

## THE COMPOSITAE OF NEW GUINEA VI\*

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### SUMMARY

This sixth article on the *Compositae* of New Guinea contains (1) additions to previous publications, mainly concerning *Eupatorium* and *Carpesium*, and (2) the treatment of tribe 5. *Heliantheae*, with 17 genera in the area.

### ADDITIONS TO PREVIOUS ARTICLES

#### Additions to part I

p. 515, add under line 17 from above:

c. Erect herbs; heads many-flowered, involucre 6-seriate (in New Guinea species), imbricate, setae of pappus filiform, scabrid . . . . . **4. Eupatorium**

p. 524, add above line 7 from below:

#### 4. EUPATORIUM

*Eupatorium* L., Sp. Pl. (1753) 836; Koster, Blumea 1 (1935) 492; Cabrera, Fl. Buenos Aires 6 (1963) 37; Aristeguieta in Lasser, Fl. Venezuela 10, 1 (1964) 119; Hilliard, Comp. Natal (1977) 52.

Herbs or shrubs *Leaves* mostly opposite, very rarely alternate. *Heads* few- to many-flowered, small or rather large, often corymbose; *involucre* one- to many-seriate, imbricate; *corolla* infundibuliform or having a campanulate limb, never yellow; *anthers* obtuse, rarely subsagittate at the base, with an apical appendage; *style-arms* usually long, obtuse at the apex, pubescent, long exserting; *achenes* oblong, 4–5-angular, truncate at the top, glabrous or with ciliate ribs; *pappus* existing of numerous filiform scabrid setae, uni-seriate; *receptacle* flat or slightly convex, glabrous or pubescent.

**D i s t r i b u t i o n:** About 600 species (Cabrera, l.c.); most in Central and South America, also Europe, Asia, Africa.

#### *Eupatorium odoratum* L.

*E. odoratum* L., Sp. Pl. ed. 2 (1763) 1174; Koster in Pulle, Fl. Suriname 4, 2 (1938) 113; Aristeguieta in Lasser, Fl. Venezuela 10, 1 (1964) 130, fig. 22; Hilliard, Comp. Natal (1977) 52.

\* I in Nova Guinea, Bot. 24 (1966) 497–614 (numbering of tribe in accordance with this paper); II in Blumea 18 (1970) 137–145; III in Blumea 20 (1972) 193–226; IV in Blumea 22 (1975) 207–217; V in Blumea 23 (1976) 163–175.

Branched herb; *stem* terete, subglabrous or sparsely hirsute (hairs curved, whitish), 4 mm thick; *branches* thin, c. 1 mm thick, internodes 5–17 cm long. *Leaves* opposite, shortly petiolate, blades deltoid-oblong, cuneate, acute at the base, gradually attenuate, acute at the apex, undulate-dentate, chartaceous, hirsute at both sides, corrugate above, 3–5.5 cm long, 1–2.5 cm broad; petiole 3–6 mm long. *Heads* corymbose, pedunculate, peduncles filiform, 0.5–1.5 cm long, often with one minute linear bract; *involucre* cylindrical, 1 cm long, phyllaries 5–6-seriate, appressed, gradually shorter to the exterior ones, oblong, with dark prominent ribs, acute and mucronate or obtuse at the apex. *Flowers* numerous; *corolla* narrow, 5 mm long, lobes short, acute; *anthers* subobtusate at the base, subobtusate at the apex; *style-arms* long, linear, subobtusate; *achenes* thin, linear-turbinate, subangular, sparsely hirsute, 4–5 mm long; setae of *pappus* dingy whitish, 5 mm long; *receptacle* convex.

**Distribution:** South America, introduced into India, Ceylon, Vietnam, Thailand, the Malay Peninsula, the Philippine I., Indonesia, New Guinea, South Pacific I.

NEW GUINEA. E a s t. New Britain Dist.: Rabaul subdist., Malabunga, Gazelle Peninsula, 1970, *Henty NGF 49130* (L).

**Collector's annotations:** Young shoots erect to 90 cm, later scandent, leaves foetid-smelling, corolla bluish-white.

**Ecological notes:** Weed at edge of cocoa plantation.

p. 603, add on line 18 from above after 'herb.: – 9–13 cm tall.; change on line 22 from above '2.5' into '11'; add on line 4 from below: Central Dist.: subdist. Port Moresby, southern Mt. Victoria Range, crest, 1974, *Croft LAE 61782* (L).

**Collector's annotation:** Flowers white to pinkish.

**Ecological notes:** Alpine grassland, shallow fen; altitude 3600 m.

### Additions to part III

p. 193, on line 19 from above 'small, numerous' has to be omitted and '3. *Epaltes*' has to be changed into '9'; after line 3 from below two lines have to be added:

9a. Outer phyllaries scarious; achenes oblong. . . . . **3. *Epaltes***

b. Outer phyllaries foliaceous or with herbaceous appendage; achenes narrowly lageniform, beaked . . . . . **10. *Carpesium***

p. 225, add after line 9 from above:

### 10. CARPESIMUM

*Carpesium* L., Sp. Pl. (1753) 859; Benth. & Hook. f., Gen. Pl. 2 (1873) 336; Hoffmann in E. & P., Nat. Pfl. Fam. 4 (5) (1894) 206; Bailey, Queensl. Fl. 3 (1900) 856; Gagnepain in Lec., Fl. Indo-Chine 3 (1924) 559; Ohwi, Fl. Japan (1965) 861; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 396.

Erect branched herbs. *Leaves* alternate. *Heads* terminal or axillary, sessile or shortly pedunculate, heterogamous, disciform; *involucre* semiglobose, phyllaries few-seriate, imbricate, outer ones foliaceous or with herbaceous appendage, inner ones oblong, obtuse or sometimes acute, scarious. *Marginal flowers* many-seriate, female; *corolla* tubular, with 3–5 short teeth, yellow; *style-arms* short, linear,

rounded at the apex, flat; *achenes* narrowly lageniform, beaked, ribbed, glabrous, beak glandular, *pappus* wanting. *Disc-flowers* numerous, bisexual, *corolla* slender, infundibuliform, limb slightly dilate, with 5 lobes; *anthers* sagittate at the base with a filiform auricle at both sides, rounded at the apex; *style-arms* spatulate, rounded at the apex; *achenes* like those of marginal flowers; *receptacle* flat or convex, naked.

**D i s t r i b u t i o n:** 34 (or less) species in southeast Asia, New Guinea, Australia, Europe.

### ***Carpesium cernuum* L.**

*C. cernuum* L., Sp. Pl. (1753) 859; Clarke, Comp. Ind. (1876) 130; Hoffmann in E. & P., Nat. Pfl. Fam. 4 (5) (1894) 206, fig. 103, a–e; Bailey, Queensl. Fl. 3 (1900) 856; Gagnepain in Lec., Fl. Indo-Chine 3 (1924) 560, fig. 59 (11); Van Steenis, Bull. Jard. Bot. Btzg. sér. 3, 13 (2) (1934) 186; Fournier, Fl. France (1946) 957; Ohwi, Fl. Japan (1965) 863; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 396.

Erect herb, 9–100 cm tall, *stem* c. 5 mm thick, densely whitish hirsute, much-branched; *branches* often obliquely erect, internodes 2–11 cm long. *Leaves* undulate-mucronate-dentate, hirsute at both sides, chartaceous, lower ones petiolate, spatulate-oblong or ovate or ovate-lanceolate, long-attenuate to the base or abruptly narrowed or subcordate at the base, acute or obtuse, shortly or long acuminate, 2–25 cm long, 1–6 cm broad; petioles narrowly alate, 0.5–14 cm long; higher leaves sessile, lanceolate-ovate, elliptic or spatulate- or lanceolate-oblong, attenuate and acute at both ends, 2–7 cm long, 0.5–2 cm broad, short or long acuminate. *Heads* solitary, terminal, nodding, 0.5–2 cm diam., peduncles 3–50 mm long; *phyllaries* 3–4-seriate, outer ones foliaceous, oblong or lanceolate, acute, hirsute, inner ones much shorter, 3–5 mm long, narrowly oblong, acute, obtuse, or rounded, subequal in length, stramineous, pubescent; *corolla* of *marginal flowers* ovoid, with 3–5 lobes, c. 2 mm long, *achenes* c. 2.5 mm long; *corolla* of *disc-flowers* 2.5 mm long, with campanulate limb with 5 lobes; *receptacle* convex.

**D i s t r i b u t i o n:** India, Indonesia, Philippine I., Vietnam, Formosa, China, Corea, Ryu Kyu I., Japan, New Guinea, Australia, Europe.

NEW GUINEA. **E a s t.** Northern Dist.: Mt. Kenive, (Nisbet) west slope, Kokoda Dist., 1974, *Croft LAE 65171* (L). — Morobe Dist.: Sattelberg, Sambanga, 1937, *Clemens 7051* (A, L); Amieng, 1941, *Clemens 12043* (A).

**C o l l e c t o r s ' a n n o t a t i o n s:** Flowers yellow or yellowish.

**E c o l o g i c a l n o t e s:** Margin of river, on stone and bank; moderate to steep sloping grassland, intermontane valley, densely covered with *Cyathea*; altitude (1500–1800)–2400 m.

**R e m a r k:** Clarke (l.c. 130–131) distinguished 6 varieties of *Carpesium cernuum* L., which as he stated, could be considered to be species as well.

Gagnepain (l.c.) mentions the great variability of this species as far as concerns the shape of the leaves, the size of the heads, and the pilosity.

In this light it would not be advisable to distinguish the slender plants from Morobe Dist. (*Clemens 7051* and *12043*) as a form or a variety of *Carpesium cernuum* L., before a profound study of the variability of the whole species has been made.

## 5. HELIANTHEAE

*Heliantheae* Cass., J. Phys. Chim. Hist. Nat. 88 (1819) 189; Hoffmann in E. & P., Nat. Pfl. Fam. 4 (5) (1894) 210.

Herbs or shrubs *Leaves* mostly opposite. *Heads* heterogamous or homogamous, rarely unisexual; *corolla* mostly yellow, rarely white, red, purple, or violet; *marginal flowers* female or neuter, *corolla* ligulate, rarely tubular or reduced; *disc-flowers* bisexual or sterile, *corolla* tubular, 4- or 5-lobed, *anthers* 4 or 5, obtuse, slightly sagittate at the base, obtuse at the top, *style-arms* often lanceolate, acute, flat, *pappus* wanting or existing of scales or needles or setae, never of fine setae, *receptacle* mostly paleaceous.

*Distribution*: Mostly in America.

## KEY TO THE GENERA IN NEW GUINEA

- 1a. Leaves alternate; heads unisexual, homogamous, female ones lower down in the axils of the leaves, 2-flowered, inner phyllaries connate into a 2-loculate body provided with hooks or spines; corolla wanting, achenes enclosed in the involucre; masculin heads terminal and in the axils of the upper leaves, many-flowered, achene rudimentary. Monoecious . . . . . **1. Xanthium**
- b. Leaves alternate or opposite; heads heterogamous or homogamous, inner phyllaries not connate into a 2-loculate body; marginal flowers female or neuter or wanting, corolla present; disc-flowers bisexual . . . . . 2
- 2a. Leaves opposite; heads small, sessile or on short peduncles, solitary in the axils of the leaves and forks of the stem; inner phyllaries closely enveloping the achenes of the marginal flowers, enlarged in fruit. . . . . **2. Acanthospermum**
- b. Leaves opposite or alternate; inner phyllaries not closely enveloping the achenes, not enlarged in fruit. . . . . 3
- 3a. Achenes crowned by 2–8 retrorsely hispid awns, pappus wanting. . . . . 4
- b. Achenes not crowned by retrorsely hispid awns, pappus present or wanting. . . . . 7
- 4a. Achenes orbiculate, dorsally compressed . . . . . **3. Coreopsis**
- b. Achenes linear, linear-oblong, linear-fusiform, obovate-oblong, or cuneate, compressed or 3- or 4-gonous . . . . . 5
- 5a. Radical leaves dense, cauline ones few, alternate or opposite; in New Guinea species phyllaries lanceolate, marginal flowers female . . . . . **4. Glossogyne**
- b. Leaves opposite, upper ones sometimes alternate; outer phyllaries often foliaceous or herbaceous, inner ones with membranaceous margins, marginal flowers neuter or wanting or rarely female. . . . . 6
- 6a. Achenes linear-fusiform, more or less 4-angular, compressed; in New Guinea species with long hispid beak . . . . . **5. Cosmos**
- b. Achenes gradually longer to central part of head, obovate-oblong, cuneate or linear, often narrowed in the upper part but not beaked . . . . . **6. Bidens**
- 7a. Pappus existing of scales or many plumose long hairs. . . . . 8
- b. Pappus wanting or existing of 1–3 hairs or needles or awns. . . . . 12
- 8a. Pappus existing of many plumose long hairs. . . . . **7. Tridax**
- b. Pappus existing of scales, sometimes with 2 lanceolate awns. . . . . 9
- 9a. Pappus in New Guinea species existing of 5–10 scales with fringed margins and 2 lanceolate awns. . . . . **8. Tithonia**

- b. Pappus existing of scales without 2 lanceolate awns. . . . . 10
- 10a. Achenes obovoid, thick, rotundate at the apex; pappus cup-shaped, short, existing of connate fringed scales. . . . . **9. Eleutheranthera**
- b. Achenes turbinate or obconical-oblong; pappus not cup-shaped . . . . . 11
- 11a. Scales of pappus oblanceolate, long. . . . . **10. Galinsoga**
- b. Scales of pappus subdeltoid, short. . . . . **11. Wedelia**
- 12a. Achenes of marginal flowers with 2 wings along the margins and 2 awns at the apex . . . . . 17
- b. Achenes without marginal wings. . . . . 13
- 13a. Achenes with an irregularly dentate rim at the apex. . . . . **13. Eclipta**
- b. Achenes without an irregularly dentate rim at the apex. . . . . 14
- 14a. Phyllaries 5, with patent gland-hairs . . . . . **14. Sigesbeckia**
- b. Phyllaries one- to many-seriate, without patent gland-hairs . . . . . 15
- 15a. Outer phyllaries foliaceous. . . . . **15. Spilanthes**
- b. Outer phyllaries not foliaceous . . . . . 16
- 16a. Phyllaries 2–3-seriate, acute or obtuse at the apex. . . . . **11. Wedelia**
- b. Phyllaries 3- to many-seriate, imbricate, squarrose, rounded and erose at the apex . . . . . **16. Zinnia**
- 17a. Wings of achenes of marginal flowers laciniate (teeth rigid, flattened, acute). . . . . **12. Synedrella**
- b. Wings of achenes not laciniate . . . . . **17. Verbesina**

1. XANTHIUM

*Xanthium* L., Sp. Pl. (1753) 987; Lessing, Syn. Comp. (1832) 219; Benth. & Hook. *f.*, Gen. Pl. 2 (1873) 355; Clarke, Comp. Ind. (1876) XI; Hoffmann in E. & P., Nat. Pfl. Fam. 4(5) (1894) 222; Bailey, Queensl. Fl. 3 (1900) 857; Widder, Repert. spec. nov. 20, Beih. (1923) 6; Robertson in Black, Fl. S. Austr., ed. 2, 4 (1957) 873; Cabrera, Fl. Buenos Aires 6 (1963) 190; Aristeguieta in Lasser, Fl. Venezuela 10 (1) (1964) 478; Koster in Backer & Bakh. *f.*, Fl. Java 2 (1965) 399; Ohwi, Fl. Japan (1965) 866; Wild, Kirkia 6 (1) (1967) 3; Cabrera in Correa, Fl. Patag. 7 (1971) 131.

Herbs, monoecious, annual. *Leaves* alternate, lobate or coarsely dentate, petiolate. *Heads* solitary or glomerate, terminal and axillary, unisexual, homogamous; *female* ones lower down in the axils of the leaves, 2-flowered, ovoid, sessile, outer phyllaries *c.* 5, connate at the base, short, inner ones connate into an ellipsoid firm *2-locellate* body provided with hooks or spines (free tips of the phyllaries), each locellus with a hollow, conical, bidentate beak at the apex, one *flower* in the beak, *involucre* after anthesis hardened and enlarged, *achenes* enclosed in the involucre, oblong, compressed, glabrous, *pappus* wanting; *masculine heads* terminal and in the axils of the upper leaves, globose, many-flowered, deciduous after anthesis, *phyllaries* numerous, small, *corolla* infundibuliform, 5-dentate, filaments connate, *anthers* free, obtuse at the base and at the apex, *achenes* rudimentary, stalk-like, receptacle columnar, paleaceous.

**D i s t r i b u t i o n:** About 70 species in North, Central, and South America, Atlantic I., Europe, Asia Minor, Asia, Africa, Australia, Pacific I.

**Xanthium pungens** Wallroth

*X. pungens* Wallroth, Beitr. Bot. 1, 2 (1844) 227, 231–232; Widder, Repert. spec. nov. 20, Beih. (1923) 64; *ibid.* 41 (1937) 280; Robertson in Black, Fl. S. Austr. ed. 2, 4 (1957) 874; Parham, Pl. Fiji (1964) 232–235.

Branched herbs, *stem* angular, ribbed, sparsely hispid (hairs short, thick), 6 mm thick. *Leaves* cordate, cuneate at the base, acute at the apex, irregularly coarsely dentate (teeth acute); *blades* 9–10.5 cm long, 10.5–12 cm broad, shortly hispid at both sides, chartaceous, petiole 4.5–5.5 cm long. *Involucre* body of female heads later on 22 mm long, 11 mm thick; outer *phyllaries* lanceolate; *masculine heads* 11 mm diam., *corolla* 1.5 mm long.

**D i s t r i b u t i o n:** North America, introduced into southeast Africa, Australia, New Guinea, Fiji I.

NEW GUINEA. E a s t. Central Dist.: Port Moresby subdist., Lakoli Valley, 1970, *Womersley NGF 43679* (L).

**C o l l e c t o r ' s a n n o t a t i o n:** Erect shrubby plants.

**E c o l o g i c a l n o t e s:** On cultivated and waste land; altitude 75 m.

**R e m a r k:** Widder (1937) 280 reports transitional forms between *X. pungens* and *X. occidentale* Bertol. from the coasts of North America as well as from southeast Africa. Possibly, both species have to be combined to one species.

## 2. ACANTHOSPERMUM

*Acanthospermum* Schrank, Pl. Rar. Hort. Monac. (1819) pl. 53; Benth. & Hook. *f.*, Gen. Pl. 2 (1873) 349; Hoffmann in E. & P., Nat. Pfl. Fam. 4 (5) (1894) 218; Blake, Contr. U.S. Nat. Herb. 20 (10) (1921) 384; Cabrera, Fl. Buenos Aires 6 (1963) 180; Humbert, Fl. Madagascar 3 (1963) 629; Aristeguieta in Lasser, Fl. Venezuela 10 (1) (1964) 468; Wild, Kirkia 6 (1967) 5; Stuessy, Ann. Miss. Bot. Gard. 62 (4) (1975) 1062; Hilliard, Comp. Natal (1977) 292.

