



## A new species of *Sphagneticola* (Asteraceae: *Ecliptinae*) from Indonesia

A.E. Orchard<sup>1</sup>

### Key words

Indonesia  
new species  
*Sphagneticola*  
Wetar Island

**Abstract** A new species, *Sphagneticola annua* (Asteraceae: *Ecliptinae*) is described from the coast of Wetar Island, Indonesia. It differs from the four other species in this genus in having an annual lifeform, and in having disc florets which are apparently functionally staminate, with glabrous corollas. The new species and the two other Asian / Malesian species of *Sphagneticola*, *S. trilobata* and *S. calendulacea*, are illustrated.

**Published on** 29 July 2013

### INTRODUCTION

The genus *Sphagneticola* was described by Hoffmann (1900) with a single species, *S. ulei* O.Hoffm. However, Hoffmann's species had previously been described as *Silphium trilobatum* L. by Linnaeus (1759), based on a description and plate in Plumier (1757). The equivalence of these two descriptions was not recognised for many years. In the meantime, *Silphium trilobatum* was transferred to a number of different genera: *Wedelia*, *Stemmodontia*, *Thelechitonia* and *Complaya* (see Strother (1991), Robinson & Cuatrecasas (1992) and Pruski (1996) for a summary).

*Sphagneticola* was resurrected by Pruski (1996). He recognised four species: *S. brachycarpa* (Baker) Pruski, *S. calendulacea* (L.) Pruski, *S. gracilis* (Rich.) Pruski and *S. trilobata* (L.) Pruski. The genus was defined as stoloniferous herbs rooting at the nodes, stems sympodial with terminal capitula displaced laterally, ray laminas abaxially glandular, anther appendages black and ovate, achenes tuberculate and lacking well-developed carpodia, elaiosomes and pappus awns, and often with the body of the achene extended upwards as a collar. *Sphagneticola brachycarpa* is confined to the northern part of South America, *S. gracilis* to the Caribbean, *S. calendulacea* to the Indian subcontinent, East Asia and Malesia, and *S. trilobata* is apparently native to the Neotropics, but is widely cultivated almost throughout the tropics and has become naturalised in parts of Africa, eastern Australia, Malaysia, the Pacific and parts of southern United States of America.

While working on Australasian and Malesian taxa of the *Wedelia* / *Melanthera* / *Wollastonia* complex, I received on loan a specimen from Wetar Island, Indonesia, which differed from all Malesian wedelioid taxa. It does, however, agree with the critical characters of *Sphagneticola* in most respects, but differs in being an erect annual rather than prostrate and rooting at the nodes. It is described below as the fifth species of that genus. As diagnostic illustrations of the taxa of *Sphagneticola* are relatively scarce, the new species is illustrated, along with the other two species of *Sphagneticola* found in Asia / Malesia.

