

COLOLEJEUNEA METZGERIOPSIS, A NEW SPECIES RECORD FOR THAILAND

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Cololejeunea metzgeriopsis (K. I. Goebel) Gradst. *et al.*, a neotenic liverwort, was newly discovered in lowland evergreen forest, southern Thailand. A description and illustrations of Thai plants are provided.

Key words: epiphyllous liverworts, *Metzgeriopsis pusilla*, neoteny, southern Thailand

INTRODUCTION

With more than 400 currently published species, *Cololejeunea* (Spruce) Steph. is considered the largest genus of Lejeuneaceae (Söderström *et al.* 2016, Yu *et al.* 2013). The genus is widely distributed in the humid tropics, subtropics and in some of the oceanic warm temperate area, and is mostly found on living leaves (Pócs and Piippo 2012). Thirteen subgenera are currently accepted in the genus, namely subg. *Aphanolejeunea* (A. Evans) Pócs, subg. *Austrocololejeunea* Tixier, subg. *Chlorocolea* R. M. Schust., subg. *Chlorolejeunea* Benedix, subg. *Chondriolejeunea* Benedix, subg. *Cololejeunea*, subg. *Cryptolejeunea* Benedix, subg. *Diaphanae* R. M. Schust., subg. *Leptocolea* (Spruce) Schiffn., subg. *Metzgeriopsis* (K. I. Goebel) Pócs, subg. *Pedinolejeunea* Benedix ex Mizut., subg. *Protocolea* R. M. Schust., and subg. *Taenirolejeunea* (Zwickel) Benedix (Pócs and Piippo 2012, Söderström *et al.* 2016).

In Thailand, *Cololejeunea* was first reported by Stephani (1902), who described *C. schmidtii* Steph. and *C. siamensis* Steph. from Koh Chang Islands. Later, more new *Cololejeunea* species and new distribution records from Thailand were published over the next one hundred years. So far, about 50 species have been reported for the country (Chantanaorrapint and Pócs 2014, He *et al.* 2012, Lai *et al.* 2008, Phetkhajone and Chantanaorrapint 2018, Pócs and Podani 2015). During botanical surveys in southern part of Thailand, *Cololejeunea metzgeriopsis* (K. I. Goebel) Gradst. *et al.* was discovered.

TAXONOMIC TREATMENT

Cololejeunea metzgeriopsis (K. I. Goebel) Gradst. *et al.*, Bot. J. Linn. Soc.
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(Fig. 1)

Basionym: *Metzgeriopsis pusilla* K. I. Goebel, Ann. Jard. Bot. Buitenzorg 7: 54 (1888). = *Lejeunea metzgeriopsis* K. I. Goebel, Flora 72: 2 (1889). – Type: lost. Neotype designated by Gradstein *et al.* (2006): Malaysia, Perak, Taiping, Bukit Larut ('Maxwell Hill'), 1,100–1,200 m, humid secondary montane forest along road to summit, abundant on palm leaves, 8 March 2004, Gradstein, Ilkiu-Borges & Yong 10435 (neotype: GOET; isoneotypes: CAS, G, JE, KTU, NY, UBC).

Plants pale-green, turning whitish green when dry, thallose, prostrate, unistratose, without costa; thallus irregularly pinnate or bipinnate, 300–440 μm wide (including cilia), main axis usually broader than branches; dorsal surface of thallus bearing finger-like rhizoidal outgrowth; thallus margins densely ciliate, 3–7 cells long. Thallus cells in apical portion of branches isodiametric to slightly rectangular, 14–24 \times 12–18 μm , thin-walled, intercellular space usually absent; in basal portion of branches and main axis rectangular to isodiametric, 30–50 \times 16–26 μm , thick-walled with trigone and 1–2 intermediate wall thickenings, the trigones and intermediate thickenings frequently with an intercellular space. Oil bodies not seen. Rhizoids hyaline or pale brown, frequently branched at the apex, arranged in 2 irregular rows on ventral surface of thallus. Asexual reproduction by discoid gemmae, occurring near the base of cilia.

Dioicous. Androecia in short spikes of 3–6 pairs of lobulate bracts, bract lobe rhombic, 380–400 \times 160–200 μm , apexes acuminate to acute, free margin crenulate; bract lobule oblong to hemispherical, 220–320 \times 96–140 μm , apexes acuminate to obtuse; antheridia 2 per bract; bracteoles absent; a tuft of rhizoids present at the base of the male spike. Gynoecia and sporophyte not seen on Thailand specimens.

Habitat and ecology: *Cololejeunea metzgeriopsis* was found on living leaves from high humid lowland to lower montane rain forests at altitude between ca 500 and 1,700 m.

Distribution: Fiji Islands, Indonesia, Malaysia, New Caledonia, Papua New Guinea, Philippines (Gradstein *et al.* 2006, Pócs and Piippo 2012), new to Thailand.

