

***Ptychanthoideae* (subfam. of *Lejeuneaceae*, *Hepaticae*) from Vanuatu, with the description of *Caudalejeunea streimannii* Gyarmati sp. n.**

Andrea Sass-Gyarmati

Research Group for Bryology of the Hungarian Academy of Sciences at the Botany Department of Eszterházy College, EGER, Pf. 222, H-3301, HUNGARY, e-mail: gyarmati@ektf.hu

Abstract. A list of 18 Lejeuneaceae (subfam. Ptychanthoideae) species of Vanuatu is given based on the collection of the late Heinar Streimann, identified by the Author. 12 species are new to Vanuatu, and one out of them is new to science.

Introduction

Vanuatu is a group of 83 islands in the South West Pacific, North East of New Caledonia and North West of Fiji. The British and French who settled the New Hebrides in the 19th century, agreed in 1906 to an Anglo-French "Condominium", which administered the islands until independence in 1980.

This neat geographical unit is divided into three groups: the Torres and Banks Islands in the north, the Y-shaped central group from Espiritu Santo and Maewo to Efate, and to Tafea islands (Tanna, Aniwa, Futuna, Erromango and Aneityum) in the south.

This study is based on collections made by the late Heinar Streimann during the period of 15-28 October 1998 in several localities on Efate and Espiritu Santo islands. The material was

kindly borrowed by CANB for identification.

Hepatics of Vanuatu previously have been reported by Stephani (1914,1924), Tixier (1973, 1974), and by Miller et al. (1983).

Tixier (1973) reported a few ptychanthoid Lejeuneaceae species collected by Maurice Schmid during July of 1971. A Royal Society expedition between July and November 1971 (Tixier 1974) collected on Aneityum, Efate, Tanna, Erromango, Mallocolo islands and on Mt. Tabwemasana (1879m) on Espiritu Santo which is the highest summit, on the largest island of archipelago.

Key to abbreviations

The genera and the species are arranged in alphabetical order and the localities are grouped

according to the concerned islands.

An * mark before the species name means that the taxon is new to Vanuatu. After the enumeration of localities follow references, where other Vanuatu data were published.

Annotated list of the species

**Acrolejeunea aulacophora* (Mont.) Steph.

EFATE: Iririki Island (Port Vila Harbour). Very disturbed monsoon forest with exotics dominated by *Gyrocarpus americanus*, *Pterocarpus indicus*, *Leucaena glauca*, *Acacia* and coconuts on gentle slope. On semi-shaded *Gyrocarpus* trunk. *Streimann* 61988; 62001.

This species occurs also in East Africa, Indomalesia and New Caledonia and usually is confined to coastal environments. It is a remarkably disjunct Afro-Austral-Pacific species. (Gradstein, 1975).

**Acrolejeunea pycnoclada* (Tayl.) Schiffn. ssp. *pycnoclada*

EFATE: Forari Logging area, 17 km ENE of Port Vila 17° 38'S 168°27'E. Alt.: 300m. Lowland rainforest on broad undulating ridge. On shaded tree root. *Streimann* 63044.

This species has broad palaeotropical distribution.

**Acrolejeunea securifolia* (Nees) Steph. ex Watts. ssp. *securifolia*

ESPIRITU SANTO: Navota Farm, 20 km ESE of Luganville. 15° 35'S 167°00'E. Alt.: 15m. Small *Swietenia* (mahogany) plantation in grazed paddocks on flats. On semi-shaded mahogany branch. *Streimann* 62168; Luganville-Piria Road, 6 km NE of Luganville. 15° 29'S 167°13'E. Alt.: 4m. Remnant coconut plantation left as median strip in divided road. On exposed coconut trunks. *Streimann* 62752.

Archilejeunea planiuscula (Mitt.) Steph.

