

NEW RECORDS FOR THE BRYOFLOTA OF VIETNAM, 6. *Bazzania tranninhiana* sp. nov. (Lepidoziaceae)

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During our visit to the Tam Đảo National Park in 1998, with the guidance of Prof. Trần Ninh, we collected a peculiar *Bazzania* species unknown from Vietnam before. This species, with its incurved, fragile leaf apices and deeply dissected underleaves proved to be new to science. This paper provides its illustrated description.

Key words: *Bazzania subtilis* group, endemics, new species, Tam Đảo

INTRODUCTION

Pócs (2024) gave an account on the epiphyllous liverworts collected in Tam Đảo National Park from 18 to 22 November 1998, guided by Prof. Trần Ninh from Hanoi University of Science, accompanied by the botanists of Dr Nguyễn Quốc Bình and Géza Kósa, within the frame of Vietnamese-Hungarian exchange of scientists. During that trip Tamás Pócs and Trần Ninh collected also other bryophytes. Among them was a relatively small species of *Bazzania*, with translucent and fragile habit, incurved leaves and deeply dissected underleaves. After thorough investigation, this species, unknown from Vietnam, turned out to belong to the *subtilis* group of *Bazzania*, recently studied in detail by Schwarz *et al.* (2023).

This group of species can be characterized by predominantly trilobate, sometimes bilobate or truncate, often fragile leaf apex, mostly falcate and vittate leaves and (with only one exception) strongly dissected underleaves. Schwarz *et al.* (2023) gave a detailed account on the history of these species. The first species from the group was described, as *Mastigobryum subtile* by Sande Lacoste (1864) from Java. Similar species were described later as *Mastigobryum wiltensii* Sande Lac. ex Steph. (1886), *M. palmatifidum* Steph., *M. pulchellum* Steph., *M. sikkimensis* (1908), *M. indigenarum* Steph (1924), *Bazzania remotifolia* Herzog (1950). These species are now named as *Bazzania subtilis* (Sande Lac.) Trevis. (1877), *Bazzania wiltensii* (Sande Lac. ex Steph.) Schiffn. (1898), *B. palmatifida* (Steph.) Grolle (1968), *B. pulchella* (Steph.) H. A. Mill. (1981), *B. indigenarum* (Steph.) N. Kitag. (1977) and *B. herzogiana* Meijer (1960).

Schwarz *et al.* (2023) studying the hepatic flora of the Philippines and South-East Asia, revised this group and added six new species and one variety to it, accompanied by a detailed key, descriptions and illustrations. This group, based on their morphological similarity, counts now 10 species and one variety. Their distribution spreads from India to the Philippines and the Pacific. Their greatest diversity is known from the Philippines, where 4 and New Guinea, where also 6 species occur, of which 6 are endemic (Schwarz *et al.* 2023).

Our species in all characters seemed to belong to the *Bazzania subtilis* group, but differs in some aspects from all known species. Its closest relatives are *Bazzania palmatifida* and *Bazzania palmatifidoides*, both known only from New Guinea.

DESCRIPTION OF THE NEW SPECIES

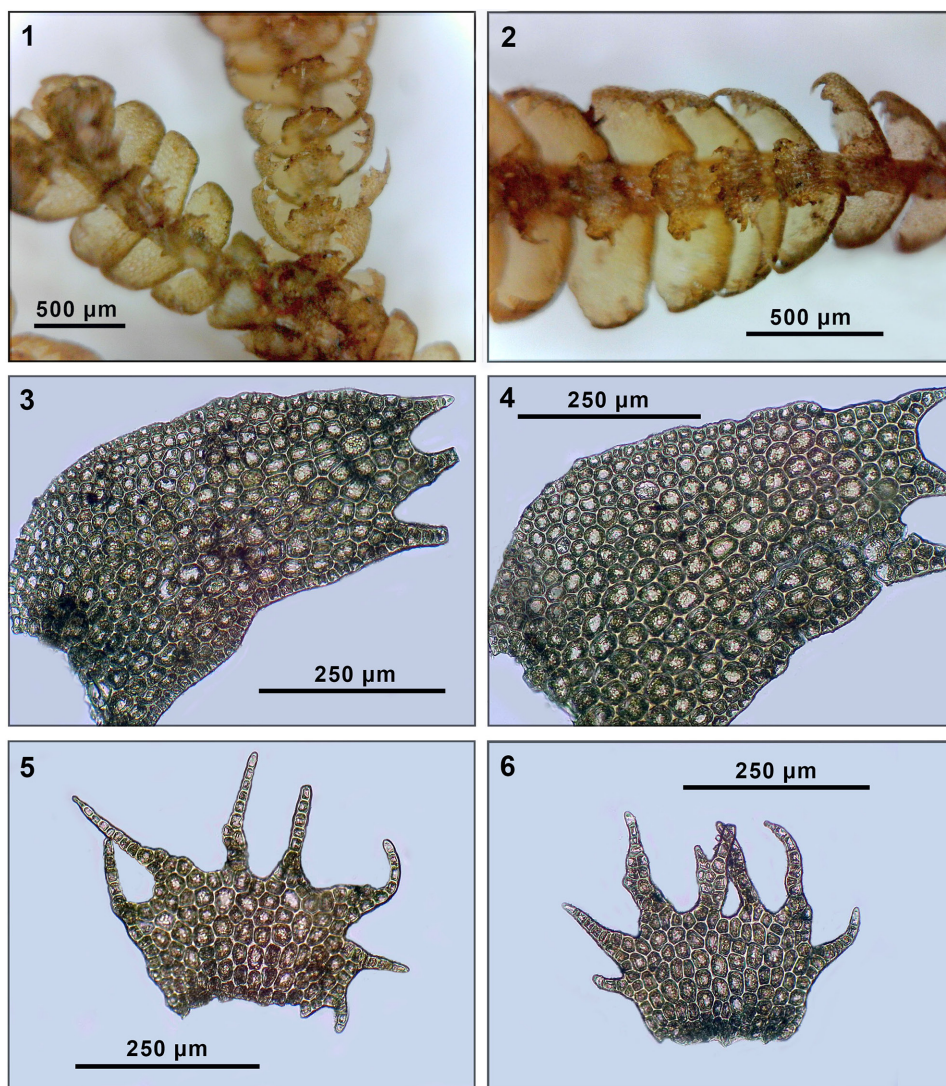
Bazzania tranninhiana Pócs et Gyarmati, *spec. nova*
(Figs 1–7)

