

## **New or little known epiphyllous liverworts, XII. *Archilejeunea helenae* Pócs & Gyarmati, sp. nova**

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**Abstract** – A new species of *Archilejeunea* is described from the Mananara North Biosphere Reserve of Northeast-Madagascar. *Archilejeunea helenae* is distinguished from the related *A. alata* Steph. by its broad and short winged perianth keels, by its very regular pinnate branching, always well developed leaf lobuli and by its overall larger cell size.

*Archilejeunea* / Lejeuneaceae / Jungermanniopsida / Madagascar

**Résumé** – Une nouvelle espèce de l'*Archilejeunea* est écrite de la Réserve de Biosphère Mananara Nord de la partie nord-oriental de Madagascar. *Archilejeunea helenae* se distingue de l'espèce voisine *A. alata* Steph. par ses carènes de périanthe larges et courtes, par sa ramification très régulièrement pinnate, par les lobules des feuilles toujours bien développées et surtout par ses plus grandes cellules.

*Archilejeunea* / Lejeuneaceae / Jungermanniopsida / Madagascar

### **INTRODUCTION**

*Archilejeunea*, although the genus badly needs a thorough revision, seems to be a group of liverworts, which, during its evolution, produced a number of endemic species, which are restricted to relatively small distribution areas and only a few of the species are widespread. Madagascar, together with the other East African islands, has 5 known species of *Archilejeunea* (Grolle, 1995), while Sub-Saharan Africa has 7 of them (Wigginton *et al.*, 1996). All, but one are endemic for the concerned area, only *A. mauritiana* Lindenb. occurs in both.

Our new species is related closest to *Archilejeunea alata* Steph., which is relatively widespread in the East African Islands, being known from Madagascar, the Comoro Islands and from Mauritius. (Grolle, 1995). Although the characters given in the protologue of *A. alata* seemed to us adequate to distinguish *Archilejeunea helenae* at the species level, we have examined the type specimen of *Archilejeunea alata* (coll. Marie nr. 4 Mayotte Island, Comoro, G.) The comparison proved our assumption that they are well distinct.