ESPIRITU SANTO: Mountain inland from Navota Farm, 18 km ESE of Luganville. 15° 34'S 167°01'E. Alt.: 230m Monsoon tropical forest at foot of limestone bluff. On semi-shaded tree trunk (*Lauraceae*.); Hasevaia (near mouth of

Adsone River), 23 km NNW of Luganville. 15° 35'S 166°58'E. Alt.: 3m. Disturbed strand vegetation and old coconut plantation. On semi-shaded tree trunk (*Securingia*). *Streimann* 62848; Hasevaig (near mouth of Adsone River), 23 km NNW of Luganville. 15° 35'S 166°58'E. Alt.: 3m. Regrowth on flats dominated by *Hibiscus tiliaceus* with no understorey. On semi-shaded dead *Hibiscus* stem. *Streimann* 62880; Navota - Luganville Road, 19 km SE of Luganville. 15° 35'S 167°01'E. Alt.: 10m. Disturbed lowland forest with coral outcrops. On shaded tree trunk. (*Pometia pinnata*). *Streimann* 62901; Nambauck Village (end of road), 12 km NW of Luganville. 15° 27'S 167°04'E. Alt.: 175m. Old garden site with regrowth on flats. On semi shaded treelet stem (*Pterocarpus indicus*). *Streimann* 62994; **EFATE:** Forari Logging area, 17 km ENE of Port Vila. 17° 38'S 168°27'E. Alt.: 300m. Lowland rainforest on broad undulating ridge. On shaded tree buttress. *Streimann* 62987, 62989, 62993, 62994; On shaded tree (*Antiaris toxicarya*) base. *Streimann* 63001, 63047; Teouma River Valley, 11 km NE of Port Vila. 17° 42'S 168°24'E. Alt.: 80m. Disturbed lowland forest on flats dominated by *Endospermum*, *Antiaris* and *Pometia*. On fallen shaded live tree trunk. *Streimann* 63166.

Widespread in the Indopacific region.

(Tixier 1974:42, under *A. mariana* (Gott.) Steph.; Miller et al 1983: 319)

**Caudalejeunea recurvistipula* (Gottsche) Schiffn.

ESPIRITU SANTO : Mt Malel, 30 km NNW of Luganville. 15° 15'S 167°05'E. Alt.: 180m. Disturbed forest on moderate slope with small limestone outcrops. On semi-shaded vine. *Streimann* 62253; Big Bay - Luganville Road, 29 km NW of Luganville. 15° 18'S 167°01'E. Alt.: 290m. Lowland forest, *Pometia* and *Dysoxylon* dominated, on gentle slope beside seasonal stream. On a shaded vine. *Streimann* 62729; **EFATE:** Forari Logging area, 17 km ENE of Port Vila. 17° 38'S 168°27'E. Alt.: 300m. Lowland rainforest on broad undulating ridge. On shaded tree base. *Streimann* 63049.

Range: Philippines, New Guinea, Indonesia, Oceania, Mascarenes, Australia (northern Queensland).

***Caudalejeunea reniloba (Gott.) Steph.**

ESPIRITU SANTO: Big Bay - Luganville Road, 29 km NW of Luganville. 15° 18'S 167°01'E. Alt.: 290m. Lowland forest, *Pometia* and *Dysoxylon* dominated, on gentle slope beside seasonal stream. On semi-shaded horizontal bamboo stem. *Streimann* 62746; **EFATE:** Forari Logging area, 17 km ENE of Port Vila. 17° 38'S 168°27'E. Alt.: 300m. Lowland rainforest on broad undulating ridge. On large branch fallen from tree crown. *Streimann* 63008.

It is the most common epiphyllous ptychanthoid *Lejeuneaceae* species in Australia and in the Indomalaysian-Oceanian region, originally reported from Australia by Verdoorn. (1934b).

***Caudalejeunea streimannii Gyarmati sp. nov.**
(see next chapter)**Dendrolejeunea fruticosa (Lindenberg & Gottsche) Lacout.**

Syn: *Thysananthus fruticosus* (Lind. & Gott.) Schiffn.

ESPIRITU SANTO: Sevua Village near Nambauck Village, 12 km NW of Luganville. 15° 27'S 167°04'E. Alt.: 175m. Moderately disturbed tropical forest on moderate slope with small garden patches. On semi-shaded vine. *Streimann* 62147; **EFATE:** Forari Logging area, 17 km ENE of Port Vila. 17° 38'S 168°27'E. Alt.: 300m. Lowland rainforest on broad undulating ridge. On shaded treelet stem. *Streimann* 63015, 63016; On shaded tree (*Pometia pinnata*) trunk. *Streimann* 63052, 63061; On shaded tree fern. *Streimann* 63064; On shaded tree trunk. *Streimann* 63127, On shaded tree trunk (*Dillenia*). *Streimann* 63137, 63138; Teouma River Valley, 11 km N of Port Vila. 17° 42'S 168°24'E. Alt.: 80m. Disturbed lowland forest on flats dominated by *Endospermum*, *Antiaris* and *Pometia*. On shaded treelet stem. *Streimann* 63167; Track to Mt McDonald, 14 km N of Port Vila. 17° 36'S 168°19'E. Alt.: 500m. Lowland tropical forest on narrow limestone ridge. On shaded treelet stem. *Streimann* 63258. Ridge below Mt McDonald, 15 km NNE of Port Vila. 17° 35'S 168°21'E. Alt.: 600m. Lowland tropical forest on narrow limestone ridge. On shaded tree

trunk. *Streimann* 63314; On one plant (*Myrmecodia*) fallen from shaded treelet stem. *Streimann* 63344.