Dichotomous, much branched herbs. *Leaves* opposite, subentire or pinnatifid. *Heads* small, sessile or on short peduncles, solitary in the axils and forks of the stem, heterogamous, radiate; *involucre* 2-seriate, outer *phyllaries* 4–6, elliptic or ovate, herbaceous, uniseriate, inner *phyllaries* 5–8, closely enveloping the achenes of the marginal flowers, enlarged in fruit; *marginal flowers* female, 5–8, uniseriate, fertile, *corolla* ligulate, elliptic or ovate, emarginate or with 3 teeth at the apex, tube as long as or much shorter than limb, pale yellow, *achenes* with closely enveloping indurate *phyllaries*, cuneate or oblong-fusiform or rarely trigonous-turbinate, laterally compressed, more or less densely echinate, with mostly uncinuate prickles, those at the apex usually elongate, *pappus* wanting; *disc-flowers* bisexual, 5–30, sterile, *corolla* tubular, yellowish, tube short, limb infundibuliform or campanulate, with 5 lobes at the apex, *anthers* cordate-sagittate or cordate or subentire at the base, with ovate obtuse appendage at the apex, *style* undivided, clavate, obtuse, hispidulous, *achenes* thin, empty; *pappus* wanting; *receptacle* small, convex or conical, with membranous concave pales enveloping the disc-flowers.

**D i s t r i b u t i o n:** 10 species in Central and South America, some introduced into North America, Africa, India, Australia.

### *Acanthospermum hispidum* DC.

*A. hispidum* DC., Prodr. 5 (1836) 522; Blake, Contr. U.S. Nat. Herb. 20 (10) (1921) 386; White, Proc. R. Soc. Queensl. 34 (1922) 60; Mattfeld, Engl. Bot. J. 62 (1929) 430; Humbert, Fl. Madagascar 3 (1963) 629, fig. 115, 5–12; Cabrera, Fl. Buenos Aires 6 (1963) 182; Aristeguieta in Lasser, Fl. Venezuela 10 (1) (1964) 469; Wild, Kirkia 6 (1967) 5; Hilliard, Comp. Natal (1977) 292.

Erect herb, 30–60 cm tall, rooting at the lower part, dichotomously branched, *stem* subangular, sparsely hispid-pilose (hairs long) or subglabrous, 4–6 mm thick. *Leaves* sessile, elliptical or deltoid-ovate, cuneate, gradually attenuate at the base, obtuse and mucronate at the apex, chartaceous, sparsely hispid-pilose at both sides, sparsely glandular below, subentire or repand-dentate (teeth very short), 1.5–4.5(–12.5, *fide* Blake) cm long, 0.5–2.5(–8, *fide* Blake) cm broad. *Heads* solitary in the axils of the leaves, subsessile; *phyllaries* 5, oblong, acute at the apex, hispid-pilose (hairs long) on the margin, membranous; *marginal flowers* 5–8 (*fide* Blake), ligule of *corolla* elliptical with 3 teeth at the apex, sparsely hispid-pilose, c. 1.5 mm long, *style* lanceolate, obtuse, *achenes* angular, cuneate, compressed, densely uncinatate-hispid, 4–5 mm long, with 2 more or less straight or curved, 3–5 mm long prickles at the apex; *disc-flowers* c. 7, *corolla* hispid-pilose, c. 1.5 mm long, lobes fairly long, ovaries glandular; pales of *receptacle* membranous, lacerate and acuminate at the upper part.

**D i s t r i b u t i o n:** South America, introduced into Madagascar, Africa, India, Lesser Sunda I., Philippine I., New Guinea, northern Australia.

NEW GUINEA. West. Merauke: 1967, *Nadi* 775 (L). – East. Central Dist.: Port Moresby, 1935, *Carr* 11880 (BM, L).

**C o l l e c t o r s ' a n n o t a t i o n s:** To 75 cm tall, flowers yellow.

**E c o l o g i c a l n o t e s:** Open places, sea level.

### 3. COREOPSIS

*Coreopsis* L., Sp. Pl. (1753) 907; Sherff, Publ. Field Mus. Nat. Hist. Bot. 11 (6) (1936) 281; Sherff & Alexander, N. Am. Fl. ser. 2, 2 (1955) 4; Hilliard, Comp. Natal (1977) 315.

Herbs or shrubs. *Leaves* opposite or rarely alternate, entire or tripartite, or 2–3-ternate, or pinnipartite. *Heads* solitary or loosely corymbose-paniculate, pedunculate, heterogamous, radiate; *involucre* mostly 2-seriate, outer *phyllaries* more or less connate at the base, much narrower and often shorter than inner ones; *marginal flowers* c. 8, mostly neuter, *corolla* ligulate, entire or dentate at the apex; *disc-flowers* numerous, bisexual, *corolla* tubular, limb widened, 4–5-dentate, *anthers* entire or shortly sagittate at the base, subacute at the apex; *style-arms* pilose at the apex or somewhat below; *achenes* dorsally compressed, orbiculate, oblong or linear-oblong, often with 2 wings; *pappus* wanting or consisting of prickles or scales; *receptacle* flat or convex, with linear-lanceolate pales.

**D i s t r i b u t i o n:** About 130 species in North, Central, and South America, tropical Africa, China, Japan, Malaya, Hawaii I.

#### **Coreopsis tinctoria** Nutt.

*C. tinctoria* Nutt., J. Acad. Philad. 2 (1821) 114; Val., Bull. Dép. Agric. Ind. Néerl. 10 (1907) 70; Mattfeld, Engl. Bot. J. 62 (1929) 437; Sherff, Publ. Field Mus. Nat. Hist. Bot. 11 (6) (1936) 417; Sherff & Alexander, N. Am. Fl. ser. 2, 2 (1955) 30.

Erect herb, 60–120 cm (*fide* Sherff) tall, branched; *stem* more or less quadrangular or nearly round, glabrous, 2–3 mm thick. *Leaves* opposite, subsessile or shortly petiolate, 1- or 2-pinnate, 5–17 cm long, upper ones undivided, leaflets linear or linear-lanceolate, 1–2 mm broad. *Heads* terminal and in the axils of the

upper leaves, subcorymbose, on thin peduncles 4–11 cm long, radiate; *involucre* 3–4-seriate, glabrous, outer phyllaries *c.* 8, linear- or spatulate-oblong, *c.* 2 mm long, inner ones deltoid- or ovate-oblong, 5–6 mm long; *marginal flowers* 7 or 8, ligule of *corolla* obovate, 3-lobate at the apex, 7–15 mm long; *corolla* of *disc-flowers* 15.2 mm long, *style-arms* obtuse, *achenes* linear-oblong, compressed, glabrous, 1.5–4 mm long, black; *receptacle* flat.

**D i s t r i b u t i o n:** North America, introduced into China (*vide* Sherff).

NEW GUINEA. West. Near Merauke, escaped from garden, 1904–1905, *Koch s.n.* (BO, L).

#### 4. GLOSSOGYNE

*Glossogyne* Cassini, Dict. Sci. Nat. ed. 2, 5 (1827) 475; Lessing, Syn. Comp. (1832) 212; Benth. & Hook. f., Gen. Pl. 2 (1873) 388; Clarke, Comp. Ind. (1876) 141; Hoffmann in E. & P., Nat. Pfl. Fam. 4 (5) (1894) 244; Bailey, Queensl. Fl. 3 (1900) 865; Gagnepain in Lec., Fl. Indo-Chine 3 (1924) 594; Robertson in Black, Fl. S. Austr. ed. 2, 4 (1957) 876; Ohwi, Fl. Japan (1965) 902.

Perennial herbs, glabrous. Radical *leaves* dense, cauline ones few, remote, alternate or opposite. *Heads* small, terminal, on long peduncles, heterogamous, radiate, or homogamous; *phyllaries* shortly connate at the base, 2- or 3-seriate; *marginal flowers* female or wanting, *corolla* ligulate, *achenes* linear-oblong, compressed, glabrous, crowned by 2–4 retrorsely hispid rigid awns, *pappus* wanting; *disc-flowers* bisexual, *corolla* tubular, 5-dentate, *anthers* obtuse at the base, *style-arms* long, subulate, hirsute, *achenes* like in marginal flowers; *receptacle* flat, paleaceous.

**D i s t r i b u t i o n:** 9 species in India, Indo-China, China, Formosa, Japan, Indonesia, Philippine I., Marianes, New Guinea, Australia, New Caledonia, New Zealand, New Hebrides.

#### *Glossogyne tenuifolia* (Labill.) Cassini

*Bidens tenuifolia* Labill., Sert. Austr. Caled. (1825) 44, t. 45. — *G. tenuifolia* Cassini in Dict. Sci. Nat. ed. 2, 5 (1827) 475; Benth., Fl. Austr. 3 (1866) 544; Bailey, Queensl. Fl. 3 (1900) 865; Gagnepain in Lec., Fl. Indo-Chine 3 (1924) 595; Van Steenis, Bull. Jard. Bot. Btzg. sér. 3, 12 (1932) 168, fig. 4; Robertson in Black, Fl. S. Austr. ed. 2, 4 (1957) 876, fig. 1174; Ohwi, Fl. Japan (1965) 902; Beadle *et al.*, Fl. Sydney Reg. (1972) 459; Fosberg *et al.*, Smithson. Contr. Bot. 22 (1975) 42.

Slender, erect or decumbent herb, sparsely or not branched, 15–50 cm tall, with thickened taproot; *stem* single or several together, ribbed, glabrous, thin, 1–1.5 mm thick; internodes 2–20 cm long. *Leaves* dense, at the base of the stem and the branches, cauline leaves few or wanting, alternate, petiolate, blades pinnate or pinnatifid, in outline often deltoid, 1–2.5 cm long, 0.5–3 cm broad, with 2–7 linear segments, subobtuse, shortly mucronate, entire, glabrous, coriaceous, uninnerved, 5–15 mm long, 1–2 mm broad; petiole thin, 1–5 cm long. *Heads* small, terminal on slender 1–13 cm long peduncles with minute linear bracts at the base; *involucre* campanulate, 2–2.5 mm long, 2-seriate, *phyllaries* *c.* 7, lanceolate, acute, glabrous; *marginal flowers* *c.* 8, tube of *corolla* 1 mm long, ligule spreading, broadly obovate, obtusely 3-dentate at the apex, parallel-nerved, 2 mm long, *style-arms* short, obtuse, *achenes* linear-oblong, compressed, glabrous, striate, 5–6 mm long, crowned by two rigid awns, retrorsely hispid at the apex; *dis-flowers* *c.* 9, *corolla* 3 mm long, *style-arms* long, subulate, hirsute, *achenes* like those of marginal flowers.



**D i s t r i b u t i o n:** Indonesia, Philippine I., Indo-China, Thailand, China, Formosa, Japan, New Guinea, Australia, New Caledonia, Fiji I., New Hebrides, Marianes.

NEW GUINEA. East. Milne Bay Dist.: Bimara, 1948, *Crutwell 116* (K); Baiawa, Moi Biri Bay, occasional, 1953, *Brass 22098* (L, LAE); north coast of Cape Vogel Penins., near Medino village, fairly common, 1954, *Hoogland 4669* (A, BM, BO, CANB, L). — Northern Dist.: Oro Bay, c. 1 km south of Beamu village, 1953, *Hoogland 3891* (A, L). — Central Dist.: Kanosia, 1935, *Carr 11150* (BM, L). — Morobe Dist.: vicinity of Kabajit Mission, 1939, *Clemens 10619, 40747, 40755* (A); Gusap, Ramu R., 1959, *Brass 32507* (US); Wau subdist., between Kaisenik and Wuri-Wuri, 1968, *Streimann & Kairo NGF 39127* (L).

**C o l l e c t o r s ' a n n o t a t i o n s:** Fleshy taproot, flowers golden or bright yellow, corolla of marginal flowers bright red.

**E c o l o g i c a l n o t e s:** Tracks and (dry) ridges in grasslands, in regularly burnt grasslands, open savanna land, on rocky soil; altitude 15–450 (–1140) m.

## 5. COSMOS

*Cosmos* Cav., *Icon. Descr.* 1 (1791) 9; Benth. & Hook. *f.*, *Gen. Pl.* 2 (1873) 387; Boerlage, *Handl.* 2 (1891) 210; Hoffmann in E. & P., *Nat. Pl. Fam.* 4 (5) (1894) 245; Sherff, *Publ. Field Mus. Nat. Hist. Bot.* 8 (6) (1932) 401; Sherff & Alexander, *N. Am. Fl. ser. 2*, 2 (1955) 130; Humbert, *Fl. Madagascar* 3 (1963) 660; Aristeguieta in Lasser, *Fl. Venezuela* 10 (2) (1964) 637; Koster in Backer & Bakh. *f.*, *Fl. Java* 2 (1965) 413.

Herbs. *Leaves* opposite, entire or lobate, or pinnate, or pinnatifid. *Heads* terminal or axillary, solitary or corymbose, on long peduncles, heterogamous, radiate or rarely homogamous, discoid; *involucre* subhemispherical, *phyllaries* 2-seriate, connate at the base, mostly about equal in length, outer ones mostly 8, herbaceous, inner ones membranous; *marginal flowers* uniseriate, 8, neuter, *corolla* ligulate, ligule obovate, with entire or dentate apex; *disc-flowers* numerous, bisexual, *corolla* tubular, with 5 teeth at the apex, *style-arms* thin, thickened at the upper part, with the apex triangularly broadened, acute, pubescent, *anthers* with entire or subsagittate base and acute apex, *achenes* linear-fusiform, more or less quadrangular, compressed, striate, mostly beaked, with 2–8 divaricating, retrorsely hispid awns, pappus wanting; *receptacle* flat, with narrowly oblong, acute, membranous pales.

**D i s t r i b u t i o n:** 31 species in North, Central, and South America; one species introduced in other tropical and subtropical regions.

### **Cosmos caudatus** H.B.K.

*C. caudatus* H.B.K., *Nov. Gen. Spec.* 4 (1820) 240; Valetton, *Bull. Dép. Agric. Ind. Néerl.* 10 (1907) 69; Mattfeld, *Engl. Bot. J.* 62 (1929) 439; Sherff, *Publ. Field Mus. Nat. Hist. Bot.* 8 (6) (1932) 411; Koster in Pulle, *Fl. Suriname* 4, 2 (1935) 156; Sherff & Alexander, *N. Am. Fl. ser. 2*, 2 (1955) 133; Humbert, *Fl. Madagascar* 3 (1963) 662, pl. 121, fig. 18–20; Parham, *Pl. Fiji Isl.* (1964) 232–235; Aristeguieta in Lasser, *Fl. Venezuela* 10 (2) (1964) 641, fig. 111; Koster in Backer & Bakh. *f.*, *Fl. Java* 2 (1965) 414.

Erect branched herb, 20–70 cm tall; *stem* subangular, grooved, sparsely hirsute, 5–10 mm thick. *Leaves* subdeltooid, 3–4-pinnate or 3–4-pinnatifid, on thin, 5–10 mm long petiole; blade 4–20 cm long, 3–15 cm broad, leaflets or segments lanceolate or oblong-lanceolate, acuminate and acute at the apex, glabrous, 2–8

mm wide. *Heads* terminal, solitary, on thin, subglabrous, 5–20 cm long peduncles, rarely with few linear, entire, 1.5–2 cm long bracts; outer *phyllaries* linear-lanceolate, acuminate and acute at the apex, glabrous, ciliate at the margins, 7–9 mm long; inner ones narrowly oblong, acute at the apex; *marginal flowers* c. 8, ligule of *corolla* oblanceolate-oblong, with 3 lobes at the apex, 1–1.5 cm long; *corolla* of *disc-flowers* 7–8 mm long, *achenes* somewhat curved, 1–3 cm long, with long, hispid beak, and with mostly 2 awns at the apex.

**D i s t r i b u t i o n:** Central and South America, introduced into India, China, Thailand, Indo-China, Indonesia, Philippine I., New Guinea, Australia, Hawaii I., Fiji I., Mauritius, Madagascar.

**NEW GUINEA.** West. Merauke Dist.: Merauke, 1904, *Koch s.n.* (BO, L). – East. Morobe Dist.: Malahang, near Lae, 1966, *Coode NGF 29532* (L); above Busu R., about 15 miles north of Lae, 1962, *Hartley TNG 9919* (CANB, L); Gabensis, 1964, *Buderus NGF 20711* (L).

**C o l l e c t o r s ' a n n o t a t i o n s:** Aromatic, up to 1.80 m tall; corolla of marginal flowers pinkish red, (rose-)pink, patent, of disc-flowers (deep)yellow.

**E c o l o g i c a l n o t e s:** Grassy roadsides; altitude 0–300 m.

## 6. BIDENS

*Bidens* L., Sp. Pl. (1753) 831; Less., Syn. Comp. (1832) 230; DC., Prodr. 5 (1836) 593; Benth. & Hook. f., Gen. Pl. 2 (1873) 387; Clarke, Comp. Ind. (1876) 139; Hook. f., Fl. Brit. Ind. 3 (1882) 309; Hoffmann in E. & P., Nat. Pl. Fam. 4 (5) (1894) 244; Boerl., Handl. 2 (1899) 211; Bailey, Queensl. Fl. 3 (1900) 864; Gagnepain in Lec., Fl. Indo-Chine 3 (1924) 606; Sherff, Publ. Field Mus. Nat. Hist. Bot. 16 (1937) 29; Sherff & Alexander, N. Am. Fl. ser. 2, 2 (1955) 70; Robertson in Black, Fl. S. Austr. 4 (1957) 876; Humbert, Fl. Madagascar 3 (1963) 663; Cabrera, Fl. Buenos Aires 6 (1963) 225; Aristigueta in Lasser, Fl. Venezuela 10 (2) (1964) 645; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 412; Ohwi, Fl. Japan (1965) 900; Wild, Kirkia 6 (1967) 13; Cabrera in Correa, Fl. Patag. 7 (1971) 146; Hilliard, Comp. Natal. (1977) 316.

Shrubs or herbs. *Leaves* opposite, very rarely ternate, upper ones sometimes alternate, entire, dentate, incised, or pinnate. *Heads* on straight rigid peduncles, corymbose, or paniculate, or solitary; heterogamous, radiate, or homogamous, discoid; *involucre* campanulate or nearly hemispherical, *phyllaries* 2- (rarely 3–4-) seriate, often connate at the base, outer ones often herbaceous or foliaceous, inner ones with membranous margins and dark nerves; *marginal flowers* one-seriate, neuter, rarely female or wanting, *corolla* ligulate, with short tube and entire or dentate ligule; *disc-flowers* numerous, bisexual, *corolla* tubular, limb cylindrical, usually 5-dentate, *anthers* entire or subsagittate at the base, acute at the apex, *style-arms* pilose above, short and acute or long and subulate; *achenes* gradually longer to the central part of the head, obovate-oblong, cuneate or linear, often narrowed in the upper part, dorsally compressed or 3–4-gonous, not beaked, bearing 1–8 rigid, retrorsely hispid awns at the apex, *pappus* wanting; *receptacle* flat, with narrow nearly flat pales.

