

***Sampera*, a new genus of Liabeae (Compositae or Asteraceae) from the northern Andes**

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Abstract.—The genus *Oligactis* (Kunth) Cass. is divided into two genera based on the two former subgenera and a new name was necessary for the non-typical subgenus. DNA sequence data have shown that these two groups are not sister taxa and that each is easily defined by morphological characters that include differences in the habit, position of the inflorescence, and the pubescence of the style branches. *Sampera*, with eight species, is named in honor of Dr. Cristián Samper, Director of the Natural History Museum, Smithsonian Institution.

The tribe Liabeae includes a distinctive but strictly tropical group of American Compositae not recognized at the tribal level until Rydberg (1927) established a separate tribe in his study of the Mexican and Central American species. In earlier studies of the family, the group was buried in either the Vernonieae (Cassini 1830) or the Senecioneae (Bentham 1873, Hoffmann 1894). The latter treatments were particularly unhelpful, with almost all the species placed in one genus, *Liabum* Adans., in the Senecioneae but with related elements scattered in other tribes: *Philoglossa* DC. in the Heliantheae, *Cacosmia* Kunth in the Helenieae, and *Chionopappus* Benth. in the Mutisieae. The chaotic treatment was partly because the tribe Liabeae possessed a confusing combination of characteristics, with styles like the Vernonieae, yellow rays like the Senecioneae, and often latex like the Lactuceae.

The structural studies of Robinson (1983a) had essentially resolved the place-

ment of the tribe in the subfamily Cichorioideae sensu lato near the Vernonieae and the Lactuceae, and this was later confirmed by a morphological cladistic study by Robinson & Funk (1987). The structural studies of Robinson (1983a, 1983b) also seemed to have resolved the generic limits within the group, recognizing 15 genera distributed from Mexico and Cuba in the north to Argentina in the south. That apparent resolution was a major improvement over previous classifications, but it was not the final word.

New collections from northern Peru revealed a previously undescribed genus, *Bishopanthus* H. Rob. (Robinson 1983b). A morphological cladistic study of the tribe (Funk et al. 1996) provided a phylogeny that was similar to the intuitive one described by Robinson (1983a, 1983b) but with a few new sister groups proposed. Re-examination of some other specimens resulted in the reduction of *Austroliabum* H. Rob. & Brettell to synonymy under *Microliabum* Cabrera (Robinson 1990). The application of

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DNA sequencing showed that a new genus, *Dillandia* V. A. Funk & H. Rob. (Funk & Robinson 2001), was needed for three species, in a group placed previously in *Munnozia* Ruiz & Pav. Now, new molecular data from nuclear and chloroplast DNA sequencing has not only supported the establishment of *Dillandia*, but also demonstrated the need for another new genus in the Liabeae (Dillon et al. 2009, Funk & Chan pers. comm.).

Within the Liabeae, the two genera, *Liabum* and *Oligactis* (Kunth) Cass., are clearly closely related (Robinson 1983a). These two genera can be distinguished from other members of the tribe by their pale anther thecae with teeth at the base, the absence of stomata on the disk corolla lobes, the lack of latex, and the presence of subquadrate raphids in the achene walls. Of the two genera, *Liabum* has leaves that are trinervate or triplinervate with ascending lower secondary veins, whereas *Oligactis* has leaves with pinnate venation (the apomorphic character). However, it is *Oligactis* that has been shown to be non-monophyletic. Robinson & Brettell (1974) recognized two subgenera in *Oligactis*. Because molecular data indicate that these two subgenera are not sister taxa, the atypical subgenus must be elevated to the genus level. *Oligactis* subg. *Andromachiopsis* H. Rob. & Brettell is therefore removed from *Oligactis* and placed in the new genus *Sampera*.

Systematic Account

The DNA sequence data (ITS, *trnL-F*, *ndhF*) separated the two groups in *Oligactis* that were already known to have at least subgeneric differences. What was not evident from the morphology was that one of the two subgenera was the sister taxon of *Liabum* but the other was not (Funk & Chan pers. comm.). Robinson (1983a) furnished a key to the subgenera that is given here in revised form with the genera *Oligactis* and

Sampera substituted for the subgeneric names *Oligactis* and *Andromachiopsis*.

