

***Bazzania konratiana* sp. nov. (Marchantiophyta: Lepidoziaceae) from Madagascar**

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Abstract – *Bazzania konratiana* sp. nov. is described from Mananara Nord Biosphere Reserve and National Park. The new species was collected from a wet lowland rainforest where annual rainfall reaches 3500 mm. It differs from the similar *Bazzania approximata* Onraedt, an endemic species from Seychelles, in its overall larger size, the thick-walled leaf cells with large bulging trigones and proportion of hyaline and chlorophyllose cells in the underleaves.

***Bazzania* / Lepidoziaceae / Madagascar / Mananara Nord Biosphere Reserve / endemism**

Résumé – *Bazzania konratiana* sp. nov. est décrite de la Réserve de biosphère du Parc national de Mananara-Nord. Cette nouvelle espèce a été collectée en forêt tropicale humide de plaine où les précipitations annuelles atteignent 3500 mm. Elle diffère de *Bazzania approximata* Onraedt, une espèce endémique des Seychelles, par sa plus grande taille, ses cellules foliaires à parois épaisses pourvues de grands trigones noduleux et par sa proportion de cellules hyalines et chlorophylliennes dans les amphigastres.

***Bazzania* / Lepidoziaceae / Madagascar / Réserve de la biosphère Mananara Nord / endémisme**

INTRODUCTION

The genus *Bazzania* Gray comprises leafy liverworts with two rows of lateral leaves inserted incubously on the stem, with a bi- or tridentate (sometimes entire) apex and a row of underleaves on the ventral side of the stem. The cells in the outer stem layer are not differentiated from those of the inner part. Most *Bazzania* species have both terminal pseudodichotomous *Frullania*-type, and intercalary branching. Intercalary branches mostly develop ventrally and are microphyllous, but can develop into branches with normal leaves as well. More than forty species of *Bazzania* have been described from sub-Saharan Africa (e.g. Stephani, 1886, 1891, 1893, 1924; Arnell, 1965; Jones, 1975; Onraedt, 1977; Pócs, 1994), most of which have been subsequently placed in synonymy, and only 14 species are accepted in the recent world checklist (Söderström *et al.*, 2016). Several of these species were described in the late 19th century from Madagascar and other East African Islands,

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but their taxonomic value is yet to be confirmed (Jones, 1975; Grolle, 1995). The author's aim is to clarify these dubious taxa and to investigate new collections in her revision of the African *Bazzania*.

Since the 1970s, collecting activity has intensified in tropical Africa, especially in the East African Islands, in which members of our department also participated. During July-August 1998 a collecting expedition was led by Tamás Pócs with the participation of Sarolta Pócs, András Szabó (EGR) and R. Ranaivojaona (TANA), sponsored by the National Geographic Society (USA), to the northeastern coast of Madagascar. The main aim was to visit the then bryologically unexplored Mananara Nord Biosphere Reserve and National Park. The park is famous for its lemur fauna (13 species), which includes the endangered Mananara-Nord sportive lemur (*Lepilemur hollandorum*), red collared lemur (*Eulemur collaris*) and Aye-aye (*Daubentonia madagascariensis*). The Park covers 240 km² land area, ascending from sea level to 400 m altitude, and includes large areas of almost untouched rainforest. It proved to be bryologically rich, and among other results, from here were described the Madagascan endemics *Diplasiolejeunea ornata* Pócs & Schäfer-Verwimp (Pócs & Schäfer-Verwimp, 2006) and the first African representative of the genus *Trachylejeunea*, *Trachylejeunea grolleana* Pócs (Pócs, 1999), currently placed in *Xylolejeunea grolleana* (Pócs) Xiao L. He & Grolle (He & Grolle, 2001). During this expedition, a conspicuous species of *Bazzania* with very densely arranged, almost entire leaves was collected, and is here described as new.