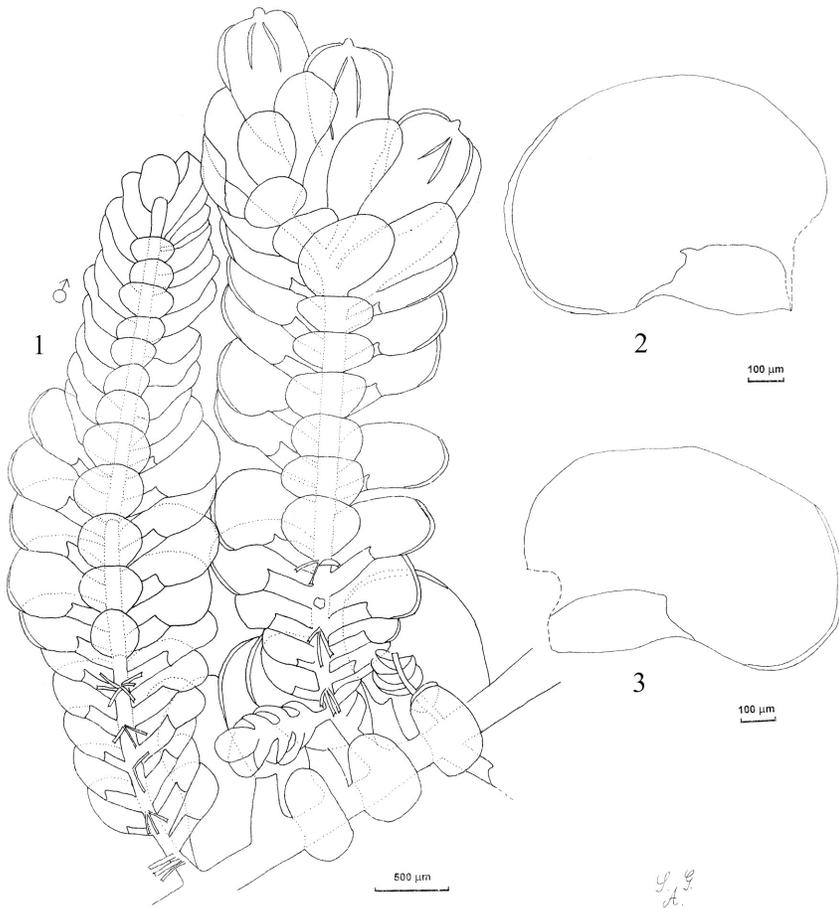
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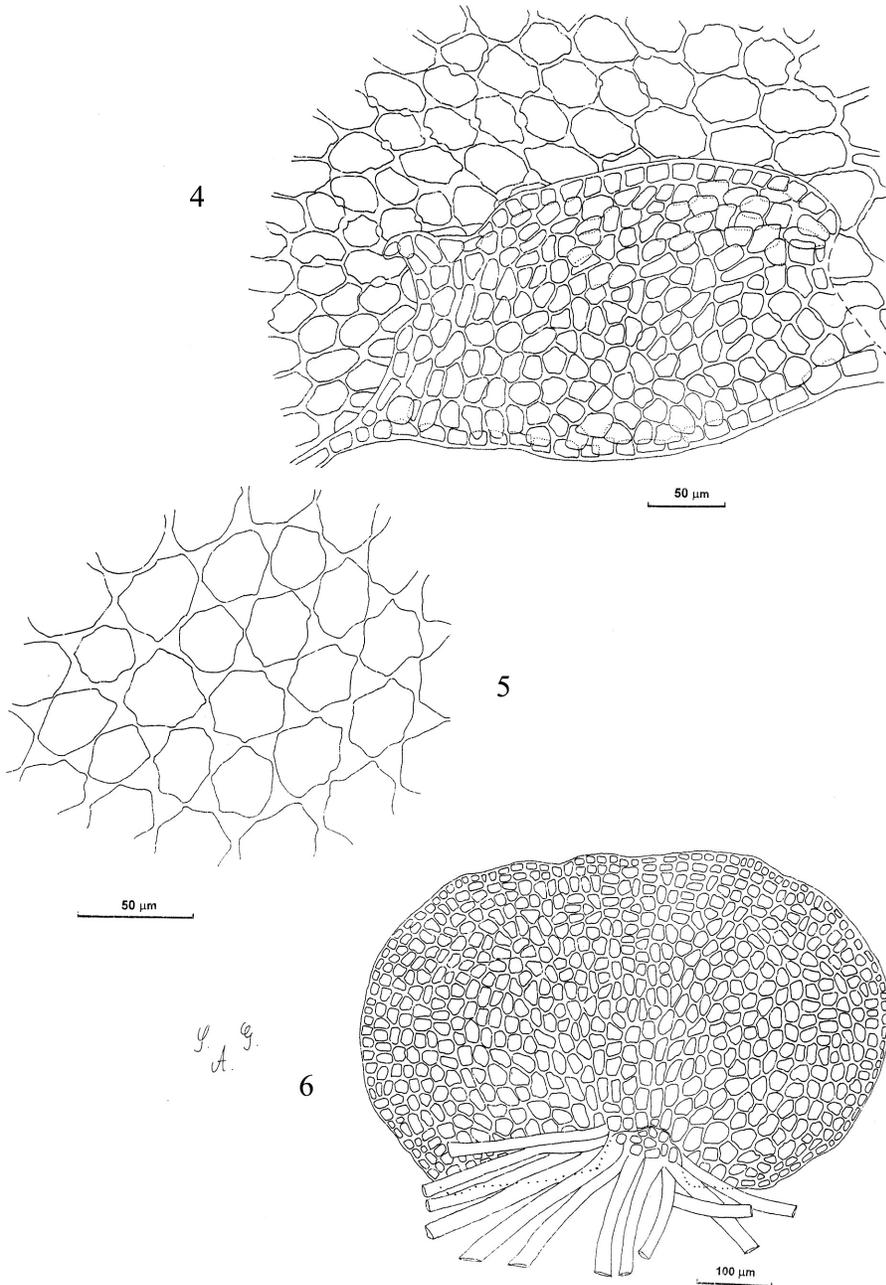
**ARCHILEJEUNEA HELENAE PÓCS & GYARMATI, SP. NOVA**  
(Figs 1-11, Figs 13-16)

*Archilejeuneae alatae* Steph. similis, sed differt ramificationibus regulariter pinnatis, lobulis bene evolutis, perianthiis late, breve alatis, cellulibus lobi majoribus et lobulis bractearum feminium rotundato-obtusis. Planta dedicata beatae Doctoris Helenae Bischler-Causse, investigatorae illustrissimae Lejeuneacearum.