Inflorescence axillary or terminal, with a subglomerate, spiciform, or racemose arrangement of heads, heads usually with 6–10 florets; anther appendages with papillose surfaces *Oligactis*
 Inflorescence terminal, with a corymbose arrangement of heads; heads with 18–50 florets; anther appendages smooth *Sampera*

The characteristics cited remain the most valid structural distinctions available for the two genera. In addition, in habit, typical *Oligactis* is a more complete vine with slender stems, whereas *Sampera* is shrubbier in appearance, with thicker stems. The style branches of the disk florets are longer than the hispidulous upper part of the style shaft in *Sampera*, rather than shorter as in *Oligactis*.

The new genus is named for Cristián Samper, Director of the National Museum of Natural History (U.S.A.), former Director of the Instituto Alexander von Humboldt, Santafé de Bogotá, Colombia, former Acting Secretary of the Smithsonian Institution, 2007–2008, and Honorary Curator of Tropical Ecology in the Department of Botany, National Museum of Natural History. Dr. Samper has made a lifelong commitment to the understanding of life on earth and its conservation, and it is fitting that a genus with some of its taxa in Colombia is named after him. It is interesting to note that one of the eight species in this new genus carries the name *Sampera cuatrecasasii* (M. O. Dillon & Sagást.) V. A. Funk & H. Rob., combining the names of Dr. Samper and the famous Smithsonian botanist Dr. José Cuatrecasas, who worked for many years in Colombia.

Sampera V. A. Funk & H. Rob.,
 gen. nov.

Type: *Liabum coriaceum* Hieron.

Oligactis subgen. *Andromachiopsis* H. Rob. & Brettell, *Phytologia* 28(1):58 (1974). Type: *Liabum pichinchense* Hieron.

Plantae frutescentes subscandentes non laticiferae; folia opposita; inflorescentiae corymbiformes; thecae antherarum pallidae; appendices apicales antherarum laeves; raphidis acheniarum subquadratis.

Scrambling shrubs, moderately branching, stems terete to strongly hexagonal, mostly tomentose, without latex; nodes with or without disks; leaves opposite; petioles with or without wings, sometimes included in perfoliate leaf pairs; blades sharply delimited and rounded to slightly cordate at base or confluent with petiole, ovate to oblong-ovate, margins subentire to serrate, never angulate, upper surface flat to slightly bullate, densely tomentose below, pinnately veined. Inflorescence terminal on branches, corymbiform, peduncles less than 5 cm long, thinly to densely tomentose. Heads with involucre broadly campanulate, involucre bracts 30–55 in 4–5 series, narrowly ovate to lanceolate, tips obtuse to narrowly acute, outer surface puberulous to arachnoid tomentose or hirsute. Ray florets 6–18, female; corollas yellow, with elliptical limbs; style branches not spiraled. Disk florets 10–34, bisexual; corollas yellow, narrowly funnelform, lobes 5, linear lanceolate, slightly longer than throat, without evident stomata; anther filaments smooth, with weak annular thickenings in walls; thecae pale, digitate at base; endothelial cells oblong, with oval or strap-shaped sclerified bands, with single thickening on each transverse wall; apical appendages oblong-ovate, smooth with short-oblong to subquadrate cells. Nectary short, not or scarcely lobed. Style base scarcely broadened; style branches up to 20 times as long as wide, ca. 1.5 times as long as hispidulous part of upper style shaft, tips narrowly obtuse. Achenes prismatic, with 5–8 ribs, bearing contorted setulae and small glandular dots, cells

of achene wall with subquadrate raphids; carpopodium short, annuliform, with small subquadrate cells in 3–5 series, walls of cells moderately thickened; pappus with 20–35 rather persistent inner capillary setae sometimes with broadened tips, with teeth of setae appearing mucronate-tipped in Hoyer’s solution, with outer series of 7–20 short setae or squamellae. Pollen spherical, 30–37 µm in diameter, with spines rather unevenly dispersed, with distinct group of inner columellae under each spine.

The genus *Sampera*, with eight species, is distributed from Colombia southward to northern Peru, with the majority of the species in Ecuador. The genus *Oligactis*, as now delimited, has species found in Costa Rica, Panama, Colombia, and Venezuela.