**D i s t r i b u t i o n:** About 300 species all over the world; most species in America.

### KEY TO THE SPECIES IN NEW GUINEA

- 1a. Outer *phyllaries* leaf-like, lanceolate, 10–35 mm long; *achenes* oblong-cuneate, with retrorse setae along the margins.      1. *B. tripartitus* var. *repens*

- b. Outer phyllaries linear or narrowly spatulate, 3–6 mm long; achenes linear, glabrous or in the upper part more or less hispid. . . . . 2
- 2a. Leaves 3-(rarely 5-)partite or undivided; outer phyllaries narrowly spatulate . . . . . 2
  - 2. *B. pilosus* var. *minor***
  - b. Leaves pinnate or bipinnate; outer phyllaries linear or linear-lanceolate . . . . . 3
  - 3a. Leaves mostly pinnate, leaflets deltoid-ovate; heads 5–8 mm thick . . . . . 3
    - 3. *B. biternatus***
    - b. Leaves bipinnate, leaflets lanceolate; heads 3–5 mm thick. . . . . 4
      - 4. *B. bipinnatus***

**1. *Bidens tripartitus* L.**

*B. tripartitus* L., Sp. Pl. (1753) 831; Sherff, Pub. Field Mus. Nat. Hist. Bot. 16 (1937) 268.

**var. *repens* (G. Don) Sherff**

*var. repens* (G. Don) Sherff, Bot. Gaz. 81 (1926) 45; Sherff, Publ. Field Mus. Nat. Hist. Bot. 16 (1937) 280, pl. 68, a–f; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 412; Ohwi, Fl. Japan (1965) 901. *B. repens* G. Don, Prodr. Fl. Nepal (1825) 180.

Erect herb, branched, 50–90 cm tall, rooting at the lower part; *stem* more or less quadrangular, ribbed, glabrous, 3–10 mm thick; internodes 4–10 cm long. *Leaves* opposite, shortly petiolate or sessile, membranaceous, tripartite, segments lanceolate, acuminate at the apex, serrate, 3.5–6.5 cm long, 7–14 mm broad, or leaves undivided, elliptic-lanceolate, acuminate at the apex, serrate, gradually attenuate at the base, 2.5–3.5 cm long, 4–10 mm broad. *Heads* terminal and in the axils of the upper leaves, pedunculate, peduncles 1.5–6 cm long; *involucre* 2-seriate, *outer phyllaries* 5–9, foliaceous, spreading, lanceolate-spatulate, entire or dentate, glabrous or nearly so, ciliate along the margins, chartaceous, 10–35 mm long, inner ones lanceolate-elliptic, shortly acuminate, acute or obtuse at the apex, glabrous, membranous, 8–10 mm long; *marginal flowers* wanting in New Guinea specimens; *corolla* of *disc-flowers* 2.5 mm long, tube filiform, limb campanulate, teeth 5, subobtusely, *style-arms* lanceolate, acute, *achenes* cuneate-linear, compressed, dark brown, with sparsely retrorsely hispid margins, glabrous, with 2 or 3 awns at the apex (2 or 3 mm long), without awns 5–7.5 mm long.

**D i s t r i b u t i o n :** China, Korea, Japan, Ryu Kyu I., Formosa, Indonesia, Philippine I., Australia, New Guinea, Europe, Asia Minor, North Africa.

**N E W G U I N E A .** West. Balim valley, along Balim R., 1966, *Kostermans & Soegeng 855* (L); Bele R., 18 km NE. of lake Habbema, occasional, 1938, *Brass 11486* (L); Noord R., 1907, *Versteeg 1192* (BO, L, U); near Alkmaar, 1907, *Versteeg 1543* (BO, L, U); SW. New Guinea, *von Römer 577* (L); Uroh R. valley, 1913, *Pulle 1144* (BO); Wissel Lake Region, Enarotali, Egogito' agapa, 1939, *Eyma 4832* (A, BO, L).

**C o l l e c t o r s ' a n n o t a t i o n s :** Corolla of disc-flowers yellow or yellowish.

**E c o l o g i c a l n o t e s :** Old grassy gardens, abandoned dry rice-fields, in heath vegetation; on loam or sandy soil; altitude 1400–2200 m.

**2. *Bidens pilosus* L.**

*B. pilosus* L., Sp. Pl. (1753) 382.

**var. *minor* (Bl.) Sherff**

var. *minor* (Bl.) Sherff, Bot. Gaz. 80 (1925) 387; Sherff, Publ. Field Mus. Nat. Hist. Bot. 16 (1937) 421, pl. 102; Kitamura, Bot. Mag. Tokyo 55 (1941) 347; Sherff & Alexander, N. Am. Fl. ser. 2, 2 (1955) 112; Cabrera, Fl. Buenos Aires 6 (1963) 230; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 412; Ohwi, Fl. Japan (1965) 901. — *B. sundaica* var. *minor* Bl., Bijdr. (1826) 913.

Erect herb, 8–110 cm tall, branched from the base, *branches* ascending, rooting at the lower part; *stem* quadrangular, ribbed, glabrous, 1–6 mm thick, internodes 2–25 cm long. *Leaves* opposite, 3-(rarely 5-)partite (higher ones often undivided), petiolate, petiole 0.5–5 cm long, *leaflets* petiolate (petiole 2–35 mm long), ovate- or lanceolate-elliptical, serrate (teeth acute, often curved), sharply acuminate at the apex, cuneate, gradually attenuate at the base, pinninerved, membranous, glabrous at both sides, without petiole 6–75 mm long, 6–26 mm broad. *Heads* terminal and in the axils of the upper leaves, single or two together, pedunculate (peduncles 2–8 cm long, ribbed, glabrous), radiate; *phyllaries* biseriate, outer ones acute, connate at the base, narrowly spatulate, ciliate, 4–6 mm long, inner ones lanceolate, with pale margins; *marginal flowers* 4–7, tube of *corolla* short, ligule elliptical, with 5 subacute teeth, 5-nerved, 5–8 mm long- *style-arms* 2 or 3, short, *achenes* linear, compressed, triangular, glabrous, dark-brown, 5–13 mm long, with 2 or 3 awns 2–4 mm long at the apex; *disc-flowers* numerous, corolla tubular, 2–2.5 mm long, with 5 acute teeth at the apex, *style-arms* 2, acute, papillose, *anthers* black, acute at the apex, *achenes* linear, quadrangular, compressed, dark-brown, 4–5 mm long, with 2 or 3 awns at the apex.

**D i s t r i b u t i o n:** Most tropical and subtropical regions.

NEW GUINEA. West s. loc., 1896, *Lauterbach* 452 (K); Star Mts., Sibil valley, common, 1959, *Kalkman* 4212 (L); id. 1959, *De Wilde & Vervoort* 472 (L); Manokwari, Minjambau, 1962, *Versteegh BW 12730* (L); Biak, Enarotalie, 1955, *Versteegh BW 3092* (L); id., north coast, near Warsa, 1915, *Feuilleteau de Bruyn* 364 (BO, L); Wissel lakes, east foot of Pèkèglbaro, Kebo, rather common, 1960, *Vink & Schram BW 8967* (L); 9 km northeast of Lake Habbema, abundant, 1938, *Brass 10747 (A, L)*; id., *Bele R.*, abundant, 1938, *Brass 11557* (L); Asiti, Kebar, common, 1961, *Vink BW 11352* (L); Baliem valley, Maghi, 1958, *Van Leeuwen s.n.* (L); Kebar valley, west of Manokwari airstrip, Andjai, 1954, *Van Royen 5105* (L); Vogelkop, surroundings of Ajoemaroe, 1952, *Brongersma 3* (L); Angguruk, 1973, *Sauveur & Sinke 2601* (L); Walei, 5 km west of Angguruk, 1973, *Sinke 43* (L); Jobi Mts., 1913, *Janowsky 395* (BO); Nassau Range, 1926, *Docters van Leeuwen 10505* (BO); Waren, 80 miles south of Manokwari, 1940, *Kanehira & Hatusima s.n.* (BO). — E a s t. Milne Bay Dist.: Baniara subdist., Bonneau village, common, 1969, *Pullen 8073* (L); Cape Vogel Peninsula, between Debora and Wabubu, 1953, *Brass 21877* (CANB, LAE). — Northern Dist.: Gailala subdist., road from Woitape to Kosipi, Uriko, 1965, *Buderus NGF 20723* (L); Kokoda subdist., Mt. Kenive, west slopes (Nisbet), 1974, *Croft LAE 65156* (L); near Saiho hospital, fairly common, 1953, *Hoogland 3485* (A, CANB, L). — Central Dist.: Port Moresby subdist., Manumu village, 1973, *Isles & Vinas LAE 59076* (L); Sogeri-Rouna divide, c. 2 miles west of Sogeri, 1962, *Schodde 2852* (L); Mafulu, common, 1933, *Brass 5525* (NY); Boridi, 1935, *Carr 13213* (BM, CANB, L). — Morobe dist.: Kup, 1972, *Ströder s.n.* (L); Kundiawa, Sipagulschool, *Ströder s.n.* (L); Bulolo, 1950, *Fryar NGF 3628* (A, BO, CANB, L, LAE); id., Plantation area, 1957, *Wells NGF 7392* (CANB, LAE); Edie Creek Road, Wau, 1953, *Womersley, Hoogland & Taylor TNG 4933* (A, BO, L, LAE); id., 1963, *Henty NGF 16512* (L); Lae subdist., Igam, *Millar NGF 35246* (L); mountain slope above village of Sopa, 1962, *Hartley TGH 10360* (L); Ekna village, common, *Blackwood 219* (K); Kaiapit subdist., Markham valley, 1964, *Jermey 4413* (L). — Gulf Dist.: environs of Malalaua, near mouth of Tauri R., 1966, *Schodde & Craven 4580* (L). — Eastern Highlands Dist.: Mt. Wilhelm, Pengagl-Pindaunde ridge, beside summit path, 1971, *Smith ANW 15205* (L); Chimbu subdist., above Keglsugl, 1967, *Kairo & Streimann NGF 35747* (L); id., Keglsugl, 1960, *Borgmann 286* (L); Goroka subdist., Mt. Otto, summit, common, 1970, *Johns & Noble NGF 47097* (L); id., Mt. Otto, westside, 1970, *Johns & Noble NGF 47061* (L); Noreikora swamp, near Kainantu, 1966, *Wheeler ANU 5726* (L); Highland Agricult. Exp. Station Aiyura, 1959, *Carne 5, 6* (LAE). — Western Highlands Dist.: Mt. Hagen Range, south slope, near Tomba village, common, 1956, *Hoogland & Pullen 6153* (CANB, L, LAE); Komun valley, village of Kiliga, 12 miles east of Mt. Hagen station, 1957, *Pullen 178* (CANB, LAE); Upper Kaugel valley, Alip, Kebaka, 1962, *Bowers 17* (CANB); Nondugl, 1955, *Harrison 117* (LAE); Wabag,

Parwas, common, 1964, *Flenley ANU 2001* (L); Lai valley, Wabag-Kubalis area, west of Wabag, 1960, *Robbins 2927* (CANB); Wabag subdist., near Yogos village, lower Tale valley, 1960, *Hoogland & Schodde 6705, 6706* (L); Kompiai, Jimi valley, *Street & Manner 161* (L). — New Ireland Dist.: above Lemeris, 1967, *Coode, Crolep & Katik NGF 29774* (L) — Southern Highlands Dist.: Tari subdist., Wau'we near Tari Gap, 1966, *Gillison NGF 25218* (L); Mt. Ialibu, near Repeater station, 1972, *Stevens & Foreman LAE 55907* (L); Mendi subdist., near Kagoba, Tambul-Mendi Road, 1973, *Womersley LAE 55397* (L). — Madang Dist.: Saidor subdist., Finisterre Mts., Moro, common, 1964, *Sayers NGF 21469* (L). — Sepik Dist.: Lumi subdist., Torricelli Mts., near Miwaute village, 1961, *Darbyshire 347* (L); Telefomin subdist., slopes above Busilmin airstrip, 1975, *Barker LAE 67672* (L); id. near Busilmin airstrip on track to Tifalmin, 1975, *Barker LAE 67587* (L).

**Collectors' annotations:** Plants 1.20–2 m tall, stems often purplish; corolla marginal flowers white, cream-coloured, or pale yellow, of disc-flowers bright deep orange-yellow.

**Ecological notes:** Weed in gardens, open places, on waste ground, roadsides, in (subalpine, swampy, anthropogenic) grasslands, clearings in forests, in (sub)montane rainforest, burned edges of forest patches, secondary regrowths, savannas, along beach; on clay, limestone, sandy soil, peaty soil; altitude 2–3410 m.

### 3. *Bidens biternatus* (Lour.) Merrill & Sherff

*B. biternatus* (Lour.) Merrill & Sherff in Sherff, Bot. Gaz. 88 (1929) 293; Sherff, Publ. Field Mus. Nat. Hist. Bot. 16 (1937) 388, pl. 99 a, c–m; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 413; Ohwi, Fl. Japan (1965) 901; Wild, Kirkia 6 (1967) 26; Hilliard, Comp. Natal. (1977) 318. — *Coreopsis biternata* Lour., Fl. Cochinch. ed. 1 (1790) 508.

*B. chinensis* Willd., Sp. Pl. 3 (1804) 1719 (synonym according to Sherff 1929: 293); Mattfeld, Engl. Bot. J. 62 (1929) 438.

Erect herb, 30–90 cm tall, branched, stem quadrangular, ribbed, glabrous, 2–5 mm thick; internodes 2.5–18 cm long. Leaves opposite (upper ones alternate), petiolate, pinnate or bipinnate, petiole 1–5 cm long (upper ones undivided), leaflets 5, lanceolate, or ovate- or elliptic-lanceolate, long acuminate, acute at apex, cuneate and tapering at base, sharply serrate, glabrous or nearly so at both sides, membranaceous, 10–50 mm long, 2–20 mm broad. Heads mostly radiate, on 1–9 cm long peduncles; outer phyllaries linear, acute, subglabrous, ciliate, 5–6 mm long, inner ones elliptic, acute or subobtuse, subglabrous, with pale margins; marginal flowers 2–4 or wanting, ligule of corolla oblong-elliptic, 2- or 3-dentate, 4–6 mm long, disc-flowers numerous, corolla 2.5–3 mm long, tube shorter than limb, teeth subacute, pubescent; achenes linear, glabrous, black, 7–10 mm long, with 2–5 awns at the apex.

**Distribution:** Arabia, Afghanistan, India, Thailand, Indo-China, Malay Peninsula, Philippine I., Indonesia, Formosa, China, Korea, Japan, Australia, New Guinea, Polynesia, Africa, Madagascar, Réunion, Cape Verde, Madeira, introduced in France.

NEW GUINEA. West. Tobadi, 1908, *Atasrip s.n.* (BO); Merauke, 1904, *Koch s.n.* (BO, L); Awemko, 55 km north from Mindiptana, rather common, 1959, *Kalkman BW 6494* (L); south coast, 1907, *Versteeg 1868* (identified as *B. bipinnata* L. by Lauterbach, Nova Guinea 8, 2, 1910: 337) (BO, L, U); Nassau Range, 1926, *Docters van Leeuwen 10495* (BO, L, U); Kaap Samoeting, 1941, *Anta 5* (A, BO); Rouffaer R., 1926, *Docters van Leeuwen 10087* (BO, L, U); Vogelkop, surroundings of Ajamaroe, Semoe, 1952, *Brongersma 32* (L); Vogelkop Peninsula, Kebar Valley, near Andjai, 1961, *Van Royen & Sleumer 6778* (L); Wissel Lakes region, surroundings Post and foot of Mt. Boebeiro, 1939, *Eyma 4902* (A, BO); Orok R. valley, 1913, *Versteeg 1177* (BO, GH, L); Hollandia and vicinity, 1959, *De Wilde & Vervoort 420* (L).

– E a s t. Islands near southeast coast of New Guinea: 1884, *Armit s.n.* (MEL). – New Ireland Dist.: Kavieng, 1964, *Coode NGF 29593* (L). – Milne Bay Dist.: Cape Vogel Peninsula, between Debora and Wabubu, 1953, *Brass 21877* (A, L). – Central Dist.: Port Moresby subdist., east slope of Lake Myola, abundant, 1973, *Croft 34521* (L); Aroa R., 1884, *Armit s.n.* (MEL); Kanosia, 1935, *Carr 11749* (BM, CANB, L); Port Moresby, 1876, *Coldie 27* (MEL); Astrolabe Range, 1894–1895, *Armit s.n.* (MEL). – Morobe Dist.: Finschhafen, 1891, *Lauterbach 1325* (L). – Eastern Highlands Dist.: Chimbu valley, Pindaunde, above Keglsugl, common, 1971, *Wace ANU 13017* (L). – Western Highlands Dist.: Sirunki, northeast slopes of Putidi hill, 1962, *Walker ANU 461* (CANB), *ANU 479* (L). – Southern Highlands Dist.: Mendi valley, near Mendi, 1961, *Schodde 1331* (L). – Madang Dist.: Bundi subdist., Brahman, 1972, *Henty NGF 49247* (L). – Western Dist.: Strickland R., 1885, *Bäuerlen 370* (MEL).

**Collectors' annotations:** Plants 1.80 m tall; corolla of marginal flowers white, yellow, of disc-flowers yellow, orange, brown.

**Ecological notes:** Weed in gardens, roadsides, near habitations in grasslands, on edges of submontane grassland with secondary forest, savannas, on coral bank, on burned edges of forest patches; on marshy soil, loam, limestone; altitude 0–1800 m.

**Remark:** Sherff (1937) distinguished *B. biternatus* var. *biternatus* (mentioned as *B. biternata sensu stricto*) and *B. biternatus* var. *glabratus* (Vatke) Sherff, the first mentioned having often bipinnate leaves and achenes being finally 0.7–2 cm long, the last mentioned having rarely bipinnate leaves and achenes being finally 2.5 cm long. In the New Guinea specimens these differences could not be found. Also Wild (1967, p. 27) could not distinguish these varieties.

