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NOTE

Cheilolejeunea trapezia (Nees) Kachroo & R.M. Schust. ex Mizut. var. *ceylanica* (Gottsche) A.E.D. Daniels & K.C. Kariyappa comb. et stat. nov. (Lejeuneaceae) from India

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ABSTRACT: It is found that the species *Cheilolejeunea ceylanica* falls within the circumscription of the polymorphic *C. trapezia*. The only tenable character that distinguishes the former and the latter is the presence of vitta in leaves of the former. Hence, the name *C. ceylanica* is reduced to a variety of *C. trapezia* and a new combination *C. trapezia* var. *ceylanica* is made here. Figures and photographs are provided to prove the conclusion. Incidentally, var. *ceylanica* is an addition to the liverwort flora of India from Courtallam in the Southern Western Ghats.

KEY WORDS: *Cheilolejeunea trapezia* var. *ceylanica*, Courtallam, Western Ghats.

INTRODUCTION

Nees (1830) described *Jungermannia trapezia* as a new species and typified the name on a material from Java. Mizutani (1961) placed *J. trapezia* in the genus *Cheilolejeunea*. Nees (1830) described *Jungermannia thymifolia* var. *imbricata* and typified the name again on a material from Java. Gottsche et al. (1845) elevated variety *imbricata* to the rank of a species and placed it in the genus *Lejeunea*. Hattori (1957) transferred *L. imbricata* to the genus *Cheilolejeunea*. But Thiers (1992), who found *C. trapezia* (Nees) Mizut. and *C. imbricata* (Nees) S. Hatt. conspecific, reduced *C. trapezia* to a synonym of *C. imbricata*. Zhu and Grolle (2004) rightly pointed out that *C. trapezia* is the correct name for *C. imbricata*, the former epithet being priorable at the rank of a species. Gottsche (1845) described *Lejeunea ceylanica* as a new species and typified the name on a material from Ceylon (Sri Lanka). Schuster and Kachroo (1961) placed *L. ceylanica* in the genus *Cheilolejeunea*.

The first record of the species *Cheilolejeunea imbricata* in India was by Stephani (Sp. Hepat. 6: 396. 1923) but under the name *Strepsilejeunea planifolia* Steph. (*vide* Asthana et al., 1995). Asthana et al.'s (*l.c.*), revision of the genus *Cheilolejeunea* in India has 9 species including *C. imbricata* (= *C. trapezia*). While discussing the affinities of the allied species, Asthana et al. (*l.c.*) pointed out the difficulty in distinguishing *C. trapezia* from *C. ceylanica*. The key characters used by them to separate the latter from the former are the relatively long (5 or 6 cells long) second tooth of the leaf lobule and the 5 to 10 cells long and 3 to 5 cells wide vitta in the midleaf. Zhu et al. (2002) who included *C. ceylanica* as well as *C. imbricata* (= *C. trapezia*) in their monograph on the genus *Cheilolejeunea* in China also mentioned both the characters earlier given by Asthana et al. (*l.c.*) but failed to indicate the number of cells in the second tooth of the leaf lobule. However, they pointed out 2 additional characters *viz*., the angle of divergence (30–60º) of leaf attachment to stem and the usual falcate nature of the leaves. While discussing the plasticity of *C. trapezia*, Zhu et al. (*l.c.*) stated that it is the most variable species (also *vide* Thiers, *l.c.*; Zhu & Grolle, *l.c.*) in China and pointed out the variations as - underleaves are usually imbricate and sinuately inserted on the stem or remote and subtransversely inserted, leaves incurved at ventral and apical margins, the length of the second tooth of the leaf lobule varies from 1 to 6 cells (2–6 cells in *C. ceylanica*, Thiers, 1992), ventral merophytes usually 2 or 3 cells wide and 4 cells wide only in well-developed stems (2–4 cells wide is a subgeneric character, Thiers, 1992) and the number of oil bodies 1 to 3 per cell in leaves. The sexual characters which are the most conservative and reliable ones to distinguish taxa are the same barring the male bracts which are 2 to 5 pairs in *C. ceylanica* but 2 to 8 pairs in *C. trapezia*. All these characters fall well within the circumscription of *C. trapezia* (Table 1).