Key to the species of *Sampera*

- 1a. Median involucre bracts ovate, shortly acute; longer pappus bristles thickened, especially at tips; upper surfaces of leaf blades smooth or with exsulcate venation 2
- 1b. All involucre bracts lanceolate, narrowly acute; longer pappus bristles slender with tips only slightly broadened; upper surfaces of leaf blades often rugose or bullate. 4
- 2a. Nodes with stipuliform disks to 3 or 4 times as wide as the stem; heads usually with 12 ray florets and 12 disk florets. *S. ochracea*
- 2b. Nodes without stipuliform disks or with disks not more than twice as wide as the stem; heads with 2–10 ray florets and ca. 10–15 disc florets 3
- 3a. Heads with 2–4 ray florets and ca. 15 disk florets; lower surfaces of leaves with thin tomentum allowing dark color of secondary veins to show. *S. cuatrecasasii*
- 3b. Heads with 8–10 ray florets and ca. 10 disk florets; lower surfaces of leaves with thick tomentum obscuring color of secondary veins. *S. coriacea*

- 4a. Leaf blades ovate-lanceolate; peduncles with appressed arachnoid tomentum; plants from near or below 2500 m. *S. asplundii*
- 4b. Leaf blades mostly oblong-ovate; peduncles with floccose tomentum; plants mostly above 2500 m. 5
- 5a. Base of leaf blade abruptly acute to subtruncate. 6
- 5b. Base of leaf blade acuminate to decurrent. 7
- 6a. Heads with (5-) 6-8 ray florets; inner pappus bristles 3.5-4.0 mm long *S. ecuadoriensis*
- 6b. Heads with 14-18 ray florets; inner pappus bristles 4.5-5.5 mm long *S. pichinchensis*
- 7a. Petiole winged, continuous between decurrent base of leaf blade and nodal disk. *S. cusalaguensis*
- 7b. Petiole not winged. *S. pastoensis*
- Saupera asplundii*** (H. Rob.) V. A. Funk & H. Rob., comb. nov.
- Oligactis asplundii* H. Rob., Phytologia 35(3):200 (1977).
Distribution.—Ecuador.
- Saupera coriacea*** (Hieron.) V. A. Funk & H. Rob., comb. nov.
Figs. 1, 2
- Liabum coriaceum* Hieron., Bot. Jahrb. Syst. 29:58 (1900).
- Oligactis coriacea* (Hieron.) H. Rob. & Brettell, Phytologia 28(1):58 (1974).
- Liabum scandens* Domke in Diels, Biblioth. Bot. 116:167 (1937).
- Oligactis scandens* (Domke) H. Rob. & Brettell, Phytologia 28(1):59 (1974).
- Liabum granatense* Cuatrec., Feddes Rept. Spec. Nov. Regni Veg. 55:128 (1953).
- Oligactis granatensis* (Cuatrec.) H. Rob. & Brettell, Phytologia 28(1):58 (1974).
- Oligactis coriacea* var. *granatensis* (Cuatrec.) H. Rob., Phytologia 35(3):201 (1977).
Distribution.—Colombia, Ecuador, Peru.
- Sampera cuatrecasii*** (M. O. Dillon & Sagást.) V. A. Funk & H. Rob., comb. nov.
- Oligactis cuatrecasii* M. O. Dillon & Sagást., Arnaldoa 2(2):25 (1994)[1995].
Distribution.—Peru.
- Sampera cusalaguensis*** (Hieron.) V. A. Funk & H. Rob., comb. nov.
- Liabum cusalaguense* Hieron., Bot. Jahrb. Syst. 29:55 (1900).
- Oligactis cusalaguensis* (Hieron.) H. Rob. & Brettell, Phytologia 28(1):58 (1974).
Distribution.—Ecuador.
- Sampera ecuadoriensis*** (Hieron.) V. A. Funk & H. Rob., comb. nov.
- Liabum ecuadoriense* Hieron., Bot. Jahrb. Syst. 19:60 (1894).
- Oligactis ecuadoriensis* (Hieron.) H. Rob. & Brettell, Phytologia 28(1):58 (1974).
Distribution.—Ecuador.
- Sampera ochracea*** (Cuatrec.) V. A. Funk & H. Rob., comb. nov.
- Liabum ochraceum* Cuatrec., Collect. Bot. Barcelone 3:302 (1953).
- Oligactis ochracea* (Cuatrec.) H. Rob. & Brettell, Phytologia 28(1):58 (1974).
Distribution.—Peru.
- Saupera pastoensis*** (Cuatrec.) V. A. Funk & H. Rob., comb. nov.
- Liabum pastoense* Cuatrec., Not. Fl. Colomb. 6:36 (1944).
- Oligactis pastoensis* (Cuatrec.) H. Rob. & Brettell, Phytologia 28(1):58 (1974).
Distribution.—Colombia.
- Sampera pichinchensis*** (Hieron.) V. A. Funk & H. Rob., comb. nov.
- Liabum pichinchense* Hieron., Bot. Jahrb. Syst. 29:56 (1900).