#### 4. *Bidens bipinnatus* L.

*B. bipinnatus* L., Sp. Pl. (1753) 832; Bailey, Queensl. Fl. 3 (1900) 865; Lauterbach, Nova Guinea 8 (1) (1910) 337; Gagnepain in Lec., Fl. Indo-Chine 3 (1924) 608; Mattfeld, Engl. Bot. J. 62 (1929) 439; Sherff, Publ. Field Mus. Nat. Hist. Bot. 16 (1937) 366, pl. 89, 1–s; Sherff & Alexander, N. Am. Fl. ser. 2, 2 (1955) 107; Humbert, Fl. Madagascar 3 (1963) 664, t. 121, fig. 15–17; Ohwi, Fl. Japan (1965) 901; Tutin c.s., Fl. Europaea 4 (1976) 140; Hilliard, Comp. Natal (1977) 319.

Erect herb, 55 cm (according to Sherff 30–170 cm) tall, branched, stem 4-angular, glabrous or nearly so, c. 3 mm thick; internodes 3–7 cm long. Leaves opposite, upper ones alternate, petiolate (petiole 5–15 mm, according to Sherff 2–5 cm long), deltoid, bipinnate, without petiole 2.5–4 cm (according to Sherff 4–20 cm) long; 2–3 cm broad, leaflets 5, rhomboid-elliptic, acute at the apex, cuneate at the base, serrate or entire, glabrous, membranaceous, 1–2 cm long, 3–6 mm broad. Heads terminal and in the axils of the upper leaves, small, obscurely radiate, pedunculate (peduncle filiform, 2.5–4 cm; according to Sherff 1–10 cm long); involucre 3-seriate, outer phyllaries linear-lanceolate, obtuse at the apex, c. 2 mm long, inner ones narrowly elliptic, subacute at the apex, 5–7 mm long; marginal flowers 3 or 4, corolla with very thin 2 mm long tube and oblong, 3 mm long ligule, obscurely dentate at the apex, achenes linear, compressed, scarcely hispid along the margins, dark brown, 7–9 mm (according to Sherff 10–18 mm) long, with 2 (according to Sherff 3 or 4) c. 2 mm long awns at the apex; disc-flowers few, corolla 3 mm long with very short thin tube and narrow limb with 5 acute lobes at the apex, achenes like in marginal flowers.

**Distribution:** North, Central, and South America, Malaysia, India, China, Formosa, Korea, Japan, Philippine I., Australia, New Guinea, New Caledonia, Africa, Madagascar, southern Europe.

**Collector's annotation:** Flowers orange.

**Ecological notes:** Marshy places, along-alang fields; altitude 2100 m.

**Remark:** Moore (in Gibbs, *Contr. Phyt. Fl. Arfak Mts.*, 1917: 183) mentioned *B. bipinnatus* from Arfak Mts., Angi Lakes, 1913, *Gibbs 5562* (BM). This specimen, however, consisting of two small poor plants, is not recognized as *B. bipinnatus*.

## 7. TRIDAX

*Tridax* L., *Sp. Pl.* (1753) 900; Benth. & Hook. *f.*, *Gen. Pl.* 2 (1873) 392; Hoffmann in E. & P., *Nat. Pl. Fam.* 4 (5) (1894) 247; Humbert, *Fl. Madagascar* 3 (1963) 665; Aristeguieta in Lasser, *Fl. Venezuela* 10 (2) (1964) 693; Koster in Backer & Bakh. *f.*, *Fl. Java* 2 (1965) 414; Wild, *Kirkia* 6 (1967) 10; Hilliard, *Comp. Natal* (1977) 321.

Herbs, *stem* creeping-ascending. *Leaves* opposite. *Heads* terminal, solitary, fairly large, heterogamous, radiate, on long peduncles; *involucre* campanulate, *phyllaries* 2- or more-seriate; *marginal flowers* one-seriate, female; *corolla* ligulate, 3-dentate, *style-arms* long, acute, pilose, *achenes* turbinate, angular, pilose, hairs of *pappus* long, plumose, dingy-white; *disc-flowers* numerous, bisexual, *corolla* tubular, 5-dentate, *anthers* sagittate, acute at the apex, *style*, *achenes*, and *pappus* like in marginal flowers; *receptacle* convex, paleaceous.

**Distribution:** About 40 species in Central and South America, chiefly Mexico, 1 in West North America; 1 species introduced into many tropical countries.

### *Tridax procumbens* L.

*T. procumbens* L., *Sp. Pl.* (1753) 900; Clarke, *Comp. Ind.* (1876) 142; Hook. *f.*, *Fl. Br. Ind.* (1881) 311; Boerl., *Handl.* 2 (1891) 243; Lauterbach, *Nova Guinea* 8 (2) (1910) 337; Gagnepain in Lec., *Fl. Indo-Chine* 3 (1924) 609; Mattfeld, *Engl. Bot. J.* 62 (1929) 439; Humbert, *Fl. Madagascar* 3 (1963) 666, t. 115, fig. 29–32; Parham, *Pl. Fiji Isl.* (1964) 232–235; Aristeguieta in Lasser, *Fl. Venezuela* 10 (2) (1964) 698, fig. 118; Powell, *Brittonia* 17 (1) (1965) 80; Koster in Backer & Bakh. *f.*, *Fl. Java* 2 (1965) 414; Wild, *Kirkia* 6 (1967) 11; Weeds and Aliens in Africa (1968) 7, 8; Hilliard, *Comp. Natal* (1977) 321.

Herb, prostrate, obliquely erect in the upper part, 30–80 cm tall, *stem* branched, often rooting at the nodes, patently hirsute, *internodes* 1.5–9 cm long. *Leaves* petiolate, blades ovate-elliptic, cuneate at the base, acute or subobtuse at the apex, irregularly coarsely serrate or lobed (teeth acute, subdeltoid), patently hispid (hairs long) at both sides, 1.5–5.5 cm long, 0.5–3.5 cm broad, petiole 2–15 mm long. *Heads* on straight, patently hirsute (hairs long), 5–40 cm long peduncles, tapering to the apex; *involucre* 3-seriate, 5–7 mm long, outer *phyllaries* ovate or ovate-lanceolate, shortly acuminate and obtuse, herbaceous, densely hirsute, inner ones oblong, mucronate, longer than the outer ones, membranaceous, sparsely pilose; *marginal flowers* 5 or 6, *corolla* 4–5 mm long, tube thin, ligule broadly oval, about as long as tube; *corolla* of *disc-flowers* with recurved pilose lobes; *achenes* densely pilose, 2 mm long, *pappus* 5–6 mm long, hairs many, finally radiating; pales of *receptacle* acute, membranaceous, oblong, lanceolate.

**Distribution:** Central and South America, introduced into North America (Florida), tropical Africa, Madagascar, India, Ceylon, Birma, Nepal, Malay Peninsula, Indonesia, Philippines, Indo-China, Formosa, Hongkong, New Guinea, North Australia, Fiji I., Marshall I., Solomon I., Hawaiian I., New Caledonia.

NEW GUINEA. West. Hollandia, 1959, *Van Zanten H 3* (L); Merauke, 1907, *Versteeg 1877* (BO, K, L, U); id., 1908, *Branderhorst 317* (BO, K, L, U); id., 1956, *Van der Sijde BW 4028* (CANB, L); lighthouse near Boeti, west of Merauke, 1954, *Van Royen 4822* (CANB, L, LAE); Kaimana, near airstrip, common, 1957, *Van Leeuwen KAI 5* (L); Cycloop Mts., Ifar, 1961, *Van Royen & Sleumer 5676* (CANB, L). — East. New Britain Dist.: Rabaul, 1915, *Kenny s.n.* (BRI); id., 1929, *Herre 203* (NY); near Rabaul, State Plantation, *Frogatt 13* (K). — New Ireland Dist.: Lamakot, *Peekel 32* (B, L). — Milne Bay Dist.: Misima subdist., Irae I., Conflict Group, 1969, *Mann NGF 43234* (L); Cape Vogel Peninsula, near Waruka village, common, 1954, *Hoogland 4357* (A, BM, BO, BRI, CANB, K, L, LAE, MEL, US); Cape Peninsula, Menapi, 1953, *Brass 21812* (A, CANB, L, LAE). — Northern Dist.: c. 1 km south of Soputa village, common, 1953, *Hoogland 3755* (A, BM, BO, BRI, CANB, L, LAE). — Central Dist.: Port Moresby, 1954, *Kingston K 152* (LAE); Hisiu, 1935, *Carr 11368* (BM, CANB, L, NY); Port Moresby, near Jackson's airport, 1963, *Heyligers 9* (CANB); c. 3 miles west of Sogeri, 1962, *Schodde 2918* (A, BRI, CANB, K, L, LAE); Rigo subdist., between Kwikila and Kapakapa, 1962, *Pullen 3237* (CANB). — Morobe Dist.: near Wharf, 1966, *Coode NGF 29508* (L); Morobe, very common, 1948, *Womersley NGF 3164* (A, BRI, LAE); Bulolo, 1957, *Wells NGF 7398* (BRI, CANB, L, LAE); id., 1950, *Fryar 3631* (A, BO, BRI, CANB, L, LAE); Markham R. valley, Nadzab, common, 1962, *Hartley 9876* (CANB). — Madang Dist.: Bogia subdist., near Potsdam Harbour, very common, 1958, *Pullen 1160* (A, CANB, L, LAE); Bogia coast, Lower Ramu-Atitau area, 1958, *Robbins 1721* (CANB); Saidor subdist., Matafuna, Long Island, 1970, *Millar NGF 38450* (L). — Sepik Dist.: Aitape subdist., near Pultalul village, c. 1 mile inland from Aitape, 1961, *Darbyshire & Hoogland 7789* (CANB, L, LAE).

**Collectors' annotations:** Spreading weed up to 1 m high, semi-prostrate or erect, forming clumps several feet in diam., leaves dark dull green above, light or greyish dull green below; phyllaries purple-green; corolla of marginal flower white or cream, or pale yellow, disc-flowers bright- or orange yellow; achenes (light) brown; pales yellow with purplish apex.

**Ecological notes:** Waste ground, weedy vegetation, native gardens, coconut plantations, old cultivations, riversides, *Imparata*-fields, roadsides, tracks through tall grassland, grass-lands, open places, savanna, sea coasts, close behind coral strands, walls behind the beach, cliffs above ridge; on gravel and sandy soil; altitude 0–900 m.

## 8. TITHONIA

*Tithonia* Desf. ex Juss., Gen. Pl. (1789) 189; Benth. & Hook. f., Gen. Pl. 2 (1873) 374; Hoffmann in E. & P., Nat. Pil. Fam. 4 (5) (1894) 235; Blake, Contr. U.S. Nat. Herb. 20 (10) (1921) 424; Aristeguieta in Lasser, Fl. Venezuela 10 (2) (1964) 621; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 405; Wild, Kirkia 6 (1967) 55; Hilliard, Comp. Natal (1977) 307.

Herbs or shrubs. *Leaves* alternate or sometimes opposite below, linear-lanceolate or ovate, triplinerved. *Heads* heterogamous, radiate; *involucre* hemispherical or broadly campanulate, *phyllaries* 2–5-seriate, gradually shorter to the exterior ones, lanceolate or oblong, ribbed, vittate; *marginal flowers* 8–20, uniseriate, neuter, *corolla* oblong, emarginate or with 2 or 3 teeth; *disc-flowers* numerous, bisexual, *corolla* with slender tube and cylindrical or infundibuliform limb, with 5 teeth at the apex, *anthers* cordate-sagittate at the base, with ovate apical appendages, *style-arms* slender, recurved, dorsally hispid, with linear-lanceolate, acuminate, hispid appendages; *achenes* oblong, angular, *pappus* consisting of 1 or 2 palaceous awns and 4–12 free or united scales, or of more or less united scales only, or wanting; *receptacle* convex, with rigid, striate, concave, persistent pales, embracing the achenes.

**Distribution:** 14 species in Central and South America, 1 species introduced in North America, tropical Asia, New Guinea, Pacific I., Africa.



***Tithonia diversifolia* (Hemsley) A. Gray**

*T. diversifolia* (Hemsley) A. Gray, Amer. Acad. 19 (1883) 5; Blake, Contr. U.S. Nat. Herb. 20 (10) (1921) 434; Mattfeld, Engl. Bot. J. 62 (1929) 436; Parham, Pl. Fiji Isl. (1964) 232–235; Aristeguieta in Lasser, Fl. Venezuela 10 (2) (1964) 572, fig. 96; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 405; Wild, Kirkia 6 (1967) 56; Hilliard, Comp. Natal (1977) 308.

Erect herb or shrub, branched, 3–9 m tall (fide Blake), *stem* 3–6 mm thick, striate, sparsely pilose, glabrescent. *Leaves* alternate, petiolate or sessile, ovate, 3- or rarely 5-lobate (higher ones sometimes undivided), cuneate at base, gradually attenuate into the petiole, triplinerved, chartaceous, lobes ovate, long acuminate at apex, crenate-serrate (teeth obtuse and mucronulate), shortly pilose, glandular above, shortly pilose below, blades 4–10 (according to Blake to 20) cm long, 2.5–8 (according to Blake 18.5) cm broad, petioles 3–6 cm long, with narrow margin, auriculate at base. *Heads* large, terminal, solitary, heterogamous, pedunculate, peduncles striate, ribbed, sparsely pilose, fistulose, gradually widened to the apex, 5–9 cm long; *involucre* 4-seriate, 1.5–2 cm long, *phyllaries* chartaceous or herbaceous, sinuate at apex, vittate, glabrous, outer ones oblong-ovate, acute, inner ones broadly oblong or obovate-oblong, rounded and mucronate at apex; *marginal flowers* 12–14, *corolla* with 2 or 3 teeth at the apex, yellow, 4–6 cm long, *corolla of disc-flowers* c. 8 mm long, lower part pubescent, *achenes* angular, with few long hairs along the margins, c. 5 mm long, *pappus* consisting of 2 lanceolate awns, unequal in length, 3–4 mm long, and of 5–10 scales, oblong-lanceolate, 1.5–2 mm long, fringed; pales of *receptacle* acuminate, acute, 9–11.5 mm long.

**D i s t r i b u t i o n:** Central America, introduced into North and South America, Seychelles, Ceylon, India, Malaya, Indonesia, Philippines, Hongkong, New Guinea, New Caledonia, Bismarch Archipelago, Fiji I., Society I., Hawaii I., Cook I., tropical and South Africa.

**NEW GUINEA.** East. New Ireland Dist.: Lamekot, *Peekel* 39 (BO). — New Britain Dist.: Gazelle Peninsula, Keravat Plantation, 1956, *Womersley & Jones* 8790 (A, L, LAE). — Central Dist.: Port Moresby subdist., Hombrum Bluff Road, common, 1969, *Tippett UPNG* 345 (L); Koitaki, 1935, *Carr* 11975 (BM, L). — Madang Dist.: Raumu Valley, near Dumpu village, abundantly naturalized, 1955, *Hoogland* 5171 (A, L, LAE).

**C o l l e c t o r s ' a n n o t a t i o n s:** Plants 1.20–3 m tall, corolla bright and deep, or golden yellow.

**E c o l o g i c a l n o t e s:** Roadsides, savanna-woodland, banks of streams in open country; altitude 275–450 m.

**9. ELEUTHERANTHERA**

*Eleutheranthera* Poit. in Bosc., Nouv. Dict. Hist. Nat. 7 (1803) 498; Benth. & Hook. f., Gen. Pl. 2 (1873) 371; Hoffmann in E. & P., Nat. Pfl. Fam. 4 (5) (1894) 236; Aristeguieta in Lasser, Fl. Venezuela 10 (2) (1964) 548; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 407.

Annual herbs. *Leaves* opposite, petiolate. *Heads* small, sessile, axillary, solitary, homogamous or rarely heterogamous; *involucre* campanulate, *phyllaries* few, one-seriate, herbaceous, nearly equal in length, *flowers* all fertile or inner ones sterile, *marginal flowers* wanting or few, neuter, *corolla* small, ligulate, *disc-flowers* few, bisexual, *corolla* tubular, limb narrowly campanulate, lobes 5, short, acute,

pilose, *anthers* free or nearly so, sagittate at the base, obtuse at the apex, *style-arms* linear, acute, pilose at the apex, *achenes* obovoid, subangular, thick, somewhat compressed, rotundate at apex, often tuberculate, *pappus* short, cup-shaped, composed of connate, densely pilose, fringed scales, sometimes with 2 or 3 needles; *receptacle* small, faintly convex, *pales* oblong, keeled, scarious, pilose (hairs at the apex long), embracing the flowers.

**D i s t r i b u t i o n:** One species in Central and South America, introduced into tropical Asia, Africa, and New Guinea.

### **Eleutheranthera ruderalis (Swartz) Schultz.-Bip.**

*E. ruderalis* (Swartz) Schultz.-Bip., Bot. Zeit. 24 (1866) 165; Merrill, Pap. Mich. Acad. Sci., Arts and Letters 20 (1935) 111; Koster in Pulle, Fl. Suriname 4 (2) (1938) 149; Meikle, Kew Bull. (1953) 118; Parham, Pl. Fiji Isl. (1964) 232–235; Aristeguieta in Lasser, Fl. Venezuela 10 (2) (1964) 548, fig. 91; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 407. — *Melampodium? ruderalis* Swartz, Fl. Ind. Occ. 3 (1806) 1372.

*E. prostrata* Schultz.-Bip., Bot. Zeit. 24 (1866) 239; Boerl., Handl. 2 (1891) 206; Hochreutiner, Candollea 5 (1934) 322.

Herb, branched, 20–50 cm tall, *stem* 1–3 mm thick, shortly pilose. *Leaves* ovate-oblong, chartaceous, repand-dentate, gradually narrowed, obtuse at apex, shortly decurrent, cuneate at base, thinly pilose at both sides (hairs long), blades 1.5–5.5 cm long, 0.5–2 cm broad, petioles 2–12 mm long. *Heads* on 1–10 mm long filiform peduncles, with 5–7 *flowers*, *phyllaries* c. 6, oblong, obtuse or subobtuse, pilose, 5–6 mm long, *corolla of disc-flowers* 3–4 mm long, lobes pilose, *anthers* black; *achenes* partly pilose, 3–4 mm long.

**D i s t r i b u t i o n:** Central and South America, introduced into Africa, Indonesia, Singapore, New Guinea, Fiji I.

**NEW GUINEA.** East. New Ireland Dist.: Katu Plantations, 26 miles from Kavieng, 1967, Coode, Cropley, Katik NGF 29741 (L). — Central Dist.: 12 miles north of Port Moresby, Tovobada Hills, east foot slopes, 1965, Heyligers 1230 (L); c. 8 miles north north west of Port Moresby, very common, 1967, Pullen 6963 (L); Port Moresby subdist., Moitake, Tippett UPNG 327 (L). — Sepik Dist.: Agoram subdist., Timbuk Mission, common, 1959, Pullen 1744 (L). — Western Dist.: Daru I., abundant, 1936, Brass 6322 (A, BM, BO, BRI, LAE).