DISCUSSION

A perusal of pertinent literature shows that the

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characters used by earlier authors to distinguish *Cheilolejeunea trapezia* from *C. ceylanica* are the number of ventral merophyte cells which are 2 cells wide in *C. ceylanica* but 2 to 4 in *C. trapezia* (*cf.* Mizutani, 1978, 1980; Thiers, 1992; Asthana et al., 1995; Zhu et al., 2002). However, in the ample fresh material from various localities in the southernmost Western Ghats studied now, the ventral merophyte is either 3 or 4 cells wide. Leaves are imbricate and obliquely to widely spreading in both the species, sometimes falcate (*cf.* Mizutani, *l.c.*; Asthana et al., *l.c.*; Zhu et al., *l.c.*; Zhu and Grolle, 2004) (Table 1). Such conditions can be found in the same plant in the present material. The insertion of underleaves is transverse to subtransverse, sometimes sinuate (*cf.* Mizutani, *l.c.*; Asthana et al., *l.c.*; Zhu et al., *l.c.*; Zhu and Grolle, 2004). All the 3 types of insertions are found in the same material in the present study. The shape and nature of the leaf lobule being rectangular, truncate or acute, inflated or not (*cf.* Thiers, *l.c.*) and the length of the leaf lobule tooth are highly variable (Fig. 1). However, *C. ceylanica* does possess a vitta in the leaves, a consistent character that distinguishes it from *C. trapezia*. Since, this is the only tenable character that distinguishes *C. ceylanica* from *C. trapezia*, *C. ceylanica* is reduced to a variety of *C. trapezia* and a new combination is made here.

Cheilolejeunea trapezia (Nees) Kachroo & R.M. Schust. [J. Linn. Soc., Bot. 56: 509. Feb. 1961, comb. invalid.] ex Mizut. var. ***ceylanica*** A.E.D. Daniels & K.C. Kariyappa comb. & stat. nov.

Figs. 1 & 2

Lejeunea ceylanica Gottsche in Gottsche et al., Syn. Hepat.: 359. 1845 (as *Lejeunia*). - Type: Ceylon, without precise locality & collector's name, Herb. Hooker. (G).
Pycnolejeunea ceylanica (Gottsche) Schiffn. in Engl. & Prantl, Nat. Pflanzenfam. 1(3): 124. 1893; Steph., Sp. Hepat. 5: 621. 1914, isonym.
Cheilolejeunea ceylanica (Gottsche) R.M. Schust. & Kachroo in Kachroo & R.M. Schust., J. Linn. Soc., Bot. 56: 509. 1961; Mizut., J. Hattori Bot. Lab. 44: 121. 1978, 47: 324. 1980 & 51: 155. 1982; B.M. Thiers, Trop. Bryol. 5: 17. 1992; R.-L. Zhu et al., Nova Hedwigia 75: 393. 2002.

