

Tropical Bryology 9: 123-130, 1994

Taxonomic Results of the BRYOTROP Expedition to Zaïre and Rwanda

27. Lepidoziaceae, II

Tamás Pócs

Eszterházy Teachers' College, Dept. of Botany, Eger, Pf.43, H-330, Hungary

The present treatment deals with the genera of *Lepidozia* and *Bazzania* in Central Africa, as the rest of the *Lepidoziaceae* was discussed in details by E. Fischer in the previous volume (Fischer 1993).

Abbreviations:

* New record for Rwanda viz. Zaire

KB: Kahuzi-Biega (Zaire)

Ka: Karisimbi (Rwanda)

Ny: Nyungwe Forest (Rwanda)

Ak: Akagera region (Rwanda)

Ki: Kigali region (Rwanda)

100-171: number of collecting site.

For locality data and description, see the contribution by E. Fischer (*Tropical Bryology* 8: 13-37, 1993). The specimens are deposited in the herbarium of the Conservatoire et jardin botanique Genève (G). Duplicates are in the herbarium of the author (except for unicates).

Lepidozioideae

In Central Africa the genera *Lepidozia*, *Sprucella*, *Kurzia*, *Telaranea* and *Arachnioposis* are represented. The tropical African representatives of the subfamily were reviewed by Pócs (1984).

Lepidozia Dum. emend. Joerg.

is represented in Central Africa by two subgenera:

- 1 Leaves obliquely to subtransversely inserted, quite uniform on main stem and branches, (3)4(5) lobed, with sinus reaching at least 1/3 of the leaf length. The reduced half leaf accompanying side branching and the first amphigastria of lateral branches are bifid, the latter is displaced so that the branch appears to originate from its axil. Seta *Lepidozia* type,

in African species with 12 or more rows of large cortical cells surrounding the smaller medullary cells. Its representatives in tropical Africa inhabit the montane rainforests, subalpine and afroalpine habitats.Subg. *Lepidozia* 1

- 1* Leaves longitudinally inserted, bifurcate, on the stem 3(4) lobed, on branches bilobed, the sinus not exceeding 1/4 leaf length. Reduced half leaf and the first amphigastria of lateral branches in general entire, lanceolate (occasionally bifid). The first amphigastria of side branches is not or slightly displaced, near ventral in position. Seta with 8 rows of large cortical cells surrounding the smaller medullary cells. Its representatives in tropical Africa inhabit the lowland rainforests.Subg. *Sprucella* (Steph.) Vanden Berghen 7

Subg. *Lepidozia*

The African species of this subgenus were left in a confusing state since their description. The widespread *L. cupressina* was known from Africa under different local names (*L. natalensis*, *L. truncatella*) while most local taxa were described by Stephani, based only on the type specimens. In one work (Stephani 1910) he had described at least three taxa which, after studying adequate material, can not be distinguished at species level. Arnell's treatment for the South African species did not help much to solve the confusion. The difficulty with African *Lepidozia* is represented partly by the fact, that the taxa are highly variable. The two most widespread species (*L. cupressina* and *L. stuhlmannii*) are very malleable, producing both ecologically and geographically differing infraspecific units. The characters used before to delimit different species are partly good to distinguish these infraspecific taxa, like geographical subspecies (races) with own distribution or sympatric varieties sometimes differing in their ecology. Series of transitional forms interconnect these infraspecific taxa. In other cases the differences, on which the distinction of species were based, have no taxonomic significance at all.

