

## **A Survey of the Genus *Pluchea* (Compositae, Plucheeae) in Australia**

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SUSANNE HUNGER

## A survey of the genus *Pluchea* (Compositae, *Plucheeae*) in Australia

### Abstract

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The genus *Pluchea* in Australia is revised. Six endemic species, i.e., *P. baccharoides*, *P. dentex*, *P. dunlopiae*, *P. ferdinandi-muelleri*, *P. rubelliflora*, *P. tetranthera* and one non-endemic species, *P. indica*, are recognized. A key to the genera of the Australian *Plucheeae* and a key to the *Pluchea* species in Australia are provided, descriptions of the species, illustrations, chromosome numbers (first records for *P. dentex* and *P. rubelliflora*:  $2n = 20$ ) and a distribution map are presented.

### Introduction

The earliest known Australian *Pluchea* collection was made by Robert Brown in 1802 during the expedition of Matthew Flinders at Broad Sound and Thirsty Sound, Queensland (specimens at BM, K). The material was later examined by Bentham (1867) for the preparation of the Flora Australiensis. He and Ferdinand Mueller validated the names of nearly all Australian *Pluchea* species.

Due to badly outlined generic delimitations and a lack of detailed investigations, taxonomic confusions surrounded the genus in Australia. One example may illustrate the problem: *Eurybia conocephala* was described by Mueller (1855), who being uncertain about the taxonomic position of this species changed its generic status several times. In 1865 he placed it in *Aster* (with the synonym *Olearia conocephala*) and finally transferred it to *Pluchea* (1887: 150) with the remark: “for including this plant in *Pluchea* it is, however, needful to extend somewhat the limits of that genus ...”. Moore (1905: 138) described a new genus, *Cratystylis*, and formed the combination *Cratystylis conocephala* (F. Muell.) S. Moore. Further studies on this genus (Anderberg & al. 1992) pointed out that it must be even removed from the vicinity of the *Inuleae* and *Plucheeae* and that its systematic position is to be found in the paraphyletic *Cichorioideae*.

There are eight genera of the *Plucheeae* in Australia; the endemic *Allopterigeron*, *Coleocoma* and *Thespidium* are monotypic, whereas *Streptoglossa* comprises eight species. The distribution of the remaining four larger genera, *Epaltes*, *Pluchea*, *Pterocaulon*, and *Sphaeranthus* is not restricted to Australia.

Following Anderberg’s cladistic analysis (1991), *Streptoglossa*, *Epaltes* and *Sphaeranthus* form together with *Pluchea* the so-called *Pluchea* clade, while *Pterocaulon*, *Coleocoma* and *Thespidium* belong to other subgroups and are rather different in habit. *Allopterigeron*, first

regarded as an uncertain member of the tribe (Anderberg 1991: 149) seems to be closely related to *Streptoglossa* (Dunlop 1981a: 168, 1981b: 186) and the herbaceous Australian representatives of *Pluchea* (Anderberg 1994: 293). Despite being one of the few *Plucheeae* taxa having marginal florets with radiate corollas, *Streptoglossa* seems to be rather close to *Pluchea* and less closely related to *Epaltes* and *Sphaeranthus*.

Today there are six endemic *Pluchea* species known from Australia. Habitually the Australian species form two distinct groups. *P. rubelliflora* and *P. dentex* are herbaceous perennials, sometimes with a woody rootstock, whereas the species of the *P. tetranthera* complex (*P. tetranthera*, *P. ferdinandi-muelleri*, *P. dunlopii*) and *P. baccharoides* are shrubs. *Pluchea rubelliflora* is the most abundant and together with *P. dentex* and *P. dunlopii* the most widespread species, while all others occur much more locally and *P. baccharoides* even appears to be rare. All endemic species possess the same number of chromosomes, i.e.  $2n = 20$  (see below and Hunger 1996, there erroneously quoted as  $2n = 10$ ). Furthermore there are two non-endemic species recorded from Australia, i.e. *Pluchea indica* and *P. dioscoridis*. Whereas *P. indica* occurs in Northern Territory and Queensland (Fig. 1), *P. dioscoridis* is recorded only from Queensland by Bailey (1900: 817) and Hnatiuk (1990: 69), but so far no specimen was seen by the author so that these records could not be confirmed yet.

Bentham (1867: 527) divided the Australian *Pluchea* species on shape of the capitula and involucre bracts in two sections, *P. sect. Pluchea* and *P. sect. Eyrea*. However, the many similarities between both groups suggest that a separation into different sections is not appropriate. Anderberg (1991: 165), on the other hand, treated the herbaceous species in his cladistic analyses as a special group, because, in his opinion, it could not be demonstrated that they belong to the same monophyletic group as the rest of *Pluchea*. Among other things he based his argument on the appressed pappus teeth of *Pluchea rubelliflora*, a feature that is, however, quite common for the genus and until now there are no reasons to exclude *P. rubelliflora* and *P. dentex* from this genus. But further studies are necessary and a comprehensive investigation of the genus and its close relatives will clarify the problems concerning the generic delimitation.

Material and methods

The present paper is part of a revision of the genus *Pluchea* in the Old World and Australia.

This study is based on field observations and collections made during an excursion in 1995 in the Pilbara Region (Western Australia), on plants cultivated from wild origin in the Botanic Garden Berlin-Dahlem, as well as on material from the herbaria A, AD, B, BM, BR, C, CANB, G, K, MEL, MO, P, PERTH, W, and WU.

Cytological preparations were made by using the standard method described by Vogt & Oberprieler (1993) with root tip tissue of plants raised in the Botanic Garden Berlin-Dahlem.

Key to the Australian genera of the *Plucheeae*

- 1. Capitula aggregated into dense compound secondary heads . . . . . 2
  - Capitula not aggregated into dense compound secondary heads . . . . . 3
- 2. Pappus absent, anthers tailless . . . . . *Sphaeranthus*
  - Pappus present, anthers tailed . . . . . *Pterocaulon*
- 3. Corolla of hermaphroditic florets 3-lobed, anthers 3, tailless . . . . . *Allopterigeron*
  - Corolla of hermaphroditic florets 4–5-lobed, anthers 4–5, tailed . . . . . 4
- 4. Capitula forming dense clusters along the main stem . . . . . *Thespidium*
  - Capitula solitary or in terminal clusters . . . . . 5
- 5. Pappus present . . . . . 6
  - Pappus absent, or at most developed as a short rim . . . . . *Epaltes*

- 6. Pappus of rigid scalelike bristles . . . . . *Coleocoma*
- Pappus not as above . . . . . 7
- 7. Achenes sericeous, capitula more than 1 cm long, marginal florets usually ligulate or corolla regularly or irregularly lobed . . . . . *Streptoglossa*
- Achenes not sericeous, capitula less than 1 cm long, marginal florets not ligulate, corolla regularly lobed . . . . . *Pluchea*

### Key to the Australian *Pluchea* species

- 1. Herbaceous growth habit . . . . . 2
- Shrubby growth habit . . . . . 3
- 2. Leaf bases decurrent, leaves glabrous, glandular or pilose, capitula (3.5)4.0–5.0(7.0) mm long . . . . . 1. *P. rubelliflora*
- Leaf bases not decurrent, leaves densely glandular, glands stipitate, capitula 5.0–8.0(9.0) mm long . . . . . 2. *P. dentex*
- 3. Plant pilose or densely tomentose . . . . . 4
- Plant not as above . . . . . 6
- 4. Plant densely tomentose . . . . . 4. *P. ferdinandi-muelleri*
- Plant pilose . . . . . 5
- 5. Leaves (0.7)1.0–2.5(3.0) cm long, obovate, obtuse or somehow truncate . . . . . 5. *P. dunlopia*
- Leaves 2.0–7.0 cm long, obovate to narrow obovate, acute . . . . . 7. *P. indica*
- 6. Leaves entire, linear, 0.05–0.2(0.3) cm wide . . . . . 3. *P. baccharoides*
- Leaves dentate, linear-lanceolate to obovate, (0.3)0.5–1.0(1.8) cm wide . . . . . 6. *P. tetranthera*

**1. *Pluchea rubelliflora*** (F. Muell.) B. L. Rob. in Proc. Amer. Acad. Arts 47: 206. 1911. – Fig. 2.

≡ *Eyrea rubelliflora* F. Muell. in Linnaea 25: 403. 1853.

≡ *Pluchea eyrea* (F. Muell.) F. Muell., Rep. Babb. Exp.: 12. 1859, nom. illeg.

Type cons. prop. (Hunger 1997: 803): [Western Australia], Nickol River between Karratha and Roebourne, NW Coastal Hwy 20°48'S, 116°55'E, 19.9.1995, *Hunger & Kilian* 3726 (MEL; isotypes: B, BM, CANB, K, PERTH).

Note: Caused by a misinterpretation of Mueller's original *Eyrea rubelliflora* concept, the current circumscription of *P. rubelliflora* does not include its original type material anymore. Four sheets of the original material are known to exist in Mueller's herbarium (MEL 1621087, 1621088, 1621089, 1621090) and one in W and they actually represent *P. dentex*. In order not to alter the long established nomenclature of these species, conservation of the name *Eyrea rubelliflora* with a conserved type has been proposed (Hunger 1997).

