

CONTRIBUTION TO THE KNOWLEDGE OF GENUS *COLOLEJEUNEA* IN SOUTH-EAST ASIA

III. SOME NEW SPECIES

by

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A few number of new species belonging to the genus *Cololejeunea* are described, 2 from Thailand, 2 from Laos, and 1 from Malaya

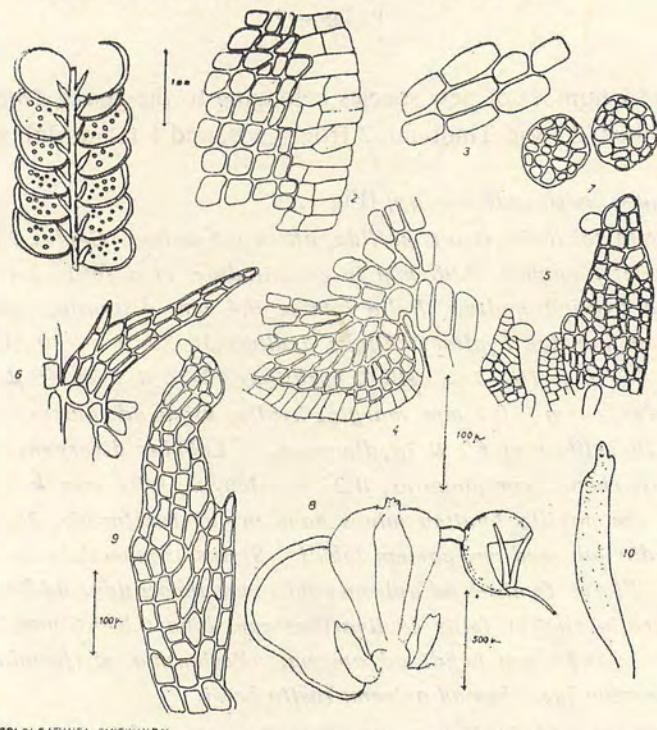
Cololejeunea smitinandii nov. sp; (Fig 1.)

Planta foliicola, viridis pallida, affixa substrato. Caules 0.9-0.5 cm longi, pauciter ramosi, 0.08 mm in crassitudine, cum foliis 1.4 mm lati. Rhizoidea hyalina multa. Folia interse 0.4 mm distantia, subrotunda. Lobus cum margine hyalino; cellulis hyalinis 30-50 μ \times 20 μ , cellulis marginis 15-20 μ 10-15 μ , cellulis basalibus 60-70 μ \times 25-40 μ . Lobus subrotundus, 1 mm \times 0.8 mm, margine hyalino usque ad caulem. Gemmae multae, 20 cellulis et 60 μ in diametro. Lobulus divergens ex caule, bidentatus, rectus, complanatus, 0.25 mm longus, 0.04 mm latus. Dens apicalis cum papilla hyalina minus haud majus reniformis, 20 μ longa, dens media ad medianam partem lobuli. Stylus monocellularis. Plantae dioicae. Flores feminei ad apicem caulis cum innovatione ad basin floris. Folia floralia similia foliis caulinariibus cum lobo 0.8-0.6 mm, lobuloque 0.35 mm \times 0.10 mm bifidi ad apicem. Perianthia piriformia, sinibus ventralibus confluentibus ad apicem; rostro brevi.

Dioeceous plant, light-green, discrete, attached to any substratum. branches 0.5-0.8 mm lenght. Stem 0.08 mm thick, breadth with leaves 1.4 mm, slightly ramified, hyaline with numerous rhizoids. Leaves 0.4 mm Spacing. Cells thin-walled with trigones and intermediate thickenings hardly visible. Hyaline cells of the margin 30-50 μ \times 20 μ , cells of the edge of leaf, 15-20 μ \times 10-15 μ , cells of the center of the leaf, 40-50 μ \times 15-20 μ . Suborbicular lobe of 1 mm \times 0.8 mm, longly adnate on the stem, the hyaline margin reaching almost the caulinar cells. Propagules very numerous of about 20 cells, 60 μ in diameter. Lobule diverging from the stem, bident, upright, flat, 0.25 mm long,

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0.04 mm wide, median tooth carrying the papilla; apical tooth situated low on the lobule. Hyaline papilla more or less reniform, with thick walls, 20μ long. Stylus hyaline, monocellular, fugacious. Female inflorescence on the top of the stem, carrying on an innovation. Perianth leaves with lobe and lobule similar to those of the stem leaves: lobe $0.8 \text{ mm} \times 0.6 \text{ mm}$, lobule $0.35 \text{ mm} \times 0.10 \text{ mm}$, bifid at the top. Perianth, piriform ventral folds confluent at the top.