In case of *L. stuhlmannii* and *L. lacerata* even within a single population or single specimen one can observe such characters, which were used to distinguish these species. In my revision (Pócs 1984), after studying the type specimens and some of the material accumulated since Stephani's descriptions, I tried to delimit the African *Lepidozia* species. Since the publication of my Synopsis I studied much more material, including the BRYOTROP collections from central Africa and on this base I try to re-evaluate my concept and to supply key for the Central African taxa, as follows:

Key for the Central African taxa of *Lepidozia*

- 1 Leaves very asymmetrical. Dorsal base auriculate, exceeding the midline of the stem, concealing its dorsal side. Additional teeth at leaf and amphigastria base often present. The breadth of largest leaf lobes often more than 8 cells. Leaf cells with evenly thickened cell wall. The amphigastrium lobi elongate-acute lanceolate, at 6 cells distance from apex never broader than 2 cells. Oil bodies medium to large, 3-5 per cell, coarsely granulated, Jungermannia or Calypogeia type.2
- 1* Leaves less asymmetrical. Dorsal base, if bulging at all, never auriculate and neither reaching the midline, none concealing the stem. Additional teeth never occur on leaf or amphigastrium base. The breadth of largest leaf lobe always less than 6 cells. Leaf cells thin or unevenly thickened with small trigones at least in cells near the leaf margin. The amphigastrium lobi broad or narrow triangular, at 6 cells distance from apex always 3 or more cells broad. Oil bodies small to medium size, 6-16 per cell, homogenous or consisting of 2-5 segments, Bazzania type.3
- 2 Leaves with 3-4 lobes. With only 1-2 small additional teeth at certain leaf and amphigastrium bases. Medium sized to large, yellowish or olive green plants with stem up to 5 cm length (usually much

- smaller, 2-4 cm long). Widespread montane and subalpine forest plant..... *Lepidozia cupressina* (Sw.) Lindenb. ssp. *cupressina*
- 2* Leaves with 4-5 lobes. Large teeth occur on practically all leaf and amphigastrium bases. Robust, pale or vivid green plants with stems regularly of 5-7 cm size. Restricted to the upper montane and subalpine ericaceous belt of Ruwenzori and Kilimanjaro mountains..... *Lepidozia cupressina* (Sw.) Lindenb. ssp. *quinquefida* (Steph.) Pócs
- 3 Elongate (up to 6 cm), pale green, weekly and irregularly branching plant with lax, remote, asymmetric, usually 3 lobed leaves. Amphigastria with low disc, wider than long but not wider than the stem, at insertion 10-28 cells broad, inserted to 6-17 ventral merophytes. Larger stems with 27-50 cortical and 100-230 medullary cell rows (14-19 cells wide and 12-17 cells high). Usually intermixed among other bryophytes, especially in Sphagnum, rare in tropical Africa, at Afroalpine habitats. *Lepidozia pearsonii* Spruce
- 3* Small to medium sized (shoots up to 5 cm, but usually shorter) more regular pinnately branching plants with remote to imbricate, 3-4 lobed leaves. Amphigastria with high disc (except *L. abyssinica*), at insertion 8-15 cells broad, inserted to 4-9(10) ventral merophyte cells. Stems with 23-25 cortical and with 58-63 medullary cells (approximately 12-14 cells wide and 10 cells high). In tropical Africa plants from the montane rainforest to the Afroalpine belt.4
- 4 Leaves distant to contiguous, concave, turned inwards, towards the stem, hence the shoot threadlike. The cells have small trigones at least in the lobi. Angle of branches approx. 60° to the stem. Usually yellowish to olivaceous green plants. Amphigastria round in outline, widest at their middle, usually much wider than the stem. The sinus between the amphigastria lobi usually V shaped.5
- 4* Leaves contiguous to imbricate, plane or slightly concave, only the lobi are incurved, hence the shoot is flat. Trigones not or slightly visible. Angle of branches 70-90° to the stem. Pale, dull or dark green plants. The amphigastria narrower or only slightly wider than the stem. The sinus between the amphigastria lobi usually U shaped.....6
- 5 Small to medium sized plants forming quite rigid mats with stems parallel to the substrate. Leaves longer than wide, very asymmetric, with unequal lobes, the dorsal being the longest, which turns towards the apex. Widespread Afro-montane taxon. *Lepidozia stuhlmannii* Steph. ssp. *stuhlmannii*
- 5* Minuscule plants (with 0.5 to 2 cm long shoots) forming dense, soft, pale olivaceous green, cushionlike mats with stems directed in all directions. Leaves very concave, symmetric, with the two central lobes being longer than the lateral ones. Rare afroalpine taxon..... *Lepidozia stuhlmannii* Steph. ssp. *pulvinata* (Steph.) Pócs
- 6 Pale or dull green plant with spatulate amphigastria, broadening upwards. Cells with thin or evenly thickened walls, no trigones. Amphigastria usually equalling or slightly broader than the stem, with lobules broad triangular, 4-6 cells wide at their base and with high discus. Very rare in tropical Africa, only in subalpine habitat. *Lepidozia reptans* (L.) Dum.
- 6* Vivid green plant with very low amphigastria equalling or narrower than the stem. At least here and there higher, round shaped amphigastria occur. Cells with slight trigones at least in leaf lobules. Amphigastrium lobes usually narrow, 1-2 cells broad at their base. Widespread in the Afro-montane belt, usually occurs together with typical *L. stuhlmannii*.