Plants monoicous or dioicous, 10–25 mm long, pale yellow-green. Leaves imbricate, widely spreading, 0.9–1 × 0.65–0.68 mm, oblong, arched at antical margin, straight or incurved in middle at postical margin, entire, rounded at apex; apical cells 12–22 × 8–14 µm; median ones 20–32 × 12–25 µm; basal ones 16–40 × 14–28 µm; walls faintly trigonous, with or without intermediate nodular thickenings; vitta distinct; oil bodies 1–3 per cell, 15–25 × 5–10 µm, elongate, segmented; leaf lobules 0.45–0.5 × 0.23–0.25 mm, rectangular, flat or swollen, incurved or not, free at margin, truncate or slightly constricted at apex, 2-toothed; first tooth indistinct; second one *ca.* 40 × 12 µm, acute, 1–8 cells long and 1 or 2 cells wide at base; keel straight or arched, smooth. Underleaves distant and transversely to subtransversely inserted, to rarely imbricate and sinuately inserted, 0.3–0.45 × 0.3–0.38 mm, almost twice as broad as stem, orbicular to ovate, 2-lobed for half, entire. Male inflorescences on lateral branches, capitate or spicate, with 2–8 pairs of swollen bracts, sometimes with apical innovations; bracteoles 1 or 2, confined to base of inflorescence. Female inflorescences with 1 subfloral innovation of *Radula-Jubula* type; bracts *ca.* 0.83 × 0.45 mm, oblong-obovate, incurved at margin; lobules linear; bracteoles *ca.* 0.6 × 0.23 mm, oblong-obovate, 2-lobed at apex. Perianth 0.63–0.99 × 0.48–0.63 mm, obovate, 4- or 5-plicate with 1 dorsal (often absent), 2 lateral and 2 ventral sharp or blunt plicae.

Habitat: Corticolous on *Lagerstroemia microcarpa* Wight (*Lythraceae*), a tree common in moist deciduous forests, *ca.* 750 m.

Distribution: Australia, Bangladesh, China, Indonesia, Japan, Kampuchea, Micronesia, New Caledonia, the Philippines, Samoa, Sri Lanka, Thailand, Vietnam and India: Western Ghats of Tamil Nadu (Tirunelveli).

Specimens examined: **INDIA**, Tamil Nadu, Tirunelveli Dist., Courtallam, Vythamalai, *ca.* 750 m, 03.02.2011, *K.C. Kariyappa 3946*. ***Cheilolejeunea trapezia*:** Kanyakumari Dist., W. Ghats, Muthukuzhivayal, *ca.* 1250 m, 26.01.2001, *A.E.D. Daniels* 1433 p.p.; *ca.* 1100 m, 08.12.2009, *A.E.D. Daniels & J.L. Mabel 587*; Tirunelveli, Agasthyamalai, Pongalapparai, *ca.* 1500 m, 19.04.2010, *K.C. Kariyappa 3650* p.p.

Note: Zhu and Grolle (2004) ascribed the combination *Cheilolejeunea trapezia* to Kachroo and Schuster (1961) since their publication appeared in February whereas Mizutani's appeared in October 1961. The purported basionym cited by Kachroo and Schuster (*l.c.*) was a combination based on *Jungermannia trapezia* Nees, a fact overlooked by Zhu and Grolle (*l.c.*). This wrong citation of the basionym makes the combination published by Kachroo and Schuster invalid (Art. 33.7 *cf.* ex. 20. a).

Schiffner (1893) was the first to make the combination *Pycnolejeunea imbricata* who, however, attributed it to Stephani (also *vide* Schiffner, 1898).