Perennial herb or subshrub up to 0.6 m high with erect branches; pilose, trichomes simple, uniseriate, multicellular; glabrous or glandular, glands sessile. Leaves 1.0–5.0(7.0) cm long, (0.1)0.3–0.7(1.5) cm wide, narrowly lanceolate to lanceolate, entire or dentate, pilose, glabrous or glandular, leaf bases decurrent, apex acute. Capitula (3.5)4.0–5.0(7.0) mm long, hemispherical, heterogamous, numerous, pedunculate, in loose terminal clusters; marginal florets female, numerous; disc florets hermaphroditic, 5–30. Peduncles (0.1)0.1–4.0(6.0) cm long, with 1–6(9) bracts reaching the capitulum. Involucral bracts in 4–5(6) rows, outer involucral bracts glabrous to sparsely glandular, 1.3–1.8(2.6) mm long, 0.4–0.7 mm wide, lanceolate, apex acute to acuminate, margin scarious; inner involucral bracts scarious, (2.8)3.0–4.2(4.5) mm long, (0.2)0.3–0.4 mm wide, linear-acute. Receptacle slightly concave, verrucose, (1.5)1.7–2.7(3.0) mm in diameter. Marginal florets 2.0–2.5(3.5) mm long, 3–4-lobed. Disc florets 2.0–3.0(4.0) mm long, 5-lobed, lobes glabrous or glandular, corolla pink; style shortly

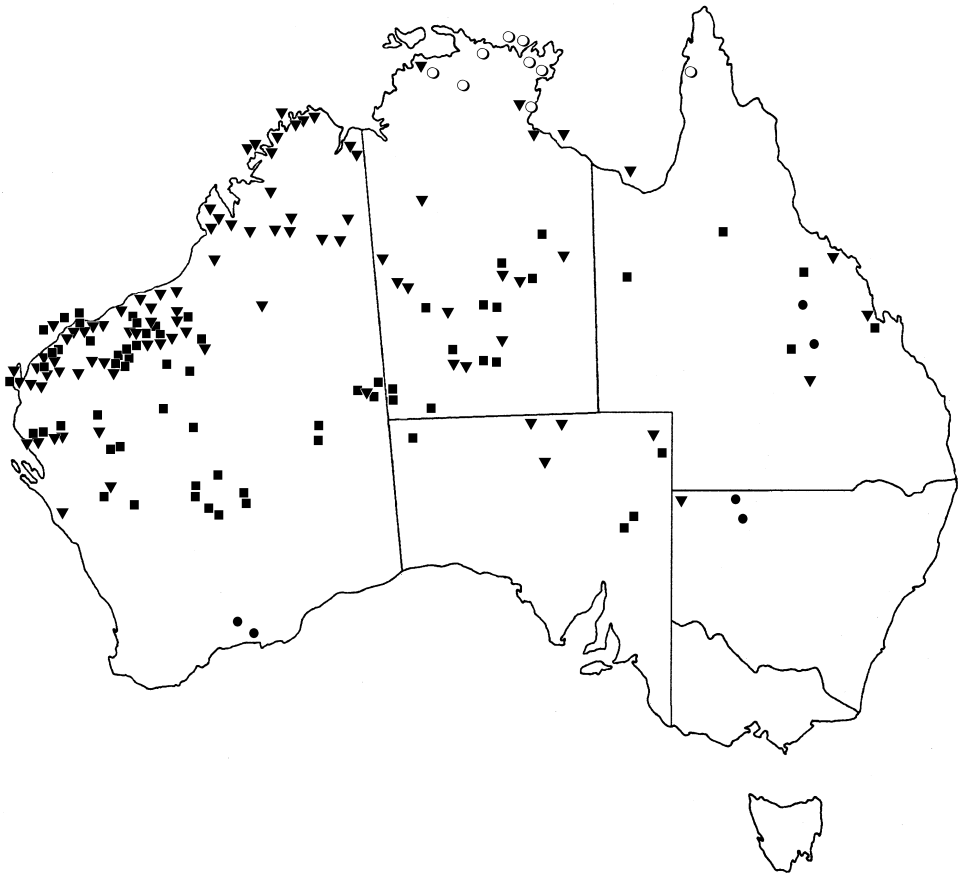


Fig. 1. Distribution of *Pluchea dentex* [■], *P. baccharoides* [●], *P. rubelliflora* [▲], and *P. indica* [○].

divided, style branches with sweeping hairs reaching far below the bifurcation; anthers tailed, 1.4–2.0 mm long, basal appendages (0.2)0.3–0.5(0.6) mm long, apical appendages obtuse, filament collar cells swollen. Achenes sparsely hairy, terete to subangular, 0.6–0.8 mm long, 0.2–0.3 mm in diameter, with a small ring-shaped carpopodium; achenes of disc florets often pale, with a broad ring-shaped carpopodium. Pappus (1.6)1.8–2.5(3.0) mm long, of 6–18 free barbellate bristles in one row, caducous.

Chromosome number:  $2n = 20$  (W. A., 19.9.1995, *Hunger & Kilian* 3726 (B); W. A., 3.10.1995, *Hunger & Kilian* 4246 (B)). The chromosome number of this species has been unknown before.

Flowering and fruiting period: (April)May to November.

#### Distribution and ecology

*Pluchea rubelliflora* is distributed in Western Australia in the Northern Province mainly in the Dampierland and the North and Central Kimberleys, in the Eremaean Province mainly in the Carnarvon and the Pilbara Region. It is scattered all over the Northern Territory, in the north of New South Wales and South Australia and in Queensland in the Dividing Ranges and at the coast near Bowen and Marlborough (Fig. 1).

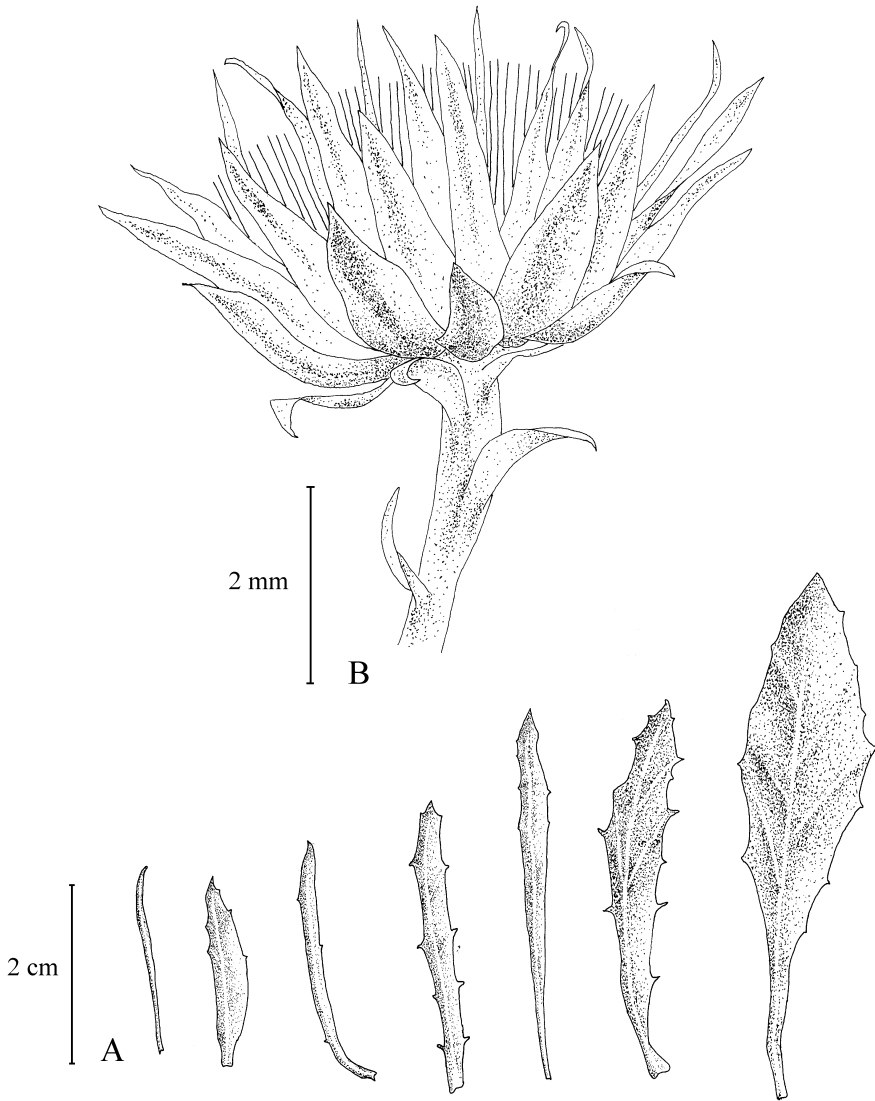


Fig. 2. *Pluchea rubelliflora* – A: leaves, B: capitulum. – From Hunger & Kilian 3726 (B).

*Pluchea rubelliflora* is an abundant species. During a collecting trip in the Pilbara region I found this species on nearly every dry river bank and near every waterhole on sandy soil or red clayed loam. Often it grows together with *P. dentex* in the same habitat and can be mistaken for it.

#### Variation

*Pluchea rubelliflora* is a very variable species. The leaves may be strongly decurrent or only inconspicuously so. Specimens observed from the Northern Province (W. A.) have leaves which become nearly linear while many of the specimens in the Pilbara Region have very broad lanceolate lower leaves.

Occasionally plants are found with a slightly glandular indument, slightly decurrent leaves and larger capitula, and both longer and more slender involucre bracts. These plants appear to be intermediate between *P. rubelliflora* and *P. dentex*. As they have been found in mixed *P. rubelliflora* and *P. dentex* populations, they might be due to hybridization. Their achenes are normally fertile. The majority of these intermediate plants have been found in the Pilbara region (W. A.) and only a few specimens occur in the Northern Territory (for specimens, see below).