Lepidozia stuhlmannii Steph. var. *abyssinica* (S. Arnell) Pócs

Lepidozia cupressina (Sw.) Lindenb. ssp. *cupressina*

African synonym: *Lepidozia truncatella* Nees in Gott.

L. cupressina is a widespread amphiatlantic species (see map 44 in Gradstein et al. 1983) with southern temperate character, but its ssp. *pinnata* (Hook.) Pócs lives in the Atlantic coast and islands of Europe down to Canary Islands. Ssp. *cupressina* is the most widespread, from the montane forests of the Caribbean Islands through the Andes to Fuegia and in Southeast Africa from Cape to East and Central Africa and to the Cameroon Mts. In many parts of South Africa is replaced by ssp. *natalensis* (Steph.) Pócs while in Afroalpine areas its ssp. *quinquefida* (Steph.) Pócs occur. In East Africa an undescribed ssp. is present. In our area ssp. *cupressina* occurs from 2100 m in the montane forest belt to 3200 m in subalpine heath vegetation, on very different substrates. It is conspicuous, that we could not record it from Mt. Karisimbi, while the species occurs on the neighbouring volcanoes, as on Nyamuragira, Mikenko and Sabyinyo.

Ny: 103, Pócs 6123; 112, Frey & Kürschner 7957; **KB:** 131, Pócs 7135; 132, Frey & Kürschner 6898, 6900, 6905b, 6908; Pócs 7107, 7185; 141, Frahm 7348; 144, Pócs 7803; 145, Pócs 7737, 7753; 148, Frey & Kürschner 7472; Pócs 7696, 7862a, 7881, 7884; 149, Frey & Kürschner 7747a.

Lepidozia pearsonii Spruce

Syn.: *Lepidozia hyalina* Steph.

In my synopsis (Pócs 1984) I treated under this species, as synonym, also the Afroalpine *Lepidozia carnosia* Steph. in Mildbr. 1910. Although its very lax appearance with elongate stem and trilobate leaves really reminds *L. pearsonii*, the symmetric leaves, the round amphigastria with high disc and the narrow stem suggests more a lax variety of *L. stuhlmannii* ssp. *pulvinata*. *Lepidozia carnosia* is known from Ruwenzori, Karisimbi and from Inyanga Mts. in Zimbabwe. Although *L. carnosia* was described from Mt. Karisimbi at 3400 m altitude by Stephani, we did not find it. Anyway, more material is needed to obtain a final solution. *Lepidozia pearsonii* in strict sense is an atlantic European

species, which occurs only very sporadically in the high African mountains, in the Afroalpine habitats of Ruwenzori, Karisimbu, Muhawura and of Mt. Kenya, between 3000 and 4250 m, in rock crevices or among Sphagnum. Sorry, we could not collect it on the Rwanda side of Mt. Karisimbi. J-L. De Sloover collected it on the NNW, Zaïrean side at 4250 m altitude.