### *Sphagneticola annua* Orchard, sp. nov. — Fig. 1

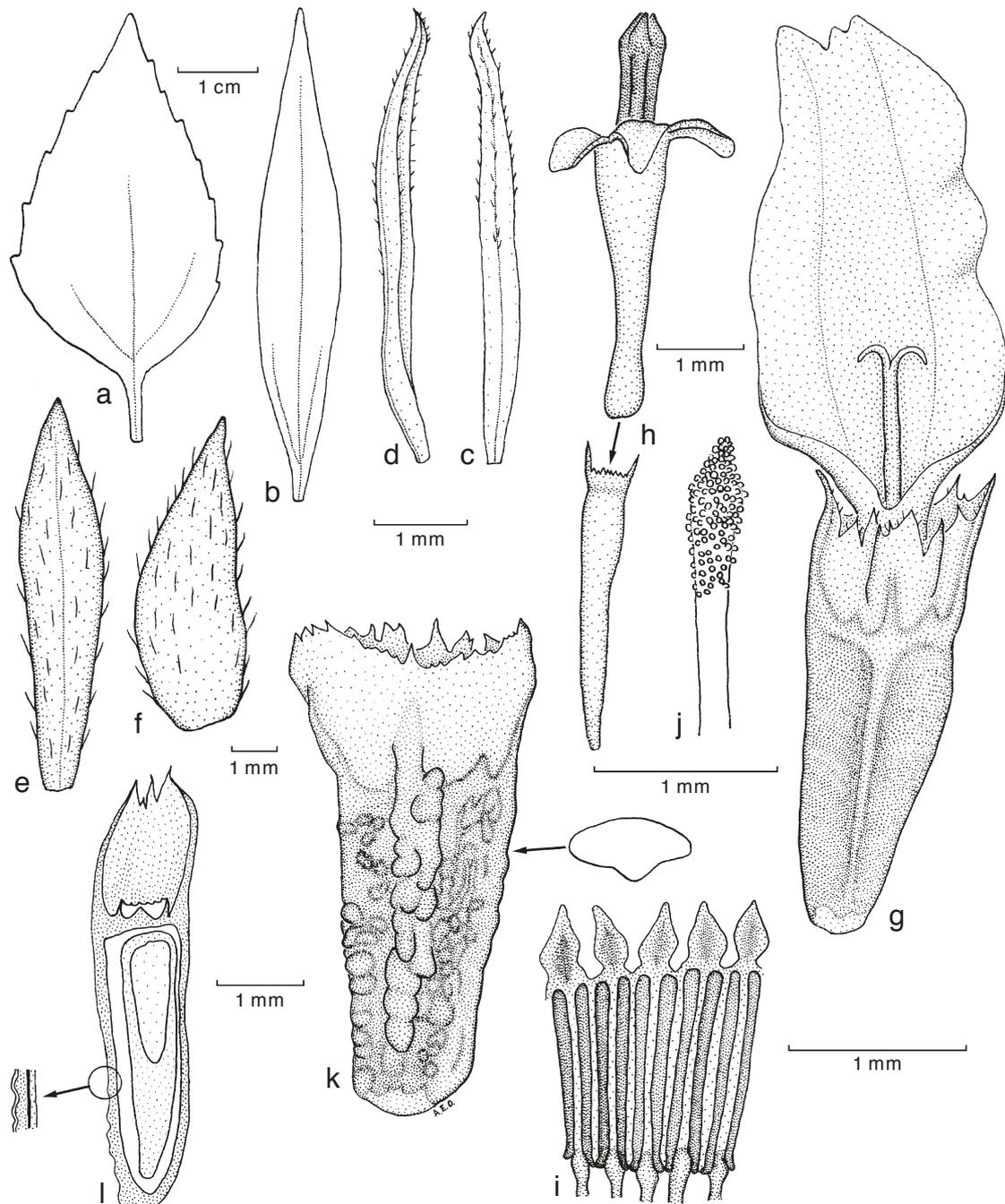
Type: C.R.Dunlop 9641 & G.J.Leach (holo DNA 69580; iso BO?, n.v.), Indonesia, Wetar Island, Kali Kuning River, 15 May 1993.

Erect slender annual herb to 40 cm tall; stems oppositely branched, sulcate, softly villous. Leaves opposite, petiolate; petiole 1 cm long; lamina ovate, 5–7 cm long, 2.5–5 cm wide, tripinnate, shortly serrate, soft herbaceous, ?succulent, finely appressed pilose; uppermost leaves lanceolate, entire. Capitula terminal, in dichasial groups of 3(–5), on peduncles 15–40 mm long; involucre bracts in 2 series, lanceolate to narrowly ovate, 8–10 mm long, subequal, pale green, soft, acute, sparsely and softly semiappressed pilose. Ray florets c. 6, pistillate; lamina yellow, oblong to ovate c. 5 mm long, 2.5 mm wide, 3-lobed, weakly striate, with a short tube, sparsely glandular and hairy on abaxial surface, with glands tiny, sessile, globular, golden; ovary obcuneate, 3-angled, with angles extended above as rays which support a lacinate, sparsely fimbriate membranous 'skirt' hiding the pappus and corolla tube. Disc florets c. 15, bisexual but probably functionally staminate; corolla creamy white to yellow, 5-lobed, with lobes spreading, lobes and tube glabrous; anthers and appendages black; anther tails very short; filament collar slightly swollen; style densely papillose distally; style arms remain within floral tube, ?fused; pappus a short serrulate corona with c. 2 teeth slightly extended as 'awns'. Paleae linear, 4–4.5 mm long, somewhat conduplicate, acute, entire, with a well-defined midrib, not carinate, shortly scabrous on midrib and margins distally. Achene grey-black, body obcuneate, 4 mm long, 2 mm wide, compressed, 3-angled, coarsely tuberculate; angles extended apically to support a lacinate membranous 'skirt'; exocarp thinly spongy; awns 0.

