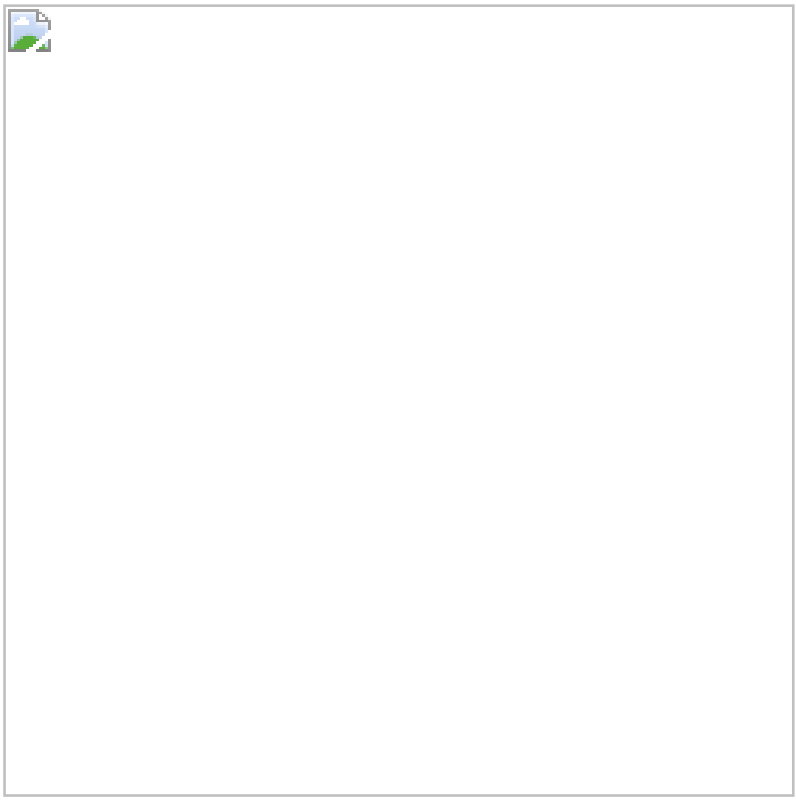

Studies in the Compositae of the Arabian Peninsula and Socotra — 4. The Arabian species of Pluchea (Compositae, Plucheeae)

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SUSANNE KING-JONES

Studies in the *Compositae* of the Arabian Peninsula and Socotra – 4. The Arabian species of *Pluchea (Compositae, Plucheeae)*

Abstract

King-Jones [née Hunger], S.: Studies in the *Compositae* of the Arabian Peninsula and Socotra – 4. The Arabian species of *Pluchea (Compositae, Plucheeae).* – Willdenowia 29: 203-220. 1999. – ISSN 0511-9618.

The genus *Pluchea* on the Arabian Peninsula and Socotra is revised. Seven species are recognized: *Pluchea arabica, P. dioscoridis, P. glutinosa, P. indica, P. obovata, P. ovalis* and *P. sordida. Pluchea indica* subsp. *yemenensis* is described as a subspecies new to science. A key to species and subspecies, a distribution map and illustrations are presented.

Introduction

The genus *Pluchea* Cass. is distributed worldwide in tropical and subtropical regions. The present paper, being part of a revision of *Pluchea* in the Old World and Australia (Hunger 1996, 1997, King-Jones in prep.), deals with the species which occur in Arabia. There are seven *Pluchea* species known from the Arabian Peninsula and Socotra: *Pluchea arabica, P. dioscoridis, P. glutinosa, P. indica, P. obovata, P. ovalis* and *P. sordida.*

Two species, *Pluchea glutinosa* and *P. obovata,* are endemic to Socotra, an island which exhibits a very high level of endemism. Important scientific expeditions to the island were made in 1880 by Bailey Balfour and in 1881 by Georg Schweinfurth. Both collections were examined by Balfour (1882, 1888). He described many species new to science, including the three endemics *Pluchea aromatica, P. glutinosa* and *P. obovata*. *Pluchea aromatica* was, however, erroneously included in the genus *Pluchea* and is actually a species of *Pulicaria* (King-Jones & Kilian 1999). *P. obovata*, a notable plant with long spreading branches, is found only in the Hajhir mountains (Balfour 1888). Its growth form is exceptional in the genus. The third species, *P. glutinosa,* is rather common and distributed all over the hilly regions of the island (Balfour 1888).

Pluchea arabica is endemic to the Arabian Peninsula. A publication by Qaiser & Lack (1986) shed light on the taxonomy of this species. They showed that the plant then known as *Phagnalon arabicum* actually belongs to the genus *Pluchea*. The species is distributed throughout Oman and South Yemen and includes plants previously known as *Pluchea laxa* and *P. multiflora*. The pleasantly aromatic subshrub grows abundantly in drier areas, where the water

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levels lie close to the surface, and is a reliable indicator for the proximity of water (Miller & Morris 1988: 104).

Pluchea dioscoridis and *P. ovalis* are widespread and closely related species, which are often confused. *P. dioscoridis* is abundant in Egypt, Palestina, Israel, Central and E Africa and is fairly common on the Arabian Peninsula. It grows along streams, in oases and is a characteristic plant of wadis. *P. ovalis* is also distributed in Africa but is additionally found in the Sudanian region and India. This species is apparently rare in the Arabian Peninsula and mainly recorded from populated or urban locations near to the coast.

Pluchea sordida is rare in the Arabian Peninsula and until now it is only known from a single location in Yemen. Its main area of distribution lies in E Africa.

Pluchea indica is chiefly an Australasian species. In Arabia it is known only from S Yemen, where it grows near the coast on salty sand plains as well as in wadi beds further inland. A subspecies endemic to S Yemen is recognized here for the first time.

Key to the species

1 Stem prostrate, capitula 8-11 mm long, corolla of marginal florets conspicuously lobed, lobes 0.4 mm long . . . . . 1. *P. obovata*
– Stem erect, capitula 4-9 mm long, corolla of marginal florets minutely lobed, lobes 0.1-0.2 mm long 2
2 Leaves petiolate, receptacle hairy . . . . . 2. *P. indica*
– Leaves not petiolate, receptacle glabrous. 3
3 Leaves auriculate and/or decurrent 4
– Leaves neither auriculate nor decurrent 5
4 Leaves broadly auriculate and/or decurrent, indument greyish woolly . . . . 3. *P. ovalis*
– Leaves slightly auriculate, never decurrent, indument pilose . . . . . 4. *P. dioscoridis*
5 Plant glandular and sparsely hairy, pilose or woolly 6
– Plant glandular, otherwise glabrous . . . . . 5. *P. glutinosa*
6 Plant pilose or woolly, hairs 0.5-2 mm long, capitula campanulate, outer involucral bracts glandular and pilose. . . . . 6. *P. sordida*
– Plant sparsely hairy, seldom pilose and never woolly, hairs 0.2-0.6(0.8) mm long, capitula obconoidal, outer involucral bracts glandular but not pilose . . . . . 7. *P. arabica*

1. *Pluchea obovata* Balf. f. in Proc. Roy. Soc. Edinburgh 11: 838. 1882. – Fig. 2, 3A
Lectotype (designated here): [Socotra], Wadi Kischen, 1.5.1881, *Schweinfurth 764* (K!). – Paralectotype: [Socotra, cliffs on the higher parts of Hajhir], 2.-3.1880, *Balfour 497* (A 11345!, BM 20920!, E!, K!, OXF!).

Note: Specimens collected during Balfour's Socotra expedition 1880 are indicated by "B. C. S." [Balfour, Cockburn, Scott] in the protolog followed by the collecting number. The herbarium labels, however, give only the name Balfour and the collecting number.

Ic.: Balfour 1888: tab. 33 (flowering branch, details).