(Stephani 1914: 134; 1924: 566; Tixier 1974: 43; Miller et al. 1983)

Is found throughout the Indopacific region.

***Lopholejeunea subfusca (Nees) Schiffn.**

ESPIRITU SANTO: Nambauck Village (end of road), 12 km NW of Luganville. 15° 27'S 167°04'E. Alt.: 175m. Old garden site with regrowth on flats. On semi-shaded tree trunk (*Pometia pinnata*). *Streimann* 62123; 62125; 62129; Logging Area near Lavatmas, 48 km NNW of Luganville. 15° 07'S 167°01'E. Alt.: 300m. Poor lowland forest on flats *Endospermum medullosum*, *Antiaris toxicarya* & *Pometia pinnata* dominated. On semi-exposed upper tree branches. (*Macaranga*). *Streimann* 62826; Hasevaia (near mouth of Adson River), 23 km NNW of Luganville. 15° 35'S 166°58'E. Alt.: 3m. Disturbed strand vegetation and old coconut plantation. On semi-shaded tree trunk. (*Securingia*). *Streimann* 62848; On semi-shaded tree trunk (*Polyscias*). *Streimann* 62867, On shaded tree base *Streimann* 62862, 62864, 62868; Regrowth on flats dominated by *Hibiscus tiliaceus* with no understorey. On semi-shaded *Hibiscus* stems and roots. *Streimann* 62879, On semi-shaded dead *Hibiscus* stem. *Streimann* 62880; Luganville - Hog Harbour Road (over river) past Matevala Plantation, 16 km N of Luganville. 15° 22'S 167°11'E. Alt.: s.l. *Calophyllum inophyllum*, *Barringtonia asiatica* dominated strand/mangrove vegetation. On shaded *Barringtonia* trunk. *Streimann* 62942, 62943, 62944, 62954.

A widespread pantropical species.

***Lopholejeunea eulopha (Tayl.) Schiffn.**

ESPIRITU SANTO: Nambauck Village (end of road), 12 km NW of Luganville. 15° 27'S 167°04'E. Alt.: 170m. Disturbed forest on limestone, surrounding seasonal stream. On semi-shaded treelet stem. (*Dendrocide*). *Streimann* 62096; **EFATE:** Forari Logging area, 17 km ENE of Port Vila. 17° 38'S 168°27'E. Alt.: 300m. Lowland rainforest on broad undulating ridge. On large branch fallen from tree crown. *Streimann* 63008; On upper branches in crown

of large tree. (*Syzigium*). *Streimann* 63092, 63115; Track to Mt Mc Donald, 15 km NNE of Port Vila. 17° 36'S 168°20'E. Alt.: 450m. Transition forest on ridge between regrowth and tropical forest. On shaded tree trunk. *Streimann* 63417.

Palaeotropic, widely distributed in Asia and Africa, and rather frequent in Queensland (Australia).

****Lopholejeunea hispidissima* Steph.**

ESPIRITU SANTO: Luganville - Hog Harbour Road (over river) past Matevala Plantation, 16 km N of Luganville. 15° 22'S 167°11'E. Alt.:s.l. *Calophyllum inophyllum*, *Barringtonia asiatica* dominated strand/mangrove vegetation. On semi-shaded tree trunk (*Barringtonia*). *Streimann* 62954, 62958, 62965.

Is it known from New Caledonia and from Australia (southern Queensland).

****Mastigolejeunea calcarata* (Steph.) Verdoorn**

EFATE: Forari Logging area, 17 km ENE of Port Vila. 17° 38'S 168°27'E. Alt.: 300m. Lowland rainforest on broad undulating ridge. On shaded tree trunk. *Streimann* 63060; Alt.: 340m. Lowland rainforest on broad undulating ridge. On upper branches in crown of large tree. *Streimann* 63106; On shaded upper treelet stem. *Streimann* 63085; Track to Mt McDonald, 14 km N of Port Vila. 17° 36'S 168°19'E. Alt.: 500m. Lowland tropical forest on narrow limestone ridge. On semi-shaded tree trunk, amongst lichen. *Streimann* 63217.