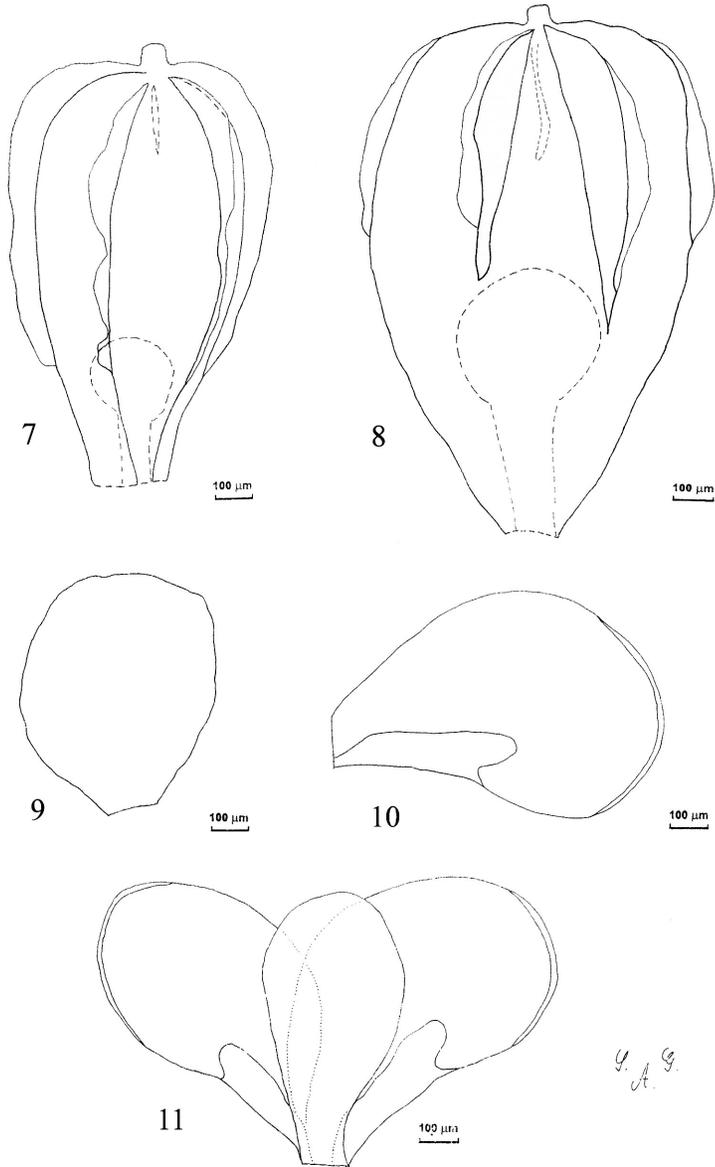
**Typus: MADAGASCAR, Mananara Nord Biosphere Reserve.** Wet type lowland rainforest on the E slopes of MAHAVOHO Hill, with many tree ferns, palms and *Pandanus* spp. at 250-350 m alt. 16°27'S, 49°46.9-47.5'E. Epiphyllous on relatively rigid, leathery leaf. Coll. Pócs T. & Szabó A. 9878/FM, 14-16 Aug. 1998. (Holotype: EGR). The new species is dedicated to the outstanding researcher of the Lejeuneaceae, the late Dr. Helene Bischler-Causse.



Figs 1-3. *Archilejeunea helenae* Pócs & Gyarmati. **1.** Habit, ventral view, with female branches and male spike. **2-3.** Leaves, ventral view. (holotype: EGR)



Figs 4-6. *Archilejeunea helenae* Pócs & Gyarmati. 4. Lobule. 5. Mid-leaf cells 6. Underleaf, with the indication of insertion line. (holotype: EGR)



Figs 7-11. *Archilejeunea helenae* Pócs & Gyarmati. **7.** Perianth (designated from the Stephani type-ventral view). **8.** Perianth. (ventral view) **9.** Female bracteole. **10.** Gynoeccial bract. **11.** Perichaetial leaves. (Drawn from Pócs & Szabó 9878/FM, holotype: EGR)