**Lepidozia reptans* (L.) Dum.

A Laurasian species widespread in temperate North America and Eurasia, with occurrences in the mountain areas of Central America and the Malayan archipelago but hitherto unknown from tropical Africa (Gradstein & Vána 1987: 413, map 19). Its separation from the Afromontane *Lepidozia stuhlmannii* is not easy, but the thin or very evenly thickened leaf cell walls and the shape of amphigastria proves to be helpful. The species has to be very sporadic in the high montane areas of Africa, similarly to *L. pearsonii*, as hitherto known only from the montane forests of Kahuzi-Biega National Park in Zaïre, from Agauria bark at 2400 m altitude.

KB: 128, Pócs 7646.

Lepidozia stuhlmannii Steph. Bot. Jahrb. Syst. 20: 308 (1895)

Syn. nov.: *Lepidozia lacerata* Steph.

Spec. Hep. 3: 562 (1909)

After studying many specimens, on one hand, *Lepidozia lacerata* Steph. was not separable any more from *L. stuhlmannii* Steph. On the other hand I found this complex well separable from *Lepidozia pearsonii* Spruce, especially by the size of the stem and number of cells in it. Therefore my attempt (Pócs 1984) to treat *L. lacerata* as a variety of *L. pearsonii*, is not any more tenable and necessary. *Lepidozia stuhlmannii* is a widespread Afromontane species known from Cameroon to East Africa, South Africa and to Réunion. It needs further studies to prove, whether the Southeast Asian *Lepidozia stahlia* Steph. also belong or not, to this species. In our area *L. stuhlmannii* is widespread on different substrates in the montane forest belt from 2400 to 3300 m altitude.

Ny: 103, Frahm 6173; 155, Pócs 8024; **KB:** 128, Pócs 7381; 131, Pócs 7134; 132, Frey & Kürschner 6905c; Pócs 7106, 7108, 7110, 7141, 7182, 7190; 133, Frey & Kürschner 6980a; 135,

Frey & Kürschner 7004; 144, *Pócs 7802*; 145, *Pócs 7631*; 148, *Frey & Kürschner 7455*; 148, *Frey & Kürschner 7456b*; *Pócs 7862, 7864*; 149, *Pócs 7594*; **KB**: 159, *Pócs 8083, 8174, 8197* (transitional to ssp. *pulvinata*), 8330.

Lepidozia stuhlmannii Steph. **var. abyssinica** (S. Arnell) **Pócs, comb. nov.**

Basionym: *Lepidozia abyssinica* S. Arnell, Sv. Bot. Tid. 54: 189, figs. 1-2 (1960).

The specimens encountered within this taxon, seemingly are very distinct from *L. stuhlmannii* Steph. by their low amphigastria narrower than the stem and by the flat leaves and by their branches more or less perpendicular to the stem. But almost all specimens (including the type) have here and there also round amphigastria typical to *L. stuhlmannii* and there are specimens completely transitional between the two. *L. abyssinica* proved to be sympatric with *L. stuhlmannii*, often sharing the same locality. Therefore it proved to be the best to treat as variety of the latter. It is widespread from Cameroon to Ethiopia and to East Africa.

NY: 135, *Frey & Kürschner 7006*; 141, *Pócs 7310*; **KB**: 103, *Pócs 6162*; 108, *Fischer 6395a* (transitional to the typical *L. stuhlmannii*); *Pócs 6354*.

Lepidozia stuhlmannii Steph. **ssp. pulvinata** (Steph.) **Pócs comb. nov.**

Basionym: *Lepidozia pulvinata* Steph. in Mildbr. Wiss. Erg. Deut. Zentr. Afr. Exped. 1907-8, II: 121 (1910)

Syn. nov.: *Lepidozia pearsonii* Spruce var. *pulvinata* (Steph.) **Pócs Proc. Third Meeting CEBWG, Praha 1982: 110 (1984)**

Although easily recognizable by its stature, transitions occur between *L. pulvinata* and *L. stuhlmannii*. Central African endemic subspecies, known only from the Afroalpine habitats of Ruwenzori, Karisimbi and Muhawura at 3400-4200 m altitude. In our investigation area was found on Mount Karisimbi, on ericaceous and Hagenia bark and on decaying wood at 3070-3700 m altitude in the subalpine and Afroalpine belts.