COLOLEJEUNEA SMITINANDII

Fig. 1. *Cololejeunea smitinandii* Tix.

1. Stem, 2. Hyaline margin, 3. Cells of the leaf, 4. Propagules, 5. Young leaves with stylus, 6. Lobule, 7. Lower and outer edge of leaf, 8. Perianth.

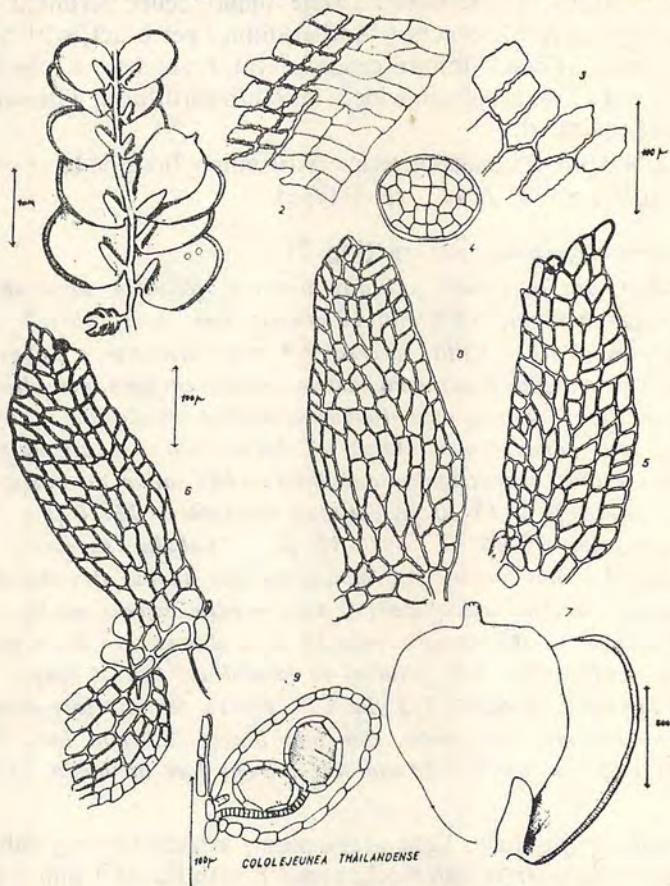
Species similar to *C. formosana* by the shape of the leaf and with a perianth near to that of the subgenus *Chlorolejeunea* Benedix.

Dedicated to my friend Dr. Tem Smitinand, the well known Thai botanist.

THAILAND: Phitsanulok (Phu Mieng), in evergreen forest on *Calophyllum* leaves, 1,300 m, 11/V/1965, n°, 1152, 1153, 1161. (Holotype).

Cololejeunea thailandense nav. sp. (Fig. 2)

Planta foliicola, viridis pallida, affixa substrato. Caules 1-2 cm longi, pauciter ramosi, 0.10 mm in crassitudine, cum foliis 2.4 mm. Rhizoidea hyalina, multa. Folia 0.4 mm interse distantia, subrotunda, lobus cum margine hyalinio. Cellulis hyalinis: 30-50 μ \times 15-20 μ , cellulis marginis: 15-20 μ \times 10-15 μ ; cellulis basalibus: 60-70 μ \times 25-40 μ . Cellulis, hexagonis trigonis incrassationibusque intermediis distinctis. Lobus subrotundus, 1.20 mm \times 1 mm, folia laxo adnatus, margine hyalinio usque ad caulem. Gemmae multae cum 30 cellulis, 100 μ in diametro; cellulis gemmarum cum parietibus tenuibus. Lobulus divergens, e caule complanatus, commissura lobuli ex lobo; margo lobuli cum cellulis semi hyalinis; lobulus 0.45 mm longus, 0.15 mm latus. Dens media cum papilla hyalina, sphaerica 20 μ in crassitudine. Stylus monocellularis. Flores masculi, terminales, laterales aut axiales cum 5 gradis bractearum fertilium. Antheridia bina, 100 μ lata, cum pediculo 100 μ longo. Flores feminei, laterales, folia floralia cum lobo 1.20 \times 0.8 mm lobuloque

Fig. 2. *Cololejeunea thailandense* Tix.