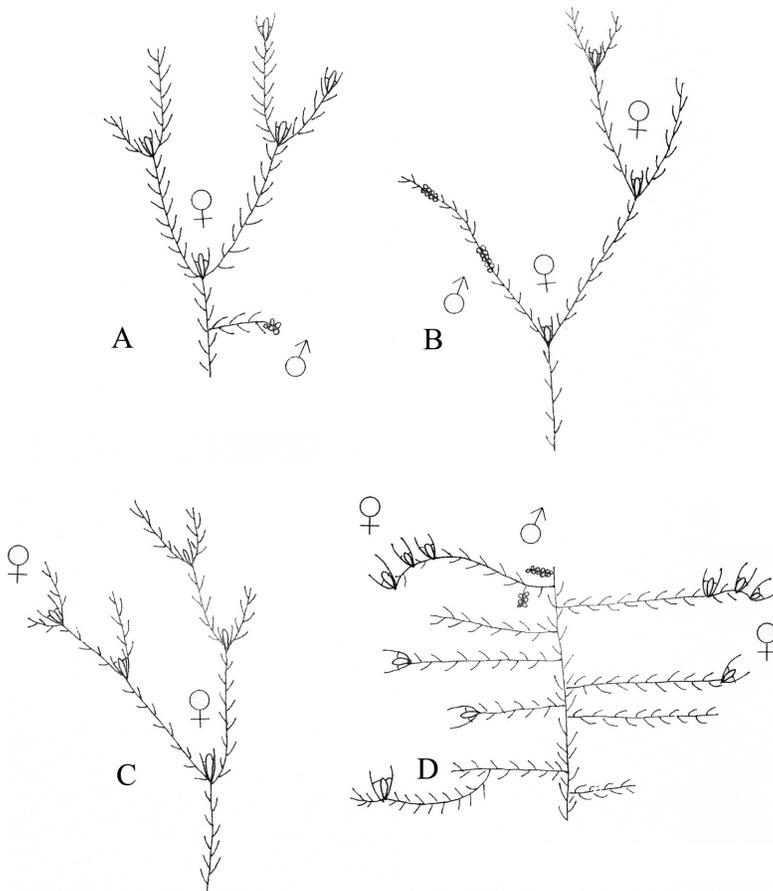


Fig. 12. Diagram of branch systems in Archilejeunea. A.B.C. *Archilejeunea alata* Steph. D. *A. helenae* sp. n.

**Autoicous.** **Plants** yellowish brown in dried condition, forming appressed mats of 2-3 cm diameter. **Shoots** 1-2 cm long and 2.3 mm wide, **stem** 160-180  $\mu\text{m}$  in diameter, in cross section composed of 15-20 cortical and 35-40 medullary cells. **Ventral merophyte** 6(-8) cells wide. **Branching** *Lejeunea* type, growth habit regularly unipinnate. **Leaf lobes** imbricate to contiguous, 550 (-600)  $\times$  725 (-825)  $\mu\text{m}$ , kidney shaped, with broadly rounded apex and entire margin, revolute towards the apex. Marginal cells quadrate to rectangular, 15  $\times$  20  $\mu\text{m}$ ; median cells 20  $\times$  35  $\mu\text{m}$  with small trigones, intermediate thickenings 0-1 per cell wall; basal cells 25  $\times$  40  $\mu\text{m}$ . **Lobules** never reduced, subrectangular about 1/2 lobe length with one tooth of 1-2 cells long. **Underleaves** plane, reniform, wider than long, 3-4  $\times$  stem width, 800  $\mu\text{m}$  long  $\times$  1350  $\mu\text{m}$  wide with entire margin and obtusely rounded apex, basal insertion line shallowly curved. **Androecia** terminal on elongate side branches (pinnae), with 9-11 pairs of bracts, bracteoles throughout the male spike. **Gynoecia** terminal on long primary branches (pinnae), with one subfloral innovation, which is repeatedly fertile, often continuing to produce further single innovations.

**Bracts** about as large as the leaves,  $500 \times 900 \mu\text{m}$ , with rounded apex, recurved margins and with ligulate, obtusely rounded **lobules**, about 1/2 of the lobe length, female bracteole oblong, margins plane  $450\text{-}500 \mu\text{m}$  wide  $\times$   $650 \mu\text{m}$  long. **Perianth** emergent, oblong-obovoid  $500\text{-}800 \times 1300\text{-}1400 \mu\text{m}$ , 4 (-5) keeled, with 0-1 (weak) dorsal keel, 2 lateral keels and 2 ventral keels. Each possesses a 2-5 cells wide wing. The wings are restricted more or less to the upper half of the perianth and downward end abruptly. Beak relatively wide and short. **Sporophyte** unknown.

