 51, 53, 54, 55, 65
<i>P. caudicola</i> J.T. Hunter & J.J. Bruhl	25
* <i>P. debilis</i> Klein. ex Willd.	25, 45, 53, 55
<i>P. erwinii</i> J.T. Hunter & J.J. Bruhl	4, 29, 30, 47
<i>P. eutaxioides</i> S. Moore	25
<i>P. exilis</i> S. Moore	1, 2, 3, 4, 25, 26, 43
<i>P. flagellaris</i> Benth.	25
<i>P. fuernrohrii</i> F. Muell.	28, 31, 32, 33, 34, 35, 36, 37, 38, 43, 47, 48, 50, 51, 55, 56, 63, 68, 69
<i>P. indigoferoides</i> Benth.	1, 25, 45
<i>P. lacerosus</i> Airy Shaw	1, 2, 3, 25, 26, 27, 43, 53, 49
<i>P. lacunellus</i> Airy Shaw	29, 31, 32, 33, 34, 35, 36, 37, 38, 47, 70, 71, 72
<i>P. maderaspatensis</i> L.	1, 2, 3, 4, 7, 12, 14, 18, 25, 26, 27, 31, 34, 43, 44, 45, 46, 47, 49, 50, 51, 53, 54, 55, 56, 68
<i>P. oblanceolatus</i> J. T. Hunter & J.J. Bruhl	29, 30, 34, 35, 69, 70
<i>P. prominulatus</i> J.T. Hunter & J.J. Bruhl	25

Table 2 continued

Taxon	Distribution
<i>P. reticulatus</i> Poiret	1, 2, 3, 4, 25, 26, 45
<i>P. saxosus</i> F. Muell.	21, 33, 34, 35, 36, 37, 38, 40, 41, 42, 74
<i>P. scaber</i> Klotzsch	14, 16, 21
<i>P. sulcatus</i> J.T. Hunter & J.J. Bruhl	25, 26, 43, 45
* <i>P. tenellus</i> Roxb.	3, 45, 53, 54, 57, 52, 59, 60, 62, 63
<i>P. urinaria</i> L.	1, 25
<i>P. virgatus</i> G. Forster	1, 2, 3, 4, 7, 12, 25, 26, 27, 28, 29, 43, 44, 45, 46, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 62, 65, 68, 70

Notes. The type of *P. virgatus* cited here follows the treatment of Smith (1981), and as accepted by Webster (1986). *Phyllanthus virgatus* forms a heterogeneous, cosmopolitan species complex. Due to the extreme variability of this species, both within and between regions, and the lack of consistent characters, we have included the following taxa within the limits of *P. virgatus*: *P. filicaulis* Benth., *P. minutiflorus* Muell. Arg., *P. simplex* Retz., *P. beckleri* Muell. Arg., *P. eboracensis* S. Moore and *P. trachygyna* Benth. It is likely, however, that after in-depth research, some of these taxa may be reinstated and others recognized.

The specimen Shultz 668 (K) was chosen to lectotypify *P. trachygyna* as it was a diagnostic female specimen, richer in material than Shultz 660 (K), and we had access to fragments of the specimen.

