

STUDIES ON GEOCALYCACEAE VII.
SUBSPECIFIC DIFFERENTIATION OF CHILOSCYPHUS
SEMITERES TOGETHER WITH FURTHER REFINEMENTS IN
CHILOSCYPHUS (S. LAT.)

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Chiloscyphus semiteres is a pan-south temperate species occurring in the Australasian, American and African sectors (FIG. 1). The species occurs in variable frequencies in different parts of its range. It is very rare in the Falkland Islands (Engel, 1990), probably lacking in the Magellanian zone of southern South America (I did not record it for the Brunswick Peninsula [Engel, 1978], and the few other Magellanian records are suspect), and somewhat common in the Valdivian zone and on Juan Fernández. In the African sector the species is restricted to Cape Province, South Africa, where apparently it is rather common judging from the number of specimen citations in Grolle (1959). The species is of variable frequency within Australasia: it is rather common in New Zealand, but in Tasmania and Australia *C. semiteres* is one of the most common or perhaps the most common hepatic. The species also occurs in the oceanic Isles of Scilly (Paton, 1965) and Scotland (Long, 1982).

Chiloscyphus semiteres is characterized by a) undivided, entire leaves that are broadly rounded to truncate at the apex; b) conspicuous, deeply divided underleaves that frequently are asymmetrically inserted and have the laminal margin on each side with a process grading from dentiform to lobuliform; and c) a variable gynoeccial position: some to many on short lateral-intercalary branches lacking normal leaves, while others are on terminal branches and main shoots.

The species exhibits subspecific differentiation only in the Australasian sector, where it may be separated into two varieties as follows:

KEY TO VARIETIES OF *CHILOSCYPHUS SEMITERES*

1. Underleaf disc lateral armature well-developed: mostly laciniate to lobulate; trigones minute to small, only occasionally medium and straight-sided; underleaves often $1.5-3\times$ stem width; plants translucent
..... *C. semiteres* var. *semiteres*
1. Underleaf disc lateral armature reduced: mostly dentiform to ciliiform or lacking, only sporadically small-laciniiform; trigones normally large and bulging to knotlike (in shade forms medium and straight-sided to weakly bulging); underleaves normally $1-1.5\times$ stem width; plants dull-opaque
..... *C. semiteres* var. *canaliculatus*

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

Jungermannia semiteres Lehm., Linnaea 4: 363. 1829; *Chiloscyphus semiteres* (Lehm.) Lehm. & Lindenb. in G. L. & N., Syn. Hep. 190. 1845;