**C o l l e c t o r s ' a n n o t a t i o n s:** Ascending or straggling ground layer herb, to 90 cm tall; corolla yellow.

**E c o l o g i c a l n o t e s:** Weed in native gardens, along roadsides, well drained areas near water, open areas, woodlands, poor monsoon forest communities, half-shaded wastelands grazed by cattle; altitude 0–75 m.

## **10. GALINSOGA**

*Galinsoga* Ruiz & Pav., Fl. Peruv. Chili Prodr. (1794) 110, t. 24; Lessing, Syn. Comp. (1832) 245; Benth., Fl. Austr. 3 (1866) 542; Benth. & Hook. f., Gen. Pl. 2 (1873) 390; Clarke, Comp. Ind. (1876) 142; Hoffmann in E. & P., Nat. Pfl. Fam. 4 (5) (1894) 247; Bailey, Queensl. Fl. 3 (1900) 866; Humbert, Fl. Madagascar 3 (1963) 666; Cabrera, Fl. Buenos Aires 6 (1963) 232; Aristeguieta in Lasser, Fl. Venezuela 10 (2) (1964) 658; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 414; Wild, Kirkia 6 (1967) 9; Cabrera in Correa, Fl. Patag. 7 (1971) 149; Hilliard, Comp. Natal. (1977) 322; Canne, Rhodora 79 (1977) 335.

Annual herbs. *Leaves* alternate or opposite. *Heads* terminal and in the axils of the upper leaves, small, pedunculate, heterogamous, radiate; *involucre* semiglobose, *phyllaries* 2-seriate, ovate, membranous, striate; *marginal flowers* 4 or 5, female, *corolla* ligulate, short, white, entire or with 2 or 3 teeth, *achenes* turbinate, 4- or 5-angular, outer ones slightly compressed; *pappus* existing of linear or oblong scales, curved; *disc-flowers* bisexual, *corolla* tubular, tube short, limb narrowly campanulate, yellow, with 5 short teeth, *anthers* sagittate at the base, acute at the apex, *style-arms* short, acute or subacute, *achenium* turbinate, angular, *pappus* existing of numerous linear or oblong or oblanceolate, ciliate, scarious scales; *receptacle* conical or elongate, paleaceous.

**D i s t r i b u t i o n:** 14 species in Central and South America, 1 species nearly worldwide introduced.

### *Galinsoga parviflora* Cavanilles

*G. parviflora* Cavanilles, Icon. Descr. Pl. 3 (1795) 41, t. 281; Benth., Fl. Austr. 3 (1866) 542; Clarke, Comp. Ind. (1876) 142; Bailey, Queensl. Fl. 3 (1900) 866; Robertson in Black, Fl. S. Austr. 4 (1957) 877, fig. 1175; Cabrera, Fl. Buenos Aires 6 (1963) 232, fig. 68; Humbert, Fl. Madagascar 3 (1963) 667, fig. 115, 22–28; Aristeguieta in Lasser, Fl. Venezuela 10 (2) (1964) 658; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 414; Wild, Kirikia 6 (1967) 9; Cabrera in Correa, Fl. Patag. 7 (1971) 149; Tutin *et al.*, Fl. Europaea 4 (1976) 144; Hilliard, Comp. Natal. (1977) 322; Canne, Rhodora 79 (1977) 373, fig. 17.

Erect herb, often much branched, 8–40 cm high, *stem* ribbed, thinly pilose in the upper part, sometimes with gland-hairs, lower part glabrous. *Leaves* petiolate, opposite, ovate or ovate-oblong, repand-serrate, cuneate at the base, obtuse or acute and acuminate at the apex, 3-nerved, thinly pilose or subglabrous at both sides, 10–55 mm long, 4–35 mm broad, petiole slender, 2–15 mm long, with patent hairs and gland-hairs. *Heads* subglobose, often 2 together, 5–8 mm diam., peduncles 7–35 mm long, *involucre* 3 or 4 mm long, *phyllaries* subequal in length, ovate, subacute, subglabrous; *marginal flowers* 5, rarely wanting, *corolla* pubescent, ligule broadly obovate, c. 2 mm long, 3-dentate, tube with long hairs, *pappus* consisting of very short pales; *disc-flowers* pubescent, c. 1 mm long; *achenes* black, pubescent, c. 1.5 mm long; *pappus* c. 1.5 mm long, scales oblanceolate; pales of *receptacle* oblong-spathulate, mostly with 2 lanceolate acute lateral lobes.

**D i s t r i b u t i o n:** Nearly worldwide in temperate and subtropical regions.

NEW GUINEA. E a s t. Morobe Dist.: Edie Creek Road, Wau, 1953, *Womersley, Hoogland & Taylor* 493 (A, CANB, LAE); Mumeng subdist., Track to Mt. Shungol, 1970, *Kairo NGF* 45368 (L); 16 km Kundiawa, Kup. 1972, *Ströder s.n.* (L). — Eastern Highlands Dist.: Mt. Wilhelm, east slopes, 1959, *Brass* 30648 (L); Noreikora Swamp, near Kainanta, common, 1966, *Wheeler ANU* 5725 (L); Chimbu Valley, about a mile down from Gembogl, 1971, *Wace ANU* 13018 (L); Kegsugl Airstrip, very common, 1971, *Wace ANU* 13037 (L); Kainantu-Aiyura Road, Kainantu, 1968, *Henty NGF* 29259 (L); Chimbu subdist., Waimambuno, Upper Chimbu R., common, 1957, *Pullen* 367 (CANB, LAE). — Western Highlands Dist.: Kubor Range, Uimba, Nona-Minj divide, common, 1963, *Vink* 16329 (L). — Sepik Dist.: Oksapmin, Telefomin subdist., 1968, *Henty, Isgar & Galore NGF* 41736 (L).

**C o l l e c t o r s ' a n n o t a t i o n s:** Erect or semi-erect, to 1 m tall; corolla of marginal flowers white, of disc-flowers (dark)yellow.

**E c o l o g i c a l n o t e s:** Weed in gardens, in old cultivations, edges of grasslands, clearings in forest, montane forests, roadsides in grassland, swamp-borders; on drained flat ground, black peaty soil; altitude 1410–2650 m.

## 11. WEDELIA

*Wedelia* Jacquin, Enum. Pl. Carib. (1760) 8; Select. Stirp. Amer. Hist. (1763) 217, t. 130; Lessing, Syn. Comp. (1832) 222; Benth. & Hook. f., Gen. Pl. 2 (1873) 370; Hoffmann in E. & P., Nat. Pfl. Fam. 4 (5) (1894) 234; Bailey, Queensl. Fl. 3 (1900) 860; Gagnepain in Lec., Fl. Indo-Chine 3 (1924) 601; Robertson in Black, Fl. S. Austr. 4 (1957) 875; Cabrera, Fl. Buenos Aires 6 (1963) 206; Humbert, Fl. Madagascar 3 (1963) 643; Aristeguieta in Lasser, Fl. Venezuela 10 (2) (1964) 537; Ohwi, Fl. Japan (1965) 899; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 404; Cabrera in Correa, Fl. Patag. 7 (1971) 139.

Herbs. *Leaves* opposite (highest ones sometimes alternate), entire or dentate. *Heads* terminal and in the axils of the highest smaller leaves, solitary or 2–4 together, heterogamous, radiate, on often long peduncles; *involucre* semiglobose or campanulate, phyllaries 2–3-seriate; *marginal flowers* female, one-seriate, *corolla* ligulate, yellow, with a very short tube and a 2- or 3-dentate ligule, *style-arms* rather broad, acute or obtuse, achenes obovoid, more or less laterally compressed, 3-angular; *pappus* wanting, cup-shaped or existing of 1 or 2 needles; *disc-flowers* bisexual or rarely male, *corolla* tubular, with a campanulate 5-lobed limb, yellow, *anthers* with obtuse or sagittate base and acute apex, *style-arms* rather broad, acute or obtuse, *achenes* obovoid, more or less laterally compressed, 4-angular, *pappus* like that in marginal flowers; *receptacle* convex, with keeled pales embracing the disc-flowers.

**Distribution:** About 100 species in North, Central, and South America, SE. Asia, New Guinea, Australia, Solomon I., Bismarck I., tropical Africa, Madagascar.

## KEY TO THE SPECIES IN NEW GUINEA

- 1a. Leaves petiolate; petioles 0.5–6.5 cm long, blades oblong-ovate or (sometimes broadly) ovate. . . . . **1. *W. biflora***  
 b. Leaves sessile or nearly so; petioles 0–0.8 cm long, blades oblong- or linear-lanceolate or linear, rarely narrowly oblong-ovate . . . . . **2. *W. spilanthoides***

**1. *Wedelia biflora* (L.) DC.**

*Verbesina biflora* L., Sp. Pl. ed. 2 (1763) 1272; Burm., Fl. Ind. (1768) 184; Bl., Bijdr. (1826) 911. — *W. biflora* DC. in Wright, Contr. India (1834) 18; Hook. f., Fl. Brit. Ind. 3 (1881) 306; Boerl., Handl. 2 (1891) 241; Bailey, Queensl. Fl. 3 (1900) 861; Lauterbach, Nova Guinea 8 (1910) 337; (1912) 866; Gagnepain in Lec., Fl. Indo-Chine 3 (1924) 604; Merrill, Phil. J. Sci. 29 (1926) 427; Mattfeld, Engl. Bot. J. 62 (1929) 433; Craib in Kerr, Fl. Siam 2 (1936) 275; Kitamura, Bot. Mag. Tokyo 55 (1941) 347; Walker & Rodin, Contr. U.S. Nat. Herb. 30 (1949) 467; Humbert, Fl. Madagascar 3 (1963) 644; Parham, Pl. Fiji Isl. (1964) 232–235; Ohwi, Fl. Japan (1965) 900; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 404; Beadle *et al.*, Fl. Sydney Reg. (1972) 458. — *Melanthera biflora* Wild., Kirkia 5 (1965) 4; 6 (1967) 48; Hilliard, Comp. Natal. (1977) 312.

*Wollastonia strigulosa* DC. in Decaisne, Herb. Timor. (1835) 86; DC., Prodr. 5 (1836) 548.

*Wollastonia scabriuscula* DC. in Decaisne, Herb. Timor. (1835) 86; DC., Prodr. 5 (1836) 547. — *W. scabriuscula* Boerl., Handl. 2 (1891) 242.

*Wollastonia glabrata* DC., Prodr. 5 (1836) 548. — *W. glabrata* Boerl., Handl. 2 (1891) 241; Valetton, Bull. Dép. Agric. Ind. Néerl. 10 (1907) 69.

*W. strigulosa* K. Schum., Engl. Bot. J. 9 (1887) 223; Boerl., Handl. 2 (1891) 242. — *Wollastonia strigulosa* DC. ex Decne, Nouv. Ann. Mus. Paris 3 (1834) 414.

Herb or shrub, 40 cm or taller, *stem* ribbed, 2–6 mm thick, sparsely pilose; *internodes* 1–16 cm long. *Leaves* petiolate, lower ones on 0.5–6.5 cm long petioles,

blades oblong-ovate or (sometimes broadly) ovate, long- or sometimes shortly acuminate, acute or rarely subobtuse at apex, cuneate, or rounded, or rarely nearly straight at base, (often remotely) serrate-dentate, undulate or subentire,  $\pm$  3-nerved, firmly herbaceous, thinly appressed hispidulous at both sides, 2.5–23 cm long, 1–17 cm broad. *Heads* solitary or sometimes binate, peduncles 2–90 mm long, pubescent; *phyllaries* oblong, with an obtuse or acute, often recurved apex, appressed-pubescent, 5–7 mm long; *marginal flowers* c. 8, *corolla* oblong, emarginate or dentate or subtruncate at the apex, parallel-nerved, appressed-pubescent below, 6–15 mm long, *style-arms* lanceolate, subacute, papillose at the upper part, *achenes* obovoid-oblong, triquetrous, truncate, glabrous, c. 2.5 mm long, *pappus* wanting or consisting of one short needle; *disc-flowers* 20–30, *corolla* c. 5 mm long, *style* like in marginal flowers, *achenes* obovoid, angular, glabrous or minutely pilose, with minute tubercles, c. 2.5 mm long, *pappus* wanting or consisting of one short sometimes curved needle; pales of *receptacle* firm, rigid, obovate-oblong, with a short, triangular, obtuse or acuminate, hispid apex, c. 4 mm long, nerves prominent, parallel.

**Distribution:** Indonesia, Philippine I., India, Indo-China, China, Formosa, Ryu Kyu I., Japan, New Guinea, Australia, Norfolk I., New Caledonia, Samoa, Marshall I., Bismarck I., Cook I., Tonga I., Fiji I., Solomon I., New Hebrides, Carolines, Santa Cruz I. Rennell I., east coast of Africa.

NEW GUINEA. West. Lorentz R., Bivak I., 1907, *Versteeg 1010* (BO, L, U), 1100 (BO, U); *Pulle 25a* (BO); Merauke, *Versteeg 85* (L); 1904, *Koch s.n.* (BO, L); id., common, 1907, *Versteeg 1967* (BO, L, U); id., 1956, *Van der Sijde BW 4004* (L); Manokwari, Kedri-tinggi, 1960, *Moll BW 9822* (L); id., Jenkela, common, 1914, *Gibbs 6201* (BM, K); id., Masni coast, Gondopi-Aroei, 1961, *Koster BW 11071* (L); P. Mansinan near Manokwari, 1922, *Van Hasselt s.n.* (BO); Pionier bivak, 1926, *Docters van Leeuwen 9367* (BO, L, U); Sorong, Cape Casuaris, NW. of Sorong, 1949, *Hellendoorn 56* (L); id., 1954, *Van Royen 3110* (L, LAE); id., Misool, Waima, 1948, *Pleyte 782* (L); Klamono, 1948, *Pleyte 656* (BO, L); id., Cape Baroe, 1948, *Djam hari 383* (A, L); Jappen-Biak, Seroei, 1939, *Aet & Idjan 113* (A, L); id., P. Biak, Aryom, 1939, *Aet & Idjan 939* (L); Mamberamo R., mouth, 1913, *Janowsky 460* (BO, GH, L); Mambor I., 1912, *Janowsky 11* (BO); Geelvinkbaai, Mt. Elefant, 1873, *Meyer 8* (K); Waren, 1940, *Kanehira & Hatusima 13066* (BO); Schouten I., Soepiori, 1915, *Feuilleateau de Bruyn 255* (BO); Idenburg R., Bernard Camp, 1939, *Brass 14094* (A, L); Hollandia, common, 1910, *Gjellerup 149* (BO, L); id., 1956, *Kalkman BW 3366* (L); id., Holtekang, 1953, *Versteegh 109* (BO, L); Mt. Wakobi, 1913, *Atasrip 76* (BO, L); Oeta, Sg. Oemar, 1941, *Aet 230* (A, BO, L); Arfak Mts., Minjambau, 1962, *Koster BW 13935* (L). — East. New Britain Dist.: Gazelle Peninsula, Nodup, 1934, *Waterhouse W 851* (K, L); Kaudrian subdist., Unai R., Fullernhorn Harbour, common, 1965, *Sayers NGF 21836* (L); Galilo village, near Cape Hoskins, West Nakanai, 1954, *Floyd 3527* (A, BO, BRI, CANB, L); Talasea subdist., north shore of Lake Dakataua, Willaumez Peninsula, 1973, *Croft et al. NGF 4139* (L); Kaip valley, 1957, *Robbins 172* (BM); West Nakanai, Gulili Village, 1954, *Floyd 3527* (L); Rabaul, 1915, *Henty s.n.* (BRI); Talasea subdist., banks of Lake Dakataua, across ridge from Bulumuri village, 1974, *Barker & Vinas LAE 66522, 66720* (L). — New Ireland Dist.: Kavieng, 1967, *Coode & Cropley NGF 29588* (L). — Manus Dist.: SW. Manus, Pelikawa, abundant, 1971, *Stone & Streiman 10407* (L). — Milne Bay Dist.: Normanby I., Waikaiuna, 1956, *Brass 25907* (A, L, LAE); Misima I., Narian, common, 1956, *Brass 27612* (A, L); Rossel I., Jinju, frequent, 1956, *Brass 28547* (A, L); Ferguson I., Iamelele, common, 1956, *Brass 26021* (A, L, LAE); Goodenough I., 1953, *Brass 25099* (A, L, LAE); id., Bolu Bolu, common, 1953, *Brass 24458* (A, L, LAE); Menapi, Cape Vogel Peninsula, 1953, *Brass 21712* (A, L); Biniguni camp, Gwariu R., 1953, *Brass 23722* (A, L, LAE); Woodlark I., Kulumadau, 1956, *Brass 28717* (BO, L, LAE); Wagalasa I., Losuia subdist., 1969, *Maim & Osborn NGF 43021* (L); Sudest I., Louisiades, 1889, *MacGregor s.n.* (MEL); id., 1849, *Mac Gillavry s.n.* (K); id., Rambuso, 1956, *Brass 28167* (BO, L, LAE). — Northern Dist.: near west end of Dobodura airstrip along Samboga R., common, 1953, *Hoogland 3802* (A, BM, L); subdist. Kokoda, 0.5 km east of Hanjiri Village on the Luwuni R. bank, 1975, *Wiakabu & Kairo LAE 70234* (L). — Central Dist.: Port Moresby subdist., Laloki Road to Nazareth Mission, 1969, *Gebo UPNG 268* (L); Aroa R., 1884, *Armit s.n.* (MEL); id., 1935, *Carr 11438* (BM, L, NY); Borabere, 1925, *Brass 719* (GH); Laua village, 1965, *Buderus NGF 25831* (L); Kuraudi, 1926, *Brass 1382* (GH); Fife Bay, 1930, *Lister Turnor 60, 67* (BM). — Morobe Dist.: Bulolo, Wau subdist., 1966, *Kairo & Streimann 27877* (L); Finschhafen, 1886,

*Hollrung* 28 (BO, K, MEL); id., 1889, *Warburg* 21427 (A); id., 1890, *Lauterbach* 36 (L); id., 1945, *Sawyer* 243 (L); id., 1889–1891, *Weinland* 16 (BO, K, L); Markham R. valley, c. 35 miles west of Lae, 1962, *Hartley TGH* 9879 (CANB, L); Lae subdist., Lasanga I., 1969, *Streimann NGF* 44297 (L); Huon Peninsula, along Kua R., north of Zalimpa, 1964, *Hoogland* 8997 (L); Markham R. valley, Maralumi Creek, Erap, 30 miles from Lae, 1959, *Henty NGF* 11541 (L, LAE); Wau subdist., Salamaua Track, 10 miles of Wau, 1969, *Streimann & Kairo NGF* 47710 (L). – Gulf Dist.: Aumo near Ihu, 1966, *Craven & Schodde* 729 (L); Malalaua R., between Tapala and Malalaua, near mouth of Tauri R., 1966, *Schodde* 4554 (L); Baimuru subdist., tributary of Era R., 1974, *Croft & Vinas LAE* 61304 (L); Saibai I., 1885, *Stewart s.n.* (MEL); Vailala R., Thu, 1926, *Brass* 958 (BRISB, GH). – Western Highlands Dist.: near Mt. Hagen station, 1956, *Hoogland & Pullen* 6227 (BM). – Madang Dist.: Lower Ramu-Aitau, above Dimir, 1958, *Robbins* 1871 (CANB); Saidor subdist., Long I., 4 km north of Matafuna village, 1970, *Millar & Vandenberg NGF* 48537 (L). – Sepik Dist.: Agoram subdist., track from Timbunke to Kwoiwut, 1959, *Pullen* 1646 (CANB, L); Ossima, Vanimu subdist., 1969, *Streimann & Kairo NGF* 39266 (L); Aitape subdist., Ali I., 1969, *Millar & Vandenberg NGF* 40923 (L); Leitire village, 1965, *Sayers NGF* 18048 (L); near Yellow R., 1949, *Womersley* 3881 (A, BO, L, LAE). – Western Dist.: Fly R., 1885, *Bauerlen* 542 (MEL); id., *Hartmann s.n.* (MEL); Lower Fly R., east bank opposite Sturt I., abundant, 1936, *Brass* 8080 (A, BRI, L); Daru subdist., Kauaharo Creek off Fly R., 1968, *Millar NGF* 35267 (L); Daru I., 1936, *Brass* 6230 (A, BM, BRI, L, LAE).