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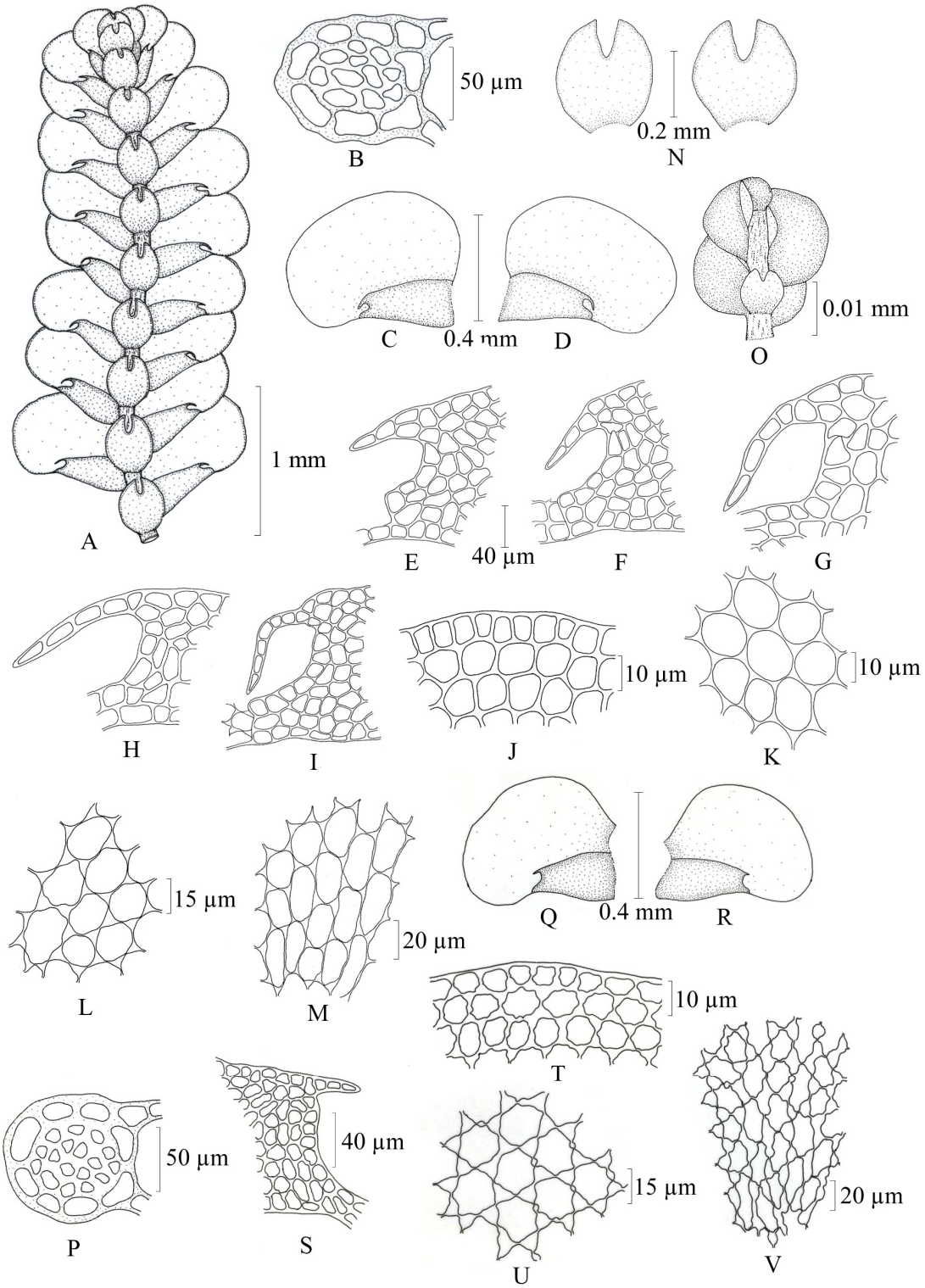


Fig. 1. (A–O)*Cheilolejeunea trapezia* (Nees) Kachroo & R.M. Schust. ex Mizut. var. *ceylanica.* A: Plant. B: Stem cross section. C & D: Leaves. E–I & S: Variations in leaf lobule tooth. J: Leaf apical cells. K: Leaf median cells. L: Leaf basal cells. M: Leaf basal vitta cells. N: Underleaves. O: Male inflorescence. (P–V) *Cheilolejeunea trapezia* (Nees) Kachroo & R.M. Schust. ex Mizut. P: Cross section of stem. Q & R: Leaves. S: Leaf lobule apex. T: Leaf apical cells. U: Leaf median cells. V: leaf basal cells (A–O drawn from *Kariyappa 3946*; P–V from *Kariyappa 3650*)