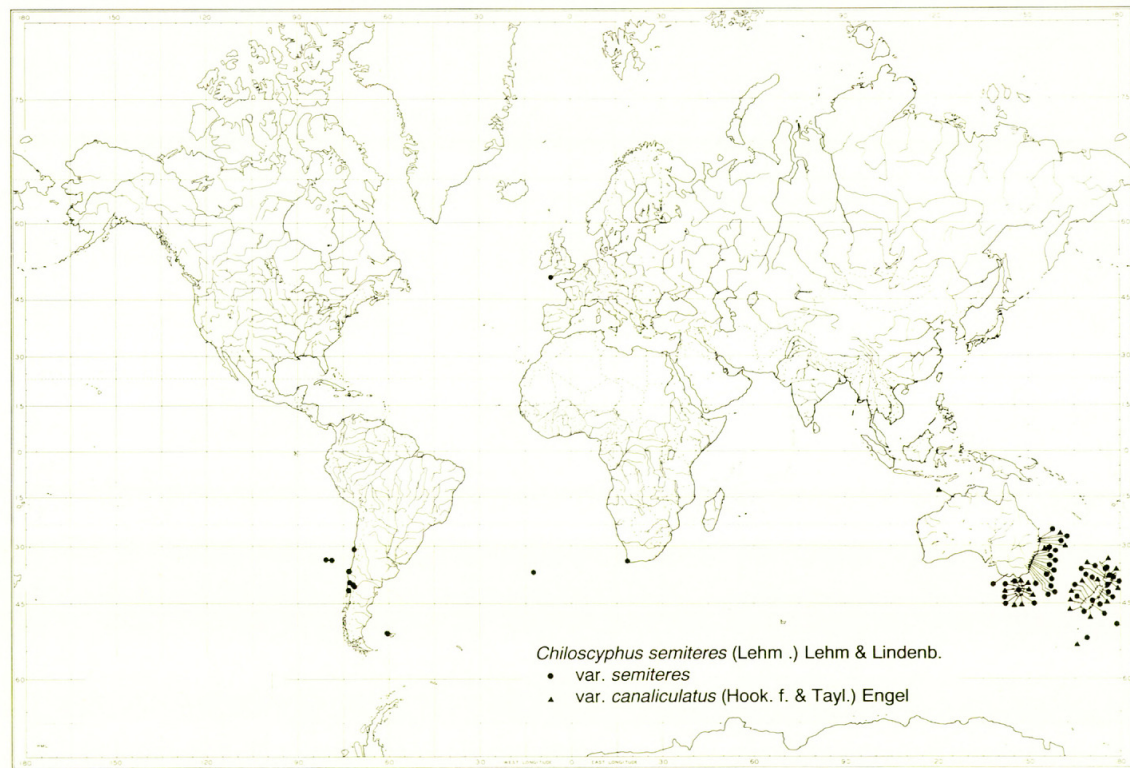


FIG. 1. Distribution of the two varieties of *Chiloscypus semiteres*.

Lophocolea semiteres (Lehm.) Mitt., J. Linn. Soc., Bot. 16: 188. 1877. ORIGINAL MATERIAL. SOUTH AFRICA: Cape Prov., (Cap. Bonae Spei), "latere orientali montis Teufelsberg", *Ecklon* (G!).

Plants translucent. Trigones minute to small, occasionally medium and straight-sided, 2.4–4.8 μm , the ratio of trigone diameter to length of intervening thin wall between trigones 1:2–5.6. Underleaf disc often 1.5–2 $\times$ stem width; the lateral armature well developed: mostly laciniiform, at times lobuliform.

Distribution: Pan-south temperate (FIG. 1).

Chiloscyphus semiteres* var. *canaliculatus (G. L. & N.) Engel, comb. & stat. nov.

Chiloscyphus canaliculatus G. L. & N., Syn. Hep. 710. 1847; *Jungermannia canaliculata* Hook. f. & Tayl., London J. Bot. 3: 563. 1844, *hom. illeg.*, *non J. canaliculata* Nees, Hep. Javanicae 10. 1830; *Lophocolea heterophylloides* var. *canaliculata* (G. L. & N.) Carring. & Pears., Pap. & Proc. Roy. Soc. Tasmania 1887: 51. 1888; *Lophocolea canaliculata* (G. L. & N.) Steph., Bull. Herb. Boissier 6(9): 786. 1906 (= Spec. Hep. 3: 86). LECTOTYPE (*nov.*). NEW ZEALAND: "Falls of Waitangi", *Hooker s. n.* (FH!—c. per. + δ).

Plants dull-opaque. Trigones normally large and bulging to knotlike, in shade forms medium and straight-sided to weakly bulging, (4.8–)6–7.2(–8.4) μm , the ratio of trigone diameter to length of intervening thin wall between trigones variable: 1:(0.9–)1.2–2.6(–3.2). Underleaf disc usually 1–1.5 $\times$ stem width; the lateral armature reduced: mostly dentiform to ciliiform or lacking, only sporadically small-laciniiform.

DISTRIBUTION: New Zealand, Tasmania and southeast Australia (FIG. 1).

FURTHER REFINEMENTS IN CHILOSCYPHUS

1) SUBSPECIFIC DIFFERENTIATION OF *CHILOSCYPHUS NOVAE-ZEELANDIAE*

This polymorphic species occurs in New Zealand, Tasmania and southeast Australia. It may be subdivided into three units, as follows:

a) ***Chiloscyphus novae-zeelandiae* var. *novae-zeelandiae***

Jungermannia novae-zeelandiae Lehm. & Lindenb. in Lehmann, Nov. Min. Cogn. Stirp. Pug. 6: 33. 1834; *Lophocolea novae-zeelandiae* (Lehm. & Lindenb.) Nees in G. L. & N., Syn. Hep. 168. 1845; *Chiloscyphus novae-zeelandiae* (Lehm. & Lindenb.) Engel & Schust., Nova Hedwigia 39: 420. 1984 [1985]. ORIGINAL MATERIAL. NEW ZEALAND: South Is., Dusky Bay, *s. coll.* [Menzies] (BM!, G!, S![2], ex hb. Hooker—c. per.).

b) ***Chiloscyphus novae-zeelandiae* var. *meridionalis*** (Steph.) Engel, comb. & stat. nov.

