A synopsis of *Plagiocheilus* (Compositae: Astereae)

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Summary. A synopsis of *Plagiocheilus* (Compositae: Astereae) is provided, giving full synonymy, type citations and the location of known types, together with relevant notes and commentary, and the currently accepted distribution of each taxon; the distribution of taxa is also tabulated. Six species are recognised, one containing three subspecies. A key to species is presented. One author citation is corrected following an incorrect assumption by de Candolle when describing *Plagiocheilus tanacetoides*. The synonymy of *Polygyne inconspicua*, under *Eclipta prostrata*, is précised once again. An index to names associated with *Plagiocheilus* is given, and the *nomen nudum* of *Plagiocheilus herzogii* commented upon.

Key Words. Anthemideae, Asteraceae, *Eclipta prostrata*, subtribe Grangeinae, subtribe Hinterhuberinae, *Polygyne*, *Polygyne inconspicua*.

Introduction

During the recent extraction of material of Bolivian endemic Compositae, as part of a wider TIPAs (Tropical Important Plant Areas) Project at the Royal Botanic Gardens, Kew, material of *Plagiocheilus* Arn. ex DC. (Compositae: Astereae) provided a few problems, not least the historical determination of Ecuadorian material as *P. ciliaris* Wedd. — which I consider a Bolivian endemic.

Plagiocheilus is a genus of six species ranging from Colombia in the north (*P. bogotensis* (Kunth) Wedd.) south to northern Argentina, Paraguay and Southern Brazil (*P. tanacetoides* Hook. & Arn. ex DC.) (see Table 1); the majority of species are Andean. First recognised by Arnott, and described by de Candolle (1838: 142), the genus was placed in the tribe Anthemideae (although considered a subtribe by de Candolle) — the beginning of a tribal misplacement that has continued until relatively recently. Benth (1873) maintained the tribal position, followed by Hoffmann (1892: 279), and in several Flora treatments, such as Baker (1884: 292–293 — Brazil), Cabrera (1974: 421–422 — Entre Rios, Argentina), Dillon (1981: 12–15 — Peru), and Ariza Espinar (1997: 24 — Argentina). However, Robinson & Brettell (1973) quite convincingly argued that the genus was misplaced and belonged in the Astereae, a treatment followed by several authors, e.g. Nesom & Robinson (2006), Hind (2011 — Bolivia) and Sancho (2014: 231–232 — Argentina). Its position in the Astereae was confirmed by Karaman-Castro & Urbatsch (2009) and Brouillet *et al.* (2009), where the two species sampled (*P. bogotensis* (Kunth) Wedd. and *P. soliviformis* DC.) were placed next to species sampled in *Archibaccharis* Heering. This supports the

earlier proposals by Robinson & Brettell (1973), Grau (1977) and Bremer (1994). It is also clear from the molecular work that its position in the subtribe Grangeinae, as proposed by Nesom & Robinson (2006), is no longer tenable and that it is most probably best placed closer to, or in, the subtribe Hinterhuberinae s.str.

The species are perennial herbs and, with the exception of the more robust *Plagiocheilus bogotensis* and *P. tanacetoides*, dwarf species of high Andean grassland, all with bilabiate marginal floret corollas (with two inner lobes) which are whitish or reddish to purplish. The marginal florets are multiseriate, pistillate and female, and the achenes apically constricted, erostrate and epappose. Most of the Andean species are still rarely collected and all are poorly represented in herbaria, suggesting that further fieldwork and intensive collecting of all species might help further resolve the species delimitation presented below. Indeed, both Cuatrecasas (1954: 246–247) and Dillon (1981: 15) have suggested that the variable and most widely distributed *P. soliviformis* DC. may well include within its variation *P. ciliaris* Wedd. and *P. peduncularis* (Kunth) Wedd.

In the following synopsis, a key to species is provided followed by a numerical listing of species. Distributions of the taxa are only provided at country level. No attempt has been made to determine the conservation status of any of the taxa because of the scarcity of collections and lack of field data on most labels, including collection altitude. It is hoped that someone will use it as the basis for a generic revision, especially to sort out the species relationships. A total of six species are recognised. Full synonymy, type citations and the location of known

Table 1. Distribution of taxa in *Plagiocheilus*

Taxon	Argentina	Bolivia	Brazil	Colombia	Ecuador	Paraguay	Peru	Venezuela
<i>bogotensis</i>				X	X		X	
<i>ciliaris</i>		X						
<i>frigidus</i>							X	
<i>peduncularis</i>					X			
<i>soliviformis</i>		X		X	X		X	X
<i>soliviformis</i> subsp. <i>soliviformis</i>		X		X	X		X	
<i>soliviformis</i> subsp. <i>colombianus</i>				X				
<i>soliviformis</i> subsp. <i>multiflorus</i>				X				
<i>tanacetoides</i>	X		X			X		

types, together with relevant notes and commentary on those types, is provided.