Ecology — Found on a shoreline, under a dense shrubby layer of *Mussaenda* regrowth, in clayey sand. The leaves in the type specimen have dried tissue-paper thin, but in life were probably at least semisucculent.

Notes — The generic placement of this species presents some difficulties. It clearly belongs in subtribe *Ecliptinae*, but if studied within the overview of the subtribe presented by Panero (2007), it keys to *Baltimora*, a genus of two species of the Neotropics, mainly on account of its black anthers and functionally staminate disc florets. *Baltimora* was revised by Stuessy (1973), who recorded that one species, *B. recta* L. was also known from Java. Stuessy provided good descriptions and

<sup>1</sup> c/o Australian Biological Resources Study, GPO Box 787, Canberra ACT 2601, Australia; e-mail: tony.orchard@environment.gov.au.



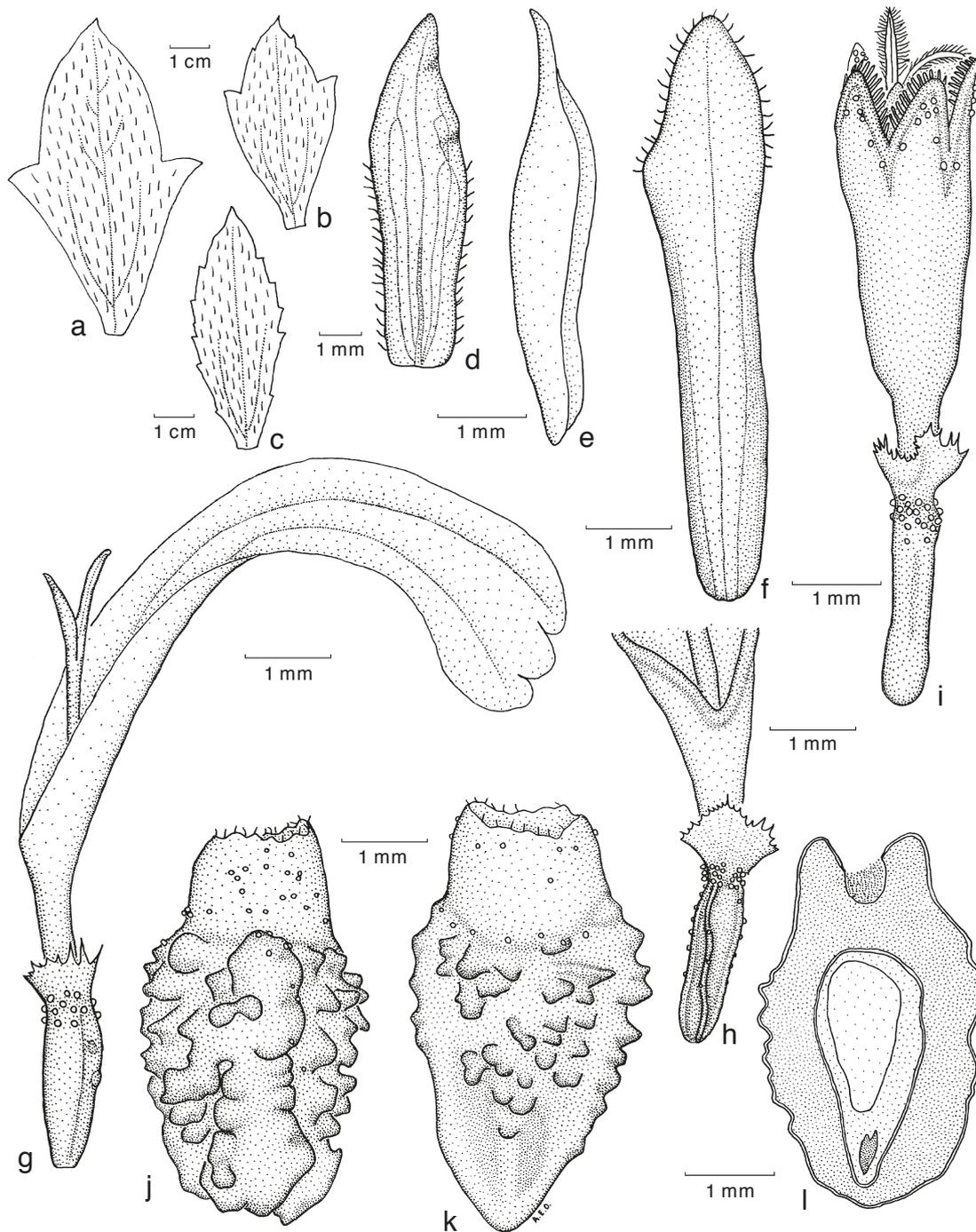
**Fig. 1** *Sphagneticola annua* Orchard. a. Lower leaf; b. upper leaf; c. palea, dorsal view; d. palea, lateral view; e. outer involucre bract; f. inner involucre bract; g. ray floret; h. disc floret; i. stamens; j. young style (from within anther tube); k. achene; l. longitudinal section of achene (all: C.R.Dunlop 9641 & G.J.Leach, holo, DNA).