## DISCUSSION

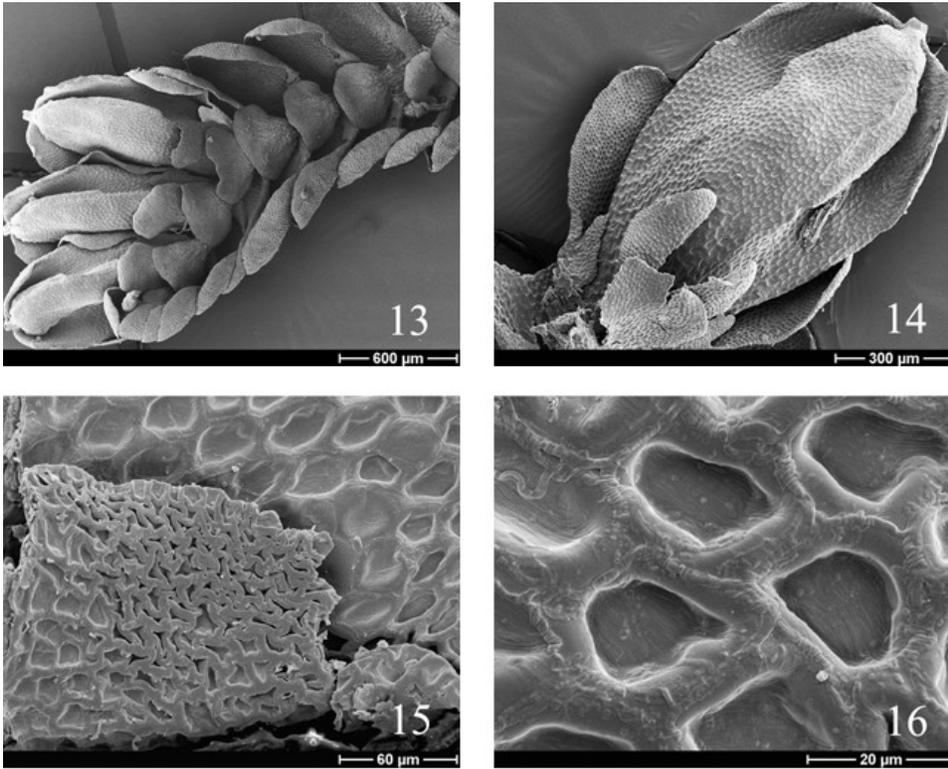
The regularly pinnate habit is at the first sight the most striking feature of the plant, unusual by other members of the genus. With the new species the known number of *Archilejeunea* species in Madagascar is raised to 6, almost equaling the number of species known from continental Africa. The area where it was collected, is one of the larger, more or less intact remnants of the already very decimated lowland rain forests at the eastern coast of Madagascar. Mananara Nord Biosphere Reserve proved to be a diversity center not only for mammals and vascular plants, but also for the cryptogams. The first representative of the hepatic genus *Xylolejeunea* (He & Grolle, 2001), *Xylolejeunea grolleana* (Pócs) He & Grolle was described from here under the basionym *Trachylejeunea grolleana* by Pócs (1999) and a moss species hitherto known only from the Neotropics was also found in the Reserve [*Calymperes venezuelanum* (Mitt.) Pitt., Orbán, 2000]. Other new taxa of Lejeuneaceae are under description.

Concerning the differences between *Archilejeunea helenae* and *A. alata*, the following table serves for comparison.

Table 1. Differential characters of *Archilejeunea helenae* and *A. alata*

	<i>A. helenae</i>	<i>A. alata</i>
Growth habit (see plate IV)	Branching intercalary, perianths on the tip of side branches with one very short repeatedly fruity innovation	Branching mostly terminal, with very few intercalary branches, perianths terminal with two repeatedly fruiting innovations
Leaf lobule	well developed, never reduced	even when developed, much smaller
Leaf cells	median cells: $20 \times 35 \mu\text{m}$ basal cells: $25 \times 40 \mu\text{m}$	median cells $18 \times 27 \mu\text{m}$ basal cells $18 \times 36 \mu\text{m}$
Underleaf	always plane	recurved with few exceptions
Bract lobule	obtusely rounded	acute
Perianth wings	restricted more or less to the upper half of keels	wings cover 3/4 part of the keels

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Figs 13-16. *Archilejeunea helenae* SEM (all from holotype) **13**. Plant with perianths (ventral view); **14**. Perianth – ventral view; **15**. Leaf lobules; **16**. Median leaf cells.

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