

The Synonymy of the African Moss Genus *Quathlamba* with the American genus *Neosharpiella*.

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The moss genus *Neosharpiella* was originally described by Robinson and Delgadillo (1973) and typified on the basis of a new species from alpine habitats in the mountains of central Mexico, *N. aztecorum* H. Rob. & Delgad. A second species was included from the Andes, *N. turgida* (Mitt.) H. Rob. & Delgad., that was originally described as a *Physcomitrium*. Among the distinctive features of this acrocarpous genus were its imbricated leaves that had blunt tips with distinctive 1- or 2-celled apices, and broadly oval to spherical capsules. Though not mentioned at the time, no attempt was made to place the genus in any other family than the Funariaceae in which the South American species had been originally described.

Recently, the senior author saw in the *Mosses of Southern Africa* (Magill 1987) the description of *Quathlamba* Magill, a new genus found at high elevations in alpine habitats in Lesotho. Despite the presence of a number of unusual gametophytic and sporophytic features, the genus had been placed in the Bartramiaceae because of its small mouthed, globose capsules, large warty spores, and stomata with two guard cells. The features of *Quathlamba*, however, including its thin, undifferentiated stem cortical cells, erect-appressed, ovate to elliptical or oblong-elliptical, nearly ecostate leaves, distinctive leaf areolation, and eperistomate, spherical capsules were those of *Neosharpiella*. Robert Magill and Bruce Allen at the Missouri Botanical Garden both made comparisons of the specimens and concluded that *Quathlamba debilicostata* Magill was not only a *Neosharpiella*, but that it was conspecific with an American species. As mentioned in the original description, African material has a spherical capsule with a small mouth and thin-walled exothecial cells that would most closely relate it to the Mexican species, *Neosharpiella aztecorum* rather than the Andean *N. turgida*. In addition, this synonymy is further confirmed by their axillary hairs: in *Quathlamba debilicostata* and *Neosharpiella aztecorum* the axillary hairs are three-celled (Fig. 1 E, F) while in *N. turgidum* they are two-celled (Fig. 1 I).

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Neosharpiella aztecorum H. Rob. & Delgad., Bryologist 76: 537. 1973.

Type: **Mexico**. Tlaxcala: N-facing slope of La Malinche, alpine, open, moist, soil, 11 Sep 1968, *Delgadillo 2599a* (holotype US; isotype MEXU).

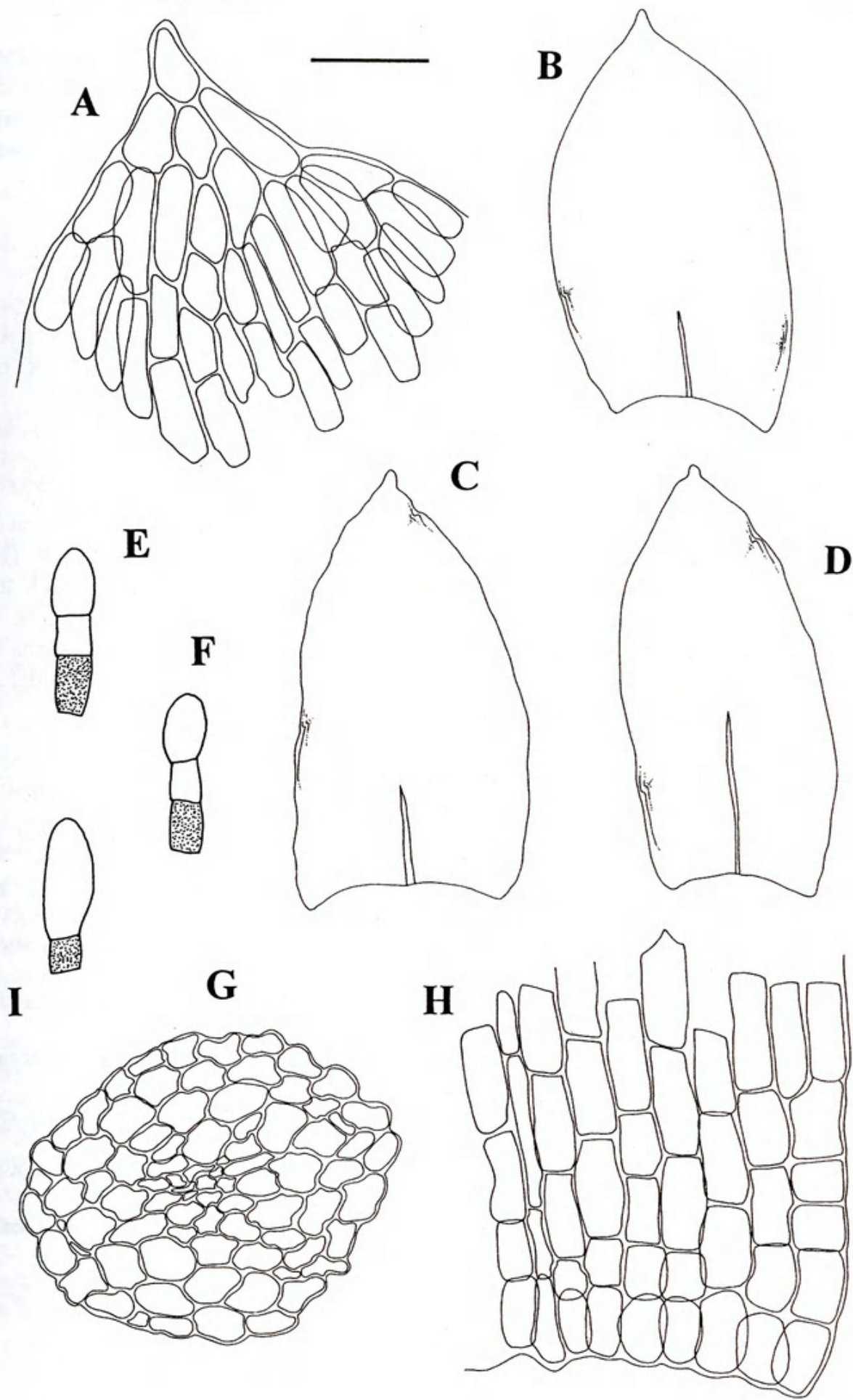
Quathlamba debilicostata Magill, Fl. Southern Africa, Part 1 (fasc. 2): 421. 1987. Type: **Lesotho**. Top of Sani Pass, on soil of rock crevices along northern cliff face just E of Mountain Lodge, 2860 m, *Magill 4512* (holotype MO; isotype PRE), *syn. nov.*