Ka: 159, *Pócs 8151, 8222*; 162, *Pócs 8087, 8134, 8301, 8230*; 167, *Fischer 8120*.

Subg. *Sprucella* (Steph.) Vanden Berghen

The genus *Sprucella* was distinguished by Stephani (1887), while the quite parallel *Neolepidozia* was created and both genera was discussed in details by Fulford and Taylor (1959). They considered them, as segregate genera of *Lepidozia*. Species of *Neolepidozia* according to this concept do not occur in tropical Africa. *Neolepidozia* later was merged partly in *Telaranaea*, partly in *Lepidozia* (Schuster 1963, Grolle 1983, Piippo 1984). The genus *Sprucella* consisted of two African species, both described formerly as *Lepidozia: Sprucella succida* (Mitt.) Steph. and *Sprucella ubangiensis* (Steph.) Fulford & J. Taylor. Vanden Berghen, who dealt with *Sprucella* twice in details, formerly (Vanden Berghen 1946) recognized the genus *Sprucella*, but later (Vanden Berghen 1983) considered it to be only a subgenus of *Lepidozia*. Taking in account, that *Sprucella* is distinguished by characters, which are similar in significance to the characters distinguishing the other subgenera of *Lepidozia* (cf. Schuster 1972) and in most characters agrees with the rest of *Lepidozia*, I accept the more modern concept of Vanden Berghen (1983) and consider *Sprucella* to be a subgenus of *Lepidozia*, at similar rank to the other subgenera established by Schuster (l.c.). Otherwise all *Lepidozia* segregates at the same level should be uplifted to generic rank, which could cause unnecessary chaos within the group. I consider the two *Lepidozia* species belonging to subgenus *Sprucella* independent, in contrast to the opinion of Vanden Berghen (1983), who considers them only varieties of the same species. I could not see real transitions between the two taxa. Their distincton, based on the cell size and on the number of cells in the leaf, is easy. Their distribution, even if partly coincide, is not equal. *Lepidozia ubangiensis* has a much smaller area of distribution, occurring only in Zaïre, Congo, Gabon and in the Central African Republic, while *Lepidozia succida* is widespread in the lowland rainforests from the Republic of Guinea to Uganda and has an isolated occurrence even in Madagascar. In addition, in the overlapping distribution area, they may occur together, maintaining their distinctive characters:

Key to the species of subgenus *Sprucella*

- 7 Stem leaf 15-30 cells wide, cells 18-40 x (30)35-63(70)µm in size.....
.....*Lepidozia succida* Mitt.
- 7* Stem leaves 20-44 cells wide, cells 10-16(23) x 25-30(35) µm in size
.....*Lepidozia ubangiensis* Steph.
- Lepidozia succida* Mitt.
Syn.: *Sprucella succida* (Mitt.) Steph.
Sprucella moenkemeyeri Steph.
Lepidozia longitexta Steph.
Lepidozia laurentii Steph.
- The only representative of the subgenus in the investigation area. Widespread lowland rainforest species occurring in Kahuzi-Biega National Park from 850 to 1500 m altitude, on forest soil, roadside banks, shady rocks and decaying wood, never on bark.
KB: 119, *Pócs* 6863, 6865, 6872; 120, *Frey & Kürschner* 6594; *Pócs* 6618, 6619, 6622; 123, *Pócs* 6764; 124, *Pócs* 6783; 125, *Pócs* 6630, 6842; 126, *Pócs* 6828, 6829; 127, *Pócs* 6889.