#### Additional specimens examined

WESTERN AUSTRALIA: Carnarvon [24°51'S, 113°45'E], *J. B. Cleland* (PERTH 532738); ca. 3.5 miles S of Yardie Creek H. S. [22°33'S, 113°51'E], 26.5.1965, *A. S. George* 6619 (PERTH 532746); Lyndon R., Minilya-Learmonth rd. [c. 23°30'S, 114°00'E], 31.8.1960, *A. S. George* 1450 (B, PERTH 531758); Learmonth, 22°14'S, 114°06'E, 5.9.1970, *A. S. George* 10258 (PERTH 533742); Rocky Pool, Gascoyne River, 24°45'S, 114°08'E, 10.1975, *K. F. Kennelly* 4660 (CANB 290911), 15.10.1983, *P. S. Short* 2079 (PERTH 531901); 4 miles N of Exmouth township [21°50'S, 114°10'E], 28.5.1965, *A. S. George* 6708 (PERTH 532568); Murchison River, Galena Bridge, 27°49'S, 114°41'E, 30.9.1985, *J. D'Alonzo* 705 (PERTH 1691643); Urala Station, [21°46'S, 114°49'E], 30.4.1993, *V. Long* WP-VL-08 (PERTH 3174611); NW Coastal Hwy crossing Yannerie River, 22°52'S, 114°56'E, 29.9.1995, *Hunger & Kilian* 4096 (B, PERTH, etc.); 16 km W of Gascoyne Junction [25°02'S, 115°04'E], 29.5.1969, *P. G. Wilson* 8431 (PERTH 531707); Banks of Ashburton R. at Globe Hill [22°36'S, 115°13'E], 6.10.1905, *A. Morrison* (A, PERTH 531928, 531987); ExSB 113, Pongo paddock, Towera Station, 23°10'S, 115°15'E, 6.8.1981, *R. J. Cranfield* 1822 (PERTH 531715); 9 m[iles] S of Onslow [21°52'S, 115°12'E], 28.5.1962, *T. E. H. Aplin* 1613 (PERTH 531944); 5 km WSW of ExSB 358, Towrana Stn., 25°35'S, 115°15'E, 25.4.1982, *R. J. Cranfield* 2104 (PERTH 522031); Barrow Island [20°46'S, 115°24'E], 12.10.1952, *F. L. Hill* B637 (BM 21007, K), 9.1974, *W. H. Butler* (PERTH 531952); NW Coastal Hwy, Nanutarra Roadhouse, Ashburton River, 22°33'S, 115°31'E, 3.10.1995, *Hunger & Kilian* 4246 (B, PERTH, etc.); NW Coastal Hwy crossing Cane River, c. 22°00'S, 115°36'E, 4.10.1995, *Hunger & Kilian* 4250 (B, PERTH, etc.); Barlee Range, Henry River [c. 23°00'S, 116°00'E], 17.8.1961, *R. D. Royce* 6530 (PERTH 531812), 15.9.1959, *A. Robinson* (PERTH 531839); Maitland R., NW Coast Highway [21°00'S, 116°30'E], 23.2.1962, *A. S. George* 3308 (PERTH 531979); Fortescue Bridge, 21°29'S, 116°41'E, 19.7.1977, *S. P. Pfeiffer* 17 (PERTH 533858); 7 miles turnoff to tip, Karratha, [20°44'S, 116°52'E], 10.1986, *K. Glennon* 284 (PERTH 828475); Nanutarra – Wittenoom Rd crossing Beasley River, picnic area, 22°56'S, 116°57'E, 28.9.1995, *Hunger & Kilian* 4095 (B, PERTH, etc.); 2 km N of Dillydadjia Well, Meka Station, 27°26'S, 116°59'E, 21.9.1987, *R. J. Cranfield* 6264 (PERTH 889814); 0.5 km E of Mundong Mill, Berringarra Stn., 25°57'S, 117°04'E, 29.4.1986, *R. J. Cranfield* 5402 (PERTH 798487); Waranoolar Pool, Harding River, 20°58'S, 117°06'E, 12.9.1981, *A. S. Weston* 12734 (PERTH 532703); P. W. D. road to Harding River Dam, [c. 20°44'S, 117°09'E], 8.9.1985, *P. Glennon* 219 (PERTH 865478); Millstream [21°41'S, 117°10'E], 27.9.1969, *M. I. H. Brooker* 2132 (PERTH 532681), Pool near Horseshore Gorge, Millstream-Chichester NP, 14.8.1990, *E. Leyland* (PERTH 1432060); Chichester Range NP, below Python Pool [21°20'S, 117°14'E], 12.8.1974, *J. H. Willis* (CANB 341037); c. 28 km E of Roebourne, Jones River at Jones Bridge, NW Coastal Hwy, 20°54'S, 117°22'E, 19.9.1995, *Hunger & Kilian* 3740 (B, PERTH, etc.); Hardy River, shortly W of junction Nanutarra – Wittenoom Rd with Paraburdoo Rd, c. 22°55'S, 117°22'E, 28.9.1995, *Hunger & Kilian* 4093 (B, PERTH, etc.); E of Roebourne, Sherlock River, at Sherlock Bridge, NW Coastal Hwy, 20°56'S, 117°36'E, 19.9.1995, *Hunger & Kilian* 3750 (B, PERTH, etc.); Depuch Island, NW of Roebourne [20°37'S, 117°41'E], 29.5.1962, *R. D. Royce* 7122 (PERTH 531790, 531847); E of Roebourne, Harding River, at bridge of NW Coastal Hwy, c. 20°50'S, 118°00'E, *Hunger & Kilian* 3768 (B, PERTH, etc.); Munda Ck., Mundabullangana [20°31'S, 118°04'E], 24.2.1962, *A. S. George* 3366 (PERTH 532622); Road from Tom Price to Paraburdoo, first crossing of Bellary Creek, 28.9.1995, *Hunger & Kilian* 4068 (B, PERTH,

etc.); Port Hedland [20°24'S, 118°36'E], 7.1951, *H. Suijendorp* 3 (PERTH 532657); 4.1905, *W. V. Fitzgerald* 24 (PERTH 532665); Great Northern Hwy, c. 80 km S of Port Hedland, 21°07'S, 118°42'E, 20.9.1995, *Hunger & Kilian* 3807 (B, PERTH, etc.); Hillside Woodstock Rd to Nullagine, E of Woodstock Homestead, 21°38'S, 118°48'E, 21.9.1995, *Hunger & Kilian* 3829 (B, PERTH, etc.); ca. 105 km (118 km by road) SSE of Port Hedland, at the Turner River [c. 21°00'S, 118°50'E], 29.4.1977, *H. J. Eichler* 22538 (PERTH 3057690); Corong Creek, Woodstock Stn., S of Port Hedland [21°45'S, 118°50'E], 24.4.1958, *N. T. Burbidge* 5835 (CANB 53683, PERTH 531723), Upper Reaches of Turner River, Woodstock Stn., 28.4.1958, *N. T. Burbidge* 5920 (CANB 53682, PERTH 531936, 532649); Strelly River, [Strelly Gorge: 21°07'S, 119°03'E], 8.–9.1907, *Cleland* (PERTH 531774); Hillside Woodstock Rd to Nullagine, E of Woodstock Homestead, 21°41'S, 119°05'E, 21.9.1995, *Hunger & Kilian* 3853 (B, PERTH, etc.); Roy Hill Rd, shortly E of crossing Port Hedland – Newman Railway, c. 22°34'S, 119°18'E, 23.9.1995, *Hunger & Kilian* 3942 (B, PERTH, etc.); Warralong Sta. [20°46'S, 119°24'E], 27.5.1941, *N. T. Burbidge* 851 (PERTH 531782); Bonney Downs Hillside Rd to Nullagine crossing Shaw River, 21°48'S, 119°25'E, 21.9.1995, *Hunger & Kilian* 3858 (B, PERTH, etc.); Roy Hill Rd, 22°41'S, 119°48'E, 22.9.1995, *Hunger & Kilian* 3919 (B, PERTH, etc.); 14 m[iles] N of Marble Bar [21°00'E, 119°45'E], 9.1971, *R. Mirrington* 710911 (PERTH 531995); 18 km S of Marble Bar on the Marble Bar-Pilga Road [21°30'S, 119°45'E], 17.9.1982, *N. F. Norris* 890 (PERTH 532495); 21 km N on Bamboo Springs Road [22°30'S, 120°00'E], 15.10.1978, *H. Demarz* 7021 (CANB 289357, K, PERTH 532584), upper waters of the Fortescue R., 8.5.1958, *N. T. Burbidge* 6047 (CANB 53684, PERTH 759155); Marble Bar Rd, c. 10 km S of Nullagine, 22°00'S, 120°05'E, 21.9.1995, *Hunger & Kilian* 3878 (B, PERTH, etc.); Near Shay Gap (town), ca. 160 km E of Port Hedland, 20°29'S, 120°09'E, 9.7.1984, *K. Newbey* 10381 (MO 3658355, PERTH 531685); [near Nullagine], 21°55'S, 120°12'E, 8.6.1979, *G. Davies* 80 (CANB 297084, PERTH 532541); 4 km E of Mt. Hays, ca. 65 km E of Nullagine, 21°46'S, 120°45'E, 1.4.1984, *K. Newbey* 10110 (PERTH 531871); 10 m[iles] W of Callawa Creek [c. 20°27'S, 120°50'E], 27.5.1947, *R. D. Royce* 1949 (PERTH 531820); Yownana Creek, ca. 125 km SE of Shay Gap, 21°17'S, 121°06'E, 15.7.1984, *K. Newbey* 10498 (PERTH 532479); Oakover River, 21 km S of Two Sisters, 21°40'S, 121°08'E, 11.7.1984, *K. Newbey* 10422 (CANB 352763, PERTH 531693); 29 m N of Lookout Rocks [21°57'S, 121°24'E], 21.5.1947, *R. D. Royce* 1860 (PERTH 531855); Rudall River Region, 22°31'S, 122°05'E, 30.3.1990, *R. P. Hart* 906 (PERTH 1228684); Rudall River, 22°34'S, 122°11'E, 19.5.1971, *A. S. George* 10669 (CANB 290077, PERTH 532533), 17.8.1971, *P. G. Wilson* 10617 (PERTH 533750); Broome, 17°57'S, 122°13'E, 27.11.1986, *P. G. Wilson* 12558 (PERTH 836990); 79 km E of Broome on road to Derby, 17°49'S, 122°14'E, 13.1.1985, *P. R. Foulkes* 219 (PERTH 532460); 20 km N of Broome, and 2 km W of Beagle Bay Road on edge of Willie Creek, 17°46'S, 122°16'E, 12.8.1985, *K. F. Kenneally* 9421 (CANB 360993, CANB 360994, PERTH 532312); 7.5 km NW of Beagle Bay Aboriginal Community, 16°56'S, 122°36'E, 19.8.1985, *K. F. Kenneally* 9445 (PERTH 532304); One Arm Point, NE Dampierland, 16°26'S, 123°05'E, 2.9.1987, *B. J. Carter* 74 (PERTH 823937); N of Dragon Tree Soak, Great Sandy Desert, 19°40'S, 123°21'E, 10.8.1977, *A. S. George* 14763 (PERTH 532606, 532614); Derby to Broome Rd, 19.6 km S (by road) of Derby, 17°27'S, 123°44'E, 19.4.1985, *T. E. H. Aplin et al.* 51 (PERTH 2847272); Mt. Anderson Station, Fitzroy Station [c. 18°01'S, 123°55'E], 7.5.1962, *R. D. Royce* 6905 (PERTH 532339); Augustus Is., Bonaparte Archipelago [15°20'S, 124°30'E], 14.5.1972, *P. G. Wilson* 10739 (PERTH 532363); Kuri Bay, Bonaparte Archipelago, 15°29'S, 124°30'E, 2.9.1985, *P. R. Foulkes* 318 (PERTH 864838); Coronation Island, Bonaparte Archipelago, 15°00'S, 124°55'E, 24.5.1972, *P. G. Wilson* (PERTH 532355); Careening Bay, NW Kimberley Coast, 15°07'S, 125°00'E, 19.6.1984, *K. F. Kenneally* 8988 (CANB 364876, PERTH 431079); Prince Regent River Reserve, 15°32'S, 125°13'E, 24.8.1974, *A. S. George* 12612 (PERTH 759171); Hann River, 5 miles above junction with Fitzroy River [c. 17°30'S, 125°18'E], 6.1905, *W. V. Fitzgerald* 1186 (PERTH 532428); Near Beverley Springs Homestead, W Kimberley, 16°43'S, 125°27'E, 25.12.1991, *R. L. Barrett* 16 (PERTH 2002787); Admiralty