Representative specimens examined: MALAYSIA. Pahang, Cameron Highlands, Gunung Batu Brinchang, 04° 30' 24" N, 101° 23' 13.9" E, 1,705 m, 15 February 2015, Sangrattanaprasert 263/15F, 266/15B, 278/15D (PSU); Fraser's Hill, 03° 42' 56.0" N, 101° 44' 11.4" E, 1,230–1,277 m, 8–11 April 2014, Sangrattanaprasert 59/14C (PSU). – THAILAND. Hat Yai,

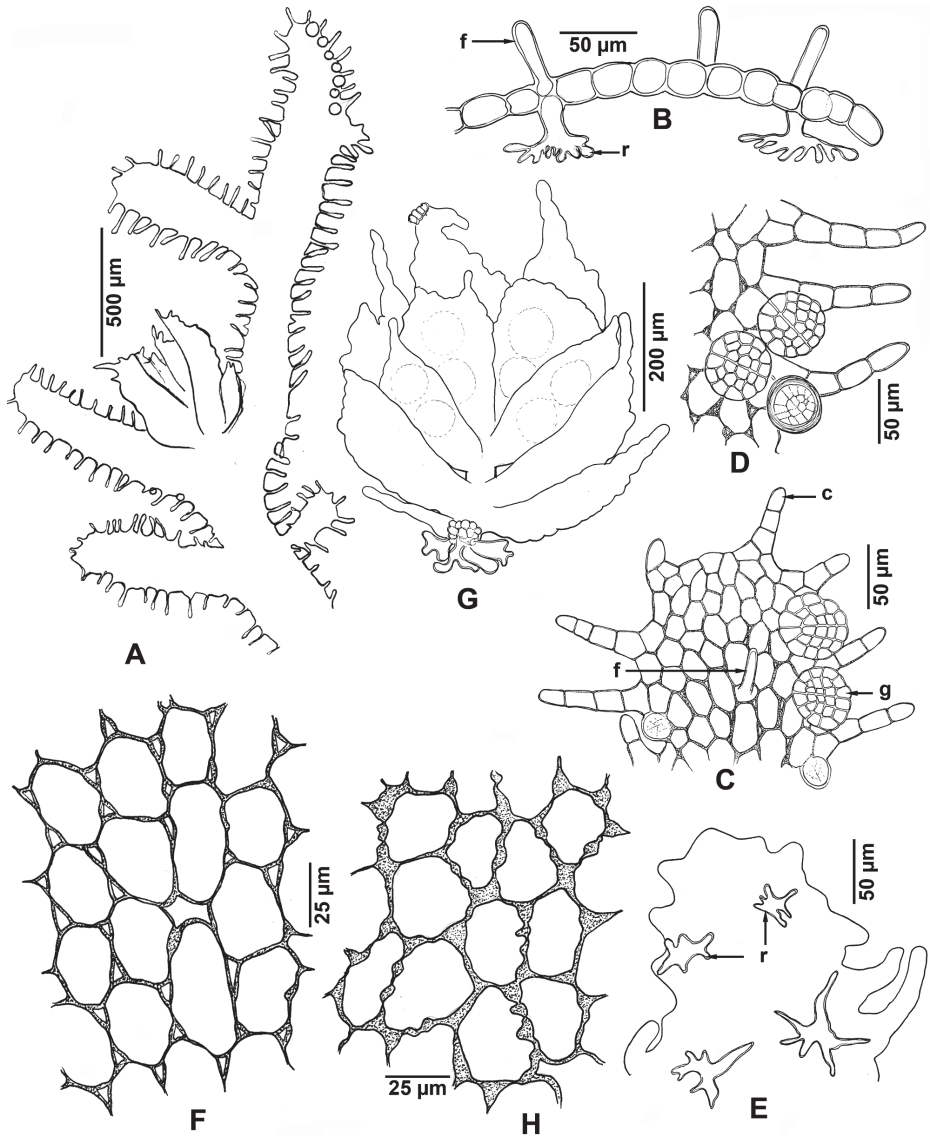


Fig. 1. *Cololejeunea metzgeriopsis* (K. I. Goebel) Gradstein *et al.* – A = male thallus with androecium, dorsal view; B = cross section of thallus, showing finger-like outgrowth (f) and rhizoids (r); C = apical portion of thallus in dorsal view, showing finger-like outgrowth, discoid gemmae (g) and cilia (c); D = thallus margins, showing gemmae and cilia; E = thallus in ventral view showing rhizoids; F = cells of main axis of thallus, showing thickenings with intercellular spaces; G = androecium, ventral view; H = cells of male bract, showing trigones and intermediate thickenings without intercellular spaces. All from Chantanaorrapint & Promma 2549D (PSU)

Ton Nga Chang Wildlife Sanctuary, Ton Nga Chang Waterfall, 06° 56' 43.91" N, 100° 13' 16.43" E, 495–500 m, 11 January 2014, Sangrattanaprasert 51/14C (PSU); 4 Oct. 2014, Sangrattanaprasert 206/14B (PSU). Yala, Betong, Ban Chulabhorn Pattana 10, 05° 49' 04.40" N, 101° 01' 50.20" E, 570 m, 15 June 2013, Chantanaorrapint and Promma 2549D (PSU).

Notes: *Cololejeunea metzgeriopsis* is easily separated from other *Cololejeunea* species by its thalloid habit consisting of unistratose thallus and having leafy branches only in the form of male and female gametangia on thallus margins. *Cololejeunea metzgeriopsis* might be confused with the members of the genus *Metzgeria* Raddi in general appearance. However, the latter differs from *C. metzgeriopsis* in having multistratose costa.

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