Acromastigoideae

Bazzania S.F. Gray

3 species and 2 subspecies occur in Central Africa out of the 4 continental African *Bazzania* species, while 6 other species are restricted to the Indian Ocean Islands (Arnell 1965, Jones 1975, 1980, Onraedt 1977). The Seychelles have 2, Madagascar 3 and Mauritius one endemic species along the more widespread ones. Although the African taxa were thoroughly revised by E.W Jones (1975) quite recently, he did not provide a key. Therefore it seemed to me practical to supply a key for the continental African species, which all belong to the Subgenus *Tridentatae* Fulford:

Key for the continental African species of *Bazzania*

- 1 Leaves without a vitta.2

- 1* Leaves with a vitta of 2-4 rows of cells at least twice as large as the surrounding lamina cells. The oil bodies of vitta cells are also much bigger. Underleaves usually quadrifid (or bifid), consisting in greater part of hyaline cells. *Bazzania nitida* (Weber) Grolle
- 2 Amphigastria distinctly connate at least at one side with the adjacent leaves. Leaf apices usually tridentate and denticulate among the teeth. Amphigastria with hyaline cells at least in the apices of teeth. Mostly green plants.3
- 2* Amphigastria totally free. Leaf apices tridentate but not denticulate among the teeth. The amphigastria totally lacking any hyaline cells. Often brownish plants.5
- 3 Leaves caducous. Small to medium sized plants, shoot width never exceeds 2 mm. With usually 2 lobed underleaves. *Bazzania decrescens* (L. & L.) Trev. ssp. *pumila* (Mitt.) Pócs
- 3* Leaves not caducous. Medium to large sized, shoot width 1 to 3 mm (in the Mascarenes up to 4 mm). Underleaves 2 or 4 lobed4
- 4 Small to medium sized, shoot width only up to 2.3 mm. The underleaves narrowly connate with leaves and usually only at one side. Underleaves with well marked apical hyaline zone sometimes exceeding its half length. West African.
.....*Bazzania decrescens* ssp. *molleri* (Steph.) E.W. Jones
- 4* Very variable in size, shoot width from 1.6 to 3.6 mm. Underleaves usually distinctly and widely connected to the adjacent leaves. Hyaline margin on amphigastria usually absent or very narrow and discontinuous, only the apical cells of teeth are normally hyaline.
.....*Bazzania decrescens* (Lehm & Lindenb.) Trev. ssp. *decrescens*
- 5 Underleaves large, orbicular, at base in most cases auriculate, 2-3 times as wide as the stem. Shoots 2-3.5 mm broad, stems 250-350 µm diam. Madagascar, Mascarene Islands, in continental Africa only in Mulanje and Uluguru Mts. *Baz-*

zania borbonica (Steph.) Steph.

- 5* Underleaves smaller, orbiculate, at base often slightly decurrent but never auriculate, 1.2-2.5 times as wide as the stem. Strong shoots up to 2 mm width, with stems up to 230 µm diameter. On Mt. Cameroon and in the Central and East African mountains in the subalpine and Afroalpine belt, never below 2700 m.
Bazzania roccatii Gola

Bazzania decrescens (Lehm. & Lindenb.) Trev.
ssp. *decrescens*

Widespread in tropical Africa from Gabon to Mauritius. In case if proves to be identical with the closely related *Bazzania adnexa* (Lehm. & Lindenb.) Trev., its area of distribution extends to Australia, Tasmania and New Zealand. In our area it is a rainforest species on bark and decaying wood from 900 to 2560 m. According to Jones (1975:303) slender forms transitional to ssp. *molleri* occur in Rwanda with narrowly connate underleaves but the underleaves have only a few hyaline cells. I observed such transitional forms among the Nyungwe specimens.

Ny: 107, *Pócs* 6311, 6313, 6322a; 108, *Pócs* 6368, 6373; 111, *Frey & Kürschner* 7907a; 155, *Pócs* 8015; **KB:** 119, *Pócs* 6864; 120, *Frey & Kürschner* 6576; *Pócs* 6623, 6628; 121, *Pócs* 7624; 124, *Frey & Kürschner* 6675a; 125, *Pócs* 6718; 130, *Pócs* 7084; 131, *Pócs* 7098a; 133, *Frey & Kürschner* 6979, 6980b; 135, *Frey & Kürschner* 7005; *Pócs* 7233; 141, *Pócs* 7306; 142, *Pócs* 7379a; **Ka:** *Fischer* 8119.