DESCRIPTION

Bazzania konratiana Gyarmati, *sp. nov.*

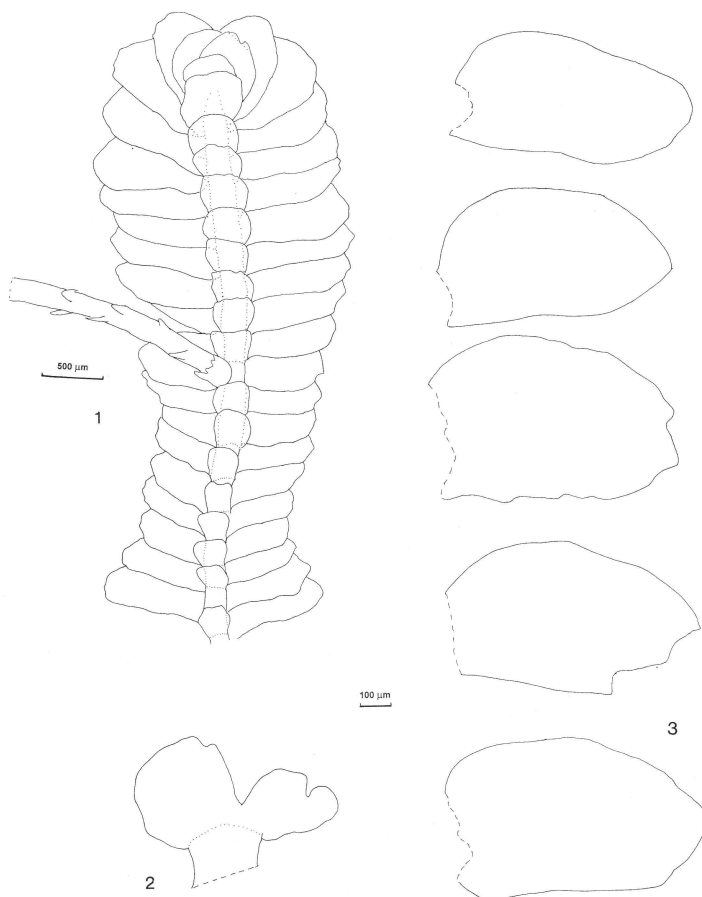
Figs 1-8

Diagnosis: *Species haec Bazzaniae approximatae similis sed major, cellulis trigonis majoribus, parietibus incrassatis, amphigastriis caule duplo latioribus, apice crenulato vel dentato, cellulis pro maxime parte chlorophyllosis marginem hyalinum pluriseriatum formantibus.*

Type: MADAGASCAR, Toamasina Prov., Mananara Nord Biosphere Reserve and National Park: lowland rainforest on the E slopes of Mahavoho Hill (very wet types along Mahavoho River, less humid on slopes) with many tree ferns, palms and *Pandanus* spp.), alt. 300 m, 16°27'S, 49°46.9-47.5'E, corticolous; 16 August 1998, T. Pócs & A. Szabó 9878/CA (Holotype: EGR, isotype: TANA).

Other specimens seen (paratypes): MADAGASCAR, Toamasina Prov., Mananara Nord Biosphere Reserve and National Park: lowland rainforest on the NW slope of Behafotra Hill, alt. 250 m, with 3500 mm annual rainfall, 16°27.1-3'S, 49°47.6-9'E; 16 August 1998, T. Pócs & A. Szabó 9877/AO (EGR, G, TANA).

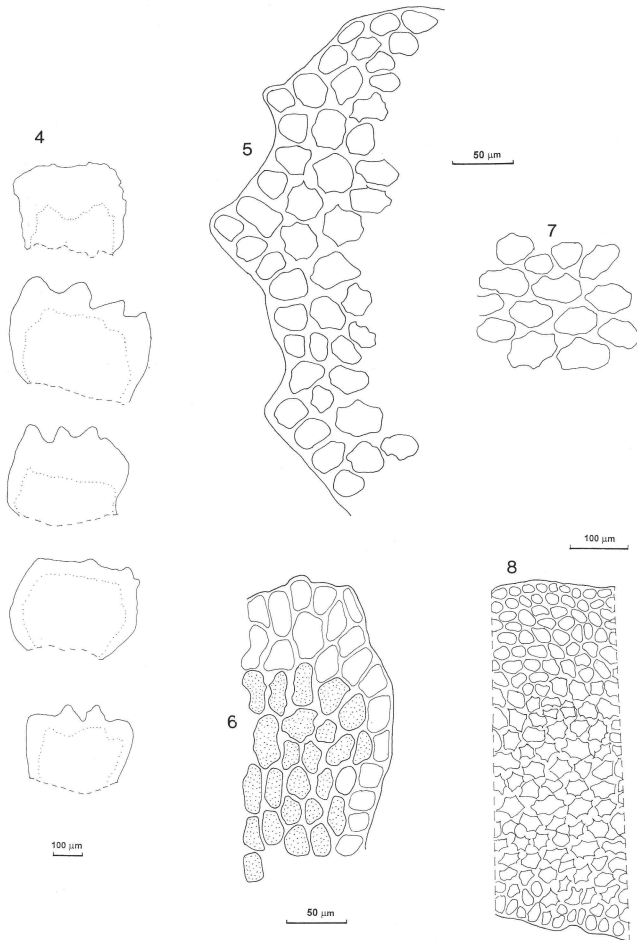
Plants dark green when fresh, dark brown in the herbarium, forming dense mats on bark. **Shoots** ribbon-like, up to 1.8 mm wide, stems about 200-220 µm in diameter. **Terminal branching** frequent, pseudodichotomous, with *Frullania*-type branches, **ventral-intercalary branching** common, almost always microphyllous; **branches** about 150 µm in diameter, with cells similar to those in normal leaves but smaller. **Leaves** densely imbricate, plane, ovate-oblong, mostly 0.85-0.90 × 0.45-0.60 mm, with almost parallel sides and entire margins, the apex rounded-entire to