1. Stem, 2. Hyaline margin, 3. Cells of the base of the leaf, 4. Propagule, 5. Young lobule, 6. Lobule and base of the leaf, 7. Perianth, 8. lobule of the perianth leaf, 9. Antheridium, 10. Elater.

0.4 mm longo. Perianthia 1.2 mm × 0.4 mm, crassa, sine sinibus ventralibus, cordiformia, rostro longo.

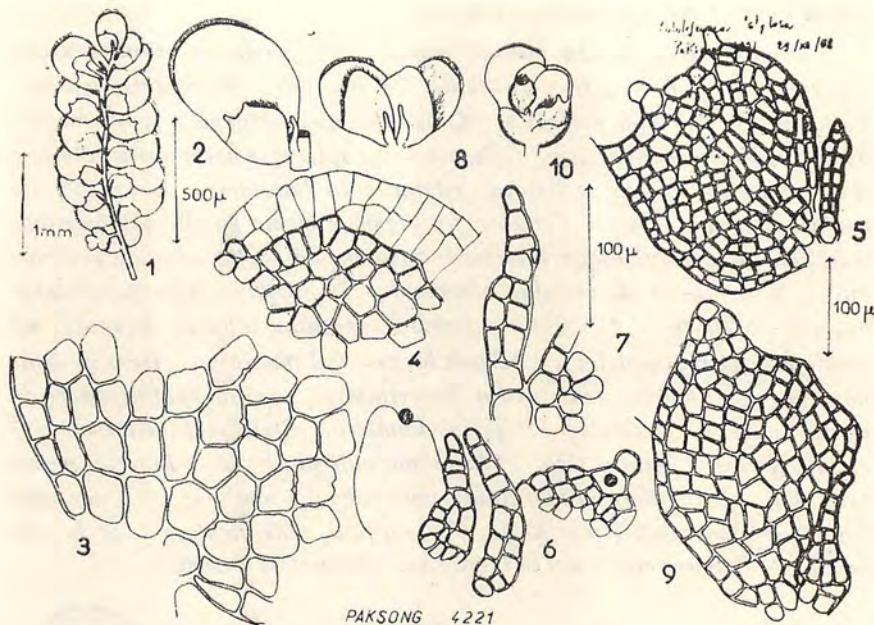
Plant relatively large, light green, attached to any substratum. Stem from 1 to 2 cm, slightly ramified, 0.10 mm thick, breadth with the leaves 2.4 mm; hyaline cells $30-50 \mu \times 15-20 \mu$, cells of the border $15-20 \mu \times 10-15 \mu$, basal cells: $60-70 \mu \times 25-40 \mu$. Suborbicular lobe, 1, 2-1 mm, longly adnate on the stem: the hyaline margin reaching almost the caulinar cells. Propagules very numerous of about 30 cells and 100 μ wide, cells thin-walled. Lobule 0.45 mm long, 0.15 mm wide, divergent from the stem, parallel to the lobe and flat. The base of the lobule inserted on the edge of the surface of the lobe. The edge of the lobule with semi hyaline cells. Median tooth with hyaline papilla of 20 μ in diameter. Stylus monocellular. Male inflorescence terminal or axial with 3 storeys of fertile bracts. Antheridium 2 per bract, with a pedicell of 100 μ long. Female inflorescence lateral, bract with a lobe 1.20 mm \times 0.8 mm and a lobule 0.4 mm wide. Perianth cordiform, without ventral folds, long rostrated.

THAILAND, Nakhon Ratchasima (Khao Yai), epiphyllous on bank of stream, 700 m, 20/V/1965, n° 1194. (Holotype).