Bazzania decrescens (Lehm. & Lindenb.) Trev.
ssp. *pumila* (Mitt.)

Pócs comb. et stat. nov.

Basionym: *Bazzania pumila* Mitt. J. Linn. Soc., Bot. 22: 322 (1887)

Synonym: *Bazzania pulvinata* Steph., *Hedwigia* 30: 267 (1891)

Jones (1975) dealt in details with *Bazzania pumila*, stating that could observe both *Bazzania decrescens* and *B. pumila* characters in different parts of the same mat. Therefore he has put *B. pumila* in the synonymy of *B. decrescens*. At the same time he admitted that *B. pumila* is restricted to a certain area of East Africa and that certain

characters, as the bilobed amphigastrium and smaller stature is usually accompanying the presence of caducous leaves. During my second 5 years stay in East Africa, Tanzania I tried to collect information on this mysterious taxon. *Bazzania pumila* with caducous leaves occurred very many cases on Mt. Kilimanjaro, where my son Bence collected it even from the canopy of *Ocotea usambarensis* mist forests. I observed it also in other Tanzanian mountains (Pare, Nguru Mts.) and then in the Comoro Islands. In the field never had doubt, whether the plant at hand is *Bazzania decrescens* or *B. pumila*, the absence or presence of caducous leaves was always so obvious character. In herbarium specimens is also very easy to recognize the denuded stems and the fallen leaves accumulated in the specimen bag. In Europe species with caducous leaves are distinguished at different level, like *Bazzania flaccida* against the non caducous *B. tricrenata*, as species or *Bazzania trilobata* var. *depauperata* as variety against the non caducous *B. trilobata* (Grolle 1972). As *Bazzania pumila* has a well defined distribution within the whole area of *Bazzania decrescens*, but might have also transitional forms to it, I considered the subspecies rank as the most suitable to accommodate this taxon, similarly to the other subspecies within *Bazzania decrescens*, ssp. *molleri*. The two vicariant subspecies seem to substitute each other in West and East Africa respectively and meet right in Central Africa. In our area *Bazzania decrescens* ssp. *pumila* occurs in montane forest areas between 2000 and 2700 m, almost exclusively on bark, with preference to Ericaceae.

Ny: 103, *Pócs* 6163, 6166; 107, *Frahm* 6300; 112, *Frey & Kürschner* 7956; **KB:** 128, *Frey & Kürschner* 7331; 128, *Pócs* 7394, 7402, 7625; 132, *Pócs* 7143; 133, *Pócs* 7201; 134, *Pócs* 7224; 136, *Pócs* 7247; 139, *Pócs* 7298; 144, *Pócs* 7586; 145, *Frey & Kürschner* 7500, 7502; *Pócs* 7650.

Bazzania nitida (Web.) Grolle

Southern temperate species distributed in from South America (S-Brasil, Chile-Patagonia) through South and tropical Africa to Australia. In our area typical montane forest species between 2000 and 2740 m altitude, occurring on different substrates.

Ny: 107, *Pócs* 6322b; 108, *Pócs* 6351; 111, *Pócs* 6412; 112, *Pócs* 6437; 113, *Pócs* 6477; 155, *Pócs*

8022; **KB**: 141, *Pócs* 7308; 145, *Pócs* 7662, 7769.

Bazzania roccatii Gola

In the higher mountains of tropical Africa from Mt. Cameroon to Mt. Kilimanjaro, in the upper montane, subalpine and Afroalpine belt between 2700 and 4000 m. In our area from 2700 to 3300 m in altimontane Hagenia-Hypericum forest, elfin forest and in subalpine ericaceous heath with scattered giant *Senecio* trees.