Gulf, between Mitchell Plateau and Port Warrender [c. 14°30'S, 125°30'E], 24.8.1978, A. C. Beauglehole & E. G. Errey 59084 (PERTH 829331); 3 miles S of Fitzroy Crossing [18°17'S, 125°33'E], 3.1927, A. J. F. (PERTH 532436); Well 33, Canning Stock Route [21°46'S, 125°39'E], 30.7.1967, A. S. George 9113 (PERTH 533815), Well 39, 5.5.1979, A. S. George 15613 (CANB 289945, PERTH 532754); "Caravan Creek," Port Warrender, Mitchell Plateau, 14°34'S, 125°50'E, 21.6.1976, K. F. Kenneally 5190 (PERTH 492167); 180 km WNW of Halls Creek, 70 km NNE of Fitzroy Crossing [c. 17°30'S, 126°10'E], 25.6.1976, A. C. Beauglehole 53818 (PERTH 830380); 6 miles NE of Mt. Eliza[beth] [16°20'S, 126°20'E], 5.1905, W. V. Fitzgerald 140 (BM 20981, PERTH 532401); Vansittart Bay, 14°12'S, 126°22'E, 26.5.1984, J. H. Willis (PERTH 1691171); Sir Graham Moore Is., 13°56'S, 126°33'E, 1.7.1973, P. G. Wilson 11229 (PERTH 532347); Kalumburu [14°14'S, 126°38'E], 30.5.1971, N. Byrnes 2311 (CANB 220799, K, PERTH 532320); ca. 2 miles N Kalumburu Mission [14°16'S, 126°38'E], 30.5.1971, J. R. Maconochie 1261 (CANB 217747, PERTH 532444); Drysdale River NP, ± 15°16'S, 126°43'E, 3.8.1975, A. S. George 13197 (PERTH 532398); WSW of Cape Londonderry, ± 13°48'S, 126°46'E, 5.8.1975, A. S. George 13402 (PERTH 532371); 100 km W of Halls Creek, 18°43'S, 126°52'E, 8.7.1993, A. A. Mitchell 3217 (PERTH 3250148); East Branch Wolf Creek, ± 60 km S of Halls Creek [c. 18°40'S, 127°38'E], 13.7.1974, G. W. Carr 3568 & A. C. Beauglehole 47346 (PERTH 829765); 3.5 km W Cape St. Lambert, 14°18'S, 127°43'E, 10.6.1987, K. F. Kenneally 10312 & B. P. M. Hyland (PERTH 865958); Port Wyndham, Fore-shore [15°30'S, 128°09'E], 9.7.1974, G. W. Carr 3273 & A. C. Beauglehole 47051 (PERTH 829838); Pass of the Abencerrages, Rawlinson Range, ± 24°50[58?]'S, 128°17'E, 4.8.1962, D. E. Symon 2479 (CANB 190021, K); 32 miles S of Nicholson Station [18°30'S, 128°54'E], 13.7.1949, R. A. Perry 2431 (CANB 108291); 8 km SE of Kununurra, 15°49'S, 128°49'E, 12.3.1978, K. Pajmans 2417 (CANB 276455).

NORTHERN TERRITORY: N of Balgo Mission, 19°43'S, 128°18'E, 20.7.1973, P. K. Latz 4041 (PERTH 533769); The Granites [20°34'S, 130°21'E], 2.5.1958, G. Chippendale (CANB 74631); Tanami Sanctuary, 20°52'S, 130°33'E, 25.5.1976, P. K. Latz 6475 (PERTH 531960); Port Darwin [= Palmerston, Darwin: 12°23'S, 130°44'E], 6.1870, Schultz 644 (K), 9.6.1886, T. S. Lea (BM 21045, BR), 12.1891, 1883, F. Mueller (G, WU), M. Holtze (BR); East Point, Darwin, 12°24'S, 130°49'E, 22.5.1979, M. O. Rankin 1848 (CANB 287710, K); 15 miles SE of Wavehill Station [17°33'S, 131°14'E], 17.6.1952, R. A. Perry & Lazarides 2897 (CANB 108292, 108293, K); 6 miles SE of Mt. Allan H. S. [22°18'S, 132°18'E], 24.2.1961, H. S. McKee 8627 (CANB 94774, K); Finke River, Palm Valley, ca. 125 km SW of Alice Springs [24°10'S, 132°33'E], 1954, T. R. N. Lothian 180/54 (MO 1794910); Palm Valley [24°03'S, 132°42'E], 15.4.1956, G. Chippendale (CANB 38524), 25.8.1956, G. Chippendale (CANB 63501); Old Hamilton Downs homestead, Macdonnell Ranges, 23°38'S, 133°50'E, 19.10.1979, D. J. Nelson 2485 (BM 21073, G); Kurundi waterhole, 20°29'S, 134°41'E, 15.2.1972, C. R. Dunlop 2471 (CANB 239872); 1 m[ile] S Elkedra H. S. [21°11'S, 135°27'E], 22.10.1956, G. Chippendale (CANB 38589); Gulf of Carpentaria, Rose River, 14°17'S, 135°43'E, 7.7.1972, C. R. Dunlop 2682 (K); Underwarra [15°43'S, 136°40'E], 25.7.1967, J. McKean EP 58 (CANB 361102); Center Is. [15°41'S, 136°46'E], 12.10.1967, W. Braithwaite 3288 (CANB 337592); on Barkley Hwy, 70 km NW of Barrys Caves, 20°00'S, 137°35'E, 1.9.1981, T. & J. Whaite 3936 (K, MO 4332480).

SOUTH AUSTRALIA: Dalhousie Springs, Mt. Dare fly in. [26°27'S, 135°28'E], 24.9.1974, D. E. Symon 9340 (B, CANB 469614); Innamincka Bore No.3, 27°44'S, 140°47'E, 28.5.1976, L. D. Williams 8247 (BR, CANB 351688); about 3 km E from Tuppana waterhole, 27°45'S, 136°51'E, 29.7.1982, R. W. Purdie 2811 (CANB 331437); Neals river, 56 km S of Oodnadatta, [28°00'S, 135°27'E], B. Nordenstam & A. Anderberg 969 (MEL 1593636).

NEW SOUTH WALES: Pinaroo Lake = Fort Grey Basin, 29°06'S, 141°14'E, 8.5.1977, E. N. S. Jackson 2855 (G).