M. calcarata occurs in the rain forests of northern Queensland and is common in the subtropical rain forests of southern Queensland. Outside Australia, the species is apparently known only in the type collection from Fiji.

****Mastigolejeunea ligulata* (Lehm. & Lindb.) Schiffn.**

ESPIRITU SANTO: Independence Park, Luganville. 15° 31'S 167°10'E. Alt.: 1m. *Calophyllum inophyllum* and coconuts in flat maintained area above beach. On semi-shaded coconut stem. *Streimann* 62200.

Widespread in the Indopacific region.

****Mastigolejeunea virens* (Angstr.) Steph.**

ESPIRITU SANTO: Navota - Luganville Road, 19 km SE of Luganville. 15° 35'S 167°01'E. Alt.: 10m. Disturbed lowland forest with coral outcrops. On shaded tree buttress. *Streimann* 62902.

Widespread in the Indopacific region.

***Ptychanthus striatus* (Lehmann & Lindenberg.) Nees**

ESPIRITU SANTO: Nambauck Village (end of road), 12 km NW of Luganville. 15° 27'S 167°04'E. Alt.: 170m. Disturbed forest on limestone, surrounding seasonal stream. On semi-shaded dead treelet branch. *Streimann* 62095; Logging Area near Lavatmas (N of Sara), 48 km NNW of Luganville. 15° 07'S 167°01'E. Alt.: 300m. Poor lowland forest on flats *Endospermum medullosum*, *Antiaris toxicarya* & *Pometia pinnata* dominated. In upper branches of large felled tree. (*Endospermum medullosum*). *Streimann* 62799; Forestry Demonstration Area, Butmas, 25 km NW of Luganville. 15° 22'S 167°00'E. Alt.: 620m. Tropical forest on moderate slope, *Myristica fatua* dominant, with dense ground cover of ferns and herbaceous Urticaceae. On shaded tree trunk. *Streimann* 62443, 62451, 62452; On shaded fallen treelet stem. *Streimann* 62460; Track to Mt Tanakar, Butmas, 26 km NW of Luganville. 15° 22'S 169°59'E. Alt.: 680m. Tropical forest on limestone on moderate slope, *Myristica fatua* and *Dysoxylum* dominated. On shaded leaning treelet stem. *Streimann* 62554; Big Bay - Luganville Road, 29 km NW of Luganville. 15° 18'S 167°01'E. Alt.: 290m. Lowland forest, *Pometia* & *Dysoxylum* dominated, on gentle slope beside seasonal stream. On shaded treelet branch. *Streimann* 62731. **EFATE:** Ridge below Mt McDonald, 15 km NNE of Port Vila. 17° 35'S 168°21'E. Alt.: 600m. Lowland tropical forest on narrow limestone ridge. On shaded tree trunk. *Streimann* 63319.

(Stephani 1914: 131, 132; Tixier 1973: 82; Miller et al. 1983: 280.)

****Schiffneriolejeunea tumida* (Nees & Montagne) Gradstein var *haskarliana* (Gottsche) Gradstein & Terken**

EFATE: Teouma Valley Road, 11 km E of Port Vila. 17° 45'S 168°25'E. Alt.: 150m. Regrowth

and gardens with few remnant forest trees on flats. On semi-shaded *Antiaris toxicarya* trunk. *Streimann* 62026; Forari Logging area, 17 km ENE of Port Vila. 17° 38'S 168°27'E. Alt.: 300m. Lowland rainforest on broad undulating ridge. In crown of fallen tree. *Streimann* 63034; Teouma River Valley, 11 km NE of Port Vila. 17° 42'S 168°24'E. Alt.: 80m. Disturbed lowland forest on flats dominated by *Endospermum*, *Antiaris* and *Pometia*. Crown branches of fallen tree. *Streimann* 63162.

Widespread in the Indopacific region.