Cololejeunea bolovenensis nov. sp. (Fig. 3)

Planta, parva, viridis pallida, monoica, foliicola substrato affixa. Caules usque 0.5 cm, 0.08 mm in crassitudine, cum foliis 1 mm lati. Rhizoideis hyalinis. Folia interse 0.4 mm distantia. Lobus planus oblongus, cum margine hyalino ad partem superiorem folii, non ultra apicem in parte postica, integro, cum duobus ordinibus cellularum in latitudine. Lobus 0.6 mm longus, 0.4 mm latus. Cellulae folii cum cuticulo papilloso, parietibus levibus, incrassationibusque intermediis solum ad basin; cellulae hyalinae $20-40 \mu \times 15-20 \mu$; cellulae marginales $15-20 \mu \times 10-15 \mu$; cellulae basales $30-45 \mu \times 20-30 \mu$. Lobulus saccatus, inflatus, rotundatus, 0.3 mm longus, 0.2 mm latus cum duobus dentibus in apice. Dens apicalis brevis, unicellularis; dens media eodem modo. Papilla hyalina sphaerica, sub dente media 10 μ in diametro. Stylo multicellulari in longitudine (8), 2-4 cellulari in latitudine, 140 μ longo. Flores masculi laterales, bracteis 1-2 jugeis. Flores feminei laterales. Folia floralia marginata cum lobo, 0.4 mm longo, 0.2 mm lato, lobuloque quadrato 0.35 mm longo, 0.15 mm latostyloque lato ad basin. Perianthia desunt.

Small epiphyllous, light green plant, attached to any substratum. Stem up to 0.5 cm, 0.08 mm thick, breadth with leaves 1 mm. Rhizoids hyaline; leaves 0.4 mm spacing.

Fig. 3. *Cololejeunea bolovenensis* Tix.

1. Stem, 2. Leaf, 3. Basal cells, 4. Hyaline margin, 5. Lobule, 6. Young lobule,
7. Stylus, 8. Perianth leaves, 9. Lobule of perianth leaf 10. Male inflorescence.

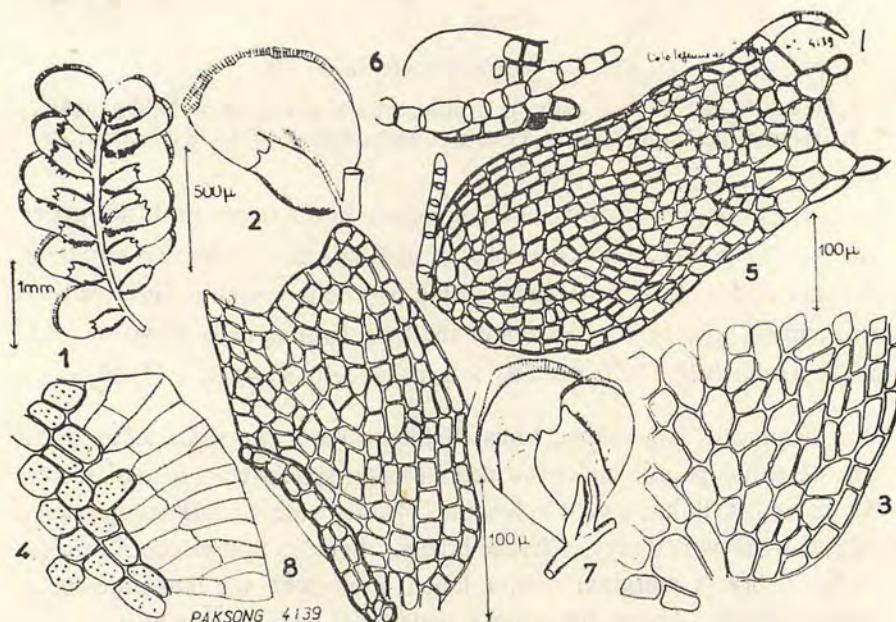
Lobe flat, oblong with hyaline margin in the upper part, not above the top of the lobe, with two ranks of hyaline cells. Lobe 0.6 mm long, 0.4 mm wide. Leaf cells each with a papillous cuticle, intermediate thickenings only at the bottom of the lobe; hyaline cells $20-40 \mu \times 15-20 \mu$; border cells $15-20 \mu \times 10-15 \mu$; basal cells $30-45 \mu \times 20-30 \mu$.