A synopsis of *Plagiocheilus* Arn. ex DC.

***Plagiocheilus* Arn. ex DC.** (de Candolle 1838: 142). Type: not stated. Lectotype (effectively selected by Cabrera 1974: 422): *Plagiocheilus tanacetoides* Hook. & Arn. ex DC.

Erect to creeping perennial herbs. *Leaves* alternate, petioles winged, lamina pinnate to bipinnate. *Inflorescences* of solitary axillary capitula or capitula short-

pedicellate in small terminal clusters. *Capitula* radiate, heterogamous; involucre campanulate to hemispherical; phyllaries few- (2 or 3) seriate, subequal, margins hyaline; receptacle convex to conical, epaleaceous. *Ray florets* multiseriate, female, corollas bilabiate, with one or two smaller lobes on inner side, purple. *Disc florets* functionally male, corollas (4- or) 5-lobed, greenish-yellow to reddish-brown, corolla tube narrow, limb narrowly funnelform, corolla lobes deltoid to oblong-lanceolate, erect to spreading. *Achenes* oblong, compressed, glabrous or sometimes setuliferous, setulae ‘anchor-shaped’; pappus absent.

Key to species of *Plagiocheilus*

1. Inflorescences corymbose, few-headed; leaves or petiole bases auriculate and clasping stem 2
- 1'. Inflorescences of solitary capitula; leaves always petiolate and leaf bases vaginate but always exauriculate 3
2. Ascending or decumbent, stoloniferous perennial (rarely annual) herb, arachnoid to sparsely pubescent; 2100 – 3000 m; Colombia, Ecuador, northern Peru 1. ***P. bogotensis***
- 2'. Erect annual herb, sparsely pubescent; 0 – 500 m; Argentina, southern Brazil, Paraguay 2. ***P. tanacetoides***
3. Leaves 1-pinnatifid 4
- 3'. Leaves 2-pinnatifid 6
4. Disc florets 12 – 15; Colombia 3b. ***P. soliviformis* subsp. *colombianus***
- 4'. Disc florets 20 – 40 5
5. Capitula on short (< 2 cm) pedicels; Peru 4. ***P. frigidus***
- 5'. Capitula on relatively long ((c. 2 –) 4 – 5 cm), slender pedicels; Ecuador 5. ***P. peduncularis***
6. Capitula <5 mm diam.; disc florets <20; Bolivia 6. ***P. ciliaris***
- 6'. Capitula 5 – 8 mm diam.; disc florets >20 (– 90) 7
7. Disc florets 20 – 50; capitula 5 – 7 mm diam.; Bolivia, Colombia, Ecuador, Peru 3a. ***P. soliviformis* subsp. *soliviformis***
- 7'. Disc florets c. 90; capitula 6 – 8 mm diam.; Colombia 3c. ***P. soliviformis* subsp. *multiflorus***

1. ***Plagiocheilus bogotensis* (Kunth) Wedd.** (Weddell 1856: 62).

Hippia bogotensis Kunth (1818: 237). Type: [Colombia:] ‘Crescit in Regno Novo-Granatensi, prope Santa Fe de Bogota, alt. 1370 hex. Floret Julio’. Holotype: P(0030733); isotypes: P(00578731, 00578732, 00578733 – ex herb. Willdenow) — none of which have apparently been imaged/or the images put up on-line (they remain ‘En prêt’ on the Muséum National d’Histoire Naturelle’s web site).

Leptinella? bogotensis (Kunth) DC. (de Candolle 1838: 142).

Plagiocheilus prostratus Benth. (Bentham 1844: 136). Type: [Ecuador:] ‘[Hartweg] 767. In montibus Loxa.’ Holotype: K(000221592 — ex herb. Benthamianum); isotypes: E(00385710), G(00301396, 00301397), K(000221593 — ex herb. Hookerianum and mounted with *Spruce* 5023 — K000221594), LD(1684304), M(0161478 — fragments in a capsule and a photograph of the holotype in K), P(00852297 — s.n.)

ICONOGRAPHY. See note under *Plagiocheilus tanacetoides*.

DISTRIBUTION. Brazil, Colombia, Ecuador, Peru.