Subshrub, stem prostrate, branched, sparsely to densely glandular, younger parts densely glandular and sometimes tomentose, trichomes simple, uniseriate, multicellular 0.1-0.4 mm long, glands sessile; older branches leafless, becoming glabrous or nearly so, rough with residual leaf scars. *Leaves* (1.0)1.5-4 cm long, 0.4-1(1.5) cm wide, obovate, sessile, base attenuate, margins entire or upper region dentate, apex obtuse or acute; glandular, sometimes with non-glandular hairs along midrip and clustered in the leaf axil. *Capitula* (7.5)8-11 mm long, campanulate, pedunculate, solitary or loosely clustered; heterogamous, marginal florets numerous in several rows, disc florets 50-100. *Peduncles* 0.3-2.5 cm long with 1-6 bracts reaching the capitulum; bracts 1.5-4.5 mm long, 0.8-1 mm wide; peduncles and bracts densely glandular and tomentose. *Involucrum* in 5-7 rows,

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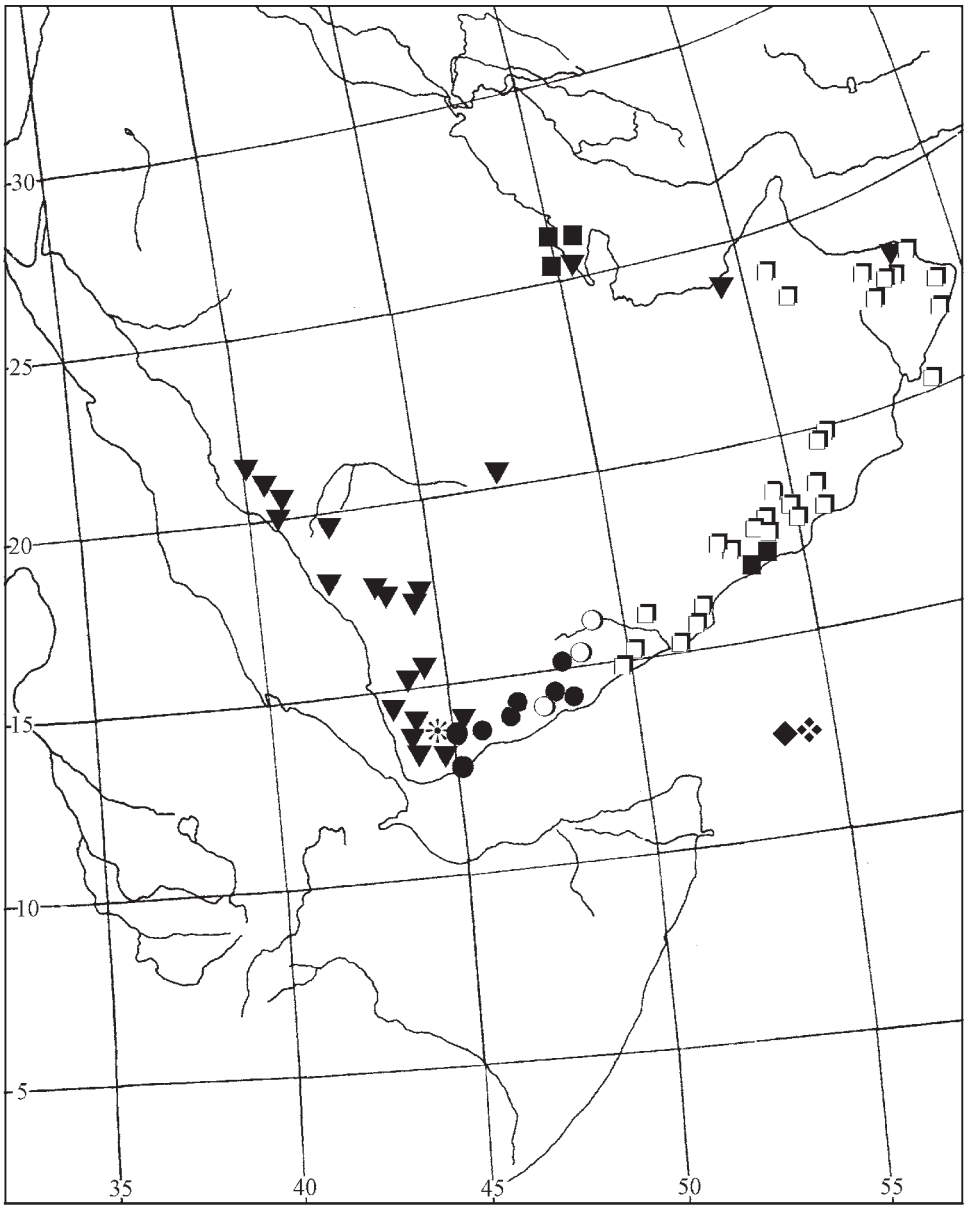

Fig. 1. Distribution of *Pluchea arabica* (❐), *P. dioscoridis* (▼), *P. glutinosa* (◆), *P. indica* subsp. *indica* (❍), *P. indica* subsp. *yemenensis* (●), *P. obovata* (❖), *P. ovalis* (■), *P. sordida* (✳).

outer and median bracts densely glandular, tomentose, margins fimbriate; outer bracts 2.5-3.5(4.5) mm long, 1-1.4 mm wide, oblong, with acute apex; inner bracts 6-8(10) mm long, 0.4-0.7(0.9) mm wide, linear, acute, glandular at the apex, fimbriate, often tinged violet. *Receptacle* flat or nearly so, verrucose, 4.5-5.0 mm in diameter. *Marginal florets* 4-5(5.6) mm long, corolla 3-4 lobed, lobes 0.3-0.4 mm long, glandular. *Disc florets* 4.4-6 mm long, corolla purple, 5-lobed, lobes 0.4-0.7 mm

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Fig. 2. *Pluchea obovata* – lectotype specimen (*Schweinfurth 764*).

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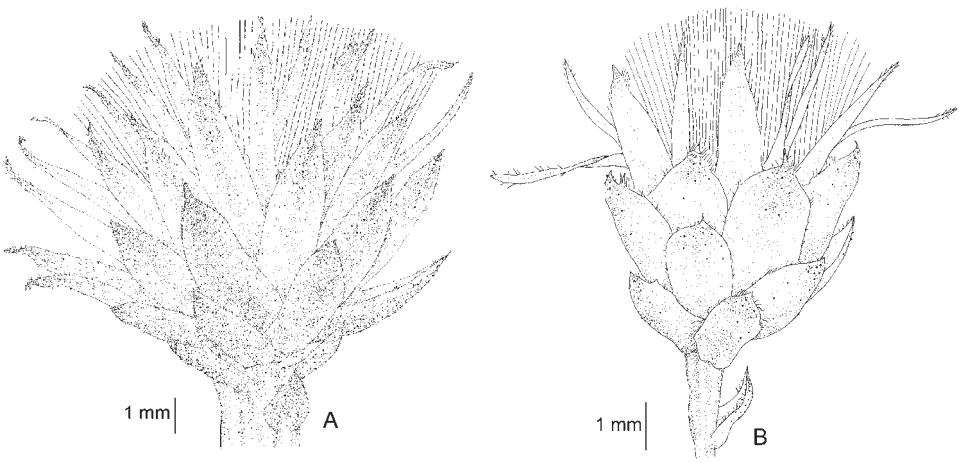

Fig. 3. A: *Pluchea obovata* – capitulum, from *Hein 96-600* (herb. P. Hein); B: *Pluchea glutinosa* – capitulum, from *Schweinfurth 646* (K).

long, glandular. *Anthers* 2.5-3 mm long, basal appendages 0.5-0.7 mm long, apical appendages obtuse, filament collar cells swollen. *Achenes* hairy, subterete, 1-1.4 mm long, 0.2-0.3 mm in diameter. *Pappus* 3-5.5 mm long, of 6-12 free, barbellate bristles in one row, teeth protruding, bristles of marginal florets resembling a fish-bone, bristles of disc florets broader.

Chromosome number: unknown.

Distribution and ecology
Endemic to Socotra (Mies 1994: 233) (Fig. 1). According to Balfour (1888: 126) *Pluchea obovata* grows only on the cliffs on the higher parts of the Hajhir Mts, especially above Wadi Qishn [Kischen] and Aduno, on stony slopes leading steeply from the watershed (Popov 1957: 714). Flowering and fruiting plants have been collected from February to May.