***Spruceanthus polymorphus* (Sande Lac.) Verd.**

ESPIRITU SANTO: Hasevaia (near mouth of Adsona River), 23 km NNW of Luganville. 15° 35'S 166°58'E. Alt.: 3m. Disturbed strand vegetation and old coconut plantation. On stem of large semi-shaded palm. (*Carpoxyton*). *Streimann* 62841; On semi-shaded tree trunk (*Securingia*). *Streimann* 62847; Regrowth on flats dominated by *Hibiscus tiliaceus* with no understorey. On semi-shaded *Hibiscus* stems and roots. *Streimann* 62873, 62874, 62877, 62878; Luganville - Hog Harbour Road (over river) past Matevala Plantation, 16 km N of Luganville. 15° 22'S 167°11'E. Alt.: s.l. *Calophyllum inophyllum*, *Barringtonia asiatica* dominated strand/mangrove vegetation. On shaded *Barringtonia* trunk. *Streimann* 62943; Disturbed strand vegetation and old coconut plantation. On stem of large semi-shaded palm. (*Carpoxyton*). *Streimann* 62841; **EFATE:** Forari Logging area, 17 km ENE of Port Vila. 17° 38'S 168°27'E. Alt.: 300m. Lowland rainforest on broad undulating ridge. On shaded tree buttress (*Terminalia sepicana*). *Streimann* 62988.; On shaded tree (*Pometia pinnata*) trunk. *Streimann* 63062; Track to Mt McDonald, 14 km N of Port Vila. 17° 36'S 168°19'E. Alt.: 500m. Lowland tropical forest on narrow limestone ridge. On semi-shaded tree trunk. *Streimann* 63212A.

It has a typical Indopacific distribution.

***Thysananthus spathulistipus* (Reinv., Blume & Nees) Lindenb.**

EFATE: Forari Logging area, 17 km ENE of Port Vila. 17° 38'S 168°27'E. Alt.: 340m. Lowland rainforest on broad undulating ridge. On shaded tree trunk. *Streimann* 63051; On upper branches

in crown of large tree. *Streimann* 63091; 63092; 63093; Ridge below Mt McDonald, 15 km NNE of Port Vila. 17° 35'S 168°21'E. Alt.: 600m. Lowland tropical forest on narrow limestone ridge. On shaded leaning treelet. *Streimann* 63353.

Paleotropical species widely distributed in Africa, Southeast Asia and Oceania.

(Stephani 1914: 134, 1924: 566, under *T. hebridensis* Steph.; Tixier 1974: 43.)

Description of the new species

***Caudalejeunea streimannii* Gyarmati, spec. nova.** (Figs 1-11)

Planta brunnea caulibus irregulariter ramosis. Folia imbricata, apicibus acutis; lobulus ovatus, moderate inflatus. Amphigastria late vel isodiametrico, orbiculata, caule 2-3 latiora. Gynoecia in ramis terminalis sine innovationibus. Folia floralia obovata, apice dentata. Perianthium planissimum, bialatum, alis latissimis, comparavunt cum speciebus aliis generis Caudalejeunea.

Typus: VANUATU, ESPIRITU SANTO:

Forestry Demonstration Area, Butmas, 25 km NW of Luganville. 15° 22'S 167°00'E. Alt.: 620m. Tropical forest on moderate slope *Myristica fatua* dominant with, dense ground cover of ferns and herbaceous Urticaceae. On shaded dead vine. *Streimann* 62383. (Holotype: CANB; isotype:-EGR).

Plants medium in size, pale brown in herbaria. Stems 5 mm long, 220 µm in diameter, with leaves 2350 µm wide, irregularly branched; ventral merophyte of the stem 4 cells wide.

Leaf lobes imbricate, widely spreading, falcately oblong 1250-1375 µm long, x 725-850 µm wide, apices acute, margins dentate; apical cells 22-30 x 15-22 µm, median cells 45-50x 25-35 µm, walls thin, trigones and intermediate thickenings rather large, nodulose, cuticle smooth; leaf lobule small, oblong-lanceolate, attenuate towards distal end; about 1/3 of the lobe length, free margin involute, with 3-4 teeth at apical portion (visible only dissecting the lobules). Underleaves approximate to loosely

imbricate, almost orbicular, 625-1100 µm long, 600-975 µm wide, truncate or emarginate, dentate or sometimes entire.

Gynoecium terminal without subfloral innovation; bract oblong, 2500-3625 µm long, 1250-1375 µm wide, apex acute or subacute, margin dentate, bract-lobule about 1/3 as long as the lobe, free margin involute; bracteole oblong 1875-2000 µm long, x 1175-1300 µm wide, throughout with marginal dentations apex rounded to obtuse, often retuse. Perianths 2500-2650 µm long x 1400-1575 µm wide, with 2 lateral keels (rarely a rather weak ventral keel could be observed), lateral keels with irregularly dentate wings, with their apex turning towards the beak.

