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A NEW SPECIES OF *AMPHICEPHALOZIA* (HEPATICAE) FROM MADAGASCAR

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Abstract: *Amphicephalozia geisslerae* is described from the collection made by Patricia Geissler in NW Madagascar, Manongarivo Special Reserve. It is the second species of *Amphicephalozia* R. M. Schust., a genus hitherto known from Patagonia, southern Chile. The occurrence of the southern temperate Gondwana element in Madagascar is discussed.

Key words: Hepaticae, Cephaloziellaceae, *Amphicephalozia,* Madagascar, Gondwana

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Amphicephalozia amplexicaulis was described by Schuster (1971) as representative of a new monotypic, southern temperate genus from the collection of Halle and Skottsberg, made in southern Patagonia during 1908.

During February–March 1998 and in 1999 the Conservatoire et Jardin botaniques de la ville de Genève organized joint expeditions with Madagascar botanists in the Manongarivo Massif at the northwestern part of the island. Patricia Geissler took part in the expedition as a bryologist and made a thorough collection in the area, almost unexplored botanically. She managed to collect more than 800 bryophyte specimens and began to deal with them, but her untimely death prevented her from identifying the material. The rich collection was sent to the first author, who, with his contributors, identified 640 specimens belonging to 167 taxa. Seven of them proved new to science, 4 new to the whole of Africa, and 19 new to Madagascar (Pócs & Geissler 2002). The new taxa are published separately by Sass-Gyarmati (2001), Pócs (2001), and the present authors in this paper. Among her collection was a small amount, gathered from decaying wood and from a shady granitic cliff at the same site of montane rain forest, of an interesting vivid green plantlet with mostly entire underleaf, which proved to be an unknown Cephaloziellaceae belonging to the above-mentioned, recently described genus of *Amphicephalozia.*

Amphicephalozia geisslerae Pócs & Váňa, *sp. nov.* (Figs 1–3)

Differt ab Amphicephalozia amplexicauli *caule composita cellulibus paucioribus (caulis diametro 7–9) parietibus incrassatis, foliis et amphigastriis compositis cellulis maioribus (medianis 25–30 × 25–28 μm) et paucioribus (diametro lobi et amphigastrii 8–10 cellulis). Perianthium ovatum vel ovato-clavatum (non obpyriforme), parti latissimi ad basim.*

Species nova in honorem Doctoris Patriciae Geisslerae, hepaticologae illustrissimae beatae dedicata.

Plants small, up to 0.5–0.6 cm long, erect to suberect, soft-textured, pale green to yellowish green, older part of plants somewhat brownish, forming dense mats on decaying wood or on rocks. Stems simple to sparingly branched, 100–120 μm (7–9 cells) in diameter. Cortex and medulla cells hardly differ, both with incrassate walls. In transversal section 20–28 cortex and 30–40 medulla cells can be observed, with walls 8–30 μm in lumen diameter and 2–10 μm thick. Branches lateral-intercalary or rarely ventral-intercalary. Rhizoids rare, restricted to basal parts of plants. Leaves succubous, subtransverse to transverse, alternate, soft-textured, spreading to nearly squarrose, unistratose, basal sectors near the insertion