Additional specimens examined
Socotra: Hajhir mountains, wadi Qishn, 12º34'N, 54º02'E, 31.3.1996, *Hein 96-600* (herb. P. Hein); Adho Demalu [Adho Dimelus: 12º35'N, 54º01'E], 16.3.1953, *Popov 231* (BM 21091); Haggier Mts, Fieri Peaks [12º36'N, 54º01'], 11.2.1990, *Miller & al. M10453* (E); 12º35'N, 54º03E, 19.4.1967, *Smith & Lavranos 423* (K); Aduno pass [c. 12º35'N, 54º05'E], 6.3.1989, *Miller & al. M8666* (E, UPS); 1897, *Bent* (K); Wadi Daneghan, 10.2.1990, *Miller & al. M10386* (UPS).

2. *Pluchea indica* (L.) Less. in Linnaea 6: 150. 1831 ≡ *Baccharis indica* L., Sp. Pl. 2: 861. 1763. – Lectotype (designated by Puy & al. 1993: 416): [India], Herb. Linn. 922.8 (LINN [photo!]).
= *Conyza corymbosa* Roxb., Fl. Ind. 3: 426. 1832. – Lectotype (designated here): *Wallich 3009/119* (G!).
= *Pluchea foliolosa* DC., Prodr. 5: 451. 1836 ≡ *Eupatorium foliolosum* Wall. ex DC., Prodr. 5: 451. 1836. – Holotype: Martabaniae, 1830, *Wallich Burm. cat. 1565* (G-DC [photo!]).

Shrub up to 2 m high with erect branches, pilose, younger parts often densely hairy, trichomes simple, uniseriate, multicellular; glandular, glands sessile. *Leaves* (2)3-7 cm long, (0.5)1-3(4) cm wide, ovate, obovate or lanceolate, with acute or obtuse apex and dentate or seldom entire margin, pilose and glandular, sometimes vernicose, density of non-glandular trichomes increasing towards margin and midrib, base attenuate and prolonged into a 0.3-2 cm long petiole. *Capitula*

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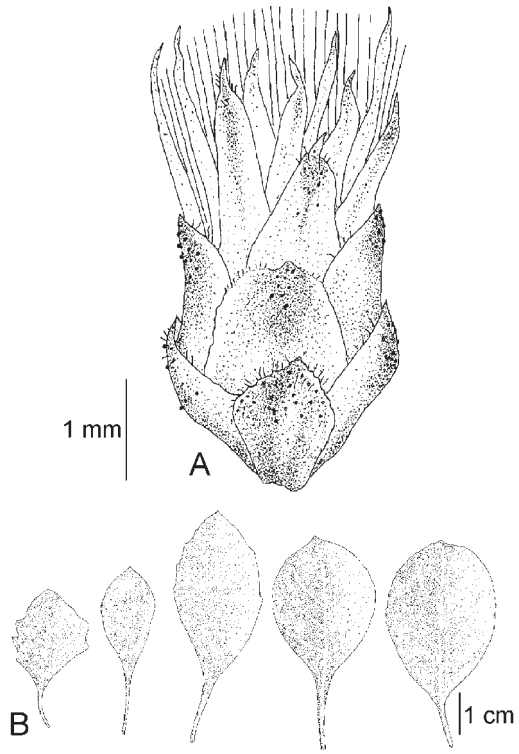

Fig. 4. *Pluchea indica* subsp. *yemenensis* – A: capitulum (from the holotype); B: leaf shapes (selection from the material seen).

(3.5)4-6(7) mm long, cylindrical, numerous, sessile or shortly pedunculate, heterogamous, forming dense corymbose panicles; marginal florets female, disc florets 3-6, hermaphroditic. *Peduncles* up to 0.5(0.7) cm long. Involucral bracts in 4-5 rows, outer involucral bracts pilose, glandular, sometimes vernicose, (1.3)1.7-2(2.5) mm long, 1-1.7(2) mm wide, ovate-acute, margins fimbriate; inner involucral bracts 3.5-5(5.5) mm long, 0.2-0.3(0.4) mm wide, linear, acute, with fimbriate apex. *Receptacle* hairy, 0.5-1.3(1.8) mm in diameter, concave or cup-shaped. *Marginal florets* (2.7)3-4(4.5) mm long, disc florets (3.5)4-5(5.5) mm long; corolla and stigma purple; *anthers* tailed, 1.8-2.4 mm long, basal appendages 0.4-0.5 mm long, apical appendages obtuse, filament collar cells swollen. *Achenes* sparsely hairy, indistinctly ribbed, slightly heteromorphic; achenes of marginal florets 0.8-1.2 mm long, 0.2-0.3 mm in diameter; achenes of disc florets either 0.6-1 mm long, 0.2-0.4 mm in diameter, pale, or often vestigial. *Pappus* of 13-20(25) free, barbellate bristles in one row, pappus bristles of disc florets sometimes fused or broader at the base.

Chromosome number: No counts from the Arabian Peninsula are published but different chromosome numbers are recorded from India n = 15 (Sarkar & al. 1982), from Pakistan n = 30 (Razaq & al. 1994), and from Hawaii n = 10 (Cooperrider & Galang 1965).

Key to subspecies of *Pluchea indica*

1 Leaves obovate or lanceolate, pilose, glandular; petioles 0.3-1 cm long; receptacle 0.8-1.3(1.8) in diameter, concave, not cup-shaped . . . . . a. subsp. *indica*

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– Leaves ovate, obovate or lanceolate, subglabrous, vernicose, glandular; petioles 1-2 cm long; receptacle 0.5-1 mm in diameter, cup-shaped . . . . . b. subsp. *yemenensis*

a. ***P. indica*** subsp. ***indica***

Pluchea indica subsp. *indica* is found on the Indian subcontinent, Thailand, S China, Indochina, the Philippines, Australia and the Pacific Islands. In Australia it is known from Northern Territory and Queensland (Hunger 1997).

On the Arabian Peninsula it is only found in S Yemen in Hadramaut (Fig. 1). It grows near the coast as well as further inland (Schwartz 1939: 276). Blatter (1919: 236) quotes also a record from Shaikh Othman [Ash Shaykh Uthman: 12º52'N, 44º59'E].

Flowering and fruiting specimens were collected throughout the year.

Additional specimens examined
YEMEN: HADRAMAUT: Azzân [14º19'N, 47º27'E], 7./8.12.1898, *Simony* (HBG); near the old fort c. 7 km NE of Ghayl Ba Wazir, 14º49'N, 49º25'E, 21.9.1998, *Kilian & Hein NK 5020* (B); el Lasb [? 15º12'N, 48º40'E], 5.8.1931, *Wissmann 1431* (HBG); Terîm - Qabr Hûd [c. 16º00'N, 49º00'E], 6.8.1931, *Wissmann 1420* (HBG); near Rahada, 9.10.1962, *Popov 31/1* (BM 21086).

b. ***P. indica*** subsp. ***yemenensis*** King-Jones, **subsp. nova** – Fig. 4
Holotype: Yemen, Abyan plain, Wadi Hassan E of Zinjibar, 13º08'N, 45º27'E, 26.3.1997, *Kilian & al.4601* (B).

A subspecie typica foliis ovatis vel obovatis vel lanceolatis, fere glabris, glandulosis et pruinosis, petiolis 1-2 cm longis et receptaculo 0.5-1 mm diametro, cupuliformi differt.

Shrub, glandular, vernicose, glands sessile. Leaves 3-7 cm long, 1-5 cm wide, ovate, obovate or seldom lanceolate, glandular, vernicose, petiolate. Petiole 1-2 cm long. Receptacle 0.5-1 mm in diameter, cup-shaped.

Endemic to S Yemen (Fig. 1). The plant is found in wadi beds, near streams or on salty sand flats near the sea. Flowering and fruiting specimens were collected throughout the year.

Note: After examining numerous specimens from the Indian subcontinent, SE Asia, the Philippines, Japan, China, Australia and the Pacific Islands this subspecies was recognized. In none of the regions mentioned specimens with the character combination typical for subsp. *yemenensis* were observed.