Lophocolea meridionalis Steph., Bull. Herb. Boissier 6(10): 888. 1906 (= Spec. Hep. 3: 113). ORIGINAL MATERIAL. NEW ZEALAND: "Insula meridionalis", Waimate (Canterbury), May 1901, *Beckett* 2737 (G!—c. δ).

c) **Chiloscyphus novae-zeelandiae** var. **grandistipulus** (Schiffn.) Engel, comb. & stat. nov.

Lophocolea grandistipula Schiffn. in Naumann, Forschungsr. Gazelle 4: 12, pl. 3, f. 29–32. 1890. ORIGINAL MATERIAL. NEW ZEALAND: Auckland, 8 Nov 1875, Naumann (FH!, sub *L. stipularis*, nom. hb.).

2) **CHILOSCYPHUS PERPUSILLUS** COMB. NOV.

Chiloscyphus perpusillus (Hook. f. & Tayl.) Engel, comb. nov.

Jungermannia perpusilla Hook. f. & Tayl., London J. Bot. 3: 380. 1844;
Lophocolea perpusilla (Hook. f. & Tayl.) G. L. & N., Syn. Hep. 163. 1845.
ORIGINAL MATERIAL. NEW ZEALAND: Campbell Is., *Hooker* (BM! [4], FH!).

3) THE TAXONOMIC POSITION OF *CHILOSCYPHUS STRIATELLUS* MASS.

This species occurs in both the Valdivian and Magellanian zones of southern South America. It has elongate, longitudinally oriented lamellae on the stem, and I am unaware of any other member of Jungermanniales with such processes. It belongs in a section of its own, as follows:

Chiloscyphus sect. **Striatelli** Engel, sect. nov.

Folia caulina et amphigastria caulina profunde bilobata, superficiebus levibus. Caulis lamellis parallelis, longitudinalibus, latitudine 2–5 cellularibus ornata.

Type: *Chiloscyphus striatellus* Mass.

Leaves and underleaves deeply bifid, smooth. Stems on all sides with parallel, longitudinal lamellae 2–5 cells high.

4) THE TAXONOMIC POSITION OF *CHILOSCYPHUS APOSINENSIS* PIIPPO

Chiloscyphus aposinensis of China is similar to the pan-tropical *C. muricatus* (Lehm.) Engel & Schust. of sect. *Microlophocolea* Spruce in having spinose leaf surfaces and deeply divided leaves and underleaves, but differs from that species in 1) the form of the leaf spines (the lumen of each protuberance is confluent with that of the subtending laminal cell and not separated from it by a cross wall [fig. 4 in Chang & Gao, 1984]); 2) the placement of leaf spines only on the dorsal surface of the leaf; and 3) the dense clusters of spines at the dorsal base of each leaf (fig. 4 in Chang & Gao, 1984). *Chiloscyphus aposinensis* belongs in an independent section, as follows:

Chiloscyphus sect. **Aposinenses** Engel, sect. nov.

Folia caulina pagina dorsali spinosa; spinae dispersae (cellula quaque spina unica ornata), sparsae ad basin ventralem, dense fasciculatae ad basin dorsalem, digitiformes, luminibus confluentibus cum luminibus laminae; folia caulina pagina levi instructa.

TYPE. *Lophocolea chinensis* Gao & Chang, Bull. Bot. Res. 4: 87. 1984 = *Chiloscyphus aposinensis* Piippo (cf. Piippo, 1990).

Dorsal leaf surface spines scattered, 1 each per cell, sparse at ventral base, in dense clusters at postical base, fingerlike, the lumina confluent with that of lamina; ventral leaf surface smooth.

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