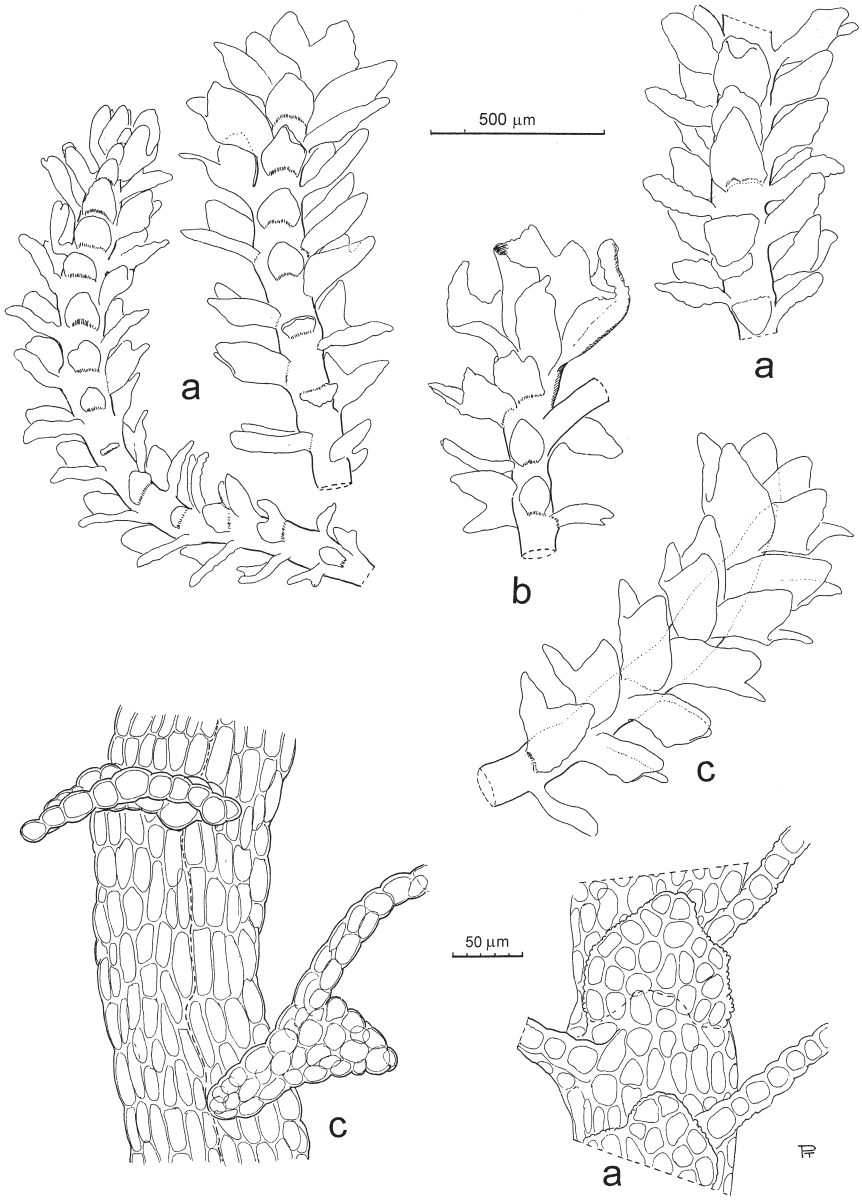

Fig. 1. *Amphicephalozia geisslerae* Pócs & Váňa, *sp. nov.* a – habit, ventral view, b – the same with perichaetium, c – dorsal view. All drawn from the type.

bistratose, inserted to stem midline, rounded-quadrate, 300–370(–450) × 270–350 µm, remote, bilobed to 0.3–0.5 their length. Lobes equal to subequal, ovate triangular, blunt to rounded, rarely subacute on tips, somewhat folded with ± recurved sinus 9–11 cells deep. Lobe width 8–10 cells. Underleaves large, mostly ovate, undivided, entire-margined like leaves; upper underleaves