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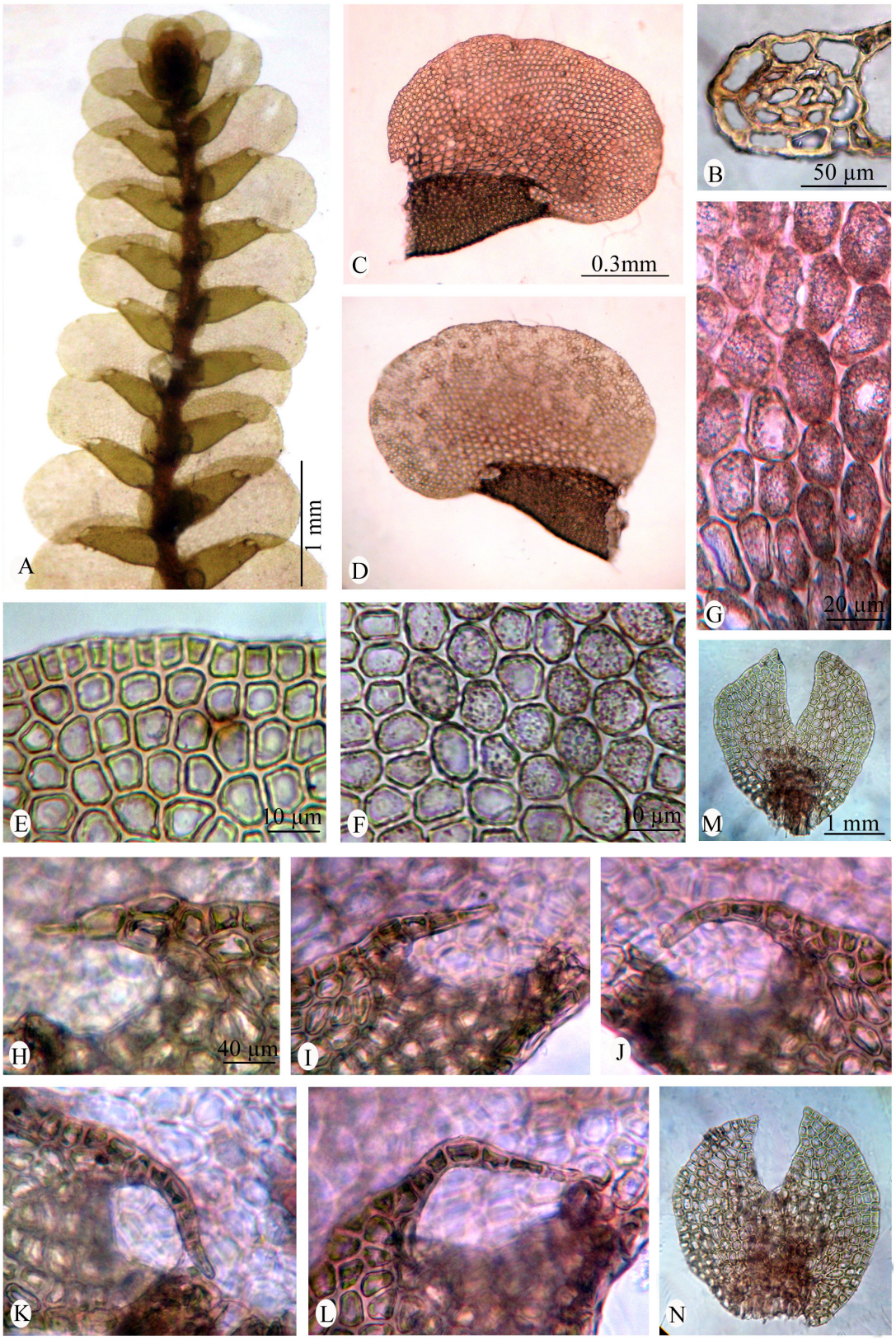


Fig. 2. (A–N) *Cheilolejeunea trapezia* (Nees) Kachroo & R.M. Schust. ex Mizut. var. *Ceylanica*. A: Plant. B: Cross section of stem. C & D: Leaves. E: Leaf apical cells. F: Leaf median cells. G: Leaf basal cells. H & L: Variations in leaf lobule tooth. M & N: Underleaves.