KB: 132, *Frey & Kürschner* 6905a; *Pócs* 7103; 148, *Frey & Kürschner* 7456a, 7459, 7478; *Frahm* 7900; *Pócs* 7858, 7887, 7888; 149, *Frey & Kürschner* 7448, 7453; *Pócs* 7743; **Ka**: 159, *Pócs* 8319, 8320.

References

- Arnell, S. 1960.** Hepatics collected by Dr. John Eriksson in Abyssinia in 1958. *Svensk Bot. Tid.* 54: 187-192.
- Arnell, S. 1965.** *Hepaticae* collected by Gillis Een in Mauritius and Réunion in 1962. *Svensk Bot. Tid.* 59: 65-84.
- Fulford, M. & J. Taylor 1959.** The segregate genera of the *Lepidozia* complex (*Hepaticae*). Part 1. *Sprucella* Steph. and *Neolepidozia* gen. nov. *Brittonia* 11: 77-85.
- Fischer, E. 1993.** Taxonomic results of the BRYOTROP Expedition to Zaire and Rwanda 10. Trichocoleaceae, Geocalycaceae, Acrobolbaceae, Balantiopsidaceae, Lepidoziaceae (*Teleranea*, *Arachniopsis*), Calypogeiaceae, Adelanthaceae, Porellaceae, Jubulaceae, Marchantiaceae (*Dumortiera*), Polytrichaceae. *Tropical Bryology* 8: 83-98.
- Gradstein, S.R., T.Pócs & J.Vána 1983.** Disjunct *Hepaticae* in tropical America and Africa. *Acta Bot. Hung.* 29: 121-171.
- Gradstein, S.R. & J.Vána 1987.** On the occurrence of Laurasian liverworts in the tropics. *Mem. New York Bot. Garden* 45: 388-425.
- Grolle, R. 1972.** *Bazzania* in Europe und Makaronesien. Zur Taxonomie und Verbreitung. *Lindbergia* 1: 193-204.
- Grolle, R. 1983.** Nomina Generica Hepaticarum; references, types and synonymes. *Acta Bot. Fennica* 125: 1-86.
- Jones, E.W. 1975.** African Hepatics. XXVII. *Bazzania*. *J. Bryol.* 8: 299-316.
- Jones, E.W. 1980.** African Hepatics. XXXII. Some little-known species and extensions of range. *J. Bryol.* 11: 311-323.
- Onraedt, M. 1977.** Bryophytes des îles Mascareno-malgaches et Seychelles III. *Hepaticae/Bazzania*. *Bull. Jard. Bot. Nat. Belg.* 47: 139-144.
- Piippo, S. 1984.** Bryophyte flora of the Huon Peninsula, Papua New Guinea. VI. *Acta Bot. Fennica* 21: 309-335.
- Pócs, T. 1984.** Synopsis of the African *Lepidozioideae* K.Müll. In J.Vána (ed.): Proceedings of the Third Meeting of the Bryologists from Central and East Europe, Praha, 14th - 18th June 1982, Univ. Karlova, Praha: 107-119.
- Schuster, R.M. 1972.** Phylogenetic and taxonomic studies on *Jungermannioideae*. *J. Hattori Bot. Lab.* 36: 322-405.
- Stephani, F. 1887.** *Hepaticae* africanae. *Engl. Bot. Jahrb.* 8: 79-95.
- Stephani, F. 1910.** *Hepaticae* in J. Mildbraed (ed.): Wissenschaftliche Ergebnisse der Deutschen Zentral-Afrika Expedition 1907-1908 unter Führung Adolf Friedrichs, Herzogs zu Mecklenburg. Klinkhardt & Biermann, Leipzig: 111-134.
- Vanden Berghen, C. 1946.** Note sur *Sprucella succida* (Mitt.) Steph. au Congo Belge. *Bull. Jard. Bot. État, Bruxelles* 18: 89-95.
- Vanden Berghen, C. 1983.** *Lepidozia* Dum. emend. Joerg. subgen. *Sprucella* (Steph.) Vanden Berghen comb. et stat. nov. (*Hepaticae*). *Bull. Jard. Bot. Nat. Belg.* 53: 321-330.