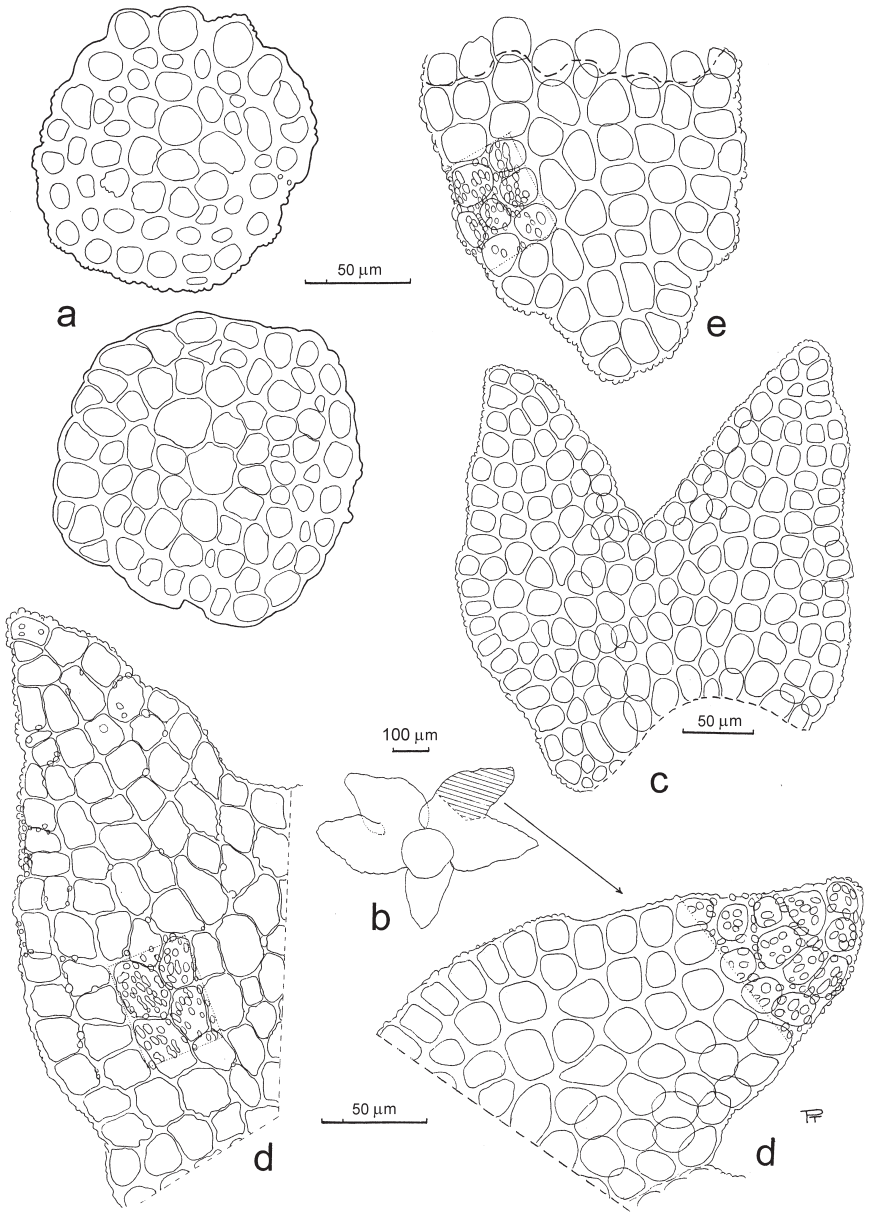

Fig. 2. *Amphicephalozia geisslerae* Pócs & Váňa, *sp. nov.* a – transversal sections of stem (upper and lower part), b – position of leaves and underleaves, c – leaf, d – lobes, e – underleaf. All drawn from the type.

sometimes bilobed, similar to leaves, but smaller, lower ones constantly unlobed. Width of underleaves 8–10 cells, which are similar in size and incrassation to those of the leaves: small, ± thick-walled, without trigones or with small to indistinct trigones, quadrate to polygonal, marginal cells (15–)18–25 × 18–23 µm, median ones 25–30 × 25–28 µm. Oil bodies finely granular *Jungerman-*

