

# Bryophytes from Frieda River, East and West Sepik Provinces, Papua New Guinea. IV. *Chiloscyphus kopenhagenii* sp. nov. (Geocalycaceae)

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Received 30 October 1997, accepted 5 January 1998

*Chiloscyphus kopenhagenii* Piippo, sp. nov., is a tiny, epiphyllous species, with fragmenting, 2-lobed and often toothed leaves, thin-walled cells and small trigones, very shallow and wide underleaves with two lobes and two teeth and numerous rhizoids. The morphology shows similar adaptations to the epiphyllous habitat as is seen in some genera of the Lejeuneaceae. *Chiloscyphus teptepensis* (Piippo) Piippo is a new combination.

Key words: *Chiloscyphus*, Frieda River, Geocalycaceae, hepatics, *Lophocolea*, Papua New Guinea, taxonomy, West Sepik

The study area, geology, vegetation and previous bryological exploration in East and West Sepik Provinces of Papua New Guinea were dealt with by Norris and Koponen (1985). The other papers published in the Frieda River series are Piippo (1986) and Norris *et al.* (1988).

***Chiloscyphus kopenhagenii* Piippo, sp. nov.** (Fig. 1)

*Planta 2–3 mm longa et 1 mm lata, pallide olivacea. Folia succuba, contigua vel imbricata, ovata, apice bilobata, margines foliorum crenulatae cellulis protrusis et saepe dentatae. Dentes foliorum longitudine 1–6 cellularum, ad basim latitudine 1–4 cellularum, cellulis protrusis. Amphigastria caule triplo latiora, profunde bilobata, marginibus unidentatis. Cellulae rotundatae, 30–50 mm longae et 20–45 mm latae, parietibus tenuibus,*

*trigonis parvis, cuticula verrucosa. Reproductio asexualis foliis et dentibus fragilibus.*

Type: Papua New Guinea. West Sepik Province: Frieda River prospecting area of Frieda Copper Co. Mt. Hartley 8 km N of Frieda Base Camp, montane rainforest on S slope, alt. ca. 1 350 m, collection site 5b, on leaf, 4°38'S 141°47'E, 5.VIII.1981 T. Koponen 35338 (H, holotype).

Plants 2–3 mm long and ca. 1 mm wide, pale olive green. Leaves succubous, contiguous to imbricate, ovate, the apex 2-lobed, margins crenulate with protruding cells and often with additional teeth, dorsal margin may be slightly straighter than the ventral margin, teeth 1–6 cells long and 1–4 cells wide at their bases, their cells protruding. Underleaves connate with the lateral leaves on one side, ca. 3 × wider than the stem, very deeply 2-lobed, lobe apices extending outwards, both margins usually with one additional tooth; underleaf