**Collectors' annotations:** Shrub or herb, scrambling over bushes, or semi-scrambling or decumbent, soft woody, succulent-stemmed; 0.5–4.5 m tall; leaves dull mid green above, slightly lighter below; corolla of marginal and disc-flowers light to bright yellow, or white. Used as cabbage; juice mixed with water used against fevers and ear-ache; leaves used as substitute for salt and to treat colds and sores inside mouth.

**Ecological notes:** On raised, grassy, sandy seashores, beaches, behind beaches and the mangroves, sand ridges within the mangroves, riverbanks, lake shores, swamp forests, in low forest regrowths, in woodland brushes, lower montane forest, *Castanopsis* dominated ridges, on rockpiles, (grassy) tracksides, grasslands, *Imperata* fields, on open grassy plains, abandoned gardens; on dark grey sand, gravel in raised riverbed, on lava rocks; altitude 0–1650 m.

## 2. *Wedelia spilanthoides* F.v.M.

*W. spilanthoides* F.v.M., *Fragm. Phyt. Austr.* 5 (1865) 64; Benth., *Fl. Austr.* 3 (1866) 538; Boerl., *Handl.* 2 (1891) 242; Bailey, *Queensl. Fl.* 3 (1900) 861; Valetton, *Bull. Dép. Agric. Ind. Néerl.* 10 (1907) 69; Lauterbach, *Nova Guinea* 8 (1912) 866; White, *Proc. R. Soc. Queensl.* 34 (1922) 60; Mattfeld, *Engl. Bot. J.* 62 (1929) 436.

Herb, 60–120 cm tall, *stem* angular, 2–4 mm thick, appressed-strigose, *internodes* 6–12 cm long. *Leaves* opposite, sessile or very shortly petiolate, blades oblong or linear-lanceolate or linear, rarely ovate-oblong, nearly rounded or obtuse at the base, subobtuse and mucronate or acute at the top, (often coarsely) serrate-dentate (teeth acute, various in length, bigger ones deltoid), strigose at both sides, chartaceous, 2.5–11 cm long, 2–40 mm broad, petioles strigose, 0–8 mm long. *Heads* solitary or binate, on 1–115 mm long strigose peduncles; *phyllaries* oblong, acute, one-nerved, strigose, 3–4 mm long; *marginal flowers* c. 11, *corolla* oblong-lanceolate, emarginate or bidentate (teeth short) at the apex, parallel-nerved, 6–8 mm long, subglabrous, *style-arms* lanceolate, acute, papillose, *achenes* obconical-oblong, triquetrous, truncate at apex, subglabrous, 2.5–3 mm long, *pappus* consisting of short, subdeltoid, acute, fringed scales; *disc-flowers* numerous, *corolla* 4 mm long, *style-arms* short, lanceolate, acute, *achenes* like in marginal flowers, *pappus*

like in marginal flowers, though sometimes with one short needle; pales of *receptacle* firm, rigid, oblong, 5 mm long, obtuse, parallel-nerved, strigose.

**D i s t r i b u t i o n:** Australia, New Guinea.

NEW GUINEA. West Mts. Cycloop, 1911, *Gjellerup 496* (L); id., along path to Netar, 1938, *Meyer Drees 94* (L); G. Pisero, 1903, *Atasrip s.n.* (L); W. of Hollandia, north of Simboro Strait of Sentani Lake, 1945, *Sigafoos 14* (BO). — East. Northern Dist.: c. 1 km inland from Gona along Popondetta track, occasional, 1953, *Hoogland & Macdonald 3449* (A, L). — Central Dist.: Sogeri subdist., Hombrum Bluff, 1970, *Pulsford UPNG 313* (L); Owen Stanley Range, 1880, *Chalmers s.n.* (MEL); *Goldie s.n.* (MEL); Port Moresby, *Edelfeldt 23* (MEL); id., Kalo, 1889, *MacGregor 27* (MEL); id., common, *White s.n.* (K); Koitahi, 1935, *Carr 12233* (BR, L); Kanosia, 1935, *Carr 11193* (BM, L); Astrolabe Range, *Lawes 25* (MEL); Rigo Dist., 1889, *MacGregor s.n.* (MEL); South Cape, 1880, *Chalmers s.n.* (MEL). — Morobe Dist.: Constantinhafen, 1890, *Lauterbach 1276* (L); id., 1902, *Schlechter 14252* (K); Sattelberg, Kalasa, Gran-hill, frequent, 1938, *Clemens 7965* (A); Kaiser Wilhelmsland, 1888, *Helwig 9* (K); Finschhafen subdist., Sialum-Kalasa road, 8 km from Sialum, 1975, *Henty & Katik NGF 49795* (L); Lae subdist., Leron Plain near Gorge, 1968, *Henty & Coode NGF 29177* (L); Kaiapit, Leron, 1963, *Henty NGF 14864* (CANB, L); Sepik Dist., near Tarengi, Wewak-Maprik road, 1959, *Robbins 2224* (CANB).

**C o l l e c t o r s ' a n n o t a t i o n s:** Diffuse herb or shrub, erect, hard-stemmed, 60–120 cm tall; flowers yellow.

**E c o l o g i c a l n o t e s:** Savannas, open (*Eucalyptus*) forest, *Themeda-Imperata* recently burnt grasslands, native gardens, rocky slopes; on sandy soils; altitude 25–540 m.

**R e m a r k:** In Von Müller's description the leaves of this species are described to be hastate- or oblong-lanceolate, rarely linear. According to Bentham (l.c.) they are from broadly lanceolate to almost linear, which is in accordance with the result of the present study. Since there is a gradual transition from oblong-lanceolate to linear leaves, no forms could be distinguished.

## 12. SYNEDRELLA

*Synedrella* Gaertn, *Fruct.* 2 (1791) 456; Lessing, *Syn. Comp.* (1832) 233; Benth. & Hook. *f.*, *Gen. Pl.* 2 (1873) 383; Hoffmann in E. & P., *Nat. Pfl. Fam.* 4 (5) (1894) 242; Sherff & Alexander, *N. Am. Fl. ser. 2*, 2 (1955) 3; Aristeguieta in Lasser, *Fl. Venezuela* 10 (2) (1964) 631; Ohwi, *Fl. Japan* (1965) 900; Koster in Backer & Bakh. *f.*, *Fl. Java* 2 (1965) 410.

Herbs. *Leaves* opposite. *Heads* axillary, rather small, radiate, heterogamous; *involucre* cylindrical, *phyllaries* few, outer ones foliaceous, inner ones stramineous; *marginal flowers* few, uni-seriate, female, *corolla* ligulate, 2–4-dentate, *style-arms* long, thin, pubescent, acute, *achenes* obovoid-oblong, dorsally flattened, with 2 marginal lacinate wings (teeth rigid, flattened, acute) and 2 awns at the apex, *pappus* wanting; *disc-flowers* few, bisexual, *corolla* narrowly infundibuliform, 4–5-lobed, *anthers* entire at the base, obtuse at the apex, *style-arms* rather long, flattened, acute, *achenes* linear-oblong, subtriangular, with 2–3 oblique awns at the apex, *pappus* wanting; *receptacle* flat, small, paleaceous.

**D i s t r i b u t i o n:** 2 species in tropical America, one introduced into most tropical countries.

### *Synedrella nodiflora* (L.) Gaertner

*Verbesina nodiflora* L., *Cent. Pl.* 1 (1755) 28; Amoën, *Acad.* 4 (1759) 290. — *S. nodiflora* Gaertner, *Fruct.* 2 (1791) 456, t. 171, fig. 7; Clarke, *Comp. Ind.* (1876) 139; Hook. *f.*, *Fl. Brit. Ind.* 3 (1881) 308; Boerl., *Handl.* 2 (1891) 242; White, *Proc. R. Soc. Queensl.* 34 (1922) 60; Merrill, *Enum. Phil.* 3 (1923) 612;

Gagnepain in Lec., Fl. Indo-Chine 3 (1924) 605; Mattfeld, Engl. Bot. J. 62 (1929) 437; Koster in Pulle, Fl. Suriname 4 (2) (1938) 152; Kitamura, Bot. Mag. Tokyo 55 (1941) 347; Sherff & Alexander, N. Am. Fl. ser. 2, 2 (1955) 3; Aristeguieta in Lasser, Fl. Venezuela 10 (2) (1964) 632, fig. 108; Ohwi, Fl. Japan (1965) 900; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 410.

Herb, erect, 25–80 cm tall, much branched, *stem* repeatedly furcate, subangular, 2–5 mm thick, sparingly appressed-hispidulous, finely glandular; *internodes* 7–21 cm long. *Leaves* subpetiolate, ovate or elliptic, narrowed into the 0.5–3.5 cm long, narrowly alate petiole, blade acute at the apex, crenate-serrate, chartaceous, appressed-hispidulous at both sides, 1.5–10 cm long, 0.5–6 cm broad. *Heads* terminal, solitary or 2–7 together, sessile or on 1–45 mm long peduncle, cylindrical, later on campanulate, 10–20-flowered; *phyllaries* 2-seriate, 4 or 5, narrowly oblong, outer ones acute, hispidulous, finely glandular, 9 mm long, inner ones subobtusate, glabrous, 7 mm long; *marginal flowers* 3–8, *corolla* tube very narrow, 2 mm long, ligule oval, 1.5 mm long, obtusely 2–3-dentate, *achene* ribbed, black or dark-brown, 4–5 mm long, often verrucose, glabrous; *disc-flowers* 6–10, *corolla* 4 mm long, *achenes* like in marginal flowers; *pales of receptacle* oblong-linear, rounded at apex.

**D i s t r i b u t i o n:** Central and South America, introduced into most tropical countries.

NEW GUINEA. West. Hollandia, common, 1938, *Brass* 8835 (A, L); Cycloop Mts., road Hollandia-Sentani, 1961, *Van Royen & Sleumer* 6588 (L); Jappen-Biak, Seroei, 1939, *Aet & Idjan* 110 (A, L); Passir Poetih near Manokwari, very common, 1958, *Kalkman BW* 6355 (CANB, L); Sorong, Doom, 1913, *Doorn* 16 (BO, L); Sorong, 1949, *Van Hellendoorn* 58 (L). — East. New Britain Dist.: New Britain, near Rabaul, State Plantation, *Frogatt* 12 (K); Pomio subdist., Fulleborn Harbour, *Croft NGF* 41329 (L). — New Ireland Dist.: New Ireland, Lamekot, P.O. Kaewieng, no date, *Peekel* 24 (BO). — Milne Bay Dist.: Fergusson I., Iamelele no. 1, 1956, *Brass* 26040 (A, K, L, LAE); Kawagiri R., Peria Creek, common, 1953, *Brass* 24207 (A, CANB, L, LAE); Cape Vogel Peninsula, 1953, *Brass* 21733 (A, CANB, L, LAE). — Central Dist.: Laloki R., Rona, plentiful, 1953, *Brass* 3595 (BO, BRI, GH, NY); id., Haga, 1926, *Brass* 895 (BO, BRI); Port Moresby, 1954, *Kingston K* 1512 (LAE); 1948, *White* 8 (BRI); Mageri, near Sogeri, 1951, *Dominey* 4133 (A, BO, L, LAE); Kanosia, 1935, *Carr* 11093 (Bm, CANB, L, NY); 1962, *Schodde* 2964 (A, BRI, CANB, K, L, LAE); Port Moresby subdist., Rigo Road between Tubusena and Baitama, *Tippett UPNG* 384 (L). — Morobe Dist.: Markham Valley, Markham Bridge, near Lae, 1959, *Henty NGF* 11508 (CANB, K, L, LAE); Lae, *Hartley TGH* 11621 (CANB, L); Wau subdist., Bulolo, Plantation area, 1957, *Wells NGF* 7390 (CANB, LAE); 1971, *Streimann & Kairo NGF* 25851 (L); vicinity of Finschhafen, 1945, *Sawyer* 230, 273 (L). — Eastern Highlands Dist.: Bubia, 1959, *Edwards* 16 (LAE). — Madang Dist.: Josephstal, Lower Ramu, common, 1958, *Pullen* 1115 (CANB); Lower Ramu-Atitau area, Bogia, 1958, *Robbins* 1705 (CANB); Saidor subdist., Long I., Matafuna Bay, 1970, *Stevens LAE* 50141 (L); id., Matafuna, 1970, *Millar NGF* 38433 (L). — Sepik Dist.: Lumi subdist., near Miwante village, Torricelli Mts., 1961, *Darbyshire* 348 (A, BM, BRI, CANB, L, LAE, US); Aitape subdist., Marok village, common, 1961, *Darbyshire & Hoogland* 7878 (A, CANB, L, LAE); Wewak-Angoram Area, But village, W. of Wehwah, 1959, *Pullen* 1328 (CANB, LAE); id., foothills of Prince Alexander Range, S. of Mt. Turu, above Ambakanja village, 1959, *Pullen* 1617 (CANB, LAE); id., Numoiken Road, near Wewak, 1959, *Robbins* 2099 (CANB); id., Yanguru-Mapaik Road, common, 1959, *Robbins* 2305 (CANB).

**C o l l e c t o r s ' a n n o t a t i o n s:** Up to 1.50 m tall, with creeping rootstock, leaves dull dark green above, mid green below; corolla of marginal flowers yellow, rarely white, of disc-flowers (bright) yellow.

**E c o l o g i c a l n o t e s:** Weed on roadsides, native gardens, in herbaceous vegetations, in river beds, streambanks, in grassy secondary growth, rain forest, cleared areas, swamp borders, open grassland, open places in jungle, woodland-grass, cliffs above the beach; on sand, brown clay-loam, or rocky soil; altitude 0–900 m.



### 13. ECLIPTA

*Eclipta* L., Mant. (1771) 157, 286; Less., Syn. Comp. (1832) 212; Benth. & Hook. *f.*, Gen. Pl. 2 (1873) 361; Boerl., Handl. 2 (1891) 241; Hoffmann in E. & P., Nat. Pfl. Fam. 4 (5) (1894) 231; Bailey, Queensl. Fl. 3 (1900) 859; Robertson in Black, Fl. S. Austr. 4 (1957) 875; Cabrera, Fl. Buenos Aires 6 (1963) 199; Humbert, Fl. Madagascar 3 (1963) 639; Aristeguieta in Lasser, Fl. Venezuela 10 (2) (1964) 507; Ohwi, Fl. Japan (1965) 899; Koster in Backer & Bakh. *f.*, Fl. Java 2 (1965) 402; Wild, *Kirkia* 6 (1967) 59; Hilliard, Comp. Natal. (1977) 303.

Herbs. *Leaves* opposite, pinninerved. *Heads* terminal and in the axils of the upper leaves, solitary or two together, rather small, heterogamous; *involucre* basin-shaped, *phyllaries* 2-seriate; *marginal flowers* 1- or 2-seriate, female, *corolla* narrowly ligulate, *style-arms* short, flat, obtuse, *achenes* more or less oblong, truncate, with an irregularly dentate rim at the apex, 3-angular, *pappus* wanting; *disc-flowers* numerous, bisexual, *corolla* tubular, with a short tube and a campanulate 4- or 5-dentate limb, *anthers* very shortly sagittate, nearly entire at the base, obtuse at apex, *style-arms* short, flat, obtuse, *achenes* more or less oblong, truncate, with an irregularly dentate rim at the apex, 4-angular, *pappus* wanting; *receptacle* convex, with narrowly linear pales.

**D i s t r i b u t i o n:** 15 species, most in South, but also in Central and North America; one species in all warm countries.

#### *Eclipta prostrata* (L.) L.

*Verbesina prostrata* L., Sp. Pl. ed. 1 (1753) 902. — *E. prostrata* L., Mant. (1771) 286; Blume, Bijdr. (1826) 915; DC., Prodr. 5 (1836) 490; Kitamura, Bot. Mag. Tokyo 55 (1941) 347; Exell, Cat. Pl. S. Thomé (1944) 225; Humbert, Fl. Madagascar 3 (1963) 640; Ohwi, Fl. Japan (1965) 899; Koster in Backer & Bakh. *f.*, Fl. Java 2 (1965) 402; Wild, *Kirkia* 6 (1967) 59; Tutin *et al.*, Fl. Europaea 4 (1976) 141; Hilliard, Comp. Natal. (1977) 304.

*Verbesina alba* L., Sp. Pl. ed. 1 (1753) 902. — *E. alba* Hassk., Pl. Jav. Rar. (1848) 528; Miquel, Fl. Ind. Bat. 2 (1856) 65; Benth., Fl. Austr. 3 (1866) 536; Clarke, Comp. Ind. (1876) 134; Hook. *f.*, Fl. Brit. Ind. 3 (1881) 304; Boerl., Handl. 2 (1891) 241; Bailey, Queensl. Fl. 3 (1900) 859; Valetton, Bull. Dép. Agric. Ind. Néerl. 10 (1907) 69; Lauterbach, Nova Guinea 8 (1912) 866; Merrill, Enum. Phil. 3 (1923) 610; Gagnepain in Lec., Fl. Indo-Chine 3 (1924) 599; Mattfeld, Engl. Bot. J. 62 (1929) 432; Koster in Pulle, Fl. Suriname 4 (2) (1938) 144; Aristeguieta in Lasser, Fl. Venezuela 10 (2) (1964) 510, fig. 81; Ohwi, Fl. Japan (1965) 899; Wild, *Kirkia* 6 (1967) 59.