The familial disposition of *Neosharpiella* remains uncertain. Placement of the genus within the Funariaceae is not acceptable due to its perennial habit, small, non-inflated calyptrae, and most importantly the presence of stomata with two guard cells. Mature stomates that often have a single cell with a central pore are a distinctive feature of the Funariaceae (Sack and Paolillo 1983; Robinson 1997) and have been considered one of the strongest unifying features of the family (see Fife 1985; Allen & Pursell 1991).

As noted above, African material of *Neosharpiella* was placed in the Bartramiaceae on the basis of its capsule shape, spore size and ornamentation, and 2-celled stomata. Otherwise, there is no particular reason for such a placement. Indeed, its odd gametophytic features, such as weak to nearly absent costae, smooth leaf cells, and undifferentiated stem cortical cells all argue against putting the genus in the Bartramiaceae. There have recently been two morphological studies (Griffin & Buck 1989; Virtanen 2000) of the Bartramiaceae that included *Neosharpiella* (as *Quathlamba*). The former considered *Neosharpiella* sporophytically close to *Bartramidula*. This in combination with its three-celled axillary hairs and similarity to *Philonotis* species with obtuse leaves, weak costae, and smooth leaf cells led them to keep the genus in the Bartramiaceae. Virtanen (2000) found that in some analyses *Neosharpiella* was associated with a group of Bartramiaceae taxa with reduced peristomes (*Bartramidula* among others), and although she maintained *Neosharpiella* in the Bartramiaceae, its relationships within the family remained unresolved.

Fife (1980) examined *Neosharpiella* in a study that related the genus to the Gigaspermaceae rather than the Funariaceae. In his view *Neosharpiella* belonged in the Gigaspermaceae because of its weakly developed to nearly absent costae,

Figure 1. *Neosharpiella aztecorum*. A. Leaf apex. B–D. Leaves. E. Axillary hair (African material). F. Axillary hair (Neotropical material). G. Stem cross-section. H. Basal leaf cells and basal margin. *Neosharpiella turgida*. I. Axillary hair. Scale bar in mm: bar = 0.03 (E, F, I); bar = 0.06 (A, G, H); bar = 0.2 (B–D). Figures A–E, H from *Magill 7154a* (MO); figure F from *Cárdenas 4118* (MO); figure G from *Magill 4512* (MO); figure I from *Lewis 87363* (MO).



ovate to elliptical or oblong-elliptical leaves (Fig. 1 B–D), enlarged, oblong leaf cells (Fig. 1 A, H), non-inflated, cucullate calyptrae, spongy, strongly wrinkled capsules, and large, coarsely verrucate spores. Most importantly Fife found that although *Neosharpiella* had extremely fragile stems that made dissection difficult, there were some collections that had whitish rhizomes.

Our examination of *Neosharpiella* indicates that Fife was correct in putting the genus in the Gigaspermaceae. In two collections (*Cárdenas 4118* and *Crosby 13547* both MO) short, white, rhizomatous stems appeared to be present. Most collections of *Neosharpiella* we examined had extremely fragile stems that broke apart on dissection. In these collections rhizomatous stems could not be demonstrated. The stems in these collections did have a dense covering of whitish rhizoids, and in this respect were identical to the stems of *Chamaebryum pottiioides* Thér. & Dix. (*Magill 1981* MO), *Costesia spongiosa* Thér. (*Mahu 11361* MO), and *Gigaspermum repens* (Hook.) Lindb. (*Weber & McVean 33156* MO). In addition to the features noted above by Fife that support the placement of *Neosharpiella* in the Gigaspermaceae we would add two other features. The undifferentiated stem cortex of *Neosharpiella* (Fig. 1 G) is a perfect match for those found in the Gigaspermaceae, and its capsule shape is matched by those of *Chamaebryum* and *Costesia*. Still, in view of the very weak rhizomatous stems in *Neosharpiella* its placement in the Gigaspermaceae should be considered tentative until material can be collected for sequencing.

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