QUEENSLAND: Bowen [20°00'E, 148°10'E], 16.1.1931, C. E. Hubbard & C. W. Winders 6564 (K); Broad Sound [22°10'S, 149°45'E], 15.9.1802, R. Brown 2102 (BM 20939[a], K); Carpentaria

ria, Island [Sweer's Island: 17°05'S, 139°35'E], 27.11.1802, *R. Brown* (BM 20939[b]); near Mt. Faraday [24°54'S, 147°18'E], 10.1846, *T. L. Mitchell* (BM 21070[b]).

Specimens of putative hybrids between *P. rubelliflora* and *P. dentex* examined

NORTHERN TERRITORY: Muggs Mistake, Macarthur River, 15°51'S, 136°37'E, 4.7.1984, *G. Wightman* 1543 (CANB 353012); Maggie Springs, Ayer's Rock, [25°21'S, 131°02'E], 25.11.1954, *G. Chippendale* (CANB 33370), 16.6.1989, *J. Palmer* 220 (CANB 387610).

WESTERN AUSTRALIA: Burrup Peninsula, c. 20°33'S, 116°50'E, 6.10.1995, *Hunger & Kilian* 4285 (B, PERTH, etc.); NW Coastal Hwy crossing Warrambo Creek, c. 21°40'S, 115°47'E, 4.10.1995, *Hunger & Kilian* 4253 (B, PERTH, etc.); 5 miles E of Nullagine [21°55'S, 120°12'E], 30.8.1966, *J. V. Blockley* 388 (CANB 469609); Hammersley range. 7 km on Witte-noom gorge road [c. 22°20'S, 118°20'E], 5.10.1989, *B. Nordenstam & A. Anderberg* 325 (PERTH 1934112); Karijini NP, Kalamina Gorge, c. 22°23'S, 118°24'E, 26.9.1995, *Hunger & Kilian* 4035 (B, PERTH, etc.); Tom Price Railway Rd, 26 km NW of Tom Price, 22°35'S, 117°40'E, 25.9.1995, *Hunger & Kilian* 4033 (B, PERTH, etc.).

## 2. *Pluchea dentex* R. Br. ex Benth., Fl. Austral. 3: 529. 1867. – Fig. 3.

Syntypes: [Queensland], sources of Gilbert river, *F. Mueller* (MEL 1621084!); Port Denison, *Fitzalan* (MEL 1621083!); [Queensland], Thirsty Sound, outer entrance, Broad Sound, 3.9.1802, *R. Brown* 2101 (BM 21191!, 21192!, K!). – Lectotype (designated here): *R. Brown* 2101 (BM 21191!, isoelectotypes: BM 21192!, K!).

= *Pluchea squarrosa* Benth., Fl. Austral. 3: 529. 1867. – Syntypes: [Western Australia], Murchison River, *Oldfield* (A!, K!, PERTH 532266!); 1854 [1859?], *Drummond Ser. 6, 150* (A 11341!, BM 21194!, P!, PERTH 1622641!).

= *P. eyrea* var. *major* Benth., Fl. Austral. 3: 529. 1867 ≡ *P. rubelliflora* var. *major* (Benth.) J. M. Black, Fl. S. Australia: 616. 1929. – Syntypes: [South Australia], Crystal Brook, *F. Mueller* (MEL 1621088!); Arkaba, *F. Mueller* (MEL 1621089!); [New South Wales], Darling River, Victorian Expedition (not traced).

Note: *Pluchea squarrosa* and *P. rubelliflora* var. *major* were first listed in the synonymy of *P. dentex* by Jessop (1981).

Perennial herb or subshrub up to 1 m high, aromatic, densely glandular, seldom sparsely covered with simple uniseriate multicellular hairs; glands sessile or stipitate, 0.2–0.6(1.0) mm long. Leaves (1.0)1.5–7.0(8.5) cm long, (0.1)0.2–0.7(0.8) cm wide, linear to narrowly oblanceolate, dentate to almost pinnatifid, sessile, covered with glands, base attenuate, apex acute. Capitula 5.0–8.0(9.0) mm long, campanulate, heterogamous, pedunculate, solitary or few together in cymose clusters. Peduncles 1.0–8.0(9.0) cm long, with bracts reaching the capitulum; bracts (2.0)2.5–6.0(10.0) mm long, 0.3–0.5 mm wide, linear to narrowly lanceolate, densely glandular. Involucral bracts in 5–6 rows, loosely imbricate, outer involucral bracts 2.0–4.0(5.0) mm long, (0.3)0.5–0.7(1.0) mm wide; densely glandular, narrowly lanceolate to linear, acute, margin slightly fimbriate, inner involucral bracts (5.0)5.5–6.5(7.0) mm long, (0.2)0.3–0.5(0.6) mm wide, scarious, linear-acute, often with violet coloured tips. Receptacle slightly concave, verrucose, (2.0)2.5–2.8(3.0) mm in diameter. Marginal florets (3.0)4.0–5.0(6.0) mm long, 3–4-lobed, lobes often glandular. Disc florets 4.0–5.0(6.0) mm long, 5-lobed, lobes glandular and sometimes hairy, corolla purple; style only shortly divided, style branches with sweeping hairs reaching far below the bifurcation; anthers tailed, (0.7)2.0–2.4 mm long, basal appendages 0.3–0.4 mm long, apical appendages obtuse, filament collar cells swollen. Achenes hairy, terete, narrow at the base, (0.8)1.0–1.2(1.3) mm long, (0.2)0.3–0.35 mm in diameter; achenes of marginal florets with small ring-shaped carpopodium; achenes of disc florets pale, carpopodium broadly ring-shaped. Pappus 3.3–4.5(5.5) mm long, of 8–15(18) free barbellate bristles in one row, caducous.

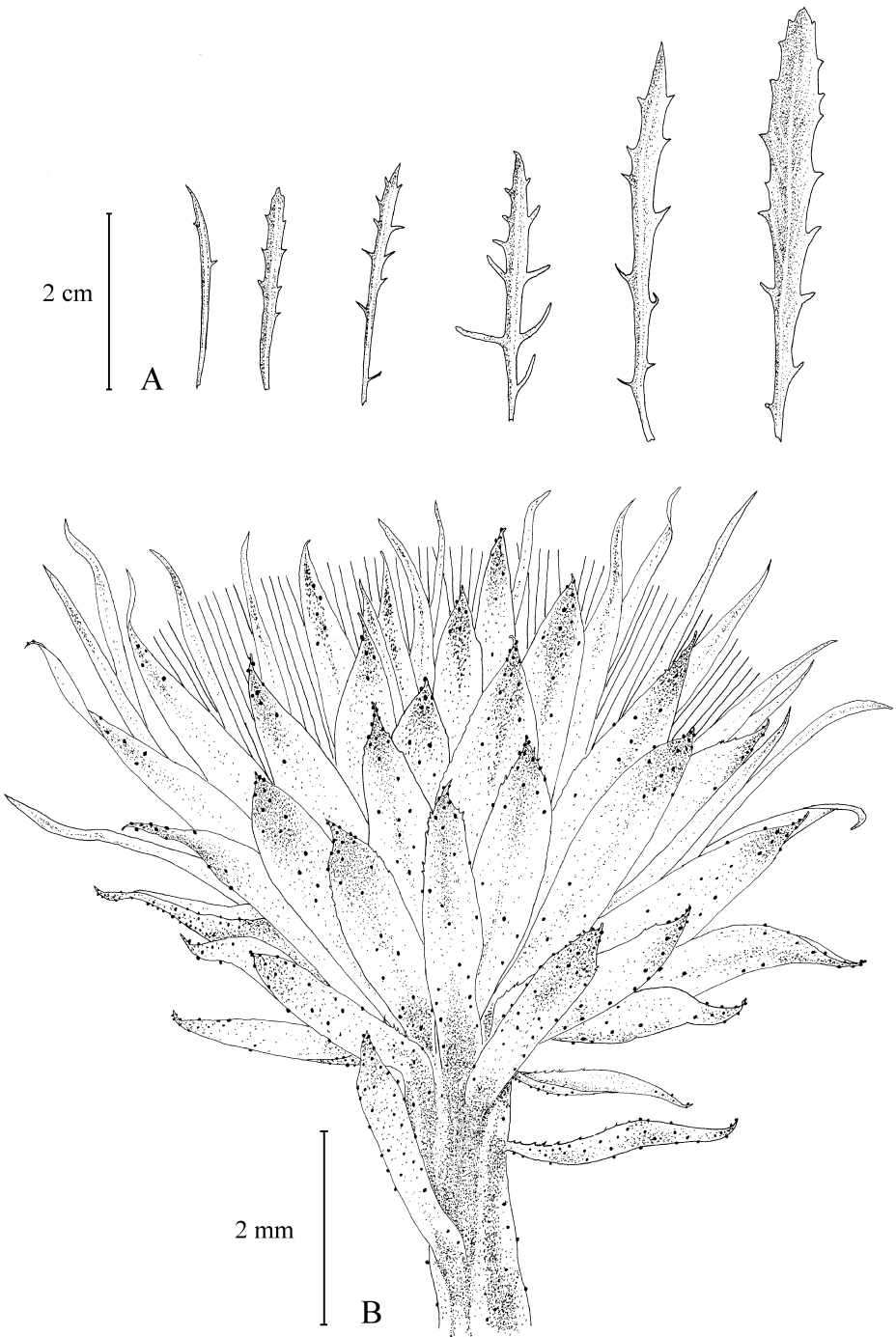


Fig. 3. *Pluchea dentex* – A: leaves, B: capitulum. – From Hunger & Kilian 4036 (B).