*E. erecta* L., Mant. (1771) 286; Blume, Bijdr. (1826) 914; DC., Prodr. 5 (1836) 490.

Herb, 10–70 cm tall, erect-ascending or creeping, often rooting at the lower nodes, usually much branched, *stem* subterete, appressed-pubescent, glabrescent, 4–10 mm thick. *Leaves* sessile, oblong-elliptic or oblong-lanceolate, narrowed at the base, acute or obtuse at the apex, entire or minutely serrate, appressed-hispidulous on both sides, 1.5–15.5 cm long, 3–40 mm broad. *Heads* often numerous, semi-globose, 0.5–1 cm diam.; peduncles thin, thickened at the top, appressed-pubescent, 0.5–7 cm long; *phyllaries* ovate, acuminate, acute, appressed-pubescent, 5–6 mm long; *corolla* of *marginal flowers* with a thin tube and a linear ligule, 2-dentate at the apex, 2.5 mm long, *corolla* of *disc-flowers* 2 mm long; *achenes* of all flowers turbinate-oblong, 3 mm long, tuberculate, black, glabrous but for some white hairs at the apex.

**D i s t r i b u t i o n:** Originating from tropical America, introduced into all warm countries.

NEW GUINEA. West. Merauke, 1907, *Versteeg* 1973 (BO, K, L, U); id., 1941, *Anta* 278 (BO, L); east of Merauke, 1904, *Koch s.n.* (BO, L); Lake Sentani near Hollandia, 1911, *Gjellerup* 475 (BO, L); Tor R., lower course, 1911, *Gjellerup* 719 (BO, GH, L); Mamberamo R., Albatros-bivak, 1926, *Docters van Leeuwen* 11232 (BO, GH, K, L, U); Arfak Mts., Kofo Anggi, 1928, *Mayer* 216 (BO); McCluer Gulf, Babo, 1941, *Aet* 667 (K, L). — East. Milne Bay Dist.: Cape Vogel Peninsula, Menapi, 1953, *Brass* 22043 (A, CANB, L, LAE); id., 1949, *Crutwell* 143 (BO, K, L); Dogura, *Anon. s.n.* (MEL); Goodenough I., Bolu Bolu, 1953, *Brass* 24369 (A, CANB, L, LAE). — Northern Dist.: c. 1 km NW of Anonda airstrip, 1953, *Hoogland* 3787 (A, BM, BO, BRI, CANB, K, L, LAE). — Central Dist.: Moitaka-Waigani, 1964, *Sillison NGF* 22003 (L, LAE); Aroa R., 1935, *Carr* 11421 (BM, CANB, K, L); Kairuku subdist., near Hisiu, 1962, *Pullen* 3549 (CANB); 1962, *Darbyshire* 804 (A, CANB, K, L, LAE); Haga Laloki R., 1926, *Brass* 893 (BRI, GH). — Morobe Dist.: Wau subdist., Bulolo, 1968, *Streimann & Kairo NGF* 39069 (L); Kajabit, 1939, *Clemens* 40675 (MICH); Lae, 1958, *Henty NGF* 9871 (CANB, L, LAE); Markham valley, Erap, near Lae, 1959, *Henty NGF* 11505 (BRI, CANB, K, L, LAE); Lae subdist., Markham bridge, 1966, *Coodo, Gillison & Ridsdale NGF* 2954 (L); id., 1970, *Coodo NGF* 46155 (L); mouth of Markham R., 1889–1891, *Weinland* 211 (BO, BRI). — Western Highlands Dist.: Strickland R., 1885, *Bäuerlen* 11 (BRI, MEL). — Sepik Dist.: Sepik R., near Yellow R., 1949, *Womersley NGF* 3882 (A, BO, K, L); Wewak-Angoram Area, Marendiwa canoe-channel, c. 2 miles SE. of Timbunke, 1959, *Pullen* 1701 (CANB, L, LAE); Angoram subdist., Wewak-Angoram, canal from Timbunke to Malimbo, 1959, *Pullen* 1773 (CANB); Aitape subdist., c. 1 mile inland from Aitape, 1962, *Darbyshire & Hoogland* 7850 (A, CANB, L, LAE). — Western Dist.: mouth of Morehead R. near Bula village, 1967, *Pullen* 7032 (L).

**Collectors' annotations:** Plants often growing in clusters, semi-erect, 60–125 cm tall, stem more or less succulent, upper part of internodes much swollen, flowers rapidly caducous, corolla of marginal flowers white, whitish, or white-green, corolla of disc-flowers white, cream-coloured, or yellow-greenish.

**Ecological notes:** *Imperata* fields, forests, scrubby or marshy banks of rivers and lakes, along creeks, swamps, savannas, wet grasslands, open places; often a common weed in native gardens and plantations, also in ditches, roadside drains, and marshy places on seashore; sandy alluvial soils; altitude 0–840 (–2100) m.

#### 14. SIGESBECKIA

*Sigesbeckia* L., Sp. Pl. (1753) 900; Benth. & Hook. f., Gen. Pl. 2 (1873) 359; Hoffmann in E. & P., Nat. Pl. Fam. 4 (5) (1894) 230; Bailey, Queensl. Fl. 3 (1900) 858; Robertson in Black, Fl. S. Austr. 4 (1957) 874; Humbert, Fl. Madagascar 3 (1963) 637; Aristeguieta in Lasser, Fl. Venezuela 10 (2) (1964) 500; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 400; Ohwi, Fl. Japan (1965) 898; Wild, Kirkia 6 (1967) 36; Cabrera in Correa, Fl. Patag. 7 (1971) 137; Hilliard, Comp. Natal. (1977) 300.

Herbs. *Leaves* opposite, dentate. *Heads* in slender, widely branched, lax panicles, heterogamous, small, obscurely radiate; *phyllaries* usually 5, patent, glandular; *marginal flowers* few, female, *corolla* ligulate, with a short tube and a short 3–4-dentate (teeth acute) ligule, *style-arms* broad, short, truncate, flat, *achenes* obpyramidal, often curved, *pappus* wanting; *disc-flowers* few, bisexual, *corolla* tubular, with a short tube and a campanulate 5-dentate (teeth acute) limb, *anthers* entire at the base and obtuse at the apex, *style-arms* and achenes like in marginal flowers; *receptacle* small, convex, with herbaceous concave *pales* embracing the achenes.

**Distribution:** 10 species in Canary I., tropical Africa, Madagascar, Formosa, China, Japan, Central and South America; one species pantropical and in subtropical regions.

#### *Sigesbeckia orientalis* L.

*S. orientalis* L., Spec. Pl. (1753) 900; Benth., Fl. Austr. 3 (1866) 535; Clarke, Comp. Ind. (1876) 133; Hook. f., Fl. Brit. Ind. 3 (1881) 304; Bailey, Queensl. Fl. 3 (1900) 858; Merrill, Enum. Phil. 3 (1923) 610;

S. Moore, *J. of Bot.* 61, suppl. (1923) 28; Gagnepain in Lec., *Fl. Indo-Chine* 3 (1924) 600; Mattfeld, *Engl. Bot. J.* 62 (1929) 431; Degener, *Fl. Hawaii* 3 (1932) fam. 344; Humbert, *Fl. Madagascar* 3 (1963) 637; Aristeguieta in Lasser, *Fl. Venezuela* 10 (2) (1964) 502; fig. 78; Koster in Backer & Bakh. *f.*, *Fl. Java* 2 (1965) 401; Ohwi, *Fl. Japan* (1965) 899; Wild, *Kirkia* 6 (1967) 36; Cabrera in Correa, *Fl. Patag.* 7 (1971) 137; Tutin *et al.*, *Fl. Europaea* 4 (1976) 140; Hilliard, *Comp. Natal.* (1977) 392, fig. 11E.

Erect much branched herb, 10–100 cm tall, sometimes with a short rhizome, *branches* furcate, *stem* subangular, hispidulous, often tinged with purple, 2–8 mm thick; *internodes* 10–16.5 cm long. Lower *leaves* with 1–5 cm long, more or less winged petioles, deltoid- or ovate-oblong, cuneate and attenuate at base, obtuse and apiculate at apex, 5–20 cm long, 1.5–12 cm broad, higher leaves sessile or nearly so, oblong-lanceolate, smaller, to 2 cm long, 0.5 cm broad, dentate or entire, acute, more or less long-attenuate at apex, chartaceous, all leaves coarsely irregularly dentate (teeth obtuse, mucronulate, up to 1 cm long), 3-nerved, appressed-hispidulous on the upper side, shortly pubescent and glandular on the lower side. *Heads* terminal and in the axils of the upper leaves, peduncles filiform, 0.5–3 cm long, with patent gland-hairs; *involucre* one-seriate, *phyllaries* linear-spathulate, 5, obtuse or rounded at the apex, herbaceous, 6–15 mm long, bearing numerous patent gland-hairs; *marginal flowers*  $\pm$  3, tube of the *corolla*  $\pm$  1 mm long, ligule deltoid-obovate,  $\pm$  2 mm long, *achenies* obpyramidal, 4-angular, truncate, tipped by a rim, black, glabrous, 4–5 mm long; *disc-flowers* c. 8, *corolla* 2 mm long; *pales* broadly elliptic, rounded at the apex, outer ones with gland-hairs,  $\pm$  5 mm long, inner ones without glands,  $\pm$  4 mm long.

**D i s t r i b u t i o n:** In all tropical and subtropical regions.

NEW GUINEA. West. Minjambau, O. A. Manokwari, fairly common, 1962, *Versteegh BW 12735* (K, L); Angguruk to Wali, 1973, *Sauveur & Sinke 2623* (L); Bele R., 18 km NE. of Lake Habbema, 1938, *Brass 11586* (A, L); Balim R., 1938, *Brass 11789* (L); Wissel Lake region, foot of Mt. Boeibeiro, 1939, *Eyma 4906* (A, BO, K, L); id., Kerimamba-Wandai, 1939, *Eyma 4638* (K, L); Siriwo R., 1912, *Janowsky 195* (BO, L). — East. Milne Bay Dist.: North slopes of Mt. Dayman, Gorge of Upper Gwariu R., common, 1953, *Brass 22629* (A, L, LAE); Baniara subdist., Bonenau village, common, 1969, *Pullen 8074* (L). — Central Dist.: Owen Stanley Range, Sogeri Region, 1885, *Forbes 141* (BM, BRI, L, MEL, NY); Mafulu, 1933, *Brass 5531* (BRI, NY); Boridi, 1935, *Carr 14272* (BM, L). — Morobe Dist.: Finschhafen, 1886, *Hollrung 92* (BO, K); id., 1889–1891, *Weinland 5* (BO); id., 1890, *Lauterbach 452* (L); Kundiawa, Sipagul School, 1972, *Ströder s.n.* (L); Partep, near Bulolo, 1947, *Bridgland 3083 A* (LAE); Wantoat, 1940, *Clemens 41186* (A); Supot, near Boana, 1962, *Henty 14740* (L, LAE). — Eastern Highlands Dist.: Upper Chimbu R. valley, Guakenigl, 1960, *Borgmann 311* (L); Mt. Wilhelm, Kegsugl-Komani Mambuno track, 1972, *Smith ANU 15363* (L); id., east slopes, 1959, *Brass 30645* (L); Upper Chimbu, Waimambuno, 1957, *Pullen 359* (BM, CANB, L, LAE); Kainantu, Wonenara Patrol Post beside Gualga R., 1963, *Henty & Carlquist NGF 16523* (L, LAE); Noreikora, Kainantu subdist., 1966, *Wheeler ANU 5876* (L). — Western Highlands Dist.: Nondugl, 1957, *Robbins 614* (BM, CANB, L, LAE); id., 1955, *Harrison 118* (LAE); id., *Womersley & Hoogland 4866* (A, BM, BO, CANB, K); near Mt. Hagen Station, 1956, *Hoogland & Pullen 5980* (CANB, L); near Yogos village, Lower Tale valley, Wabag subdist., 1960, *Hoogland & Schodde 6700* (L); near Amapyak, abundant, 1964, *Flenley ANU 2196* (L); Mt. Hagen subdist., Gumanch Plantation, 1968, *Henty NGF 41790* (L); Kubor Range, Uimba, Non-Minj Divide, very common, 1963, *Vink 16309* (L). — Southern Highlands Dist.: Goropu Mts. (Mt. Suckling), Otukai Pon, common, 1972, *Veldkamp & Stevens 5575* (L); Tari subdist., Telabo, 1972, *Powell UPNG 1575* (L). — Sepik Dist.: Telefomin subdist., Oksapmin, 1968, *Henty, Isgar & Galore NGF 41520* (L).

**C o l l e c t o r s ' a n n o t a t i o n s:** Aromatic sticky herb, to 3 m tall, stems reddish purple, grey hairy; corolla of marginal and disc-flowers dark or orange-yellow.

**E c o l o g i c a l n o t e s:** Weed in old gardens, in sweet potato and rice fields, coffee plantations, cultivated land, *Themeda* grassland on steep rocky hillsides, in

grasslands bordering swamps, on open banks of rivers, cow paddocks, forest clearings, roadsides; on loamy soil, black peaty soil; altitude 750–2700 m.

### 15. SPILANTHES

*Spilanthes* Jacquin, Enum. Syst. Pl. Carib. 8 (1760) 28; Benth. & Hook. *f.*, Gen. Pl. 2 (1873) 380; Clarke, Comp. Ind. (1876) 138; Hook. *f.*, Fl. Brit. Ind. 3 (1881) 307; Boerl., Handl. 2 (1891) 207; Hoffmann in E. & P., Nat. Pfl. Fam. 4 (5) (1894) 237; Bailey, Queensl. Fl. 3 (1900) 862; Gagnepain in Lec., Fl. Indo-Chine 3 (1924) 598; Cabrera, Fl. Buenos Aires 6 (1963) 217; Aristeguieta in Lasser, Fl. Venezuela 10 (2) (1964) 611; Koster in Backer & Bakh. *f.*, Fl. Java 2 (1965) 407; Wild, Kirkia 6 (1967) 60; Cabrera in Correa, Fl. Patag. 7 (1971) 144; Hilliard, Comp. Natal. (1977) 313.

Herbs, branched. *Leaves* opposite, simple, mostly dentate. *Heads* small or middle-sized, discoid or radiate, later on conical or ovoid, solitary or terminal in the axils of the upper leaves, heterogamous or homogamous; *involucre* campanulate or basin-shaped, *phyllaries* 1–3-seriate, outer ones foliaceous; *marginal flowers* wanting or few, female, one-seriate, *corolla* ligulate, 2–3-lobate at the apex, mostly yellow or sometimes white, *style-arms* lanceolate, acute, *achenes* oblong, triquetrous; *pappus* wanting or consisting of 1–3 hairs; *disc-flowers* many, bisexual, *corolla* tubular, narrowly campanulate in the upper part, mostly 5-lobate, *anthers* entire or rarely minutely 2-dentate at the base, subacute at apex, *style-arms* short, truncate, *achenes* oblong, laterally compressed, angular, *pappus* like in marginal flowers; *receptacle* convex or elongate-conical or subulate, *pales* navicularly folded around the flowers, with membranous margins.

*Distribution*: About 75 species; most species in Central and South America, few in North America, India, Burma, Malay Peninsula, Indonesia, Philippines, Australia, Africa; three species in New Guinea.

*Remark*: Mattfeld (Engl. Bot. J. 62, 1929: 436) distinguished two species in New Guinea; *S. acmella* (L.) Murr. and *S. grandiflora* Turcz. The first mentioned species appeared in New Guinea to be a mixture of *S. iabadiensis* and *S. paniculata*; however, the name is incorrect as pointed out by Koster & Philipson, Blumea 6 (1950) 349–350.

#### KEY TO THE SPECIES IN NEW GUINEA

- 1a. Phyllaries 3-seriate; ligule of corolla of marginal flowers 5–13 mm long, usually long-exserted outside the involucre . . . . . **1. *S. grandiflora***
- b. Phyllaries 1–2-seriate; ligule of corolla of marginal flowers, if present, 1–4 mm long, slightly exserted outside the involucre . . . . . **2**
- 2a. Leaves elliptic or rarely elliptic-ovate; heads small, later on elongated-ovoid, acute, 7–11 mm high, phyllaries 1-seriate, 5–7, marginal flowers 5, achene 1–1.5 mm long . . . . . **2. *S. iabadiensis***
- b. Leaves broadly ovate or elliptic-ovate; heads later on conical-ovoid, obtuse, 10–15 mm long, phyllaries 2-seriate, 8–14, marginal flowers absent, or 5–12 (mostly 5), achene 2–3 mm long . . . . . **3. *S. paniculata***

#### 1. *Spilanthes grandiflora* Turcz.

*S. grandiflora* Turcz., Bull. Soc. Nat. Moscou 24 (1) (1851) 185; Benth., Fl. Austr. 3 (1866) 541; Bailey, Queensl. Fl. 3 (1900) 862; Moore, Proc. Amer. Acad. 42 (1907) 544; Mattfeld, Engl. Bot. J. 62 (1929) 437; Koster & Philipson, Blumea 6 (1950) 353; Koster in Backer & Bakh. *f.*, Fl. Java 2 (1965) 408. – *Ceratocephalus grandiflora* O.K., Rev. Gen. Pl. 1 (1891) 326.

Herb, 45–80 cm tall, sometimes rooting at the lower nodes, *stem* angular, 3–4 mm thick, glabrous or nearly so, *internodes* 2–12 cm long. *Leaves* subsessile or petiolate, ovate-lanceolate, or lanceolate, or linear, towards base sharply, lower down gradually attenuate, subobtuse at the apex, subentire, or repand-mucronulate, or repand-dentate, glabrous at both sides, 3-nerved, blades 3–7 cm long, 2–16 mm broad, higher ones smaller; petioles 1–5 mm long. *Heads* at first semi-globose, later on broadly ovoid and obtuse or rounded at the apex, 10–13 mm long, peduncles straight, ribbed, glabrous, 1 mm thick, thickened to the apex, 8–35 cm long; *involucre* basin-shaped, *phyllaries* 3-seriate, 15–20, lanceolate or oblong-lanceolate, obtuse or subacute, glabrous, often finely ciliate, nerves prominent; *marginal flowers* 5–15, ligule of *corolla* 2-lobate, parallel-nerved, 5–10 mm long, tube thin, pubescent, 2 mm long, *style-arms* short, obtuse, *achenes* obovate-oblong, sometimes ciliate, glabrous, 2–2.5 mm long, *pappus* wanting; *corolla* of *disc-flowers* 5-lobate at the apex, 2 mm long, *anthers* entire at the base, *style-arms* pubescent, *achenes* ciliate, further glabrous, sometimes verrucose on the upper part, sometimes margins pale, 2–2.5 mm long, *pappus* wanting or consisting of 2 short hairs of different lengths; *receptacle* narrowly conical, 6–10 mm long, scales oblong, 3-lobate at apex, 4.5 mm long.