Rounded, bag-shaped, inflated lobule with two short teeth at the top. Hyaline papilla under the median tooth, sphaeric, 15μ in diameter. Stylus multicellular, 8 cells in length, 2-4 cells wide. Male inflorescence lateral with two storeys of fertile bracts. Female inflorescence lateral. Perianth bracts marginal, with a lobe 0.4 mm long, 0.2 mm wide and a square lobule. The stylus of the female bract wider at the base.

LAOS, near Paksong (Bolovens), epiphyllous in swampy forest, 1100 m 29/XII/1968, n° 4221. (Holotype).

Cololejeunea vidaliana nov. sp. (Fig. 4)

Planta parva, viridis pallida monoica (?), corticola. Caules usque 0.5 cm, 0.07 mm crassi, cum foliis 1.6 mm lati. Rhizoideis hyalinis. Folia interse 0.4 mm distantia. Lobus, planus, oblongus, cum margine hyalino ad partem superiorem folii, non ultra apicem in parte postica, leviter crenulato, cum duobus ordinibus cellularum in latitudine. Lobus 0.8 mm longus, 0.5 mm latus. Cellulae folii cum cuticulo papilloso, parietibus lenuibus, incrassationibusque intermediis, solum ad basin; cellulae hyalinae 40-60 μ \times 15-20 μ ; cellulae marginales 25-30 μ \times 10-20 μ ; cellulae basales 15-30 μ \times 15-20 μ . Lobulus saccatus inflatus elongatus ad medianam longitudinem lobi, 0.45 mm longus, 0.2 mm latus. Dens apicalis hamata, tricellularis, dens media duocellularis, papilla hyalina ad basin dentis mediae sphaerica, 15 μ in diametro. Stylo multicellulari, 6-7 cellulis longo, 1 cellula lato. Flores masculi haud visi. Flores feminei laterales. Folia floralia marginata cum lobo 0.7 mm longo, 0.5 mm lato, lobuloque elongato 0.5 mm longo, 0.3 mm lato, bidenticulato. Stylo cum duobus ordinibus cellularum in latitudine. Perianthia desunt.

Fig. 4. *Cololejeunea vidaliana* Tix.

1. Stem, 2. Leaf, 3. Basal cells, 4. Hyalinemargin, 5. Adult lobule,
6. Young lobule, 7. Stylus, 8. Perianth leaves.

Small corticolous, light green plant. Stem up to 0.5 cm, 0.08 mm thick, breadth with the leaves 1.6 mm. Rhizoids hyaline. Leaves 0.4 mm spacing. Lobe flat, oblong with hyaline margin, lightly crenulated, in the upper part of the lobe not above the summit of the lobe, with two ranks of hyaline cells. Lobe 0.6 mm long, 0.4 mm wide. Leaf cells each with a papillous cuticle, intermediate thickenings only at the bottom of the lobe; hyaline cells $40-60 \mu \times 15-20 \mu$; border cells $25-30 \mu \times 10-20 \mu$; basal cells $15-30 \mu \times 15-20 \mu$. Elongate, bag-shaped, inflated lobule with two teeth; apical tooth hooked with 3 cells; median tooth rounded; Hyaline papilla under the median cell spherical, 15 μ in diameter; stylus multicellular, 8 cells in length, one in breadth. Male inflorescence not seen. Female inflorescence lateral; perianth bracts marginal with a lobe 0.7 mm long, 0.5 mm wide; toothed lobule 0.5 mm long, 0.3 mm wide; stylus with two ranks of cells in breadth.

This species differs from the former one by the stylus with two ranks of cells, by the shape of the lobule and the corticolous or epiphyllous habit.

Dedicated to another good friend, Dr. J.E. Vidal, a keen worker on Laotian flora.

Laos, near Paksong (Bolovens), corticolous in clear forest, 29/XII/1 1968, n° 4139. (Holotype).

