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STUDIES ON GEOCALYCACEAE (HEPATICAE). X. NEW TAXA AND NEW COMBINATIONS IN *CHILOSCYPHUS CORDA* FOR AUSTRALASIA

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ABSTRACT

Chiloscyphus subg. ***Lophocolea*** is a new combination. ***Chiloscyphus erosus***, ***C. fertilis***, ***C. subopposítus***, ***C. edentatus***, ***C. tuberculatus***, ***C. connatifolius***, ***C. parvispinus***, ***C. semiteres*** var. ***retusus***, ***C. mittenianus*** var. ***obtusus***, and ***C. mittenianus*** var. ***symmetricus*** are described as new species and varieties from Australasia. ***Chiloscyphus subporosus*** var. ***inflexifolius*** is a new combination.

KEY WORDS: *Chiloscyphus*, Geocalycaceae, Hepaticae, Australasia

The following new taxa and new combinations are the result of a systematic study of the Australasian species of the genus *Chiloscyphus*, and a treatment of the genus for a second volume of a Manual of New Zealand, Hepaticae. The names are here published separately to make them immediately available for use.

1. ***Chiloscyphus*** subg. ***Lophocolea*** (Dum.) Engel & Schust., *comb. nov.* BASIONYM: *Jungermannia* sect. *Lophocolea* Dum., *Syll. Jungerm. Eur.* 59. 1831. [TYPE: *Jungermannia bidentata* L.]. *Lophocolea* (Dum.) Dum., *Recueil d' Observ. Jungerm.* 17. 1835.

2. ***Chiloscyphus connatifolius*** Engel, *spec. nov.* HOLOTYPE: AUSTRALIA. Tasmania: Gordon River, Gorge Creek, near Pine Landing, sea level, *Engel 14648* (F); Isotype: HO.

   Folia dorsaliter connata. Amphigastrium bidentatum vel usque 0.30-0.45 mm longitudinis bilobum, segmentis semper magnioribus quam armaturis foliorum ceteris praeditum, apicem cetera armatura adjecta carentem evolutum; margines laminarum utrinsecus dente vel cilio armati. Tuberculae cellulorum foliorum conspicuae perevolutaeque. Cellulae amphigastriorum grandes, laeves, etuberculatae.

A combination of features will separate this species from all other species in sect. *Leucophylli*. The leaves are dorsally connate and conspicuously tuberculate. Underleaves are bidentate to bilobed to at most 0.45 mm, and the segments are uniformly larger than any other underleaf armature. Underleaf cells, however, are devoid of tuberculae.

3. ***Chiloscyphus edentatus*** Engel, *spec. nov.* HOLOTYPE: AUSTRALIA. Tasmania: Cradle Mtn.-Lake St. Clair Natl. Park, Ballroom Forest, SW side of Lake Dove, 950-1050 m, *Engel 13993* (F); Isotype: HO.

Plantae ad 2.2 mm latae. Ramificatio precipue vel omnino terminalibus. Folia dorsaliter discreta, verticale vel subverticale, valde dorsaliter assurgentia et precipue erecta vel suberecta, transversa vel subsuccuba. Apex foliorum interdum anguste rotundatus, retuse-bidentatus, symmetrice vel asymmetrice breviter bifidus vel 1-dentatus. Corpora oleosa 2(3), elliptica ad longe linearia.

Chiloscyphus edentatus is allied to *C. suboppositus*, but differs from that species by the predominantly to exclusively *Frullania* type branching; the variable leaf apices, which are narrowly rounded to retuse-bidentate to symetrically or asymmetrically short bifid; the vertical to subvertical, strongly dorsally assurgent and mostly erect to suberect leaves which are consistently free dorsally; and the fewer number of oil-bodies per cell, being 2(3) vs. 3-5 per cell in *C. suboppositus*.

4. ***Chiloscyphus erosus*** Engel, *spec. nov.* HOLOTYPE: NEW ZEALAND. North Is., South Auckland Prov., Plateau E of Waiotapu Valley, ca. 1800 ft., *Allison 3569* (CHR!).

Caules demum plerumque flagelliformes; cellulae caulis parietibus distincte tenuibus praeditae. Amphigastria aspectu ventrali convexa, bifida usque 0.9 longitudinis, marginibus laminae utrinque omnino vel maximam parte appendiculo dentiformi vel laciniiformi armatis. Gemmae abundantes.

This species is related to *Chiloscyphus perpusillus* (Hook. *f.* & Tayl.) Engel, but differs in several respects. The leaf apex (gemmiparous leaves) becomes progressively more erose, and with continued gemmae formation the lobes disappear altogether (the leaf apex then ± broadly rounded). The leaves often with 1-2 accessory lobes at apex lending a ragged appearance. Vegetative branches are all or mostly intercalary (both lateral and ventral).

5. ***Chiloscyphus fertilis*** Engel, *spec. nov.* HOLOTYPE: AUSTRALIA. New South Wales: Lane Cove, *Forsyth 60* as *L. bridellii*--c. sporo.+ (male) (NSW!).

Ramificatio tantum lateri-intercalaris, ramis terminalibus carens. Caules cellulis corticalibus medullaribusque parietibus percrassis praeditis vestiti. Apex marginesque foliorum integri; trigonae gangliiformes. Bracteola foeminea 0.2-0.4 areae bracteae occupans. Lobi perianthii non divisi et integri

vel repandi vel subdenticulati vel usque 1/2 numerii toti loborum parvi-bifidi. Plantae fructibus persaepe adsunt.