**D i s t r i b u t i o n:** Java, Lesser Sunda I., Philippines, New Guinea, Australia, Micronesia (Palau).

**R e m a r k:** Leaves very variable. Turczaninow described the leaves in the diagnosis as '(foliis) ovatolanceolatis-acuminatis', which agrees with the type-specimen, Philippines, *Cuming 1154* (isotype, L).

### a. forma *grandiflora* – Fig. 1a

*Leaves* petiolate, blades ovate-lanceolate or lanceolate (in isotype 1.5–5.5 cm long, 2–25 mm broad).

NEW GUINEA. E a s t. Northern Dist.: Goilala subdist., between Kupativava and Omoretu, 1964, *Hartley TGH 13037* (L); Kokoda, without date, *Cheesman 83* (L). – Central Dist.: Koitaki, 1935 *Carr 12234* (L); Isuarana, 1936, *Carr 15634* (L); Hombrom Bluff near Sogeri, 1956, *Womersley & Shaw NGF 8825* (L). – Morobe Dist.: Markham valley, Baiune, 1959, *Henty NGF 11640* (L, LAE); vicinity of Kajabit mission, 1939, *Clemens 10810* (A, L); Wau subdist., Bulolo, 1968, *Kairo & Emos NGF 35786* (L). – Eastern Highlands Dist.: Okasa, south of Okapa, 1967, *Coode & Lelean NGF 29943* (L); Kainantu-Aiyura road, 1968, *Henty NGF 29260* (L); Wabiga, Kainantu-Okapa road, 1966, *Henty NGF 271455* (L). – Western Highlands Dist.: near Mt. Hagen station, 1956, *Hoogland & Pullen 6227* (A, BM, BRI, CANB, L, LAE); Hagen subdist., Wahgi flats near Kuli, 1957, *Robbins 514* (CANB, LAE); Kaip valley, near Korn, 1957, *Robbins 172* (A, BM, CANB, L, LAE); Kindeng Forest station, 1968, *Henty NGF 41783* (L).

**C o l l e c t o r s ' a n n o t a t i o n s:** Erect to semi-procumbent, lax herb, 30–120 cm tall; stems long, straggling, wiry, purplish; leaves grey-green; corolla of marginal and of disc-flowers (bright)yellow; achene black.

**E c o l o g i c a l n o t e s:** Grasslands, grass-swamps, mixed short grasslands, recently burnt grasslands, *Cyperaceae* boghollows, recently drained *Phragmites* swamps; secondary forests, forest trails, open savanna land; dry rocky soils along tracks; altitude 450–1950 m.



Fig. 1. *Spilanthes grandiflora* Turcz. — a. f. *grandiflora*, upper part of plant,  $\times 1$  (Cuming 1154); b. f. *linifolia* Koster, leaves,  $\times 1$  (Brass 11626, type).

**b. forma *linifolia* Koster, *nova forma* — Fig. 1b**

*Folia* subsessilia, linearia (in type 3–6 cm longa, 2–6 mm lata)

*T y p u s*: *Brass 11626* (L).

*D i s t r i b u t i o n*: New Guinea, Australia.

NEW GUINEA. West. Balim R., abundant, 1938 *Brass 11626* (L, type); Wamenco, very common, 1961, *Versteegh BW 12564* (L). — East. Morobe Dist.: Lae subdist., Leron Plain near gorge, 1968, *Henty & Coode NGF 29176* (L); Bulolo-Dongale track, Wau subdist., 1969, *Streimann & Kairo NGF 44241* (L); Menyama subdist., Menyama, 1968, *Streimann & Kairo NGF 35871* (L); id., 1953, *Henty s.n.* (LAE). — Eastern Highlands Dist.: Mogl, 1960, *Borgmann 452* (L); Kainantu subdist., Noreikora swamp, 1966, *Wheeler ANU 5880* (L); Lufa-Goroka Road, 20 miles from Goroka, Mt. Micheal, NE. slopes, 1959, *Womersley NGF 11738* (LAE); Goroka subdist., S. side of Asaro R., SW. of Goroka near village Raiga, 1957, *Pullen 605* (CANB, LAE); Kassam, occasional, 1959, *Brass 32354* (L); Aiyura, 1954, *Mc Kee 1256* (L, LAE); Kainantu subdist., Wonenara Patrol Post, beside Gualga R., 1963, *Henty & Carlquist NGF 16520* (L). — Western Highlands Dist.: Michael Kumun Banz, 1959, *Fatima College 19* (LAE); Wabag, 1953, *Kinmorley THG 20* (LAE). — Sepik Dist.: Yaugiba near Tring, Wewak-Angoram Area, 1959, *Robbins 2152* (CANB); Radarada, 1948, *Cruttwell 114* (BRI, K).

*C o l l e c t o r s ' a n n o t a t i o n s*: Erect, ascending, straggling, or sprawling herb, to 90 cm tall; leaves dull green above; corolla bright deep yellow (turning white).

*E c o l o g i c a l n o t e s*: (*Themada-Imperata*) grasslands, along tracks, native gardens, ridges at edge of rainforest; on stony sandy soils, limestone; altitude 120–1700 m.

**2. *Spilanthes iabadicensis* A. H. Moore**

*S. iabadicensis* A. H. Moore, Proc. Amer. Acad. Arts & Sci. 42 (1907) 542; Koster & Philipson, Blumea 6 (1950) 354; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 408.

Herb, 14–100 cm tall, erect or often creeping, rooting in the nodes, *stem* angular, sparsely scabridly pilose or subglabrous, 1–5 mm thick, internodes 1–10 cm long. *Leaves* subsessile or petiolate, ovate-elliptic, obtuse at apex, attenuate into the 2–12 mm long petiole, entire or undulate, chartaceous, 3-nerved, glabrous at both sides, blades 1.5–8 cm long, 7–35 mm broad, higher ones smaller. *Heads* on 1.5–4 cm long filiform peduncles (thickened in the upper part), often subpaniculate, ovoid or subglobose, 3–6 mm thick, 4–6 mm long, later on elongate-ovoid, 4–6 mm thick, 6–9 mm long, acute at apex; *phyllaries* one-seriate, 5–7, ovate or ovate-lanceolate, obtuse, minutely scarcely pilose, sometimes fimbriate at the margin; *marginal flowers* 5, ligule of *corolla* oval, with 2–3 rounded lobes at the apex, 1–3 mm long, tube thin, pubescent, as long as ligule, *style-arms* short, *achenes* compressed, black, glabrous, mostly minutely ciliate at the margin, 1–1.5 mm long, *pappus* consisting of 2 (sometimes one) very short hairs or sometimes wanting; *corolla* of *disc-flowers* infundibuliform, 1 mm long, with 3–5 deltoid subacute lobes at the apex, *anthers* entire at the base, *achenes* like in marginal flowers; *receptacle* subulate, 4–5 mm long, *pales* navicular, oblong, striate, 2.5 mm long.

*D i s t r i b u t i o n*: Malay Peninsula, Sumatra, Java, Lesser Sunda I., Celebes, Philippine I., New Guinea, South America.

NEW GUINEA. West. Waren, 60 miles S. of Manokwari, 1940, *Kanehira & Hatusima 14256* (BO). — East. Morobe Dist.: Finschhafen, 1891, *Lauterbach 1400* (L); id., 1890–1891, *Weinland 69* (BO, L); Lae subdist., 15 miles of Lai, 1970, *Streimann & Kairo NGF 47713* (L); Singaua Plantation, 1970, *Henty NGF 42950* (L); near Abo, 1971, *Henty NGF 49144* (L); Huon Peninsula, along Kua R., N. of Zalimpa, common, 1964, *Hoogland 9006* (L).

**Collector's annotations:** Herbs, 90–100 cm tall, leaves dull green above; corolla of marginal flowers white or bright yellow, of disc-flowers bright yellow.

**Ecological notes:** Weed in old gardens, in pastures under coconut trees, open grassfields, on sandy riverbanks, in waterlogged soil, roadsides; altitude 0–420 m.

### 3. *Spilanthes paniculata* Wall. ex DC.

*S. paniculata* Wall. ex DC., Prodr. 5 (1836) 625; Koster & Philipson, Blumea 6 (1950) 354; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 408.

Herb, 64 cm tall, *stem* striate, glabrous or nearly so, 2–3 mm thick, *internodes* 3–11 cm long. *Leaves* subsessile or petiolate, ovate-elliptic or elliptic, subobtuse and minutely mucronate at the apex, subcuneate, gradually attenuate at the base, chartaceous, glabrous at both sides, blades 1–9 cm long, 5–45 mm broad, petioles 2–15 mm long. *Heads* on filiform 6–20 cm long peduncles, subglobose, 6–7 mm thick, 5–6 mm long, later on conical, 8–11 mm thick, 10–15 mm long; *phyllaries* 2-seriate, ovate or elliptic, obtuse, glabrous; *marginal flowers* c. 5, ligule of *corolla* oblong, nearly rounded or broadly elliptic, 1–10 mm long, *achenes* obovate-oblong, compressed with ciliate edges, sparsely pubescent at the top, black, 2–2.5 mm long, *pappus* consisting of 2 short hairs; *disc-flowers* numerous, corolla c. 2 mm long, 4–5-lobate, *achenes* like in marginal flowers; *receptacle* subulate, finally 5–10 mm long, pales oblong, striate.

**Distribution:** India, Ceylon, Burma, Thailand, Vietnam, Indonesia, Philippine I., New Guinea, South America.

NEW GUINEA. East. Central Dist.: base of Rouna Falls, 1935, Carr 12368 (NY). – Morobe Dist Finschhafen, 1891, Lauterbach 1400a (L).

**Collector's annotation:** Corolla bright yellow.

**Ecological notes:** On exposed rocks under continual spray; altitude c. 270 m.

## 16. ZINNIA

*Zinnia* L., Syst. Nat., ed. 10 (1759) 1221; Lessing, Syn. Comp. (1832) 221; Benth. & Hook. f., Gen. Pl. 2 (1873) 357; Bailey, Queensl. Fl. 3 (1900) 858; Torres, Brittonia 15 (1963) 4; Koster in Backer & Bakh. f., Fl. Java 2 (1965) 399; Wild, Kirkia 6 (1) 1967 54; Stuessy, Ann. Miss. Bot. Gard. 62 (1975) 1097; Hilliard, Comp. Natal. (1977) 299.

Herbs or low shrubs. *Leaves* opposite, sessile or shortly petiolate, entire. *Heads* terminal, solitary, heterogamous, radiate, pedunculate; *phyllaries* 3- to many-seriate, imbricate, outer ones gradually shorter, rounded or obtuse; *marginal flowers* uni-seriate, female, *corolla* ligulate, marcescent after anthesis, persistent, with or without a short tube, *style-arms* filiform, obtuse, pubescent, *achenes* oblong or obovoid, compressed or 3-angular, truncate or 2–3-dentate at the apex, with or without awns; *pappus* wanting; *disc-flowers* numerous, bisexual, *corolla* tubular, 5-fid, *anthers* truncate or very shortly sagittate at the base, subacute at the apex, *style-arms* filiform, *achenes* compressed or angular, with or without awns, *pappus* wanting; *receptacle* concave or narrowly conical, with conduplicate pales embracing the achenes.



**D i s t r i b u t i o n:** 22 species in North, Central, and South America, escaped in Australia and New Guinea.

KEY TO THE SPECIES, ESCAPED IN NEW GUINEA

- 1a. Achenes of disc-flowers with 1 or 2 awns . . . . . **1. *Z. peruviana***
- b. Achenes of disc-flowers awnless . . . . . **2. *Z. elegans***

**1. *Zinnia peruviana* (L.) L.**

*Z. peruviana* (L.) L., Syst. Nat. ed. 10 (1759) 1221; Torres, Brittonia 15 (1963) 12, fig. 15–17. – *Chrysogonium peruvianum* L., Sp. Pl. (1753) 920.

Erect herb, 14–45 cm tall, simple or branched, *stem* thin, ribbed, glabrous or sparsely shortly strigose, 0.5–2 mm thick; *internodes* 2–8 cm long. *Leaves* sessile or subsessile, oblong or ovate-oblong, or lanceolate, or linear-lanceolate, gradually attenuate, shortly cordate or subtruncate at the base, obtuse or subacute at the apex, ciliate, chartaceous, subglabrous or sparsely strigose at both sides, 1–6 cm long, 2–16 mm broad. *Heads* on 1–6 cm long, more or less inflated, strigose peduncles, *involucre* campanulate or hemispherical, 6–15 mm long, *phyllaries* 4-seriate, obovate- or broadly oblong, squarrose, glabrous, scarious, rounded and erose at the apex; *marginal flowers* 8–20 (*vide* Torres), ligule of *corolla* obovate-oblong or spatulate or elliptic, rounded and shortly lobed or dentate at the apex, 1–2 cm long, tube short, 1 mm long, *style-arms* short, lanceolate, recurved, *achenes* oblong-linear, 3-angular, without awns, glabrous, 1 cm long, *corolla of disc-flowers* thin, 5–6 mm long, limb narrowly campanulate, lobes velvety, *style-arms* with velvety apex, *achenes* oblong-linear, 3-angular, compressed, ribbed, glabrous, 7–10 mm long, with 1 or 2 awns, unequal in length, *receptacle* conical, *pales* navicular, obtuse and erose at the apex, membranaceous, 14 mm long.

**D i s t r i b u t i o n:** Southern North America, Central and South America, escaped into New Guinea.

NEW GUINEA. **W e s t M e r a u k e**, 1904–1905, *Koch s.n.* (BO, L) (This specimen was mentioned as *Z. elegans* Jacq. by Valetton in Bull. Dép. Agric. Ind. Néerl. 10, 1907: 70, and by Mattfeld in Engl. Bot. J. 62, 1929: 431; the other specimens identified as *Z. elegans* Jacq. by Mattfeld l.c. were not seen by the present author). – **E a s t M o r o b e D i s t.**: Menyamya subdist., Menyamya, 1968, *Streimann & Kairo NGF 35880* (L).

**C o l l e c t o r ' s a n n o t a t i o n:** Flowers dark orange.

**E c o l o g i c a l n o t e s:** Growing in roadsides and in grasslands on flats; altitude 1080 m.

**2. *Zinnia elegans* Jacq.**

*Z. elegans* Jacq., Icon. Pl. Rar. 3 (1793) t. 589; Torres, Brittonia 15 (1963) 15, fig. 18–20.

Erect herb, much branched, 23–56 cm tall, *stem* hirsute, strigose, *internodes* 6–18 cm long. *Leaves* sessile, ovate, lanceolate-ovate, oblong, or elliptical, truncate or subcordate at the base, obtuse or subacute at the apex, at both sides hirsute,

glandular, 3–8 cm long, 1–4.5 cm broad. *Heads* subhemispherical, on 3–14 cm long, more or less inflated, striate, strigose peduncles; *phyllaries* squarrose, ovate, with rounded erose apex, glabrous; *marginal flowers* 8–20 (*vide* Torres), ligule of *corolla* obovate-oblong or spatulate with rounded, lobed or dentate apex *c.* 2 cm long, variously coloured, but mostly red; *achenes* obovate or cuneate, dorsally compressed, sericeous, *c.* 6 mm long, with scarious margins, awnless; *disc-flowers* numerous, *corolla c.* 7 mm long, inside velutinous, *achenes* cuneate, laterally compressed, glabrous or nearly so, *c.* 7 mm long, awnless; *receptacle* conical, *pales* linear, fimbriate, *c.* 12 mm long.

**D i s t r i b u t i o n:** Mexico; escaped into New Guinea.

NEW GUINEA. E a s t. Morobe Dist.: Vicinity of Finschhafen, 1945, *Sawyer 278* (UC).

**C o l l e c t o r ' s a n n o t a t i o n:** Corolla of marginal flowers light magenta, of disc-flowers yellow.

**E c o l o g i c a l n o t e s:** In woodland-grassland; altitude 60 m.

## 17. VERBESINA

*Verbesina* L., Sp. Pl. (1753) 901; Lessing, Syn. Comp. (1832) 231; Benth. & Hook. *f.*, Gen. Pl. 2 (1873) 379; Koster in Pulle, Fl. Suriname 4 (2) (1938) 150; Cabrera, Fl. Buenos Aires 6 (1963) 221; Aristeguieta in Lasser, Fl. Venezuela 10 (2) (1964) 583; Koster in Backer & Bakh. *f.*, Fl. Java 2 (1965) 409; Cabrera in Correa, Fl. Patag. 7 (1971) 142.

Herbs or rarely shrubs, pilose. *Leaves* alternate or opposite. *Heads* solitary or corymbose, heterogamous, radiate, or rarely homogamous, discoid; *involucre* hemispherical, *phyllaries* 2–6-seriate, dry or herbaceous, outer ones shorter; *marginal flowers* 1–2-seriate, female, *corolla* ligulate, entire or 2–3-dentate, *achenes* laterally compressed, with winged margins, obovoid, *pappus* consisting of 2 awns; *disc-flowers* numerous, bisexual, *corolla* tubular, 5-dentate, *anthers* entire at the base, acute at the apex, *style-arms* short, with a triangular, acute, papillose apex, *achenes* and *pappus* like in marginal flowers; *receptacle* convex or conical, with conduplicate pales, embracing the disc-flowers.

**D i s t r i b u t i o n:** About 200 species, most in Central and South America.

### *Verbesina alata* L.

*V. alata* L., Sp. Pl. (1753) 901; Valetton, Bull. Dép. Agric. Ind. Néerl. 10 (1907) 69; Mattfeld, Engl. Bot. J. 62 (1929) 437; Koster in Pulle, Fl. Suriname 4 (2) (1938) 150; Koster in Backer & Bakh. *f.*, Fl. Java 2 (1965) 409.

Erect herb, 15–50 cm tall or more, *stem* winged, ribbed, 1–5 mm thick, pilose, *internodes* 1–1.5 cm long. *Leaves* alternate, ovate-elliptic, dentate or lobulate, decurrent along the stem, obtuse or acute at the apex, 2–12.5 cm long, 1.5–8 cm broad, shortly hispid at both sides. *Heads* solitary on a rigid 3–18 cm long peduncle; *involucre* 2–3-seriate, *phyllaries* oblong, dentate; *marginal flowers* 2-seriate, *corolla* subacute, *c.* 2 mm long, *corolla* of *disc-flowers c.* 3 mm long, *achenes* broadly winged, 4.5–5 mm long, *c.* 4 mm broad, *pappus* consisting of one long rigid awn with uncinat apex and one very short awn.

**D i s t r i b u t i o n:** West-Indies, Suriname; escaped into Java and New Guinea.

NEW GUINEA. W e s t. Merauke, 1904, *Koch s.n.* (BO, L).