The species is named after his collector, the late Heinar Streimann, eminent bryologist, the former curator of the bryophytes in the Australian National Herbarium.

Acknowledgments. I wish thank to the director and curator of the Australian National Herbarium (CANB) for the loan of specimens, and to Tamás Pócs for reading the manuscript and giving some comments.

References

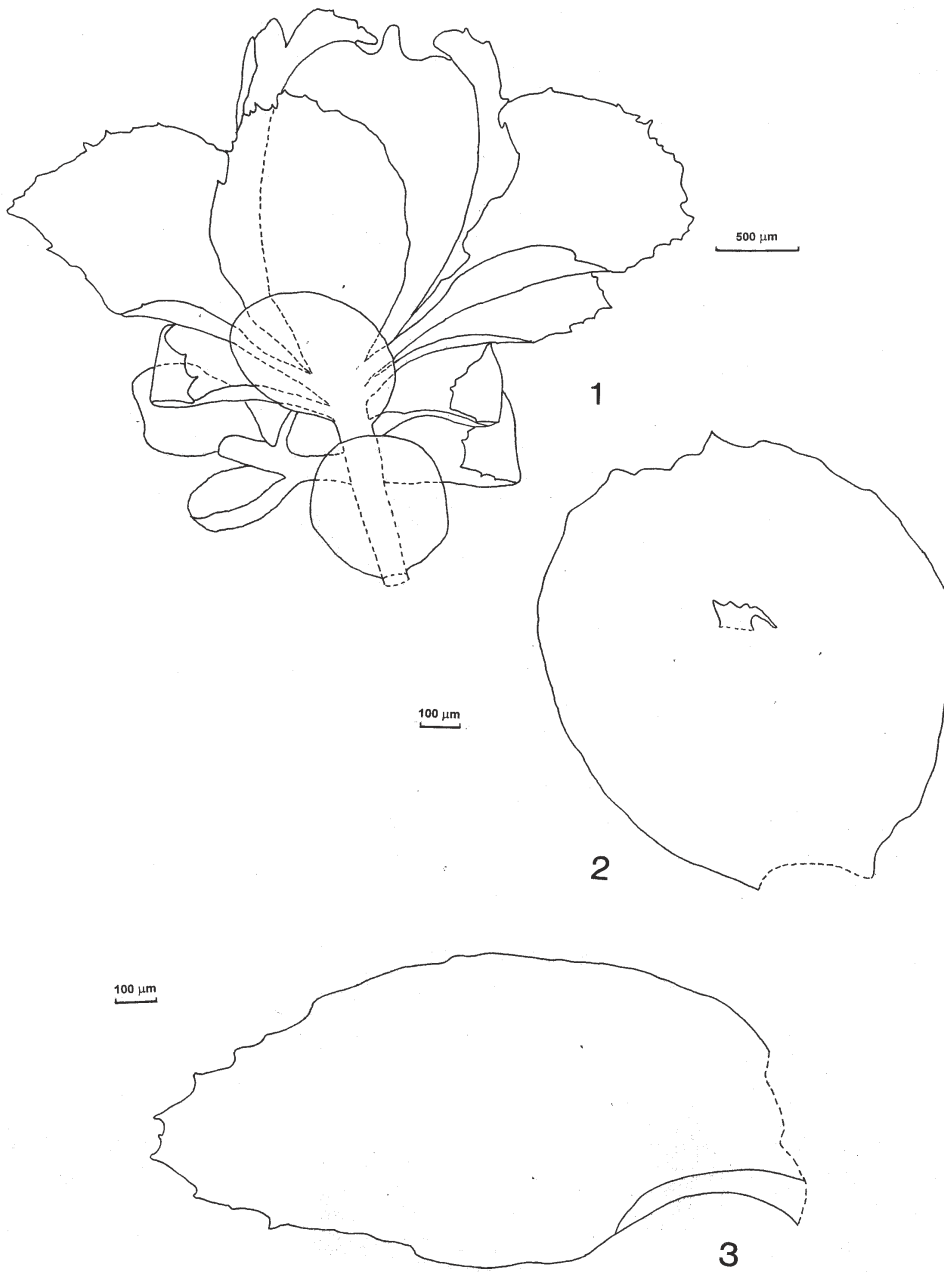
- Gradstein, S. R. 1975.** A taxonomic monograph of the genus *Acrolejeunea* (Hepaticae). *Bryophytorum Bibliotheca* 4: 1-162, pl. 1-24.
- Miller, H. A., H.O. Whittier & B. A. Whittier 1983.** *Prodromus Florae Hepaticarum Polynesiae*. J. Cramer, Vaduz.
- Stephani, F. 1914.** Hepaticae Australes. *J. Proc. Roy. Soc. New South Wales* 48: 94-135.
- Stephani, F. 1924.** *Species Hepaticarum* 6: 565-566.
- Thiers, B. M. and Gradstein, S. R. 1989.** Lejeuneaceae (Hepaticae) of Australia. I. Subfamily Ptychanthoideae. *Memoirs of the New York Botanical Garden* 52: 1-82.
- Tixier, P. 1973.** Bryophytes exotiques. *Bull. Mus. Nat. Hist. Nat. Bot.* 10: 73-86.
- Tixier, P. 1974.** Bryophytes exotiques: bryophytes des Nouvelles-Hébrides (expédition de la Royal Society). *Bull. Mus. Nat. Hist. Nat. Sér. 3*, 269: 33-45.
- Verdoorn, F. 1934.** Studien über Asiatische Jubulae. *De Frullaniaceis XV. Die Lejeuneaceae* Holostipae der Indomalaya unter Berücksichtigung sämtlicher aus Asien, Australien, Neuseeland und Ozeanien angeführten Arten. *Annales Bryologici Supplementum* 4: 40-192.
- Verdoorn, F. 1934b.** Revision der von Ozeanien, Australien und Neuseeland angeführten Lejeuneaceae Holostipae (de Frullaniaceis XVI). *Blumea* 1: 216-240.