Additional specimens examined
YEMEN: Aden, Abiyan Governorate, Zingibar Guest House [12º46'N, 45º01'E], 8.2.1989, *Miller & al. M8010* (E); Lahedj [Lahij: 13º03'N, 44º53'E], 29.4.-1.5.1931, *Wissmann 1439* (HBG); Al Huseini, N of Lahej, 25.-30.11.1937, *Scott & Britton 263* (BM 21116); valleis aux environs de Lahadj, 23.10.1889, *Deflers 128* (BR, E, G); Wadi Bonna near Wadi Hassan 40 miles E of Aden on coast [c. 13º07'N, 45º27'E], 8.8.1937, *Grasovsky 3* (BM 20993); Scheih O'Ahman pr. Aden, 6.1872, *Hildebrandt 765* (BM 21003b); Wadi Bana downstream, near Yaramis [c. 13º25'N, 45º25'E], 14.3.1988, *Boulos & al.* (BM 20934); Hot springs 30 m[iles] E of Mudia [Mudiyah] [c. 13º50'N, 46º10'E], 9.4.1953, *Grierson 196* (E); road from Lawdar to Hannap and Am Ayn, 14º01'N, 46º43'E, 19.1.1998, *Mies 862* (B, herb. B. Mies); Tukhana nr. Mukalla [c. 14º30'N, 49º00'E], 1893-4, *Lunt 64* (BM 21003a); el Lasb [? 15º12'N, 48º40'E] 5.8.1931, *Wissmann 1432* (HBG); Wadi Hajr, 100 km W of Mukalla, El Ain, 58 km N of Meifa Haga [14º02'N, 48º40'E], 13.2.1989, *Miller & al. M8158* (E).

3. *Pluchea ovalis* (Pers.) DC., Prodr. 5: 450. 1836 – Fig. 5
≡ *Baccharis ovalis* Pers., Syn. Pl. 2: 424. 1807. – Type: Senegal (P-Juss. [photo!]).
= *Baccharis ovata* Sieber ex DC., Prodr. 5: 450. 1836. – Type: [Senegal], Senegambia, *Sieber 61* (G!, M!, OXF!, S!, W!).

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= *Pluchea tomentosa* DC. in Wight, Contr. Bot. India: 16. 1834. – Syntypes: [India], Mysore, *Herb. Wight 1441/20* (E!); Madras, 1830, *Heyne* (Herb. DC.!); [India], *Herb. Machraap 3031/141a* (A 11339 [fragments and drawing!], GH).
= *Pluchea mollis* Baker in Bull. Misc. Inform. 1895: 182. 1895. – Holotype: [Oman], Dhofar, Hafa,1895, *Bent 9* (K!).
= *Pluchea dioscoridis* var. *pseudovalis* Cufod. in Nuovo Giorn. Bot. Ital., n.s. 50: 105. 1943. – Syntypes: [Ethiopia], El-Banno, 2.5.1939, *Corradi 1791* (W!); [ibid.], El-Dire, 22.5.1939, *Corradi 2025, 2026* (W!).

Note: Bornmüller's herbarium sheets from Bahrain (Iter Persico-turcicum 1892-93) are labeled as "*Conyza dioscoridis* Rauw. var. *ovalifolia* Hausskn. et Born. var. nov." Later Bornmüller (1939: 186) revoked this variety and attribut the specimens to *Pluchea tomentosa*.

Ic.: Cornes & Cornes 1989: 218 (photo of habit and flower heads).

Shrub up to 2 m high with erect branches, densely covered with sessile or stipitate glands and pilose, tomentose or woolly; trichomes simple, uniseriate, multicellular. *Leaves* (3)3.5-7(11) cm long, (1)1.5-4(6) cm wide, ovate, lanceolate or oblanceolate, with acute or obtuse apex, sessile, auriculate, either conspicuously decurrent (mainly on younger branchlets) or broadly auriculate and only slightly decurrent, pilose (density of non-glandular trichomes increasing towards margin and midrib), tomentose or woolly, sometimes upper leaf surface woolly, lower surface pilose. *Capitula* 5.4-7(7.6) mm long, campanulate, numerous, sessile or shortly pedunculate, heterogamous, forming a dense corymbose panicle; marginal florets female, 60-100; disc florets hermaphroditic, 5-15. *Peduncles* up to 1 cm long, densely pilose, glandular. *Involucral bracts* in 4-5(6) rows, the outer bracts pilose, glandular, slightly vernicose, (1.6)1.8-2.7 mm long, (0.7)0.8-1.7 mm wide, ovate-acute, margin slightly fimbriate; inner involucral bracts (4)5-6(6.5) mm long, (0.1)0.2-0.3 mm wide, linear-acute, margin fimbriate. *Receptacle* 1.5-2 mm in diameter. *Marginal florets* (3.7)4-5 mm long. *Disc florets* (3.5)4-5(6) mm long, corolla purple, lobes glabrous or glandular; *anthers* tailed, 2-2.5 mm long, basal appendages 0.5-0.6(0.7) mm long, apical appendages obtuse or acute, filament collar cells not swollen. *Achenes* hairy or sparsely hairy, terete to subangular, slightly heteromorphic; achenes of marginal florets 1-1.3 mm long, 0.2-0.3 mm in diameter, indistinctly 5(?)-ribbed with a small ring-shaped carpopodium; achenes of disc florets pale, slightly broader, with broadly ring-shaped carpopodium, or often vestigial. Pappus 4-5(5.6) mm long, of 13-20 free barbellate bristles in one row, caducous, teeth more or less protruding, bristles of disc florets often broadened at the base.

Chromosome number: Material from São Antão, Cape Verde Islands, is reported to have 2n = 40 (Borgen 1980).

Distribution and ecology
Pluchea ovalis is distributed from W Africa (Cape Verde Islands, Senegal, Togo, Morocco and Mauritania) to the Arabian Peninsula (Fig. 1). It is found in marshes, grassland and seasonally swampy grounds. In Bahrain it grows particularly in the Adhari area in moist habitats (Cornes & Cornes 1989: 218). In Oman it was found in Dhofar (Radcliff-Smith 1980: 81).

Under favourable conditions, flowering and fruiting plants can be found at almost any time of the year. From Bahrain flowering times from January to May (Phillips 1988) are recorded and for the Adhari area from February to March (Cornes & Cornes 1989).

Variation
Pluchea ovalis is a variable species, in particular the indument can vary between pilose and woolly. Wright's type material, a few specimens from India, some from Oman (e.g. *Berkeley 58*) and nearly all specimens from Bahrain are covered with a somewhat greyish woolly indument. The densely woolly leaves are paler on the lower surface. These specimens were often named

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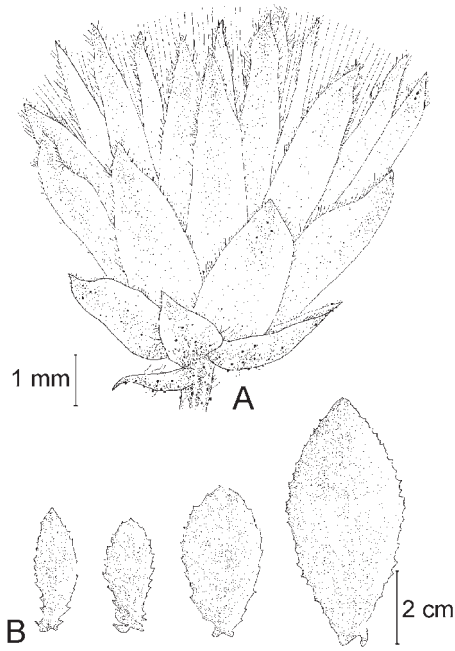

Fig. 5. *Pluchea ovalis* – A: capitulum, from *Greenway 9106* (B), B: leaf shapes.

Pluchea tomentosa. The normally quite conspicuous decurrent leaves are sometimes only slightly decurrent or have their basal part reduced to a broadly auriculate-clasping base, or they are decurrent only on the younger branchlets. The Bahrain specimens often lack decurrent leaves, but they are broadly auriculate. However, all intermediate character states are found and no correlation with a distribution pattern could be observed. *Pluchea dioscoridis* and *P. ovalis* are sometimes confused, especially when the latter lacks the decurrent leaves, they are, however, quite different in habit. *Pluchea ovalis* is a more robust plant with larger capitula and leaves, the indument is thicker, the pappus bristles of the disc florets are often broadened at the base and the bristles are caducous.