2. ***Plagiocheilus tanacetoides*** Hook. & Arn. ex DC. (de Candolle 1838: 142). Type: 'in arenosis ad flumen Parana Amer. austr. . . (v. s. comm. à cl. Wigth. [sic! = Wight])'. Holotype: G-DC(G00461548). Note: The apparent source of the material on the sheet was 'Mr Wight 1836' which would suggest that there is nothing concerning Haenke about this material — other than a mis-transliteration of the handwriting of the name and authority by de Candolle. It would appear, from Hooker & Arnott's comments (Hooker & Arnott 1851: 19 – 20) that de Candolle received the description, of both the genus and this species, from Hooker & Arnott — hence the attribution (and typographical error) at the beginning of de Candolle's protologue 'Haenke ex Arn. in litt.' — a determination slip indicates 'Genus inter *Dichrocephalum* et *Grangeam*. / vis. Arn. mss.'. The label attached to the material reads '*Plagiocheilus tanacetoides* H&A' which has been mis-transliterated as 'Haenke'. The anomalous author-citation of this species is repeated in many references (e.g. Cabrera 1974; Ariza Espinar 1997; Zuloaga & Morrone 1999; Sancho 2014); this should, of course, have been 'Hook. et Arn.' as it appeared in print in Hooker & Arnott's account of the genus (1851: 19 – 20)! If this is the case then the type material was a *Tweedie* s.n. collection sent to/received by de Candolle from Wight (not 'Wigth' [sic!]) in 1836 — if indeed it came from Wight in the first place! An examination of correspondence records in K indicates that Wight was in 'Palamcollah' (July – November 1835), and in Madras (February – October 1837), suggesting he was most probably out of England when de Candolle received the material; Wight most certainly did not collect the material. Duplicate collections are in K — K(000221595, 000221596, 000221597).

ICONOGRAPHY. Cabrera (1974: Fig. 248), Sancho (2014: 232). The robust plant illustrated in Mutis (1783 – 1816, t. 1104) is simply labelled as '*Plagiocheilus* sp.' but its habit and leaf type resembles the more erect *P. tanacetoides*, and not *P. bogotensis*, the northern South American species.

DISTRIBUTION. Argentina, Brazil, Paraguay.

NOTE. Current records suggesting that this species also occurs in Bolivia are, based on *d'Orbigny* 1359 and *Fuentes* 743, in error. *Fuentes* 743 is *Egletes viscosa* (L.) Less. and the *d'Orbigny* collection is far too small to be this taxon.

3. ***Plagiocheilus soliviformis*** (as *solivaeformis*) DC. (de Candolle 1838: 142). Type: 'in Republicâ Boliviana legit cl. Pentland. (v.s. comm. à cl. inv.)' Holotype: G-DC(G00461638 — there are five labels, two with 'Républiq de Bolivia. / M Pentland 1829' written on them, all with sprigs of material, the labels pinned to the sheet); isotype: P(00578705).

DISTRIBUTION. Bolivia, Colombia, Ecuador, Peru, Venezuela (see Note).

NOTE. The description provided by Aristeguieta (1964: 736 – 737) is just about adequate enough to confirm the presence of this species in Venezuela, but not detailed enough to determine which subspecies; the *Jahn* 1101 and *Vareschi & Pannier* 899 collections have not been seen.

3a. subsp. ***soliviformis***

DISTRIBUTION. Bolivia, Colombia, Ecuador, Peru.

3b. subsp. ***colombianus*** Cuatrec. (Cuatrecasas 1954: 246). Type: 'Colombia, Dept. Valle, Cord. Central, cabeceras del río Tuluá: Quebrada de La Vegas 3400 – 3500 m. alt. páramo. Hierba reptante estolonífera cespitosa, 21-III-1946 colect. J. Cuatrecasas 20262 (Holotypus, F)'. Holotype: F(1364621 = 0051014); isotypes: COL(000005356), F(1364622 = 0051015), P(00578710).

DISTRIBUTION. Colombia.

3c. subsp. ***multiflorus*** Cuatrec. (Cuatrecasas 1954: 246). Type: 'Colombia, Boyacá. Nevado del Cocuy, alto valle de las Lagunillas, (35 flores masculinas, 55 flores femeninas), 4000-4300 m. alt. colect. 12-IX-1938 J. Cuatrecasas 1527 (Holotypus, F)'. Holotype: F(1323628 = 0051017). Note: Material in COL(000005357) claims to be isotype material but is one of several paratypes cited by Cuatrecasas.

DISTRIBUTION. Colombia.

4. ***Plagiocheilus frigidus*** Poepp. (Poeppig 1843: 48, t. 248, f. B). Type: 'Crescit inter muscos in planitie frigore aelorno pressa circum Cerro de Pasco (13,500 ped. elev.) in Andibus Peruviae. Junio florebat. [Jun. 1829. Poeppig s.n.]' Holotype: W(0040672).