Fig. 1. *Sampera coriacea* (Hieron.) V. A. Funk & H. Rob. A. Habit, note pinnate venation. B. Head, note pubescence on involucre bracts. C. Ray corolla and style. D. Disk corolla, anthers and style. Drawing by Alice Tangerini (US). Mostly from *Ollgaard & Balslev 8277*.

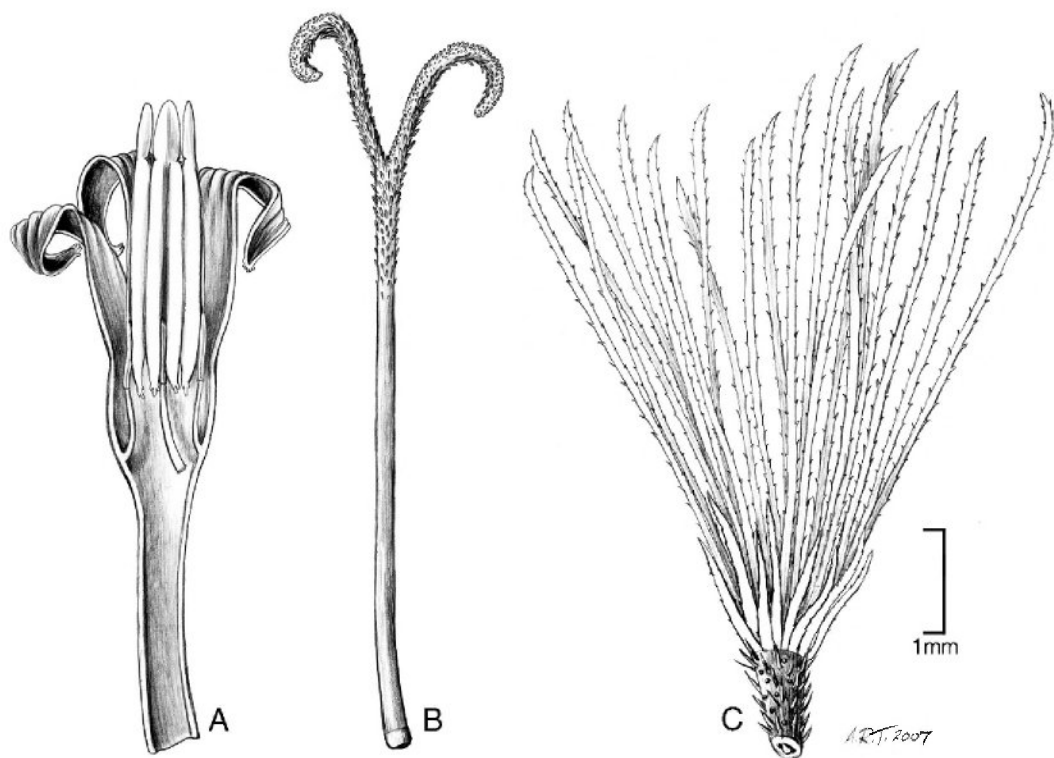


Fig. 2. *Sampera coriacea* (Hieron.) V. A. Funk & H. Rob. A. Longitudinal section of disc corolla showing bases of anther thecae. B. Style showing pubescence on the upper part of the style. C. Achene and pappus showing glands and hairs on achene and two types of pappus. Drawing by Alice Tangerini (US).

Oligactis pichinchensis (Hieron.) H. Rob. & Brettell, *Phytologia* 28(1):59 (1974).

Liabum hallii Hieron., *Bot. Jahrb. Syst.* 29:57 (1900).

Oligactis hallii (Hieron.) H. Rob. & Brettell, *Phytologia* 28(1):58 (1974).

Distribution.—Ecuador.

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