Diagnosis: The new species approaches in appearance to *B. palmatifida* (Steph.) Grolle (J. Hattori Bot. Lab. 31: 1, 1968) and *Bazzania palmatifidoides* U. Schwarz, Schäf.-Verw. et Shevock (Frahmia 33: 17, 2023), but differs from both for the almost invisible existence of a vitta. In addition, from *B. palmatifida* differs by its smooth leaf lobe margins (serrulate in *B. palmatifida*) and by its very weakly verruculose cuticle (more verrucose in *B. palmatifida* and *B. palmatifidoides*). From *B. palmatifidoides* differs also by its falcate ventral leaf margin (straight by the latter species). It also differs in the leaf shape which is basally more rectangular and not ovate in *B. palmatifidoides* and *B. palmatifida*.

Type: VIETNAM, Vĩnh Phúc Prov.: Tam Đảo Mountains National Park. Mossy elfin woodland with Melastomataceae, Ericaceae (*Vaccinium* sp.) and Theaceae shrubs and small (1–3 m) trees on the summit (Đỉnh) Rừng Rinh at 1335–1345 m, alt. 21° 28.76' N, 105° 37.88' E, on bark. *T. Pócs Trần Ninh* 9897/A (Holotype: EGR 901910, isotype PHH0035045). Paratype: EGR 901909 with the same collecting information, on decayed wood, *T. Pócs & Trần Ninh* 9897/B (Isoparatypes G, HNU, PHH0035046).

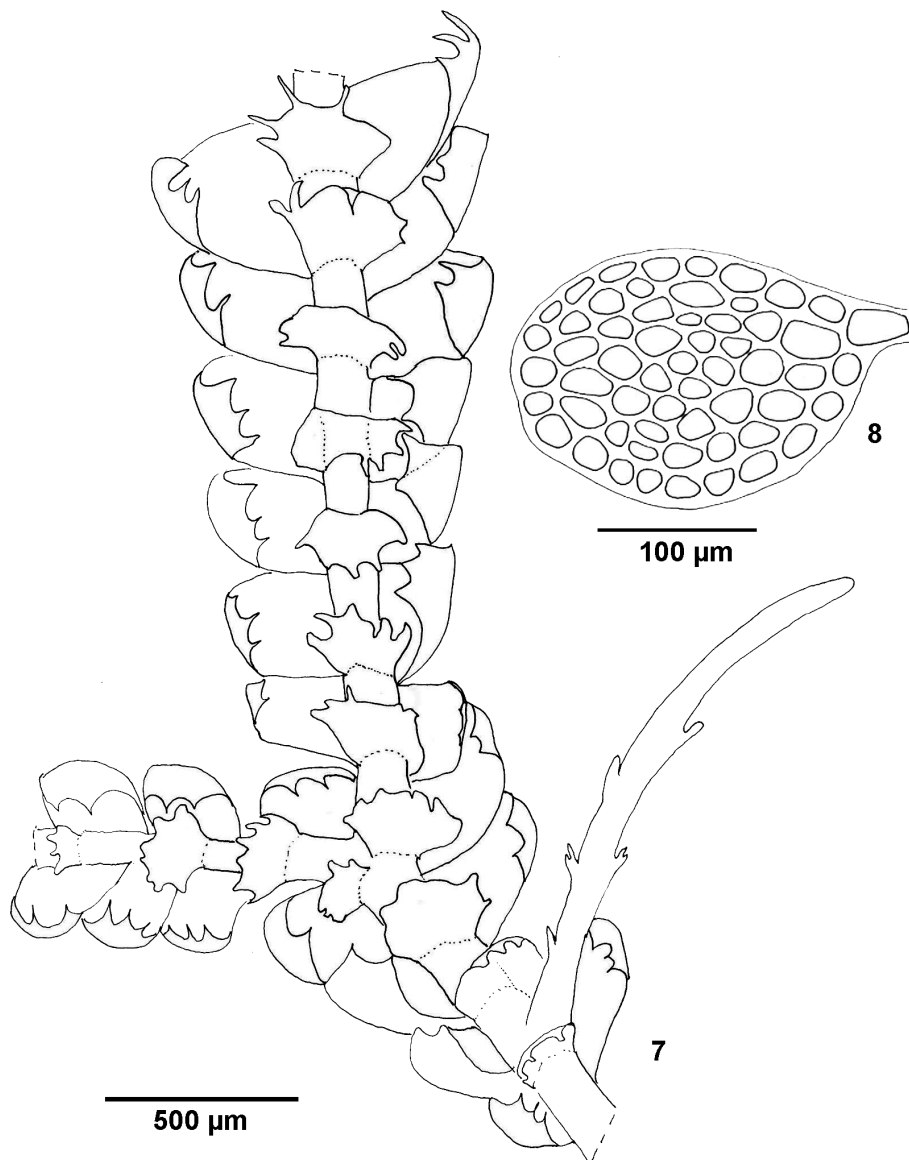
Description: The new species forms dense, palm size mats on bark of a tree at its type locality, dull green or olive or rust brown in dry state. The general habit looks very much like the one on the illustration of *B. palmatifida* holotype in Schwarz *et al.* (2023, plate 23–26), but the leaves have hardly visible vitta and their apices are more recurved and the lobes are not serrulate. Plants creeping, 1.5–2.0 cm long and 0.6–0.8 mm wide, pseudodichotomously branching (with 60–70° diverging) horizontal shoots and not too densely developing, ventral-intercalary microphyllous branches. Main stem diameter 160–180 µm,