ICONOGRAPHY. Poeppig (1843: t. 248, f. B), Dillon (1981: Fig. 2)

DISTRIBUTION. Peru.

5. ***Plagiocheilus peduncularis*** (Kunth) Wedd. (Weddell 1856: 61).

Hippia peduncularis Kunth (1818: 236). Type: [Ecuador:] Crescit in monte Antisana, alt. 1800 hex. (Regno Quitensi.) . Floret Majo. [Bonpland 2270]

Holotype: P(00578718 — together with a set of line drawings of dissections used by Weddell in *Chloris Andina* 1: Pl. 14A, 1857); isotype: P(00578717).

Leptinella? *peduncularis* (Kunth) DC. (de Candolle 1838: 141).

Cotula peduncularis (Kunth) Franch. (Franchet 1889: 345).

Culcitium pedunculare (Kunth) Macloskie (1914: 267), in error pro *Cotula peduncularis*.

Culcitium pedunculare (Kunth) Sprague (1929: 62).

Note: An effective combination, albeit with an indirect reference to the basionym, *Hippia peduncularis* Kunth.

ICONOGRAPHY. Weddell (1857: Pl. 14A 1 – 9.)

DISTRIBUTION. Ecuador.

6. *Plagiocheilus ciliaris* Wedd. (Weddell 1857: 227). Type: ‘Hab. BOLIVIE!: Cordillères du département de la Paz (Mandon [83]).’ Type/Holotype: ?P(00578719 — dated ‘Decemb^r 1856’); isotypes: BR(5521791), F(0051013), K(000634297 — dated ‘Decemb^r 1857’), P(00578720 — dated ‘Decemb^r 1857’, 04396444 — dated ‘Dec. 1865’ on a small label, 04396445 and 04396447 — dated ‘Decemb^r 1857’, 04396446 — dated ‘Decemb^r 1856’ with variant locality data indicating ‘in grammosis Cochipatal 3400–3800 m.’), RB (the label on this specimen was originally numbered ‘79’, but this was crossed out and re-numbered as ‘83’). P(00578721) is also a duplicate of Mandon 79 (‘Guaylla_aracha, au pied meme des rochers que sélvent jusquans neiges — H. 3300 m.’), but is annotated as *Plagiocheilus ciliaris* on the Mandon label, although this collection was listed by Schultz Bipontinus as ‘*Galinsoga parviflora* Cav.’ (Schultz Bipontinus 1865: 80); its collection date is stated as ‘7 8^{bre} 1858’! Clearly there is significant discrepancy amongst supposed duplicates of the same Mandon collection.

DISTRIBUTION. Bolivia.

Nomen solum, incertae sedis

Plagiocheilus herzogii Beauverd ex Herzog, *Pflanzenw. Bolivischen Anden*: 229 (Herzog 1923), nom. nud. = ?

NOTE. Herzog (1923: 229) listed several taxa collected in the area of Antofagasta, Chile, including *Oxalis occidentalis* R.Knuth (Oxalidaceae), *Nolana decemloba* Herzog (Solanaceae), *Nolana grandiflora* Herzog (Solanaceae), and *Dolia macrocalyx* Phil. (Solanaceae). All were collected at about 300 m altitude in September 1911. The *Oxalis* and *nolanas* were all marked as ‘n. sp.’ in Herzog’s account, although these were all published several years before. *Plagiocheilus herzogii* is not listed, even as a *nomen nudum* by either Koster

(1945, 1948) or Cabrera (1952) in their accounts of Herzog’s Compositae collections (Chilean collections were cited even though the majority are Bolivian). Indeed, few appear to have been collected around Antofagasta. Marticorena & Quezada (1985) and Marticorena *et al.* (1998) did not list any taxon that might correspond to anything looking like *Plagiocheilus* with the exception of *Cotula mexicana* (DC.) Cabrera.

The position of *Polygyne* Phil. and *Polygyne inconspicua* Phil.