The species is related to *Chiloscyphus semiteres*, but differs in 1) branching strictly lateral-intercalary; 2) stems with cortical and medullary cell walls very thick; 3) perianth lobes entire or repand-sparsely denticulate, or with 1-2 of lobes short-bifid, but never with all 3 lobes bifid; and 4) female bracteole 0.2-0.4 bract area.

6. *Chiloscyphus mittenianus* (Col.) Engel

Chiloscyphus mittenianus (Col.) Engel var. ***obtusus*** Engel, *var. nov.* HOLOTYPE: NEW ZEALAND. South Is., Otago Prov.: Mt. Maungatua, W of Mosgiel, 760 m, *Engel 17768* (F); Isotype: CHR.

A varietate typica foliis plerumque dorsaliter connatis, apice non diviso, integro, angustate vel interdum late rotundato differt.

Chiloscyphus mittenianus (Col.) Engel var. ***symmetricus*** Engel, *var. nov.* HOLOTYPE: NEW ZEALAND. South Is., Westland Prov.: Westland Natl. Park, track to Alex Knob, off track to Louisa Peak, 1170 m, *Engel 18973* (F); Isotype: CHR.

A varietate typica foliis uniformiter dorsaliter liberis, apice subaeque vel aeque bifido segmentis piliferis praedito, segmento ventrali in stratum uniseriatum e 5-7(-8) cellulis compositum terminanti differt.

7. ***Chiloscyphus parvispinus*** Engel, *spec. nov.* HOLOTYPE: NEW ZEALAND. South Is., Otago Prov.: S side of Mt. Cargill, just below summit, N of Dunedin, ca. 2200 m, *Engel 17563* (F); Isotype: CHR.

Plantae dioecae. Folia tota bifida, pagina dorsali hispida, supra luminem cuiusque cellulae prominenta brevi-conica e 1(2) cellulis composita obsita, pagina ventrali perlaevi. Segmenta amphigastriorum integra vel 1-2 dentibus armata, armatura nullo modo regulariter opposita. Perianthium et paginae utrinque bractearum gynoicialium hispidae.

Chiloscyphus parvispinus differs from the related *C. gippslandicus* Engel & Schust. of Tasmania and Australia by the 1(2) celled surface teeth, which are juxtaposed over the lumen of most lamina cells; the uniformly hispid, consistently bifid leaves; and the hispid perianth and gynoecial bract surfaces.

8. *Chiloscyphus semiteres* (Lehm.) Lehm. & Lindenb.

Chiloscyphus semiteres (Lehm.) Lehm. & Lindenb. var. ***retusus*** Engel, *var. nov.* HOLOTYPE: AUSTRALIA. New South Wales: Murrumbidgee River, Rules Point, 37 km NW of Adaminaby, *Streimann 7482* (CBG!).

A varietate typica apicibus saepe retusis vel curto-bifidis, lobis plerumque rotundatis differt.

The *Chiloscyphus semiteres* complex also includes the following:

Chiloscyphus platensis (Mass.) Engel, *comb. nov.* BASIONYM: *Lophocolea platensis* Mass., Atti Accad. Sci. Mediche Natur. Ferrara 80(3/4):12. 1906 of NE Argentina and SE Brazil.

9. ***Chiloscyphus subopposítus*** Engel, *spec. nov.* HOLOTYPE: AUSTRALIA. Tasmania: Cradle Mt.-Lake St. Clair Natl. Park, Pine Valley, Cephissus Falls, NNW of L. St. Clair, 850 m, *Engel 14247* - c. sporo. (F); Isotype: HO.

Plantae dioecae, magnae, usque 5 mm latae. Ramificatio maximam partem intercalaris. Folia subopposita horizontalia, late patentia, vulgo dorsaliter connata; apices non congruente breviter bifidi segmento dorsali perparviori; segmentum ventralis folii varium, acutum vel acuminatum interdum apiculatum; margines folii dorsales ventralesque integri. Amphigastria usque 0.5 longitudinis divisa.

Chiloscyphus subopposítus is a close relative of *C. trialatus* (Gott.) Engel & Schust., but may be distinguished from that species by 1) the shallowly divided underleaves, divided to at most 0.35 mm; 2) the dioecious condition; and 3) the opaque and rigid texture.

10. ***Chiloscyphus subporosus*** var. ***inflexifolius*** (Steph.) Engel, *comb. & stat nov.* BASIONYM: *Lophocolea inflexifolia* Steph., Spec. Hep. 6:278. 1922.

11. ***Chiloscyphus tuberculatus*** Engel, *spec. nov.* HOLOTYPE: NEW ZEALAND. South Is., Southland Prov.: Fiordland Natl. Park, Tutoko River, W. of Milford Sound, 50 m, *Engel 18844* (F); Isotype: CHR.

C. aculeato Mitt. similis, sed ramificatione frullanioidea plerumque terminali, tuberculis folii bene evolutis in paene toto celularum conspicuis, foliis dorsaliter liberis usque 0.30-0.35 longitudinis bifidis, cellulis folii medianis 17-23 µm latis × 20-25 µm longis, lobulis bractearum masculorum saccati, a latere viso sacculi verrucoso-mamillato differt.

The species is closely allied to *Chiloscyphus aculeatus* Mitt., but may be distinguished from it by predominately terminal, *Frullania*-type branching; the well-developed tuberculae, which are conspicuous on nearly all leaf cells; the more deeply bifid leaves (divided to 0.30-0.35 mm), which are free dorsally; and the smaller leaf cell size.

The following combination also is required:

Chiloscyphus profundus subsp. ***cladogynus*** (Schust.) Engel, *comb. nov.* BASIONYM: *Lophocolea heterophylla* subsp. *cladogyna* Schust., Hep. Anthoc. N. Amer. 4:223. 1980.