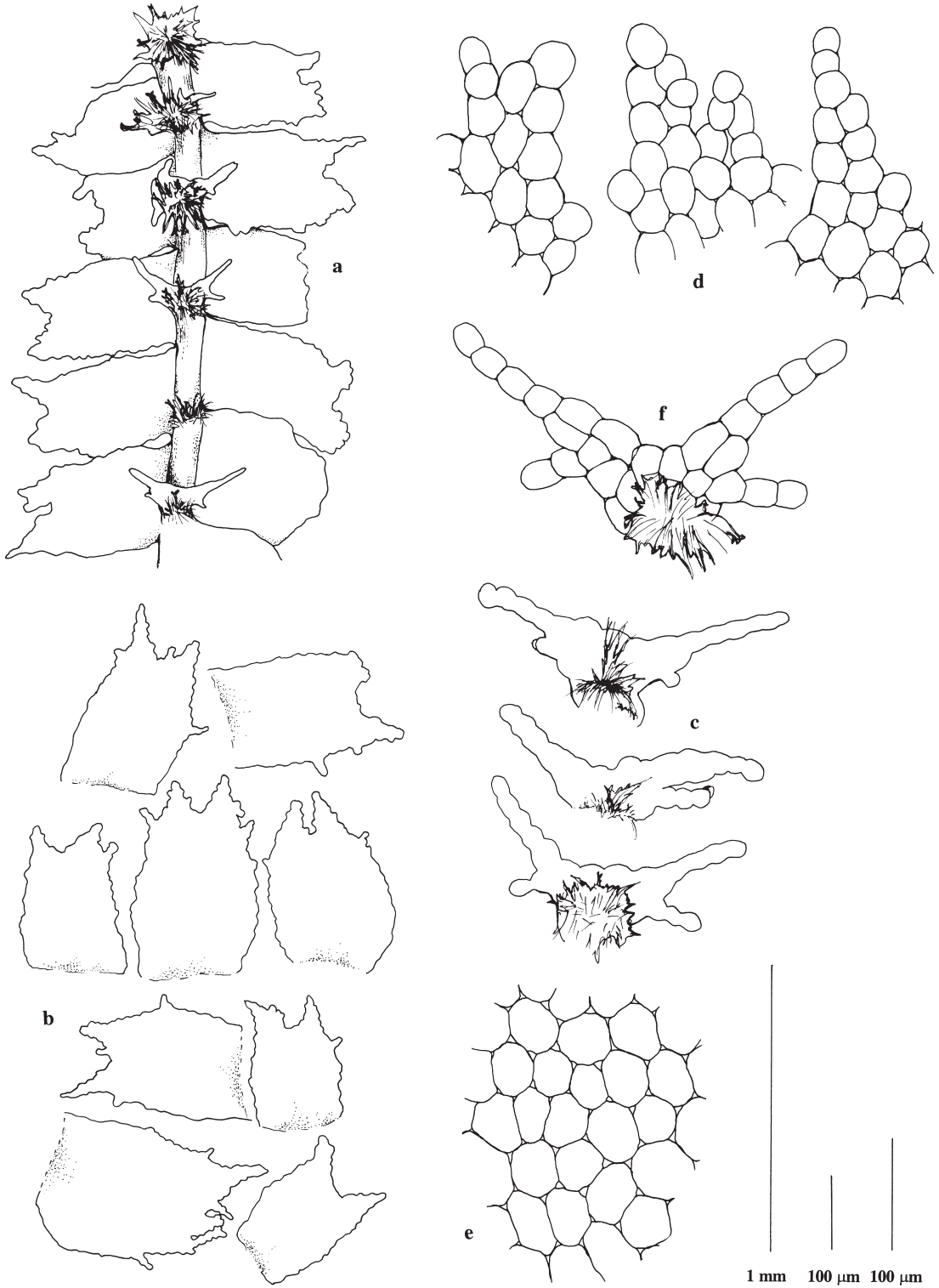


Fig. 1. *Chiloscypus koponenii* Piippo (drawn from the holotype) — a: Habit from ventral side. — b: Leaves. — c: Underleaves. — d: Apical leaf cells. — e: Median leaf cells. — f: Cells from underleaf. — Use the 1 mm scale for a and b, the shorter 100  $\mu\text{m}$  scale for c, and the longer 100  $\mu\text{m}$  scale for d-f.

bases with numerous pale brownish rhizoids often totally covering the underleaves. Cells isodiametric or somewhat longer than wide, rounded, 30–50 µm long and 20–45 µm wide in the middle portion of leaves, thin-walled with small, sometimes middle-sized, trigones; cells of the teeth 23–38 µm long and wide; cuticle slightly verrucose. Asexual reproduction by fragile teeth and leaves. No sexual organs seen.

Characteristic for *Chiloscyphus kopenhagenii* are: (1) very small plants and epiphyllous habitat, (2) leaves 2-lobed and often with additional marginal teeth, (3) teeth and leaves fragmenting, (4) cells thin-walled and rounded, trigones usually small, (5) underleaves adapted to the epiphyllous habitat, wide and very deeply 2-lobed, lobes long and fragile, both margins usually with one additional tooth, and (6) numerous rhizoids with branched apices often covering the whole underleaf.

The new species is placed in *Chiloscyphus* Corda, even though it has asexual reproduction by caducous and fragmenting leaves (see Schuster 1963: 270, and Engel & Schuster 1984 for comments on the genus *Leptophyllopsis* Schust.). A similar means of asexual reproduction is known also from another taxon in the genus, *Chiloscyphus teptepensis* (Piippo) Piippo, *comb. nov.* (*Lophocolea teptepensis* Piippo, *Acta Bot. Fennica* 131: 163, 1985).

The members of the genus *Chiloscyphus* (incl. *Lophocolea* (Dum.) Dum.) are terrestrial or inhabit tree trunks or twigs. *Chiloscyphus kopenhagenii* is the only species confined to leaves. It is similar to certain genera of the Lejeuneaceae in its underleaves and rhizoids. No special rhizoid disc is formed as in *Drepanolejeunea* (Spruce) Schiffn., *Leptolejeunea* (Spruce) Schiffn., and *Rhaphidolejeunea* Herz. (Bischler 1968a), but numerous rhizoids with branched apices are present. Underleaves are small, much wider than long, and their lobes are slender and often elongated as in genera *Diplasiolejeunea* (Spruce) Schiffn., *Drepanolejeunea*, *Leptolejeunea*, *Rhaphidolejeunea*, and sometimes in *Harpalejeunea* (Spruce) Schiffn. (see Herzog 1939, 1942, Chen 1955, Grolle 1966, Bischler 1968ab, Mizutani 1973). These underleaf

and rhizoid characters may be in connection with the epiphyllous habitat of *Chiloscyphus kopenhagenii* and the Lejeuneaceae taxa listed above. The explanation may be that it is an advantageous character for an epiphyllous taxon and can be considered as a convergency developed independently during the evolution of these taxa, which are not closely related.

*Acknowledgements.* Prof. Timo Koponen is thanked for comments on the manuscript, and Mr. Heino Vänskä, Ph.Lic., for checking the Latin.

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