illustrations of both species of *Baltimora*, and it is clear that, while the new species resembles both of the *Baltimora* species in leaf morphology and general habit, the achene morphology is quite different. The achene in *Baltimora* is triquetrous, with usually pronounced vertical horns or wings on the distal part of the ribs, and the achene is shortly puberulent near the apex. This is quite different to the achene in *S. annua*, where the body of the achene is extended upwards into an inverted 'skirt' supported by three thickened rays, and there are no vertical wings. The achenes in *S. annua* are glabrous. In these achene features *S. annua* is much more akin to that of *S. trilobata*. Other characters separating *S. annua* from *Baltimora* species are the glabrous corolla lobes in its disc florets, an ovary in the disc florets exceeding 1 mm in length and paleae with a well-defined midrib which is shortly scabrous.

Another genus in subtribe *Ecliptinae* found geographically adjacent to *S. annua* is the northern Australian endemic *Pentalepis*

F.Muell., with six species, and resembling *S. annua* in having functionally staminate disc florets. This genus has recently been revised (Orchard 2012a). However, *Pentalepis* differs from *S. annua* in consistently having five involucre bracts in a single series, each bract subtending a ray floret, and disc florets with yellow to pale brown anthers (anther appendages always yellow). The achenes are compressed, often cucullate, and usually winged, and the pappus is a short cup with usually two short soft awns.

Another ecliptoid coastal genus in the Indo-Pacific region is *Blainvillea* Cass. also recently revised (Orchard 2012b). This genus of four species can be eliminated from consideration here, as it has consistently bisexual, fertile disc florets, a pappus of scales and/or rigid awns, and paleae which are distinctively broad, truncate and apically lacinate/ciliate. The achenes vary from obtuse to subcylindrical, and never have a raised collar or inverted 'skirt' apically.