Chromosome number:  $2n = 20$  (W. A., 6.10.1995, *Hunger & Kilian 4286* (B)). The chromosome number of this species has been unknown before.

Flowering and fruiting period: May to October.

#### Distribution and ecology

*Pluchea dentex* occurs in Western Australia in the Eremaean Province mainly in the Carnarvon, the Murchison and the Pilbara Region, in the south of the Northern Territory, in South Australia in the Deering Hills, the Flinders Ranges and near Innamincka, in Queensland in the Selwyn Ranges, near Jericho and near Marlborough in the Curtis District (Fig. 1). According to Hnatiuk (1990: 69) *P. dentex* occurs also in New South Wales in the North-Western Plains. It has been found in dry creek beds, near waterholes and flood plains on red clayey loam and sandy soil.

#### Additional specimens examined

WESTERN AUSTRALIA: Cape Range Peninsula, entrance to Shothole Canyon, 22°02'S, 114°04'E, 2.10.1995, *Hunger & Kilian 4205* (B, PERTH, etc.); Rocky Pool, Gascoyne River, approx. 850 km N of Perth, 24°45'S, 114°08'E, 10.1975, *K. F. Kenneally 4640* (PERTH 759228); Wooramel R. bridge, Perth Carnarvon Rd. [25°45'S, 114°46'E], 2.9.1959, *N. T. Burbidge 6481* (CANB 84374); Near Range Bore, 18 km SW of "Lyons River" homestead, 24°42'S, 115°10'E, 17.8.1987, *K. Newbey 11543* (PERTH 824879); Barrow Island, 20°46'S, 115°24'E, 10.1980, *R. Buckley 6854, 6911* (PERTH 531731, 532282), 24.8.1973, *W. H. Butler 123* (PERTH 533734); NW Coastal Hwy crossing Cane River, c. 22°00'S, 115°36'E, 4.10.1995, *Hunger & Kilian 4249* (B, PERTH, etc.); NW Coastal Hwy crossing Warrambo Creek, c. 21°40'S, 115°47'E, 4.10.1995, *Hunger & Kilian 4252* (B, PERTH, etc.); Enderby Island, western end, near Rocky Headland [20°40'S, 116°25'E], 13.5.1982, *B. R. Maslin 5242* (PERTH 452459); 25 miles north of Yalgoo [c. 27°50'S, 116°40'E], 9.1966, *J. R. Knox 660919* (PERTH 532126); 2 km W of Anniversary Bore, Jingemarra Station, 27°49'S, 116°47'E, 15.9.1987, *R. J. Cranfield 6065* (PERTH 869643); Burrup Peninsula, Burrup Range between Withnell and Conzinc Bay, c. 20°33'S, 116°50'E, 6.10.1995, *Hunger & Kilian 4286* (B, PERTH, etc.); Mount Augustus, 24°20'S, 116°51'E, 24.8.1987, *K. Newbey 11683* (PERTH 831107), 9.1971, *M. Wittwer 51758* (PERTH 532193); 15 km E of Namarwell Mt Gould [c. 25°46'S, 117°24'E], 8.1985, *A. L. Payne 61* (PERTH 752754); Roebourne – Wittenoom Rd, near Watthangany Bluff, c. 21°40'S, 117°30'E, 24.9.1995, *Hunger & Kilian 4004* (B, PERTH, etc.); Bally paddock, 2 km N of Rocky Bore, Milly Milly Station, 25°47'S, 117°38'E, 24.4.1986, *R. J. Cranfield 5329* (PERTH 890375); Depuch Island [20°37'S, 117°41'E], 29.5.1962, *R. D. Royce 7123* (PERTH 532185); Mt. Gould Police Station (abandoned), 25°47'S, 117°49'E, 1.5.1986, *R. J. Cranfield 5412* (PERTH 798061); below road crossing at head of Bee Gorge, Hammersley Range NP, 22°30'S, 118°00'E, 8.8.1973, *A. S. Weston 8413* (PERTH 532029); 20.7 miles N of Belele, Eremaean Province [27°00'S, 118°00'E], 2.1959, *N. H. Speck 939* (CANB 108294); Hammersley Range, 8.1958, *W. D. L. Ride* (PERTH 531766); Karijini NP, Hancock Gorge, c. 22°20'S, 118°14'E, 27.9.1995, *Hunger & Kilian 4040* (B, PERTH, etc.); Devels Staircase [22°18'S, 118°17'E], 25.7.1966, *J. V. Blockley 332* (CANB 469610); Karijini NP, Knox Gorge, c. 22°21'S, 118°20'E, 27.9.1995, *Hunger & Kilian 4039* (B, PERTH, etc.); Karijini NP, Kalamina Gorge, c. 22°23'S, 118°24'E, 26.9.1995, *Hunger & Kilian 4036* (B, PERTH, etc.); Karijini NP, Kalamina Gorge, c. 22°23'S, 118°24'E, 26.9.1995, *Hunger & Kilian 4038* (B, PERTH, etc.); Wittenoom [22°19'S, 118°21'E], 8.9.1957, *S. Elliott 15* (PERTH 532258); *S. Elliott* (PERTH 532711); Wittenoom Gorge, 9.1959, *K. Stewart* (PERTH 532142); 6 mls S of Wittenoom [22°20'S, 118°21'E], 24.8.1960, *A. S. George 1015* (PERTH 532673); Yampire Gorge, c. 15 km N of Dales Gorge, 22°24'S, 118°24'E, 30.4.1977, *R. Pullen 10930* (CANB 264026, 264025, MO 4332492); Hillside Woodstock Rd, E of Woodstock Homestead, 21°41'S, 119°03'E, *Hunger & Kilian 3847* (B, PERTH, etc.); Hillside Woodstock Rd, E of Woodstock Homestead, 21°41'S, 119°05'E, 21.9.1995, *Hunger & Kilian 3854* (B, PERTH, etc.); Roy Hill Rd, shortly E of crossing Port Headland – Newman Railway, c. 22°34'S, 119°18'E, 23.9.1995, *Hunger & Kilian 3940* (B,

PERTH, etc.); 36 km N on Bamboo Springs Road [c. 21°45'S, 119°25'E], 15.10.1978, *H. Demarz 7025* (PERTH 759198); N branch, Gascoyne R., Gt. Northern Hwy. [24°40'S, 119°30'E], 22.8.1960, *A. S. George 956* (PERTH 532231); Booloo Downs Station – Neds Gap, [Bulloo Dawns: 24°00'S, 119°35'E], 22.7.1968, *J. V. Blockley 771* (PERTH 532037), *W. E. Blackall* (PERTH 532118); Marble Bar Rd between Nullagine and Bonney Downs Homestead, 22°00'S, 120°05'E, 22.9.1995, *Hunger & Kilian 3879* (B, PERTH, etc.); 9 miles N of Nullagine [21°50'S, 120°06'E], 9.1971, *R. Mirrington 710918* (PERTH 759236); 2 miles N of Nullagine [21°56'S, 120°06'E], 28.10.1970, *H. Demarz D2813* (PERTH 532096); 20 miles N of Mundiwindi [23°30'S, 120°14'E], 20.4.1966, *J. V. Blockley 144* (CANB 469611, PERTH 532045); Uramurdah Creek, 20 km E of Wiluna, 26°38'S, 120°25'E, 6.9.1982, *L. A. Craven 7510A* (PERTH 856150); Lawlers [28°05'S, 120°32'E] 7.1899, *W. V. Fitzgerald* (PERTH 532150); 10 miles N of Mt. Sir Samuel [c. 27°30'S, 120°39'E], 17.10.1945, *C. A. Gardner 7935* (PERTH 532088); Jig[g]along Depot [23°28'S, 120°44'E], 12.5.1947, *R. D. Royce 1519* (PERTH 532177); Windich Spring, Canning Stock Route [25°33'S, 120°49'E] 8.1964, *W. H. Butler, R. Aitken & D. Hutchison H.A.61* (PERTH 532002); 18 km N of Mt. Trainee, ca. 100 km ENE of Nullagine, 21°46'S, 121°00'E, 6.7.1984, *K. Newbey 10358* (PERTH 532010); Googhenama Creek, on R.P.F. [c. 21°58'S, 121°12'E], 18.5.1947, *R. D. Royce 1799* (PERTH 532061); 15 miles N of Leonora [28°30'S, 121°20'E], 10.9.1953, *H. F. & M. Brozber 1689* (BM 20935); 25 km N of Leonora [28°32'S, 121°20'E], 21.11.1978, *H. Demarz 7248* (PERTH 532169); Yandal, Lake Darlot [27°40'S, 121°35'E], 9.1939, *W. E. Blackall* (PERTH 532053, 532223); Rudall River Region, [22°20'S, 122°05'E], 9.1986, *W. G. Martinick & Associates* (PERTH 1240722); 60 km N of Laverton, [28°00'S, 122°25'E], 27.8.1968, *P. G. Wilson 7319* (PERTH 758744); Minnie Creek, East of Laverton, [28°49'S, 122°25'E], 1.9.1961, *A. S. George 3002* (B); Miss Gibson Hill, SW of Warburton [26°52'S, 126°20'E], 25.8.1962, *A. S. George 4048* (PERTH 759201); Mt. Eveline, SE of Warburton [26°09'S, 127°07'E], 27.8.1961, *A. S. George 2926* (MO 1794611, PERTH 531634); Rawlinson Ra., Abercerraga, c. 24°58'S, 128°17'E, 24.7.1974, *A. S. George 12138* (PERTH 532134); Base of Schwerin Mural Crescent near Gill Pinacle, 24°53'S, 128°48'E, 17.6.1977, *A. A. Burbidge & P. J. Fuller 38/77* (PERTH 532207); Ewalinga Rockhole, 20 miles E Docker Creek Settlement [Docker Creek: 24°34'S, 128°50'E], 18.9.1969, *J. R. Maconochie 762* (PERTH 531669).