Key to *Phyllanthus* species of the Northern Territory and Western Australia

- 1 Branch leaves scale-like (phyllanthoid branching) 2
- 1: Branch leaves normal or sometimes reduced leaf-like 7
- 2 Leptocladus shrubs, 0.6-5 m tall; leaves 14.4-22 mm wide; secondary veins 8-15 per side; male pedicels 0.8-6.2 mm long; male sepals 0.8-2.2 mm wide; male disk lobes ellipsoid; female sepals 0.7-2.3 mm wide; stamens 5; ovary 0.6-1.5 mm long, 1-2.8 mm wide; fruit a berry, 2.5-7.6 mm long, 3.7-12.9 mm wide. **P. reticulatus** (Figure 1N,O)
- 2: Herbs to 0.8 m tall; leaves 1.7-9.8 mm wide; secondary veins 3-8 per side; male pedicels 0.1-1.6 mm long; male sepals 0.2-0.9 mm wide; male disk lobes lenticular; female sepals 0.2-1 mm wide; stamens 3; ovary 0.3-0.8 mm long, 0.3-1.4 mm wide; fruit a capsule, 1-2.3 mm long, 0.7-2.4 mm wide 3
- 3 Leaf base oblique, margins serrate, veins abaxially prominulous; female inflorescences pedunculate; ovary colliculate; fruit verrucate; native herbs 4
- 3: Leaf base not oblique, margins entire, veins not abaxially prominulous; female inflorescences not pedunculate; ovary smooth; fruit smooth; weedy herbs. 5
- 4 Branchlets rounded to angular, 6.5-16.5 cm long; stipules without a white margin; inflorescences sometimes bisexual; female flowers 1 or 2 per axil; female sepals elliptic to ovate, without a white margin; fruit densely colliculose; seed 1.4-1.9 mm long, 1-1.5 mm wide; hilum slightly depressed, not constricted, extra-hilum depression absent **P. urinaria**

- 4: Branchlets ellipsoid to flattened, 1-4 cm long; stipules with a white margin; inflorescences always unisexual; female flowers solitary; female sepals lanceolate to triangular, with a white margin; fruit sparsely colliculose; seed 0.7-1.2 mm long, 0.5-0.9 mm wide; hilum markedly depressed, constricted, extra-hilum depression present **P. sulcatus**
- 5: Petiole 0.6-1.8 mm wide; sepals 5; female flowers solitary; style merely notched **P. amarus**
- 5: Petiole 0.1-0.3 mm wide; sepals 6 rarely 5; female flowers 1-5 per axil; style divided for half or more of its length 6
- 6: Branchlets rounded, smooth; sepals 6 rarely 5; lamina margins undulate; stamens 4-6, free; seeds granulate to aculeate ***P. tenellus**
- 6: Branchlets flattened, ribbed; sepals always 6; lamina rounded, margins not undulate; stamens 3, connate; seeds striate ***P. debilis**
- 7: Plants dioecious 8
- 7: Plants monoecious 13
- 8: Lamina variously hairy, but not papillate 9
- 8: Lamina glabrous, or sometimes papillate 10
- 9: Prostrate subshrub to 0.15 m tall; stipules lacerate to erose, 0.5-1.5 mm long; lamina 4.9-14.8 mm long, margins revolute; female perianth not growing in fruit leaving the fruit exposed; ovary and fruit glabrous **P. flagellaris**
- 9: Erect shrub or subshrub 0.2-1 m tall; stipules entire, 1.4-2.8 mm long; lamina 10-25.2 mm long, margins plane; female perianth growing and enclosing fruit; ovary pubescent and fruit pilose **P. carpentariae** (Figure 1D)
- 10: Branchlets ellipsoid to flattened; male sepals 0.5-0.9 mm long, red to red-brown; female pedicels 0.1-0.2 mm wide in fruit; female sepals 0.4-1.2 mm long; ovary and fruit warted with a rounded apex **P. exilis**
- 10: Branchlets rounded; male sepals 0.8-4 mm long, white, yellow or green; female pedicels 0.2-0.5 mm wide in fruit; female sepals 1.1-2.8 mm long; ovary and fruit smooth with a depressed apex 11
- 11: Branchlets 0.4-0.7 mm wide; male sepals 2-3.9 mm long, 1.3-2.7 mm wide; male disk 2-3.1 mm wide; female sepals 1.2-2.1 mm long, 1.4-2.1 mm wide; filaments connate completely, 1.2-2.6 mm long; anthers 0.9-1.4 mm long; style divided less than half way; seeds smooth **P. baeckeoides**
- 11: Branchlets 0.6-1.2 mm wide; male sepals 0.8-2 mm long, 0.8-2 mm wide; male disk 0.6-1.3 mm wide; female sepals 0.4-1.6 mm long, 0.6-1.6 mm wide; filaments free or connate for only half way, 0.2-0.7 mm long; anthers 0.3-1 mm long; style undivided; seeds sculptured 12
- 12: Female pedicels at anthesis 2-5 mm long; filaments free or connate for half their length; anthers 0.7-1 mm long; style 1.2-2.4 mm long; fruit 4.2-4.7 mm wide; column 1.2-2 mm long; seeds 2.1-2.3 mm long, striate **P. saxosus**
- 12: Female pedicels at anthesis 0.7-2 mm long; filaments always free; anthers 0.3-0.4 mm long; style 0.3-1.2 mm long; fruit 1.5-4.1 mm wide; column 0.6-1 mm long; seeds 1.3-1.9 mm long, colliculate **P. scaber**
- 13: Branchlets ribbed 14
- 13: Branchlets smooth 15