Additional specimens examined
Saudi Arabia: Qatif Oasis [26º36'N, 49º58'E], 31.3.1987, *Collenette 6189* (E), ibid., 27.1.1966, *Mandaville 527* (BM 21061); 2 km E. of al-Hufu, al-Hasa Oasis, [25º20'N, 49º34'E], 22.10.1987, *Mandaville 8662* (E).
Bahrain: Between Hamad Town & the BDF hospital, [26º06'N, 50º30'E], 2.1.1985, *Alder 86* (E); nr. oil refinery, 18.2.1984, *Cornes 106* (E); Bahrein, 1.3.1893, *Bornmüller 400* (B, BM 20930, E, HBG, LD, W).
Oman: Dhofar, Central Salalah [17º01'N, 54º04'E], 17.6.1978, *Berkeley 58* (BM 20927, E); Dhofar, Thumrait-Hegeif T/O, 17º08'N, 54º08'E, 25.11.1981, *Maconochie 2981* (BM 21058, E).

4. *Pluchea dioscoridis* (L.) DC., Prodr. 5: 450. 1836. – Fig. 6
≡ *Baccharis dioscoridis* L., Cent. Pl. 1: 27. 1755 ≡ *Conyza dioscoridis* (L.) Desf., Tabl. École Bot., ed. 2: 144. 1815 . – Type: [Egypt], *Hasselquist,* Herb. Linn. 992 (LINN [photo!]).
= *Conyza odora?* Forssk., Fl. Aegypt.-Arab.: 148. 1775. – Type: [Egypt], *Forsskål 1141* (C) [see Hepper & Friis 1993: 129].
= *Conyza krausii* Sch. Bip. ex Walpers, Repert. Bot. Syst. 2: 972. 1843 ≡ *Pluchea krausii* (Sch.

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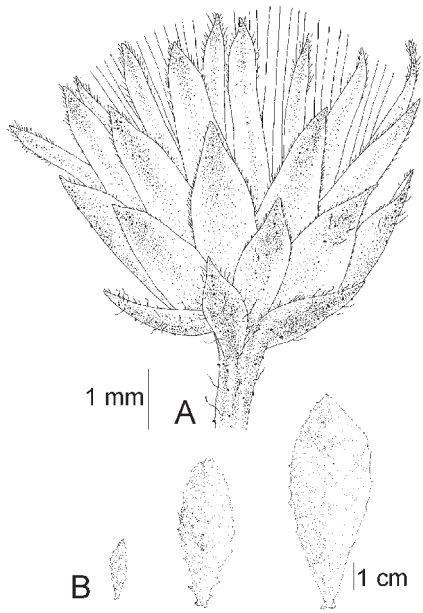

Fig. 6. *Pluchea dioscoridis* – A: capitulum, from *J. P. Mandaville 2652* (BM 21062); B: leaf shapes.

Bip.) Sch. Bip. ex Steetz in Peters, Naturw. Reise Mossambique, Bot. 6, 2: 442. 1864 ≡ *Pluchea dioscoridis* var. *glabra* Oliver & Hiern, Fl. trop. Afr. 3: 329. 1877. – Syntypes: [Mozambique], Cabaceira, *Kirk* (?K); [Mozambique], Inhambane, *Peters* (†B).
= *Blumea baccharoides* Sch. Bip. in Richard, Tent. Fl. Abyss. 1: 391. 1848 ≡ *Conyza modatensis* Sch. Bip. in Schweinfurth, Beitr. Fl. Aethiop. 144. 1867. – Type: [Ethiopia] Prope Adeganna in provincia Modat ad rivos, 11.4.1839, *Schimper 1018* (BM 21109!, BR!, G!, M!, P 11535!, W!).

Shrub up to 3 m high with erect branches, pilose, glandular, rarely glabrous, the trichomes simple, uniseriate, multicellular, the glands sessile or stipitate. *Leaves* 2-7 cm long, 1-3 cm wide, narrowly lanceolate to lanceolate, dentate or entire, with attenuate, auriculate base and acute apex. *Capitula* numerous, (4.5)5-7(9) mm long, campanulate, sessile or pedunculate, heterogamous, forming a dense corymbose panicle. *Peduncles* up to 1(1.5) cm long. *Involucral bracts* in 4-5(6) rows, the outer involucral bracts (1.3)1.5-2.2(2.5) mm long, (0.5)0.7-1(1.5) mm wide, ovate-acute, pilose, glandular, with fimbriate margin; inner involucral bracts 4.2-5.2 mm long, 0.3-0.6 mm wide, linear, acute, with fimbriate margin. *Receptacle* slightly concave, verrucose, 1.4-2(2.5) mm in diameter. *Marginal florets* 2.7-4 mm long. *Disc florets* 3-10, (3.5)4-5(6) mm long, corolla and stigma light purple, corolla 5(6)-lobed, lobes glandular, (0.6)0.7-0.9(1) mm long; *anthers* tailed, 1.8-2.4 mm long, basal appendages 0.5-0.6(0.7) mm long, apical appendages obtuse or acute; filament collar cells not swollen. *Achenes* of disc florets often vestigial, pale, often with minute hairs or scales at the apical plate, achenes of marginal florets glabrous or sparsely hairy, terete to subangular, 0.9-1.1 mm long, 0.2-0.3 mm in diameter, indistinctly ribbed. *Pappus* of 10-25 barbellate bristles in one row, teeth protruding, bristles of irregular length, bristles of disc florets often with plumose apex, caducous.

Chromosome number: Gill & Abubakar (1975) counted n = 10 for a specimen from Dar-es-Salaam, Tanzania.

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Distribution and ecology
Pluchea dioscoridis is widespread in tropical and subtropical Africa and the Arabian Peninsula (Fig. 1). In Saudi Arabia it is abundant along streams, especially in the southern mountains (Collenette 1985), around Najran and in the whole S Hijaz reaching the Yemen border (Migahid 1974). In E Saudi Arabia *P. dioscoridis* is occasional to frequent on canal banks or field edges in the oases (Mandaville 1990: 289). It was also found on Tarut Island, in Abu Dhabi (United Arab Emirates) and near Muscat in Oman. In Yemen *P. dioscoridis* is a characteristic plant of wadis. It is abundant where ground water is close to the surface (Wood 1997: 291). It was found mainly in the area around Ta'izz, in the Haraz Mts (Schwartz 1939: 276), in Wadi Urbil on steep gravelly-rocky slopes, in wadis near Al Hudaydah (Deflers 1889: 149) and in the vicinity of San'a.