in cross section has one layer of $17.5\text{--}20.0\text{ }\mu\text{m}$ cortical cells with *ca* $5.0\text{ }\mu\text{m}$ thick walls and $22.5\text{--}30.0\text{ }\mu\text{m}$ long medullary cells with slightly less thickened walls. Microphyllous branches up to $3\text{--}6\text{ mm}$ long, $50\text{--}160\text{ }\mu\text{m}$ thick, with distant, scale like, simple or $2\text{--}4$ lobed leaves of $45\text{--}50\text{ }\mu\text{m}$ long, $25\text{--}30\text{ }\mu\text{m}$ wide and sometimes with colourless rhizoids. Leaves imbricate, falcato-ovate, $400\text{--}450\text{ }\mu\text{m}$ long, $300\text{--}320\text{ }\mu\text{m}$ wide, trilobate (seldom bilobate), in their lower



Figs 1–6. *Bazzania tranminhiana*, spec. nova – 1–2 = habit, ventral views; 3–4 = side leaves; 5–6 = underleaves (photos by T. Pócs from the holotype)

third 12–18 cells wide, with recurved apex. The narrowing, acute and hooked lobe ends are often broken down probably for vegetative propagation. Both the leaves and underleaves are fragile. Median cells isodiametric or rectangle, 20–27(–37) μm long, gradually becoming smaller ($15.0 \times 22.5 \mu\text{m}$) towards



Figs 7–8. *Bazzania tranminhiana*, spec. nova – 7 = habit, ventral view; 8 = transversal section of main stem (Del. A. Sass-Gyarmati from the holotype)

the margins, vitta hardly can be observed. Cell walls thin, with very small trigones, cuticle weakly verruculose. Underleaves approximate, erect spreading or reflexed both in dry and wet stage, $240\text{--}270 \times 180\text{--}(200) \mu\text{m}$, connate on one side to the lateral leaves, wider than long, together with their lobes about twice of stem width. No hyaline margin, cell size smaller than leaf cells, $15.0 \times 22.5 \mu\text{m}$ in average. Divided from $\frac{1}{4}$ to half length into 4–8 uniseriate, seldom biseriate, 3–12 cells long segments, which are directed outward like fingers of an open palm and some of them ends in a hyaline papilla. The discus is 6–7 cells high and 12–18 cells wide. Insertion straight or near so.

Few gynoeical branches develop on the ventral side of the stem, but perianths and archegonia were not observed.

DISCUSSION

Although molecular studies were not yet carried out on most members of *Bazzania subtilis* group, at least a part of the species seem to be closely related and probably the result of the geographical isolation of taxa in the Indo-Pacific realm. It can be expected, that even more species of the group are waiting for description from the area. They seem to be mainly sterile or only one sex is known. Sporophytes were not observed. Therefore, most of them are propagated by fragmentation of leaf apices, of leaves or of the whole plant. It is an interesting question, how could members of this group so effectively disperse in such a big area consisting mainly of islands. However, at the same time, probably their reproduction limited to vegetative mood is the explanation, why so many geographically isolated taxa could evolve.

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