- 14 Branchlets angular; stipules 1.7-5.2 mm long; lamina 19-30 mm long, prominulous;
male pedicel 1.2-4.3 mm long; seeds smooth or finely striate **P. lacerosus**
- 14: Branchlets rounded; stipules 0.6-1.4 mm long; lamina 5.5-18 mm long;
male pedicel 0.3-1 mm long; seeds rugose to ribbed **P. lacunellus**
- 15 Female sepals enlarging and enclosing fruit 16
- 15: Female sepals not enlarging in fruit, fruit exposed 17
- 16 Male pedicels 4.2-9.5 mm long; female pedicels 3.5-14.5 mm long at anthesis;
fruit 3-5.2 mm long, 5-6.6 mm wide; seed 2.5-3.9 mm long, 1.8-2.5 mm long **P. calycinus**
- 16: Male pedicels 0.4-1.7 mm long; female pedicels 1-4.8 mm long;
fruit 2.2-4.3 mm long, 2.5-5.2 mm wide; seeds 1.7-2.2 mm long, 1.2-1.8 mm wide **P. carpentariae**
- 17 Fruit ellipsoid, apex rounded not depressed; seeds elongated (distinctly
longer than wide; falcoid) and bicolorous, yellow and red; filaments
completely connate; plant growing pendulously from sandstone outcrops **P. cauticola**
- 17: Fruit transversely ellipsoid, apex depressed; seeds not elongated (only
slightly longer than wide), only one colour; filaments free to connate; plant
not growing pendulously from sandstone outcrops 18
- 18 Seeds rugose; hilum slightly depressed, not bordered; fruit smooth and
glabrous; filaments free **P. erwinii**
- 18: Seeds granulate to tuberculate; hilum slightly depressed, not bordered;
fruit smooth to verrucate, hairy or glabrous; filaments free or connate 19
- 18: Seeds smooth or rarely striate (*P. aridus*); hilum slightly or markedly depressed,
bordered or not bordered; fruit smooth, hairy or glabrous; filaments free or connate 21
- 19 Leaf margins not thickened; female sepals 0.8-2 mm long, 0.6-2 mm wide;
styles merely notched; stipule base rarely caudate. **P. maderaspatensis**
- 19: Leaf margins thickened; female sepals 0.3-1.2 mm long, 0.2-0.7 mm wide; styles
divided for half or more of their length; stipules commonly and distinctly caudate 20
- 20 Branchlets angular to ellipsoid, \pm winged, 0.6-1.7 cm long; leaves prominently
veined and prominulous; female sepals 0.3-0.5 mm long in fruit; rare species
restricted to Darwin and Kakadu regions **P. prominulatus**
- 20: Branchlets rounded, never winged, 5.5-30 cm long; leaves obscurely veined;
female sepals 0.9-1.2 mm long in fruit; widespread and common species **P. virgatus**
- 21 Male pedicels <1 mm long 22
- 21: Male pedicels 1-6.8 mm long 23
- 22 Branchlets papillose; stipule glabrous to papillose; lamina glabrous to papillose,
paler below; male pedicels glabrous; female flowers 1-2 per axil; hilum not bordered **P. aridus**
- 22: Branchlets scabrous to puberulous; stipules scabrous; lamina puberulous,
both sides of equal intensity; male pedicels hairy; female flowers only
1 per axil; hilum bordered **P. indigoferoides**
- 23 Hilum slightly depressed, not bordered; plants glabrous, rarely not; stipules
cream; inflorescences unisexual; female flowers only 1 per axil;
filaments connate **P. eutaxioides**
- 23: Hilum markedly depressed, bordered; plants glabrous or hairy; stipules
yellow-brown, red-brown or rarely cream; inflorescences at least sometimes
bisexual; female flowers 1-3 per axil; filaments free to connate 24