Philippi (1864: 170 – 171) described the monotypic genus *Polygyne* Phil. (in the subfamily ‘Senecionideae’) from the shores of Laguna de Aculeo (Prov. Maipo, Chile), based on *P. inconspicua* Phil. It was placed into the synonymy of *Plagiocheilus* by Bentham (1873: 430), a position reiterated by Jackson (1894: 599) and, more recently, by Nesom & Robinson (2006: 307), even though its position had been definitively stated by Cabrera (1954) — as a synonym of *Eclipta prostrata* (L.) L. Reiche (1903: 271 – 272) evidently disagreed with Bentham (and Jackson in *Index Kewensis*, 1894) and placed *Polygyne* alongside *Plagiocheilus*, but still in the tribe Anthemideae. It is clear from the generic and specific descriptions that *Polygyne inconspicua* is a small annual with opposite leaves, paleaceous receptacle, bifid-rayed marginal florets and compressed, angled truncate achenes. These are not the characters found in *Plagiocheilus* (with alternate leaves, epaleaceous receptacle, bilabiate ray limbs, and obcompressed apically constricted achenes). Cabrera’s dissections (Cabrera 1954: 168, Fig. 1), based on the holotype (SGO60523 [isotype: LP(000968)]), clarify the floral characters still further.

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Appendix: Index to names

- Cotula peduncularis* (Kunth) Franch., *Miss. Sci. Cape Horn, Bot.* 5: 345 (Franchet 1890) = **Plagiocheilus peduncularis** (Kunth) Wedd.
- Cotula peduncularis* (Kunth) Macloskie, *Rep. Princeton Univ. Exped. Patagonia, Botany* 8: 830 (1906), isonym = **Plagiocheilus peduncularis** (Kunth) Wedd.
- Culcitium peduncularis* (Kunth) Macloskie in Scott, *Rep. Princeton Univ. Exped. Patagonia, 1896 – 1899* 8 (Suppl. Bot.): 267 (1914), in error pro *Cotula peduncularis* (Kunth) Macloskie = **Plagiocheilus peduncularis** (Kunth) Wedd.
- Culcitium peduncularis* (Kunth) Sprague, *Index Kew. Suppl.* 7: 62 (1929) = **Plagiocheilus peduncularis** (Kunth) Wedd.
- Hippia bogotensis* Kunth in Humb., Bonpl. & Kunth, *Nov. Gen. Sp. Pl.*, ed. folio, 4: 237 (Kunth 1818) = **Plagiocheilus bogotensis** (Kunth) Wedd.
- Hippia peduncularis* Kunth in Humb., Bonpl. & Kunth, *Nov. Gen. Sp. Pl.*, ed. folio, 4: 236 (Kunth 1818) = **Plagiocheilus peduncularis** (Kunth) Wedd.
- Leptinella bogotensis* (Kunth) DC., *Prodr.* 6: 142 (de Candolle 1838) = **Plagiocheilus bogotensis** (Kunth) Wedd.
- Leptinella peduncularis* (Kunth) DC., *Prodr.* 6: 141 (de Candolle 1838) = **Plagiocheilus peduncularis** (Kunth) Wedd.
- Plagiocheilus bogotensis** (Kunth) Wedd., *Chloris Andina* 1 (3): 62 (Weddell 1856).
- Plagiocheilus ciliaris** Wedd., *Chloris Andina* 1 (7): 227 (Weddell 1857)
- Plagiocheilus erectus* Rusby, *Mem. Torrey Bot. Club* 4 (3): 212 (1895) = **Chrysanthellum indicum** DC. subsp. **afroamericanum** B.L. Turner [HELIANTHEAE]
- Plagiocheilus frigidus** Poepp., *Nov. Gen. Sp. Pl.* (Poeppig & Endlicher) 3: 48, t. 248, f. B (Poeppig 1843).
- Plagiocheilus herzogii* Beauverd ex Herzog, *Pflanzenw. Bolivischen Anden*: 229 (Herzog 1923), nom. nud. = ?
- Plagiocheilus peduncularis** (Kunth) Wedd., *Chloris Andina* 1 (3): 61 (Weddell 1856)
- Plagiocheilus prostratus* Benth., *Pl. Hartw.* (Bentham): 136 (Bentham 1844) = **Plagiocheilus bogotensis** (Kunth) Wedd.
- Plagiocheilus soliviformis** DC., *Prodr.* 6: 142 (de Candolle 1838).
- Plagiocheilus soliviformis** DC. subsp. **colombianus** Cuatrec., *Revista Acad. Colomb. Ci. Exact.* 9 (35): 246 (Cuatrecasas 1954).
- Plagiocheilus soliviformis** DC. subsp. **multiflorus** Cuatrec., *Revista Acad. Colomb. Ci. Exact.* 9 (35): 246 (Cuatrecasas 1954).
- Plagiocheilus soliviformis** DC. subsp. **soliviformis**

- Plagiocheilus tanacetoides** Hook. ex Arn. ex DC., *Prodr.* 6: 142 (de Candolle 1838).
- Polygyne inconspicua* Phil., *Linnaea* 33 (1 – 3): 171 (Philippi 1864) = **Eclipta prostrata** (L.) L. [HELIANTHEAE]

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