NORTHERN TERRITORY: Hull River, 24°56'S, 129°19'E, 26.8.1973, *P. K. Latz 4172* (MO 2435775); Petermann Ranges Reserve. Chirnside Ck., 25°05'S, 129°38'E, 25.3.1980, *T. S. Henshall 2889* (CANB 291006); Summit of Ayers Rock, [25°21'S, 131°01'E], 30.8.1957, *R. Schodde 412* (CANB 469620, 2xG, K); Mt. Doreen, 22°17'S, 131°17'E, 15.1.1972, *C. Dunlop 2398* (CANB 221379); Mt. Sonder, [23°34'S, 132°35'E], 10.9.1958, *G. Chippendale* (CANB 161055); Standley Chasm, 35 miles W. Alice Springs, [23°43'S, 133°28'E], 16.10.1957, *G. Chippendale* (CANB 63367), 27.2.1961, *H. S. McKee 8658* (K); N. face Mt. Gillen 2 miles W Alice Springs [23°42'S, 133°40'E], 14.10.1971, *P. K. Latz 1807* (PERTH 759147); Stirling Creek, near 9 Mile Waterhole, 21°40'S, 133°47'E, 19.3.1985, *G. Leach & Smith R 693* (CANB 359246, MO 4334545); Neutral Junction Station, 21°42'S, 133° 57'E, 4.7.1974, *P. K. Latz 5610* (K); 9 miles N of Wauchope, Stuart Hwy, 20°33'S, 134°17'E, 20.7.1971, *P. K. Latz 1563* (CANB 220492); Hatches Creek, 20°52'S, 135°12'E, 16.2.1972, *C. Dunlop 2501* (CANB 233306); 11 miles NE of Alexandria Station, [19°06'S, 136°54'E], 22.6.1948, *R. A. Perry 1475* (CANB 108290, K).

QUEENSLAND: Moongerrrie, [Mongogarie?: 28°57'S, 152°56'E], 16.1.1928, *P. D. Riddell* (K); 8 km S of Mt Isa [20°52'S, 139°29'E], 3.7.1974, *P. Callerenshaw 1171* (K); Along railroad bank, Jericho [23°34'S, 146°10'E], 1.5.1946, *Clemens* (A, BM 20959, 2xC, G, K); 15 km S of Mt. McConnell HS (site 13/6–11), 20°56'S, 146°59'E, 11.6.1992, *E. J. Thompson & Sharpe CHA59* (K); Mt. Slopeaway, near Marlborough, Port Curtis District, [22°51'S, 149°50'E], 30.8. 1963, *N. H. Speck 1749* (CANB 138950).

SOUTH AUSTRALIA: Mt Lindsay, 27°02'S, 129°54'E, 6.8.1962., *D. E. Symon 2560* (CANB 167785, K); ca. 18 km NE of Mt. Cooperinna, 26°15'S, 130°05'E, 8.9.1978, *N. N. Donner 6618*

(K); Gammon Range NP, Flood plain of Italoewie Creek, 30°30'S, 139°09'E, 3.10.1981, *W. Bushman* 19 (AD 98206108), Italoewie Gorge, *J. B. Cleland* (AD 97413394); Paralana Springs, [30°11'S, 139°27'E], 24.8.1968, *D. E. Symon* 6008 (CANB 196990); Creekline ± 6 miles W of S. A.-Q. border fence, N of the Cooper, between Innamincka and Nappamerrie Stn., [27°40'S 140°54'E], 19.8.1968, *D. E. Symon* 5795 (B, CANB 358666, K).

**3. *Pluchea baccharoides*** (F. Muell.) F. Muell. ex Benth., Fl. Austral. 3: 528. 1867. – Fig. 4.

≡ *Spiropodium baccharoides* F. Muell., Fragm. 1: 34. 1858–59.

Syntypes: [Queensland], Belyando river, 26.[29.]7.1846, *Mitchell* 199 (BM 21071!, K!, MEL 1621079!); [Queensland], Suttor river, *F. Mueller* (MEL 1621080!, K!). – Lectotype (designated here): *F. Mueller* (MEL 1621080!, isoelectotype: K!).

Shrub up to 1.0 m high with erect branches, older branches leafless, whole plant often vernicose, sparsely to densely glandular; glands sessile. Leaves 1.0–2.5 cm long, 0.05–0.2(0.3) cm wide, linear to lanceolate, sessile, covered with dotlike sessile glands, often vernicose, margin recurved, entire or remotely denticulate, base attenuate or prolonged into a petiole, apex acute. Capitula (5.0)5.5–6.3(6.5) mm long, obconoidal, sessile or shortly pedunculate, numerous, forming a loose to dense panicle; homo- or heterogamous; marginal florets female, 0–60; disc florets hermaphroditic, 2–30. Involucrum in 6–7(8) rows, outer and median bracts glandular, vernicose, margins scarios, fimbriate; outer bracts 1.5–1.8 mm long, 0.8–1.0 mm wide, ovate-acute; inner bracts 3.5–5.0 mm long, 0.1–0.3(0.4) mm wide, linear-acute. Receptacle slightly concave, verrucose, 0.6–0.8 mm in diameter. Marginal florets 3.0–3.8 mm long, 3–4-lobed. Disc florets 3.0–4.5 mm long, (4)5-lobed, lobes non-glandular, corolla pale purple. Anthers 1.5–2.0(2.2) mm long, basal appendages 0.2–0.4 mm long, apical appendages ± obtuse, filament collar cells indistinct. Achenes hairy, terete to subangular; achenes of marginal florets 1.2–1.6(1.8) mm long, 0.2–0.3 mm in diameter, carpodium broadly ring-shaped; achenes of disc florets pale, often vestigial. Pappus of 15–22, 2.5–4.2(4.5) mm long, free, barbellate bristles in one row; bristles of disc florets broad, 0.06–0.1 mm in diameter, with protruding and longer teeth towards the apex, apex often recurved.

Chromosome number: unknown.

Flowering and fruiting period: July–November.

#### Distribution and ecology

*Pluchea baccharoides* is endemic to Australia and occurs in New South Wales only in the north and west of Wilcannia and Wanaaring (Porteners 1992: 201), Waveley Downs and the Paroo River district (Fig. 1). According to Cunningham & al. (1981: 684) it is a rare shrub and appears to be restricted to sandy alluvial soils. In Queensland it is distributed in the area around Surbiton and Belyando River, and the Warrego River region (Hnatiuk 1990: 69). In Western Australia *P. baccharoides* has been found in the South-West Province around Esperance and the Coolgardie Goldfields.

#### Additional specimens examined

NEW SOUTH WALES: Waverley Downs to Hungerford [29°06'S, 143°54'E], 10.1912, *J. L. Boorman* (B, BM 21071); Paroo River district [30°05'S, 144°05'E, – 29°34'S, 144°17'E], 10. 1912, *J. L. Boorman* (G).

QUEENSLAND: 4.5 km E of Moray Downs HS, 21°57'S, 146°40'E, 5.4.1992, *E. J. Thompson & B. K. Simon* BUC 346 (MEL 1616644); 15 miles ENE of “Surbiton” Stn., S Kennedy Dist. [23°09'S, 146°37'E], 25.9.1964, *L. G. Adams* 1318 (CANB 152193).

WESTERN AUSTRALIA: Coolgardie Goldfields [30°57'S, 121°09'E], 10.1909, *Maiden* (C); Esperance [33°49'S, 121°52'E], 11.1909, *Maiden* (C).