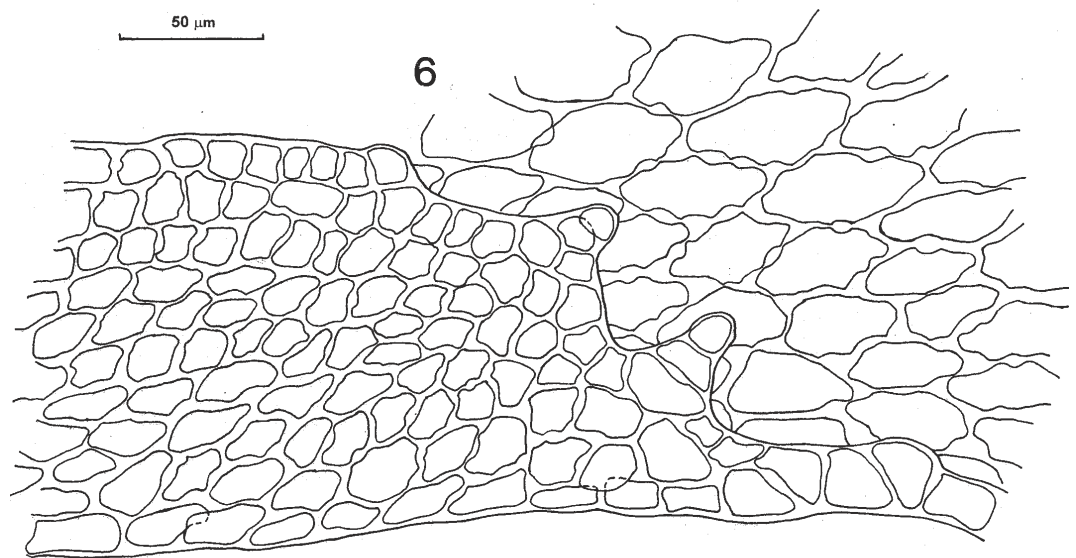
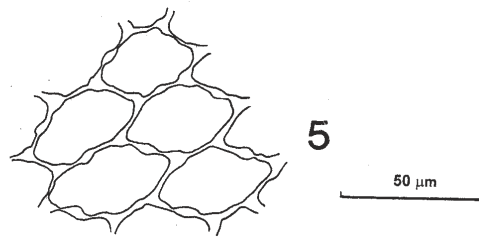
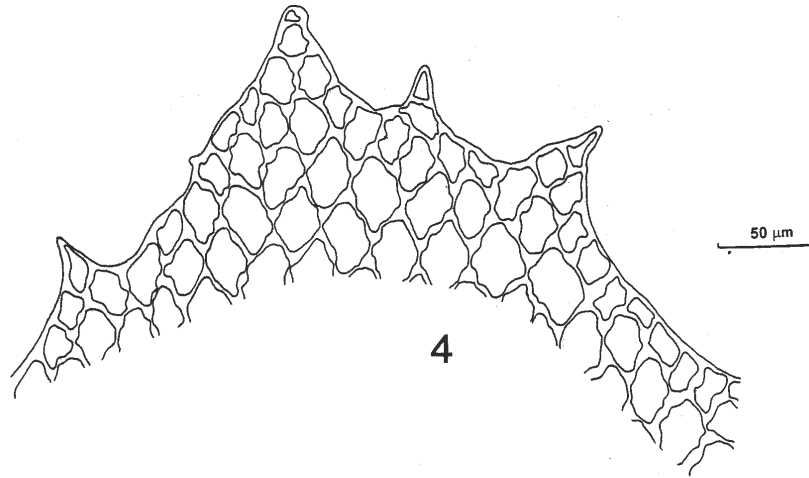
Figs 1-3. – *Caudalejeunea streimannii* Gyarmati **1:** Habit, ventral view, with perianth. **2:** Underleaf. **3:** Leaf, ventral view. (Drawn from *Streimann 62383*, holotype CANB)