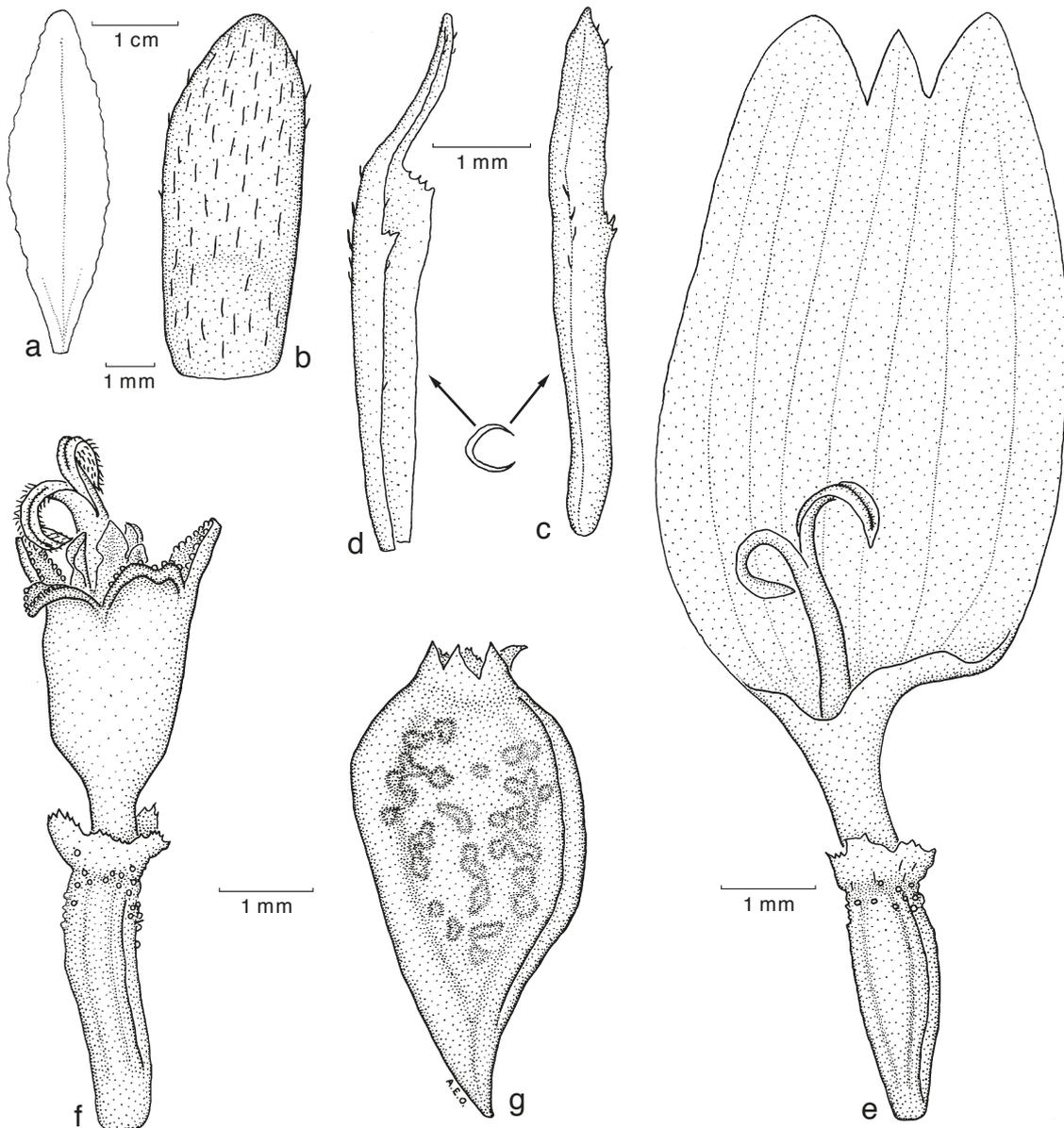


**Fig. 2** *Sphagneticola trilobata* (L.) Pruski. a–c. Leaves, lower to upper; d. involucral bract; e. ray palea, lateral view; f. disc palea, dorsal view; g. ray floret, lateral view; h. detail of base of ray floret, adaxial view; i. disc floret; j. ray achene; k. disc achene; l. longitudinal section of achene (all: R.W.Purdie 7947, CANB). © Australian Biological Resources Study, reproduced with permission.

The genus *Wedelia* Jacq. has also been reported from the Indo-Pacific. This generic name has been applied to a discordant group of pan-tropical taxa, and in its current sense is almost certainly polyphyletic. A review of the group, including *Wollastonia* DC. ex Decne., *Melanthera* Rohr, and other taxa has recently been published (Orchard 2013). None of the 100+ species in this complex has an achene morphology resembling the skirted form found in *S. annua*, and most have bisexual, fertile disc florets.