Additional specimens examined
Saudi Arabia: Road to Najrahn, 50 km N of Dharan [17º40'N 43º30'E], 2.3.1981, *Hillcoat 75* (BM 21009); Najran [17º30'N, 44º10'E], 1.1979, *Chaudhary 266* (E); W Al Ashiba [17º43'N, 44º25'E], 15.4.1950, *Guichard KG/11/Tihama* (BM 20995); Mahail, 18º30'N, 42º00'E, 24.12.1971, *Popov 71/323* (BM 21090); Wadi Adamah, 19º54'N, 41º55'E, 27.10.1969, *Mandaville 2652* (BM 21062); Wadi Habaqa, S of Al-Baha [20º00'N, 41º30'E], 10.10.1985, *Fayed 1183* (B, M); Wadi Aridah, 20º37'N, 47º17'E, 31.10.1969, *Mandaville 2692* (BM 21063); Thaqif highlands, 20º45'N, 40º50'E, 8.12.1946, *Vesey-Fitzgerald* (BM 21154); Al-Hada region, about 18 km from Al-Taif [21º16'N, 40º24'E], 22.3.1985, *Fayed 1121* (B); S Tihama foothills [c. 22º00'N, 40º00'E], 2.1971, *Popov 71/49* (BM 21089); Tarut Island [26º35'N, 50º05'E], Darin village, 2.10.1987, *Mandaville 8658* (E); s. loc., 1820-26, *Ehrenberg* (BR); Wadi Said near Said, 13.3.1952, *Popov & al.* (BM 21092); Wadi Hajar, W of Maifa, 24.8.1949, *Guichard KG/HAD/120* (BM 20996); W Hagir, 16.3.1952, *Tothill 63* (BM 21149).
United Arab Emirates: Abu Dhabi [24º28'N, 54º25'E], 29.5.1982, *Western 144* (E).
Oman: Muscat - Qurm, 23º37'N, 58º28'E,1.10.1998, *Hein 5129* (B, herb. P. Hein), ibid., 1.10.1998, *Kilian 5260* (B).
Yemen: Wadi Arafat, on Taiz to Turbah road [c. 13º00'N, 44º00'E], 16.3.1984, *Miller & King 5194* (E); Al Lasab, SE of Ta'izz on Salah-'Adanan road, 28.7.1983, *Gordon 127* (E); Oberlauf des Wadi Labtah, südl. Beckenrand von At Tur [c. 13º00'N, 44º20'E], 11.3.1982, *Müller-Hohenstein & Deil 262* (E); S facing escarpment into Wadi Urbil at the S edge of At Turbah, 13º12'N, 44º07'E, 1.4.1997, *Kilian & Hein NK 4717* (B); Wadi Sara, 4 km W of Qamis al Beni Saad [c. 13º27'N, 45º30'E], 30.3.1981, *Miller & Long 3326* (E); Jabal Habaschi, slopes with terraces NE of the village Yafrus, 13º28'N, 43º56'E, 29.3.1997, *Kilian & al. 4657* (B); Wadi Fare'aa, 8 km E Habil Jabir [c. 13º31'N, 44º56'E], 24.12.1987, *Rowaished & al.* (BM 21101); Ta'izz [13º34'N, 44º02'E], dry Wadi bed north of town, 22.12.1937, *Scott & Britton 349* (BM 21117); Wadi Barakan between Taiz and Turba, 11.8.1975, *Wood Y/15/514* (BM 21175); from Hays to Udayn, at Sheehsly Muzahin [c. 13º55'N, 43º30'E], 22.9.1983, *Gordon 269* (E); Hammam Ali [14º39'N, 44º08'E], 28.8.1937, *Rathjens 37/25* (BM 21097); km 90 Hodeidah-San'a road [c. 15º00'N, 44º00'E], 20.9.1962, *Popov 8/39* (BM 21085); am Bach im Wadi Dhar bei Sanaa [c. 15º21'N, 44º12'E], 14.10.1982, *Müller-Hohenstein & Deil 832* (E); 47 km N Huth nahe der Straße nach Sadah [c. 17º00'N, 43º58'E], 2.10.1981, *Podlech 36194* (G, M).

5. *Pluchea glutinosa* Balf. f. in Proc. Roy. Soc. Edinburgh 11: 838. 1882. – Fig. 3B, 7
Lectotype (designated here): [Socotra], über Kischen, 2.5.1881, *Schweinfurth 646* (K!). – Paralectotype: [Socotra], 2.-3.1880, *Balfour 616* (K!, OXF!).

Subshrub with erect branches, densely glandular, sparsely hairy, somehow vernicose, the trichomes simple, uniseriate, multicellular, 0.1-0.4 mm long, glands sessile. *Leaves* (3)5-12 cm long, (0.6)1-3 cm wide, lanceolate to oblanceolate, sessile to shortly petiolate, with slightly attenuate base, entire to dentate margins and acute apex. *Capitula* 6-8 mm long, campanulate, sessile or pedunculate, heterogamous, forming dense corymbose panicle; marginal florets female,

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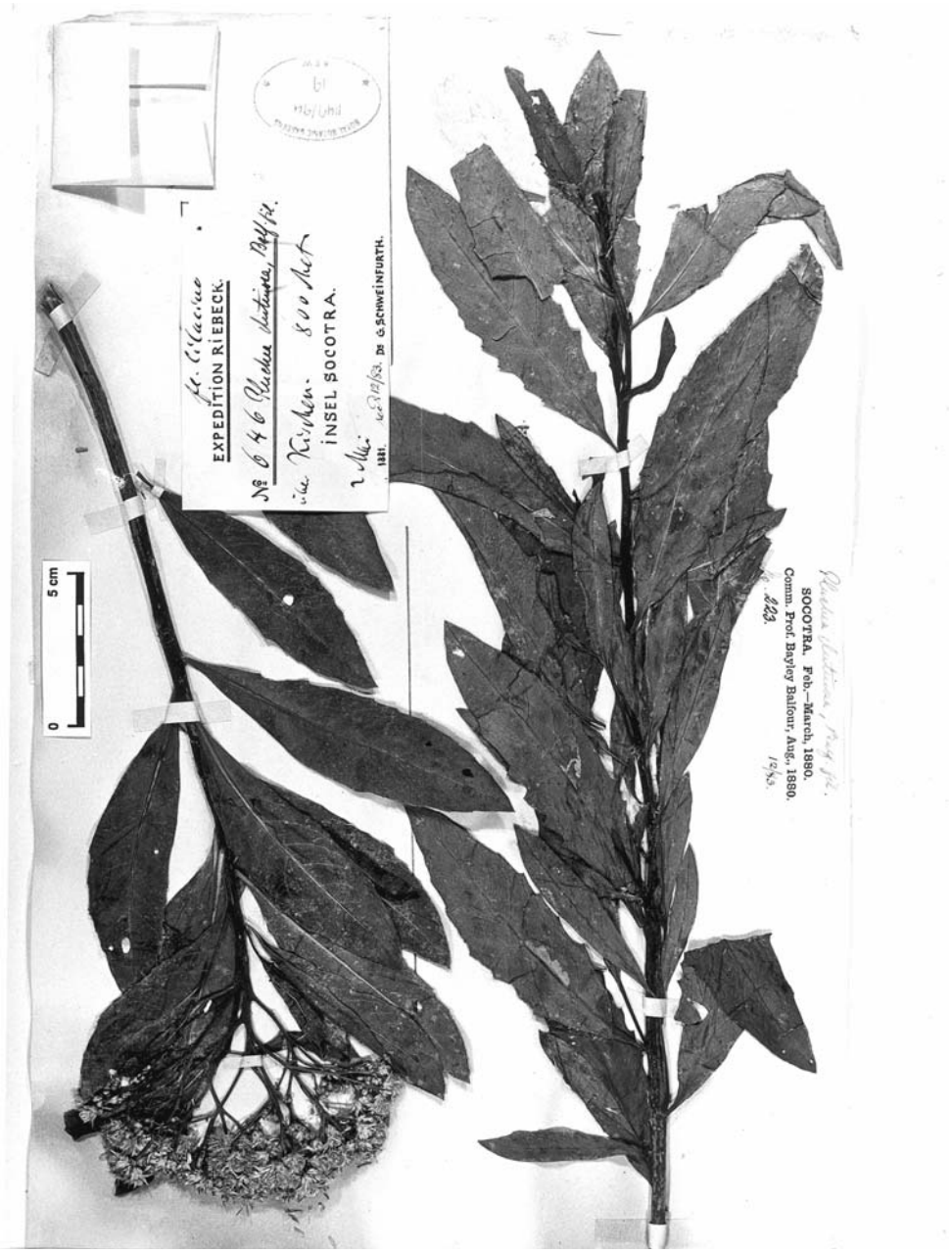

Fig. 7. *Pluchea glutinosa* – lectotype specimen (*Schweinfurth 646*).

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60-100; disc florets hermaphroditic, 9-15. *Peduncles* up to 0.5(0.7) cm long, with 0-2 bracts reaching the involucrum. *Involucral bracts* in 5-6 rows, outer and median bracts glandular; outer bracts 1.2-2.5 mm long, 1-1.2 mm wide, lanceolate to ovate, with fimbriate margins; inner bracts 5.5-6.5 mm long, 0.3-0.7 mm wide, linear, acute, with fimbriate apex. *Receptacle* cup-shaped, 1.2-1.7 mm in diameter. *Marginal florets* 3.4-4.4 mm long, minutely lobed. *Disc florets* (3.5)5-6.5 mm long, corolla purple, 5-lobed, lobes 0.4-0.5 mm long, glabrous or glandular; *anthers* 2.5-3 mm long, basal appendages 0.4-0.6 mm long, apical appendages more or less acute, filament collar cells swollen. *Achenes* sparsely hairy, indistinctly ribbed, heteromorphic; achenes of marginal florets 1-1.3 mm long, 0.2-0.3 mm in diameter; achenes of disc florets 0.6-1 mm long, 0.4-0.6 mm in diameter. *Pappus* 5-6 mm long, of 8-15 free barbellate bristles in one row, teeth protruding, bristles of disc florets 0.1-0.2 mm wide, bristles of marginal florets less wide and sometimes shorter.