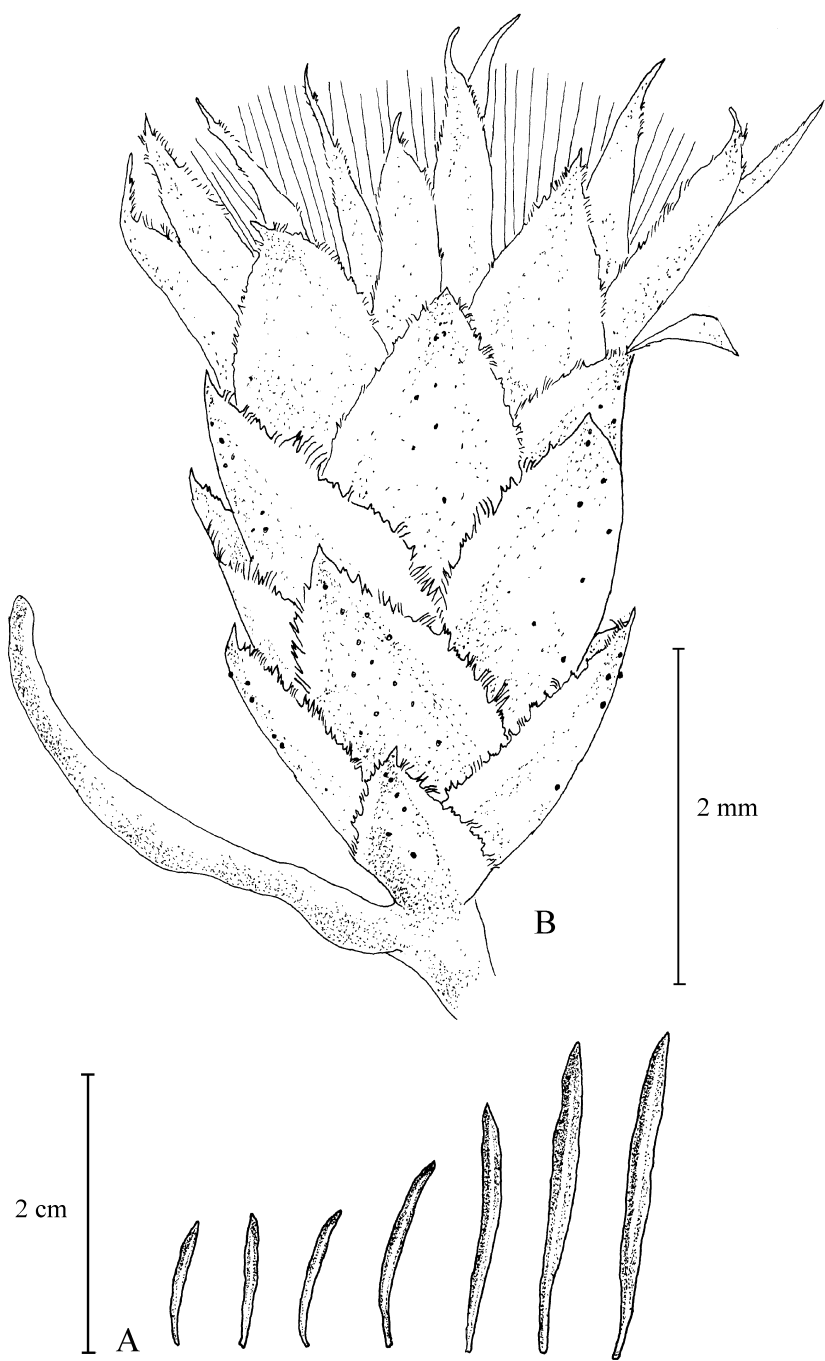


Fig. 4. *Pluchea baccharoides* – A: leaves, B: capitulum. – From Boorman (B).

**4. *Pluchea ferdinandi-muelleri*** Domin in Biblioth. Bot. 22 (89, 8): 1217. 1930.

≡ *Pluchea tetranthera* var. *tomentosa* Benth., Fl. Austral. 3:528. 1867.

= *Pluchea tetranthera* var. *cinerea* W. V. Fitzg. in J. Proc. Roy. Soc. Western Australia 3: 222. 1918.

(For description, synonymy, types, illustrations, distribution, ecology and examined specimens see Hunger 1996).

Chromosome number:  $2n = 20$  (W. A., Northwest Coastal Hwy, c. 7 km E of Whim Creek, 19.9.1995, *Hunger & Kilian* 3762 (B)). In Hunger (1996) the number has erroneously been published as " $2n = 10$ ".

**5. *Pluchea dunlopii*** Hunger in Willdenowia 26: 276–277. 1996.

(For description, types, illustrations, distribution, ecology and examined specimens see Hunger 1996).

Chromosome number:  $2n = 20$  (W. A., Munjina Roy Hill Rd, c. 100 km SSW of Nullagine, 22.9.1995, *Hunger & Kilian* 3910 (B); W. A., c. 30 km SW of Learmouth, Yardie Creek, 1.10.1995, *Hunger & Kilian* 4157 (B)). In Hunger (1996) the number has erroneously been published as " $2n = 10$ ".

**6. *Pluchea tetranthera*** F. Muell., Rep. Babb. Exped.: 12. – 1859.

(For description, types, illustrations, distribution, ecology and examined specimens see Hunger 1996).

Chromosome number:  $2n = 20$  (W. A., Mallina Yandeyarra road, near Mallina Station, 20.9.1995, *Hunger & Kilian* 3780 (B)). In Hunger (1996) the number has erroneously been published as " $2n = 10$ ".

**7. *Pluchea indica*** (L.) Less. in Linnaea 6: 150. 1831.

≡ *Baccharis indica* L., Sp. Pl. 2: 861. 1753.

Type: [India], Herb. Linn. 922. 8 (LINN).

Shrub up to 2 m high with erect branches; pilose, younger parts often villous, trichomes simple, uniseriate, multicellular; glandular, glands sessile. Leaves 2.0–7.0 cm long, (0.5)1.0–3.0 cm wide, obovate to narrowly obovate, entire to dentate, base attenuate, prolonged into a petiole, apex acute. Capitula (3.5)4.0–5.5 mm long, narrowly campanulate, numerous, sessile or shortly pedunculate, heterogamous, forming dense corymbose panicles, marginal florets female, disc florets hermaphroditic. Involucral bracts in 4–5 rows, outer involucral bracts pilose, sometimes glandular, (0.7)1.0–2.0(2.5) mm long, (0.5)1.0–1.5(2.0) mm wide, ovate-acute, margins fimbriate; inner involucral bracts 3.5–4.5(5.0) mm long, 0.2–0.3(0.4) mm wide, linear-acute, apex fimbriate. Marginal florets 2.5–4.0(4.5) mm long, disc florets (2.5)3.0–4.5(5.0) mm long, 4–5-lobed; style branches with sweeping hairs reaching far below the bifurcation; corolla pale purple; anthers tailed. Achenes glabrous to sparsely hairy, slightly heteromorphic; achenes of marginal florets 0.7–1.0 mm long, 0.2–0.3 mm in diameter; achenes of disc florets either 0.6–1.0 mm long, 0.2–0.4 mm in diameter, pale, or often vestigial. Pappus of 18–20(25) free, barbellate bristles in one row.

## Variation and chromosome numbers

*Pluchea indica* is a very variable species with a tendency to hybridize (Cooperride & Galang 1965) which could probably explain that there are different chromosome numbers published, i. e.  $n = 15$  [India: West Bengal *Howrah* (CBL H 14050)] (Sarkar & al. 1982),  $n = 30$  [Pakistan:



Makran, T. Ali 892; Karachi University, Campus, Jahan 7,8] (Razaq & al. 1994) and n = 10 [Pacific islands, *Cooperrider* 9255 (KE)] (Cooperrider & Galang 1965).

Flowering and fruiting period: (March) April to November.

#### Distribution and ecology

*Pluchea indica* is an Australasian species, distributed from India and S China throughout Indochina, the Philippines to Australia and the Pacific islands. In Australia it is known from the Northern Territory and Queensland (Fig. 1), near riversides, amongst mangrove vegetation, on saline clay pans and on the edge of tidal creeks.

#### Specimens examined

AUSTRALIA: NORTHERN TERRITORY: Malay Bay plains [11°23'S, 132°52'E], 8.5.1987, M. J. Clark 1034 (MEL 713723); Gulumarri, Elcho Island, 11°56'S, 135°49'E, 18.7.1975, C. Dunlop 3948 (CANB 469608); Howard Island, 12°09'S, 135°26'E, 9.12.1987, C. R. Dunlop (MEL 221008); Darwin [12°27'S, 130°50'E], 12.3.1971, N. Byrnes 2087 (CANB 238290); South Alligator, Arnhem Hwy, 12°45'S, 132°30'E, 10.8.1983, G. Wightman 602 (CANB 345500, 345001); Port Blane, Blue Mud Bay [13°36'S, 135°56'E], 28.1.1803, R. Brown 2099 (BM 20937); mainland opposite Groote Eylandt [14°00'S, 136°40'E], 4.1.1803, R. Brown 2098 (BM 20936); Arnhem Land, 13°45'S, 136°00'S, 28.11.1987, C. R. Dunlop 7329 (MEL 1583141). QUEENSLAND: Boigu Island, 9°14'S, 142°13'E, 20.10. 1981, J. R. Clarkson 3876 (CANB 345399); Andoom, Weipa, 12°38'S, 141°52'E, 19.3.1989, M. R. Okeilly 254 (MEL 119369).

#### Nomina exclusa

- Pluchea basiflora* F. Muell., Rep. Babb. Exp. 12. 1859 ≡ *Thespidium basiflorum* (F. Muell.) F. Muell. ex Benth., Fl. Austral. 3: 534. 1867.  
*P. conocephala* (F. Muell.) F. Muell. in Bot. Centralbl. 32: 150. 1887 ≡ *Eurybia conocephala* F. Muell. in Trans. & Proc. Victorian Inst. Advancem. Sci.: 36. 1855 ≡ *Aster conocephalus* (F. Muell.) F. Muell., Fragm. 5: 79. 1865–66 ≡ *Cratystylis conocephala* (F. Muell.) S. Moore in J. Bot. (London) 43: 138. 1905.  
*P. filifolia* F. Muell. in Trans. & Proc. Philos. Inst. Victoria 3: 56. 1859 ≡ *Allopterigeron filifolius* (F. Muell.) Dunlop in J. Adelaide Bot. Gard. 3: 183. 1981.  
*P. ligulata* F. Muell., Rep. Babb. Exp.: 12. 1867 = *Erigeron liatroides* Turcz. in Bull. Soc. Imp. Naturalistes Moscou 24: 172. 1851 ≡ *Pterigeron liatroides* (Turcz.) Benth., Fl. Austral. 3: 532. 1867 ≡ *Streptoglossa liatroides* (Turcz.) Dunlop in J. Adelaide Bot. Gard. 3: 176. 1981.  
*P. macrocephala* F. Muell., Rep. Babb. Exp.: 12. 1859 ≡ *Streptoglossa macrocephala* (F. Muell.) Dunlop in J. Adelaide Bot. Gard. 3: 170. 1981.  
*P. odora* F. Muell., Rep. Babb. Exp.: 12. 1859 ≡ *Streptoglossa odora* (F. Muell.) Dunlop in J. Adelaide Bot. Gard. 3: 172. 1981.

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