This species matches Pruski's (1996) diagnostic characters for *Sphagneticola* in terminal capitula (but not displaced laterally by sympodial stem growth), ray laminas abaxially glandular, anther appendages black and ovate, achenes tuberculate and lacking well-developed carpodia, elaiosomes and pappus awns, and often with the body of the achene extended

upwards as a collar. It differs mainly in being an erect annual rather than a prostrate perennial rooting at the nodes, and in apparently having functionally staminate disc florets. The collar at the apex of the achene, which is well-developed in *S. brachycarpa*, *S. gracilis* and *S. trilobata*, but almost absent in *S. calendulacea*, is represented in *S. annua* by a more membranous 'skirt' supported by three thickened rays arising from the apices of the achene angles. The corky achene exocarp of *S. trilobata* is also present in *S. annua*, but is much thinner. The long papillae on the adaxial side of the disc floret lobes in *S. trilobata* and some other species are absent in *S. annua*, the disc floret corolla being entirely glabrous. The new species is thus assigned to *Sphagneticola* as it more comfortably fits the diagnostic characters of that genus, rather than *Blainvillea*, *Pentalepis*, *Wollastonia* or *Wedelia* s.l.



**Fig. 3** *Sphagneticola calendulacea* (L.) Pruski. a. Leaf; b. involucral bract; c. palea, dorsal view; d. palea, lateral view; e. ray floret; f. disc floret; g. achene (a–f: A. Grierson 1134, CANB; g: M. Furuse 3322, K).

There is a note on the holotype sheet in DNA stating that a duplicate was sent to BO, and if so, this would be an isotype. The duplicate was not seen during this study.

As detailed descriptions and illustrations of *Sphagneticola* species are scarce, comparative illustrations of the other two Malesian / Asian species of this genus are provided (Fig. 2, 3).

**Acknowledgements** The curator and staff of the Northern Territory Herbarium (DNA) are thanked for the loan of their wedelioid specimens, and the curator and staff of the Australian National Herbarium (CANB) are thanked for making research facilities available. The study was carried out in part under the auspices of a consultancy from the Australian Biological Resources Study (ABRS) to prepare a treatment of the *Heliantheae* alliance for the Flora of Australia. Fig. 2, which is destined for publication in the Flora of Australia, is reproduced here with kind permission of ABRS. Annette Wilson (ABRS) read an early draft of this paper and assisted in scanning of the illustrations.

## REFERENCES

- Hoffmann O. 1900. V. *Sphagneticola*, novum genus Compositarum – Helianthoidearum – Coreopsidaeum. Notizblatt des Königlichen botanischen Gartens und Museums zu Berlin 3: 36.
- Linnaeus C. 1759. *Systema Naturae*, ed. 10. Laurentii Salvi, Holmiae.
- Orchard AE. 2012a. A revision of the Australian endemic genus *Pentalepis* (Asteraceae: Ecliptinae). *Nuytsia* 22: 371–392.
- Orchard AE. 2012b. The Australian species of *Blainvillea* Cass. (Asteraceae: Ecliptinae). *Austrobaileya* 8, 4: 653–669.
- Orchard AE. 2013. The *Wollastonia*/*Melanthera*/*Wedelia* generic complex (Asteraceae: Ecliptinae), with particular reference to Australia and Malesia. *Nuytsia* 23: 337–466.
- Plumier C. 1757 *Plantarum Americanum Fasciculus Quintus*. Schouten, Amsterdam.
- Panero JL. 2007. XXVI.4. Subtribe Ecliptinae Less. (1831). In: Kubitzki K, Kadereit JW, Jeffrey C (eds), *The families and genera of vascular plants*, vol. 8: 446–459. Springer, Berlin, Heidelberg, New York.
- Pruski JF. 1996 *Compositae of the Guyana Highland*–XI. *Tuberculocarpus* gen. nov. and some other Ecliptinae (Heliantheae). *Novon* 6: 404–418.
- Robinson H, Cuatrecasas J. 1992 *Thelechiton* Cuatrecasas, an older name for *Complaya* Strother (Ecliptinae–Heliantheae–Asteraceae). *Phytologia* 72: 141–143.
- Strother JL. 1991. Taxonomy of *Complaya*, *Elaphandra*, *logeton*, *Jefea*, *Wamalchitamia*, *Wedelia*, *Zexmenia*, and *Zyzyxia* (Compositae–Heliantheae–Ecliptinae). *Systematic Botany Monographs* 33: 1–111.
- Stuessy TF. 1973. Revision of the genus *Baltimora* (Compositae, Heliantheae). *Fieldiana Botany* 36: 31–50.