Cololejeunea chinii nov. sp. (Fig. 5)

Planta, sterilis, rupicola, pro genere Cololejeunea parva, pallide flavescentia, habitu generis Lejeunea, sparsim longeque ramosa. Caules 1 cm longi, in crassitudine 0.1 mm, cum foliis 0.3 mm lati. Folia imbricata, 0.4 mm interse distantia, triangularia, conchae formi concava, apice leviter acuto inflexa, 220 μ longa, 200 μ lata, margine fortiter irregulariterque spinosa. Cellulae mediae folii cum papilla crassa, 10-15 μ in diametro. Lobulus saccatus valde inflatus cum una dente ad apicem. Stylus foliaceus, folio similis, triangularis, cauli subparallelo applicatus, 150 μ altus, margine spinoso, cellulisque papillosis, lobuli componatus ad basin. Alia desunt.

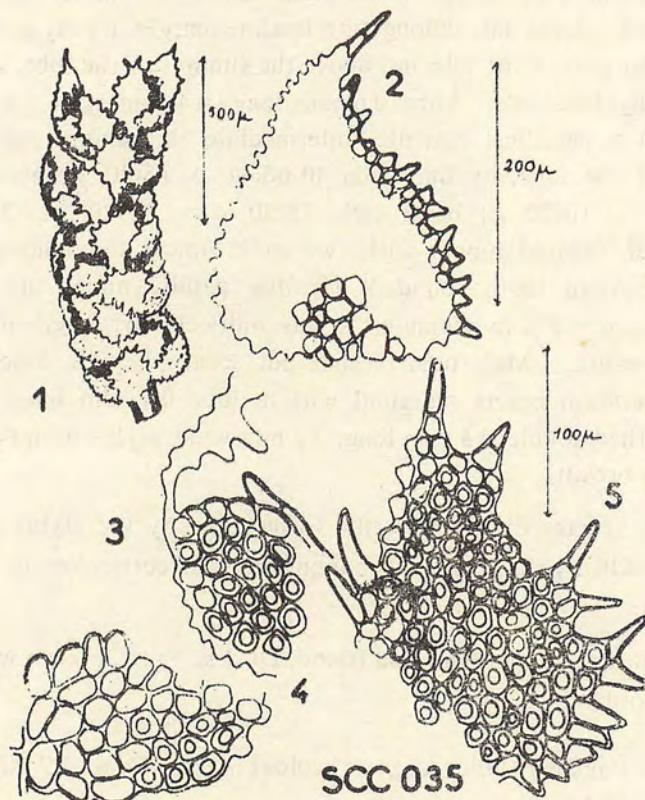


Fig. 5. *Cololejeunea chinii* Tix.

1. Stem, 2. Leaf, 3. Top of the lobe, 4. Base of the lobe, 5. Stylus foliaceous.

Small yellowish plant growing on boulders. Stems up to 1 cm, 0.1 mm thick, breadth with leaves 0.3 mm, with the habit of genus *Lejeunea*. Stem leaves 0.4 mm spacing, imbricate, triangular, 0.22 mm high, 0.20 mm wide, shell-like, concave; apex bent and with a spinous margin; cells of the center of the lobe rounded, 10-15 μ in diameter, with thick walls and papillae; lobule bag-shaped, lightly inflated with one tooth at the apex; stylus foliaceous, triangular, parallel to the stem, 150 μ high with spinous margin and papillous cells, adnate to the lobule at the base.

Very interesting plant; the other species of the subgenus *Chondrolejeunea* Ben., *C. pseudostipulata* has been known from New Guinea. The cells of the malayan species have only one papilla, and few on those of the New Guinean. In my opinion the subgenus is not closely related to *Cololejeunea*, but rather between *Drepanolejeunea* and *Cololejeunea*.

Dedicated to the collector Mr. Chin See Chung student of University of Malaya.

Malaya, Kelantan (Gua Musang), boulder in shade near the summit, 120 m 14/VIII/1970, leg. *Chin See Chung* n° 97 (holotype); Selangor (Bukit Anak Takun), on boulder, part shaded, 50 m, 12/VII/1970, leg. *Chin See Chung*.

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