Figs 4-6. - *Caudalejeunea streimannii* Gyarmati **4:** Apical cells of the leaf-lobes. **5:** Cells from the middle of leaf-lobes. **6:** Leaf lobule. (Drawn from *Streimann 62383*, holotype CANB)

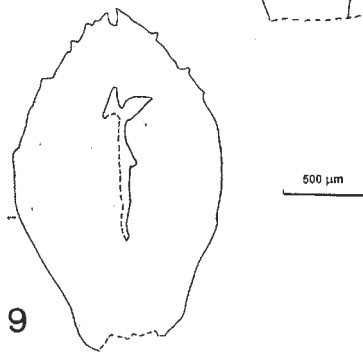
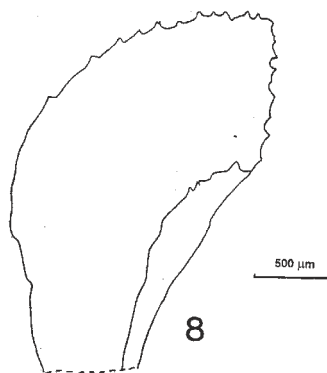
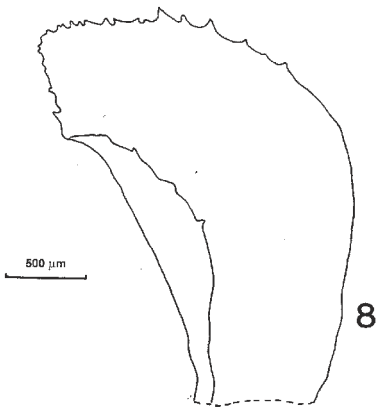
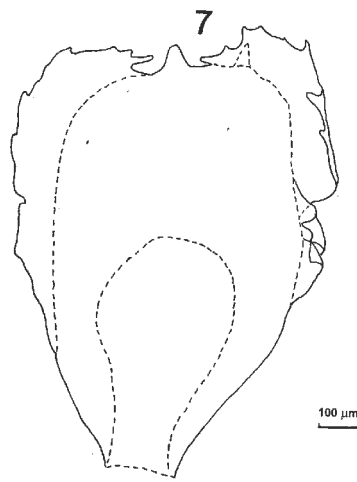
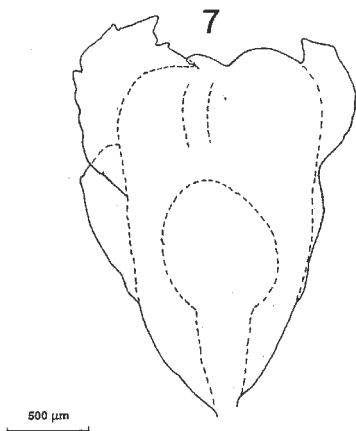
Figs 7-9. - *Caudalejeunea streimannii* Gyarmati **7:** Perianths, ventral view. **8:** Female bracts. **9:** Female bracteole. (Drawn from *Streimann 62383*, holotype CANB)

Figs 10-11. – *Caudalejeunea streimannii* Gyarmati **10:** Portion of perianth, showing the large wings. **11:** Lobules with teeth





Y. G.
A



*G. G.
A.*