Chromosome number: unknown.

Distribution and ecology
Endemic to Socotra (Mies 1994: 233) (Fig. 1), growing on the Hajhir ranges above Tamarida [Hadibo] and Wadi Qishn [Kischen]. According to Balfour (1888: 125) *Pluchea glutinosa* is a small undershrub, growing all over the hilly regions of the island.

Additional specimen examined
SOCOTRA: [near Gallonsir], *Balfour 223* (K, OXF).

6. *Pluchea sordida* (Vatke) Oliver & Hiern, Fl. Trop. Afr. 3: 328. 1877. – Fig. 8
≡ *Laggera sordida* Vatke in Oesterr. Bot. Z. 1875: 325. 1875. – Type: Zanzibar, 10.1873, *Hildebrandt 1022* (BM 21006!, K!, L!, W!).
= *Pluchea bequaertii* Robyns in Bull. Jard. Bot. État 17: 101. 1943. – Holotype: [Zaire], Kabare [2º28'S, 28º47'E], 1919, *Bequaert 5471* (BR!; isotype: B!, K!, P 11514!).

Notes: Robyns (1947: 484) considered *Pluchea bequaertii* as endemic to E Africa, occurring in the region S of Lake Edward and Lake Kivu and on the island of Idjwi. He mentioned in the description an affinity with *P. sordida* but separated *P. bequeartii* on the basis of its slightly fleshy leaves, longer peduncles and bigger capitula. Lisowski (1989: 27) also presumed a close relationship between the two taxa. I cannot confirm this distinction and consider *P. bequaertii* only as a bigger and more vigorous form of *P. sordida.*

Shrub up to 1 m high with erect branches, sparsely glandular, pilose to woolly, younger parts densely hairy, the trichomes simple, uniseriate, multicellular, 0.5-2 mm long, the glands sessile and sometimes stipitate. *Leaves* 1-5(7) cm long, 0.5-2(3) cm wide, obovate, seldom lanceolate, often with slightly recurved margin, entire or minutely dentate, sessile, pilose or woolly (density of non-glandular trichomes increasing towards margin), with the base attenuate or scarcely prolonged into a petiole and the apex acute or obtuse. *Capitula* numerous, (5.5)6-7.5(9) mm long, campanulate, sessile or pedunculate, heterogamous, forming a loose to dense corymbose panicle; marginal florets female, 60-100; disc florets hermaphroditic 3-20(25). *Peduncles* up to 20 mm long, densely pilose, glandular, with 0-6 bracts reaching the capitulum; bracts 1.5-4(6) mm long, 0.3-1.5(2) mm wide, lanceolate to linear, pilose, glandular, with entire margin, often resembling the outer involucral bracts. *Involucral bracts* in 5-6(7) rows, often with violet tips, the outer involucral bracts (1.2)1.5-2.5(3.7) mm long, (0.3)0.5-0.8(1.2) mm wide, pilose, lanceolate, acute, with fimbriate margins; inner involucral bracts (4)4.5-6(7.5) mm long, 0.3-0.6(0.8) mm wide, linear, acute, pilose, with fimbriate margins. *Receptacle* verrucose, (2.5)3-5(6) mm in diameter. *Marginal florets* 2.5-4(6) mm long, minutely 3(4)-lobed. *Disc florets* 4-5(6.8) mm long, corolla and stigma purple, corolla 5-lobed, lobes glandular; *anthers* tailed, 1.4-2.2(2.8) mm long, basal appendages 0.2-0.4 mm long, apical appendages obtuse, filament collar cells not swollen. *Achenes* hairy, terete to subangular, 0.8-1.1(1.3) mm long, 0.2-0.3(0.4) mm in diameter, indistinctly ribbed

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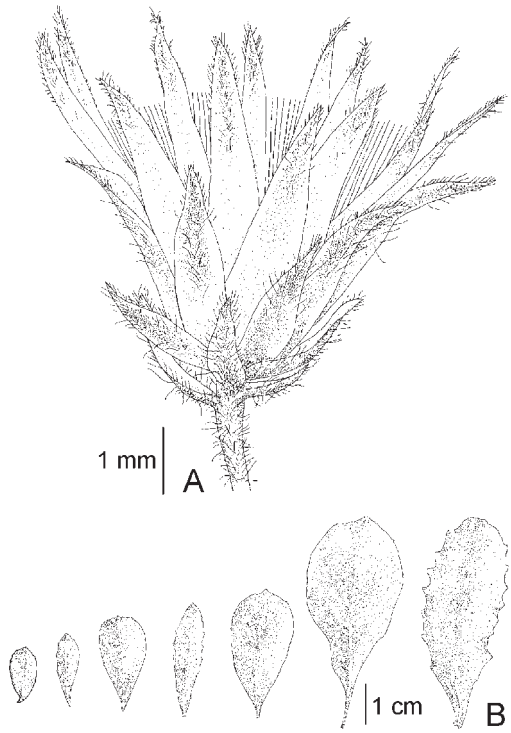

Fig. 8. *Pluchea sordida* – A: capitulum, from *H. Faulkner 4432* (B), B: leaf shapes.

with a small ring-shaped carpopodium; achenes of disc florets pale. *Pappus* (2.5)3-4(5) mm long, 10-20 free barbellate bristles with appressed teeth in one row, caducous.

Chromosome number: Renard & al. (1983) published two different chromosome numbers for *Pluchea bequaertii,* 2n = 20 for a Burundi specimen, 2n = 40 for a specimen from the Rift Valley, Kenya. However, the authors are not sure, if both samples belong to the same taxon.

Distribution and ecology
Pluchea sordida is widely distributed in E Africa (Ethiopia, Kenya, Tanzania, Zanzibar, Congo, Burundi and Rwanda) and has been found in grassland or open bushland, on swampy grounds and flood plains, on edges of salt flats, near riverbanks and the sea shore, on sandy soil and clayey loam. So far only a single record is known from the Arabian Peninsula, collected in Yemen in the area around Taiz (Fig. 1), where it is only known from thorn fences (Wood 1997: 292). Flowering and fruiting specimens were collected throughout the year, in Yemen in December.

Additional specimen examined
YEMEN: Wadi Hadhraan near Taiz [c. 13º34'N, 44º02'E], 26.12.1975, *J. R. I. Wood Y/75/1005* (BM 21176).

7. *Pluchea arabica* (Boiss.) Qaiser & Lack in Willdenowia 15: 451. 1986. – Fig. 9
≡ *Varthemia arabica* Boiss., Diagn. Pl. Orient., ser. 1, 6: 74. 1846 ≡ *Iphiona arabica* (Boiss.) Benth. in Bentham & Hooker, Gen. Pl. 2: 333. 1873 ≡ *Phagnalon arabicum* (Boiss.) Boiss., Fl. Orient. 3: 223. 1875. – Holotype: [Oman], Mascate, *Aucher-Eloy 4729* (G-BOIS; isotypes: BM 21190!, K!).

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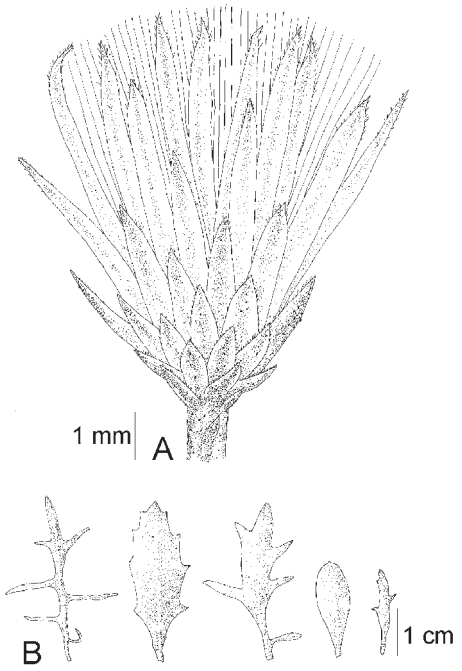

Fig. 9. *Pluchea arabica* – A: capitulum, from *Kilian & al. 5143* (B); B: leaf shapes.