- 24 Hairy shrub; branchlets rounded to ellipsoid; stipules 0.8-3.2 mm long; male sepals 1.3-2.5 mm long; male disk 1-1.4 mm wide; female disk 1.1-1.9 mm long; anther filaments 0.6-1.3 mm long; styles 0.6-1.3 mm long **P. fuernrohrri**
- 24: Glabrous herb or small shrub; branchlets flattened to ellipsoid; stipules 1.2-2.5 mm long; male sepals 0.7-1.7 mm long; male disk 0.6-1 mm wide; female disk 0.7-1.3 mm wide; anther filaments 0.2-0.6 mm long; styles 0.2-0.7 mm long **P. oblanceolatus**

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References

- Airy Shaw, H.K. (1980). The Euphorbiaceae of New Guinea. Kew Bulletin Additional Series VIII. (Royal Botanic Gardens: Kew.)
- Bentham, G. (1873). "Flora Australiensis." Vol. 6. (L. Reeve: London.)
- Briggs, J.D. & Leigh, J.H. (1988). "Rare or Threatened Australian Plants." Special Publication No. 14. (Australian National Parks and Wildlife Service: Canberra.)
- Dallwitz, M.J. (1980). A general system for coding taxonomic descriptions. Taxon 29: 41-46.
- Dallwitz, M.J., Paine, T.A. & Zurcher, E.J. (1993). "User's Guide to the DELTA System." (Division of Entomology, CSIRO: Canberra.)
- Dawson, W.R. (1958). "The Banks Letters: A Calendar of the manuscript correspondence of Sir Joseph Banks preserved in the British Museum, the British Museum (Natural History) and other collections in Great Britain." (British Museum, Natural History: London.)
- Dunlop, C.R., Leach, G.J. & Cowie, I.D. (1995). "Flora of the Darwin Region." Vol. 2. (Conservation Commission of the Northern Territory: Darwin.)
- Govaerts, R. & Radcliffe-Smith, A. (1995). New names and combinations in *Euphorbiaceae* - *Phyllanthoideae*. Kew Bull. 51(1): 175-178.
- Hnatiuk, R.J. (1990). "Census of Australian Vascular Plants". Australian Flora and Fauna Series 11. (Bureau of Flora and Fauna, AGPS Press: Canberra.)
- Hunter, J.T. & Bruhl, J.J. (1996). Three new species of South Australian *Phyllanthus* (Euphorbiaceae: Phyllanthaceae). J. Adelaide Bot. Gard. 17: 127-136.
- Hunter, J.T. & Bruhl, J.J. (1997). Two new species of *Phyllanthus* and notes on *Phyllanthus* and *Sauropus* in New South Wales. Telopea 7(2): (in press).
- James, T.A. & Harden, G.J. (1990). Euphorbiaceae. In: Harden, G.J. (ed.), "Flora of New South Wales." Vol. 1. pp. 389-430. (New South Wales University Press: Kensington.)
- Smith, A.C. (1981). "Flora Vitiensis Nova." Vol. 2. (Pacific Tropical Garden: Lawai, Hawaii.)
- Stearn, W.T. (1992). "Botanical Latin." 4th edn (David & Charles: Melksham.)

- Webster, G.L. (1970). A revision of *Phyllanthus* (Euphorbiaceae) in the continental United States. *Brittonia* 22: 44-76.
- Webster, G.L. (1986). A revision of *Phyllanthus* (Euphorbiaceae) in Eastern Melanesia. *Pacific Science* 40: 88-105.
- Wheeler, J.R. (1992). Euphorbiaceae. *In*: Wheeler, J.R. *et al.*, "Flora of the Kimberley Region." pp. 589-629. (Department of Conservation and Land Management: Como.)