Figs 1-3. *Bazzania konratiana*. **1.** Ventral view of part of stem (underleaf above the branch removed). **2.** First branch underleaf (on right) and adjacent stem underleaf. **3.** Leaves. All from the type specimen.

faintly two-three-lobed; **cells** \pm oval to isodiametric, thick-walled with large, bulging trigones, those in mid-leaf isodiametric to oval, mostly $20\text{--}25 \times 25\text{--}30 \mu\text{m}$, gradually becoming smaller and more isodiametric towards margins, $\pm 20 \mu\text{m}$ in diameter, cuticle verruculose. **Underleaves** subimbricate, quadrate, $0.34\text{--}0.38 \text{ mm} \times 0.32\text{--}0.46 \text{ mm}$, crenulate to irregularly 2-4-dentate or lobed at apex, with complete hyaline border variable in width, usually broadest (2-4 cells wide) across the top and extending in a row along the lateral margins; the hyaline cells similar in size to those of the chlorophyllose area but with thinner walls; chlorophyllose cells of underleaves similar to those in the lateral leaves but slightly smaller, with smaller trigones. Most of the underleaves are connate of their both sides by 1-3 cells with the lateral leaves. **Gynoeceia** and **androecia** not seen.

Etymology: It is named after Matthew von Konrat, renowned hepaticologist.



Figs 4-8. *Bazzania konratiana*. 4. Underleaves (dotted line indicates extent of hyaline margin). 5. Part of leaf apex. 6. Cells at margin of underleaf, showing the junction of chlorophyllose and hyaline cells. 7. Mid-leaf cells. 8. Segment of mid-leaf. All from the type specimen.

DISCUSSION

Madagascar and the East African Indian Ocean islands are known as biodiversity hotspots sheltering extraordinary biological diversity, even though Madagascar has lost as much as 80 percent of its original forest cover. Of the 14 species of *Bazzania* recognized from Africa, 11 species are known only from this region, of which 10 are endemic to Madagascar and/or one or more of the Indian Ocean islands. (Wigginton, 2009). *Bazzania konratiana* is a member of sect. *Connatae* (Steph.) Schiffn. It is similar to *Bazzania approximata* Onraedt, an

endemic species from the Seychelles (Onraedt, 1977) but differs from it in its generally larger size, the thick-walled leaf cells with large bulging trigones and the proportion of hyaline and chlorophyllose cells in the underleaves. A further species of *Bazzania* was recently described from Madagascar: the endemic *Bazzania orbanii* Pócs (Pócs, 2010), collected from the generally dry and very rocky Isalo National Park. A key to the *Bazzania* species which occur in the Mascarene Islands was given more than fifty years ago (Arnell, 1965), but several uncertain taxa need to be reassessed. The poorly known species *Bazzania integra* (Mont.) Trevis., although placed in synonymy with *Mastigobryum decrescens* Lehm. & Lindenb. by Stephani (1908: 856) and therefore not represented in the world checklist of hornworts and liverworts (Söderström *et al.*, 2016), shows superficial similarity to the new species. However, it differs by the broad connection of each underleaf with both lateral leaves and, additionally, the underleaves are much wider than long and lack the hyaline margin.

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