= *Pluchea laxa* Baker in Bull. Misc. Inform. 1895: 182. 1895. – Holotype: [Oman], Dhofar Mts, 1895, *Bent 7* (K!).
= *Pluchea multiflora* O. Schwartz in Mitt. Inst. Allg. Bot. Hamburg 10: 277. 1939. – Holotype: [Yemen], Hadramaut, Makalla, 1931, *Wissmann 1450* (HBG!).

Ic.: Qaiser & Lack 1986: 452; Miller & Morris 1988: 105 (flowering branch, details).

Subshrub up to 1 m high with erect branches, densely glandular, viscid, sometimes pilose, the trichomes simple, uniseriate, multicellular, 0.2-0.6(0.8) mm long, the glands sessile and stipitate, older branches rough with residual leaf scars. *Leaves* (1)1.5-5 cm long, 0.3-2.5 cm wide, lanceolate to narrow lanceolate, sessile, entire or dentate, sometimes deeply irregularly divided to almost pinnatifid, sparsely hairy, seldom pilose, with attenuate base and acute apex. *Capitula* (6.5)7.5-9.5(10.5) mm long, obconoidal, pedunculate, heterogamous, forming loose corymbose panicles; marginal florets female, disc florets hermaphroditic, 10-20(25). *Peduncles* 1-3.5(5) cm long, densely glandular, with 0-6 bracts reaching the capitulum and resembling the outer involucral bracts. *Involucral bracts* in 6-7 rows, the outer involucral bracts (1.2)1.4-1.8 mm long, (0.4)0.5-0.7(0.8) mm wide, glandular, ovate, acute, margins fimbriate; inner involucral bracts (6.2)6.5-7.5(8.5) mm long, 0.3-0.4(0.5) mm wide, linear, acute, with fimbriate margin. *Receptacle* verrucose, 2.3.-3.4 mm in diameter. *Marginal florets* 4.2-5.2(6) mm long, minutely 3(4)-lobed. *Disc florets* (5.2)6-7(7.5) mm long, corolla and stigma purple, corolla 5-lobed, lobes glandular, 0.5-0.6 mm long; *anthers* tailed, 2.9-3.5 mm long, basal appendages 0.4-0.5 mm long, apical appendages acute, filament collar cells not swollen. *Achenes* hairy, terete to subangular, 1-1.2 mm long, 0.2-0.4 mm in diameter, indistinctly ribbed with a small ring-shaped carpopodium; achenes of disc florets pale. *Pappus* 4-6 mm long, of 7-12 free barbellate bristles with appressed teeth, in one row; pappus bristles of disc florets with plumose apex.

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Chromosome number: unknown.

Distribution and ecology

Pluchea arabica is endemic to the Arabian Peninsula and distributed throughout Oman and S Yemen (Fig. 1). In Oman it is very common along the coast (Blatter 1921: 236) and further inland. In Yemen *Pluchea arabica* is abundant in the SE growing on rocky slopes or in stony, sandy wadi beds. Flowering and fruiting species were found throughout the year.

Use

The plant is used medicinally to treat painful swellings and boils (Miller & Morris 1988: 104). The whole plant is strongly aromatic and sprigs were often plucked and rubbed between the hands and then over the body as a deodorant (Miller & Morris 1988: 104).

Additional specimens examined

OMAN: DHOFAR: 2 km from Mugsail, 16º45'N, 53º40'E, 9.11.1984, *I. McLeish 322* (E); plain NE of Mirbat [16º58'N, 54º43'E], 2.8.1985, *Miller 7231* (E); sea cliffs nr Ras Hamar, W of Raysut [c. 16º56'N, 53º50'E], 28.9.1979, *Miller 2314* (E, K); W Hinua E of Taqah [17º00'N, 54º25'E], 30.5.1985, *Miller 7037 A* (K); wadi 5 km ENE of Mirbat, 17º01'N, 54º44'E, 19.9.1984, *Miller 6181* (E); J. Qinguri, 17º02'N, 55º01'E, 4.11.1983, *Lawton 2521* (BM 21044); wadi on N side of Jebel Qara, [c. 17º10'N, 54º30'E], 9.3.1979, *Whitecombe 506* (E); ibid., 9.3.1979, *Whitecombe 514* (E); 72 km of Ashinhaib to Zeak, 17º20'N, 54º10'E, 27.4.1985, *McLeish 520* (E); Wadi Dawkah, N foothills of J. Qara, 17º23'N, 54º00'E, 21.9.1988, *Gallagher 6898/7* (E); J. Qara, 26.10.1977, *Lawton 1857* (BM 21043, K); ibid., 7.10.1943, *Vesey-Fitzgerald 1254/4* (BM 21153); Ayoon cross roads [Ayun: 17º15'N, 53º53'E], 23.9.1978, *Berkeley 109* (E); ibid., 6.5.1978, *Berkley 15* (BM 20926); wadi 18 km S of Thamrait, [c. 17º30'N, 54º00'E], 15.9.1984, *Miller 6044* (K); Sawqirah [18º07'N, 56º32'E], 29.9.1984, *Miller 6475* (K); Assubaithi, 1992, *Jongbloed* (K). — JIDDAT AL HARASIS: Plateau above Schuwaymiyah [17º53'N, 55º54'E], 18.9.1989, *Miller & Nyberg 9426* (E); Huqf Escarpment, 10 km S of Myhoos [c. 19º50'N, 56º30'E], 22.9.1989, *Miller & Nyberg 9501* (K); Yalooni, SE of Haima [19º56'N, 56º19'E], 28.4.1982, *Maconochie 3424* (E). — MASIRAH ISL.: Haql, 20º22'N, 58º47'E, 4.2.1982, *M. D. Gallagher 6356/2* (E). — N OMAN: 25 km N Sur on Al Kamil Rd [22º20'N, 59º30'E], 2.4.1982, *J. R. Maconochie 3307* (E); 30 km before Nizwa [c. 22º30'N, 57º30'E], 15.10.1984, *Miller 6583* (K); W Rafsah, SW of Sur. [c. 22º50'N, 59º20'E], 16.3.1976, *A. Radcliffe-Smith 3923* (K); Amlah near Ibri, Wadi al Ayn [Ibri: 23º15'N, 56º16'E], 12.1.1978, *R. Whitecombe 67* (E); 10 km W of Muscar, [23º37'N, 58º38'E], 18.3.1975, *Rubens 81* (E); Lansab industrial area, 23º32'N, 58º18'E, 5.6.1987, *Gallagher 7976/16* (E); E Batinah, 5 miles SE of Seeb Intnl. Airport [c. 23º45'N, 58º20'E], 26.2.1976, *Radcliffe-Smith 3635* (E, K); Nizwa Agric Institut farm, Firq, 23º47'N, 57º47'E, 17.10.1981, *Maconochie 2862* (BM 21057, E); Wadi Jizzi, 50 km E of Buraimi City, highway to Sohar [24º23'N, 56º35'E], 10.11.1986, *Boulos & El-Ghonemy 16318* (BM 20932).

YEMEN: HADRAMAUT: 25 km NE of Ghayl Ba Wazir, 14º59'N, 49º30'E, 21.9.1998, *Kilian & Hein NK 5027* (B). — MAHRAH: 16 km from Sayhut along road to Qishn, 15º15'N, 51º21'E, 16.10.1992, *Thulin & al. 8428 A* (UPS); W of Qishn, 15º22'N, 51º36'E, 24.9.1998, *Kilian & al 5091* (B); Jabel Sharwayn 10 km W of Qishn, 15º24'N, 51º35'E, 28.9.1998, *Hein & al. 5098* (B, herb. P. Hein); Gischin [?Qishn: 15º25'N, 51º40'E], 1902, *Hein* (WU); Wadi Gabûr, Umgebung von Gischin, 7.2.1902, *Hein* (WU); Gatgît, Gischin, 27.3.1902, *Hein* (HBG, WU); Nistaun bei Râs Farták, 7.-8.3.1899, *Paulay* (HBG, WU); wadi just S of Nishtun, 15º48'N, 52º11'E, 27.9.1998, *Kilian & al. 5239* (B); lower Wadi Hablah 40 km NNW of Ghaydah, 16º35'N, 52º03'E, 25.9.2998, *Hein & al. 4941* (B, herb. P. Hein); ibid., 16º40'N, 52ºE, 25.9.1998, *Kilian & al. 5143* (B).

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