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Table 1. Distinguishing characters of the 2 species under discussion

Characters	***L. ceylanica*** (Gottsche, 1845)	***C. ceylanica*** (Mizutani, 1978, 1980)	***C. imbricata*** (Asthana et al., 1995)	***C. imbricata*** (Zhu et al., 2002) ***C. trapezia*** (Zhu & Grolle, 2004)	***C. trapezia*** (present material)
Branching	irregular	irregularly pinnate	pinnate	Not mentioned	irregularly pinnate
Ventral merophyte	Not mentioned	2 cells wide	2 cells wide	2–4 cells wide	2 or 3 cells wide
Leaves	imbricate, oblong-obovate, entire, rounded	widely to obliquely spreading, oblong, entire, rounded	widely spreading, oblong, entire, rounded	Not mentioned	widely to obliquely spreading, ovate-oblong, entire, rounded
Leaf lobules	oblong, oblique, emarginate-subulate (toothed)	rectangular, truncate, 2-toothed; first tooth indistinct, second one 5 or 6 cells long, uniseriate	rectangular, truncate, 2-toothed; first tooth indistinct, second one 2–4 cells long, 1 or 2 cells wide at base	second tooth 1–5(-6) cells long	rectangular, truncate or acute, 2-toothed; first tooth indistinct, second one 2–8 cells long, 1 or 2 cells wide at base
Oil bodies	Not mentioned	Not mentioned	1 per cell in leaves, 1–3 per cell in leaf lobules, underleaves and female bracteoles, segmented	1–3 per cell in leaves	1–3 per cell in leaves and 1 or 2 per cell in leaf lobules, segmented
Underleaves	remote, ovate, 2-lobed	usually distant, line of insertion slightly arched, *ca.* thrice as wide as stem, orbicular, 2-lobed for *ca.* half	distant, subtransversely inserted, usually twice as wide as stem, orbicular-ovate, 2-lobed for half	imbricate and sinuately inserted or remote and subtransversely inserted	imbricate to distant, sinuately or transversely to subtransversely inserted orbicular-ovate to ovate, 2-lobed for *ca.* half
Sexuality	Not mentioned	dioicous	monoicous or dioicous	dioicous	monoicous or dioicous
Male inflorescences	Not mentioned	on short lateral branches, capitate or spicate	on lateral branches, capitate or spicate	Not mentioned	on lateral branches, capitate
Bracts	Not mentioned	2–5 pairs	2–8 pairs	Not mentioned	2–4 pairs
Bracteoles	Not mentioned	at base of inflorescence	at base of inflorescence	Not mentioned	at base of inflorescence
Female inflorescences	Lateral, sessile	on lateral branches with 1 subfloral innovation	with one subfloral innovation	Not mentioned	on lateral branches with 1 subfloral innovation
Bracts	Not mentioned	obovate or oblong, rounded at apex; lobules linear	rounded at apex; lobules linear	Not mentioned	obovate or oblong, rounded at apex; lobules linear
Bracteoles	Not mentioned	oblong, 2-lobed at apex	nearly oblong-ovate, 2-lobed at apex	Not mentioned	oblong-ovate, 2-lobed at apex
Perianth	obovate, more or less 5-keeled	obovate, 4- or 5-keeled	obovate, 5-keeled	obovate, 4- or 5-keeled	Seen immature

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Cheilolejeunea trapezia var. *ceylanica* comb. & stat. nov.（細鱗蘚科）之處理

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摘要：本文將*Cheilolejeunea ceylanica*處理為*C. trapezia*之變種，區別此兩分類群的可靠特徵只有一個，即是在*C. ceylanica*葉內有假脈。因此，*C. ceylanica*在分類上由種降階成變種，成為一新組合名*C. trapezia* var. *ceylanica*。本文也提供手繪圖與照片來支持這樣的分類處理。

關鍵詞：*Cheilolejeunea trapezia* var. *ceylanica*、Courtallam、西高止山。

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