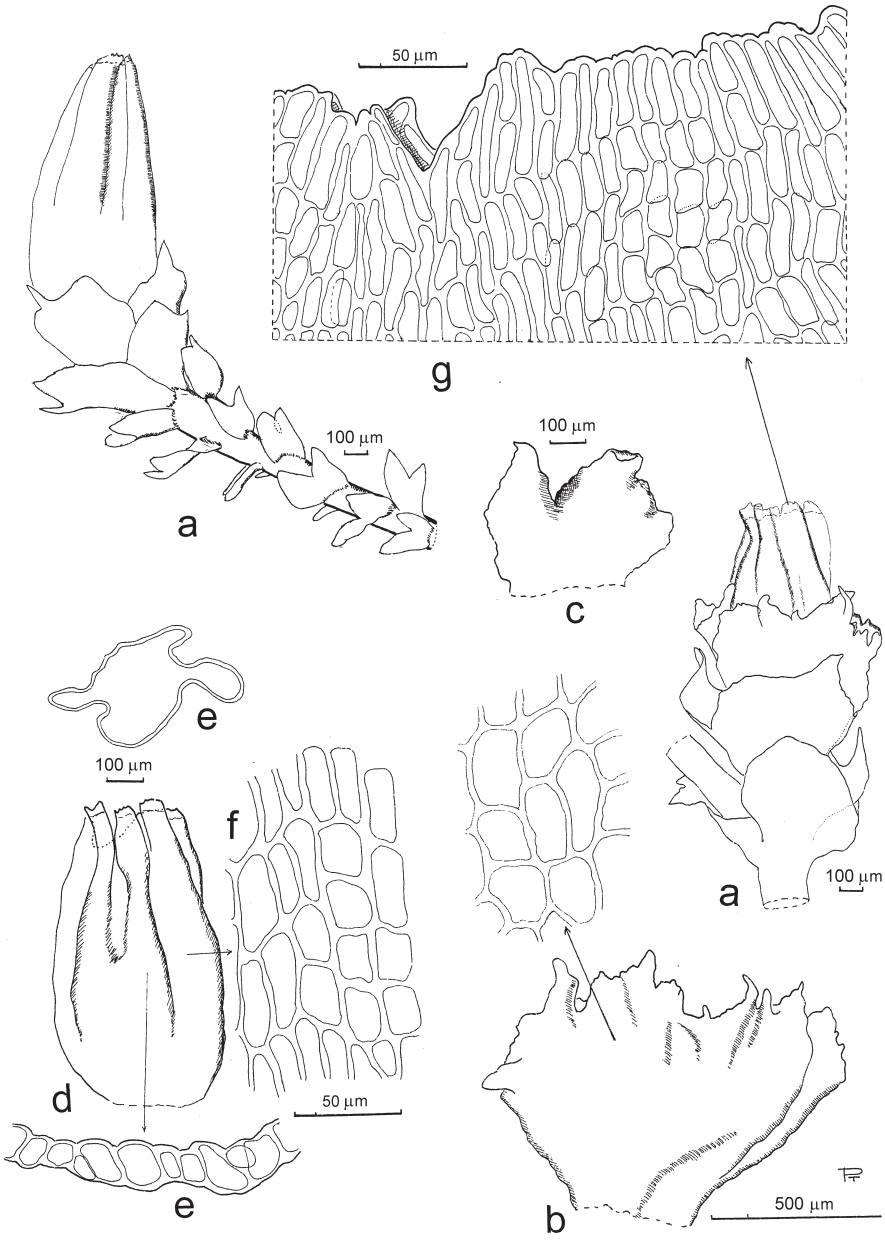

Fig. 3. *Amphicephalozia geisslerae* Pócs & Váňa, *sp. nov.* a – female shoots with perianth, b – half-fused bracts, c – bracteole, d – perianth, e – transversal sections of perianth, f – cells of perianth wall, g – cells of perianth mouth. All drawn from the type.

nia type, 2–7 per cell. Cuticle weakly to strongly papillose. Gemmae not seen. Dioecious. Male plants not seen. Gynoecia terminal, mostly on long leafy shoots, rarely on shortened shoots and then mostly with subfloral innovations. Bracts erect, sheathing, similar to leaves but slightly

larger; rarely trilobed bracts present, united with each other and with the bracteole or free. Lobes ovate-triangular, obtuse, but some bracts with subacute lobes and with entire to slightly crenulate margins. Perianth sheathed in basal part with the bracts, ovate or ovato-clavate with widest part in their lower third, 3(–4) plicate, with apical part contracted, 1.5–1.9 mm long and 0.5–0.8 mm wide, in upper part unistratose, basal part bistratose. Perianth mouth slightly crenulate by the projecting cells, mouth cells elongate, more or less hyaline, with thick walls, 45–50 × 10–15 μm, median cells *ca* 28–32 × 20–25 μm, moderately thick-walled.

HOLOTYPE: MADAGASCAR, PROV. ANTSIRANANA (Diego Suarez), Réserve spéciale de Manongarivo Ambahatra, cours supérior, 13º59'S, 48º26'E. Crête entre les deux bras de l'Ambahatra, 0.8–0.3 km au N du point côté 1528. Forêt montagnarde, alt. 1300–1500 m, sur tronc. 10 March 1999, *P. Geissler 19708/3*, CJB (G).

PARATYPES: At the same locality and date, sur des pierres. *P. Geissler 19709/1* (G, EGR, PRC).

DISTRIBUTION. The species seems to be endemic to the Manongarivo Massif in NW Madagascar.

The differences between the two known species of *Amphicephalozia* are summarized in Table 1.

The genus *Amphicephalozia*, together with *Allisoniella*, another southern temperate genus, represents the most primitive elements within the Cephaloziellaceae. Plants of both genera, in contrast to other genera of Cephaloziellaceae, have relatively large (0.3–0.5 mm wide and 3–8 mm long), erect shoots. Both genera share more massive seta of *Cephalozia*-type (8 + 4 seriate, in *Allisoniella* also more elaborate variant present), not the classical 4 + 4 seriate seta of *Cephaloziella*-type.

Moreover, *Amphicephalozia* has the trigonous (3-plicate, only exceptionally 4-plicate) perianth of *Cephalozia*-type at least in the upper part (in all other genera including *Allisoniella* it is 4- or 5-plicate). The genus retains also other primitive characteristics including more polymorphous branching mode, large underleaves, etc. On the other hand, the pellucid and soft capsule base, with the cells totally lacking secondary thickenings and pigmentation, is rather unique. However, this character was observed and described in detail by Schuster (1972) on the only mature sporophyte of *A. amplexicaulis* available for study. In *A. geisslerae* no sporophytes were found.

Discussing the above-mentioned and other characteristics, Schuster (1972, 1980) concluded that this genus is the most primitive element in Cephaloziellaceae. For a very detailed discussion, also giving the reasons for placing this genus in Cephaloziellaceae and not Cephaloziaceae, see Schuster (1972).

The distribution of the genus *Amphicephalozia*

Table 1. Differences between the two species of *Amphicephalozia* Schuster.

Character \ Taxon	*A. amplexicaulis* Schuster Patagonia	*A. geisslerae* Pócs & Váňa Madagascar
Stem diameter	120–140 (150) μm	100–120 μm
Stem diameter (number of cells)	10–11	7–9
Medulla cells	Thin-walled (< 1.5 μm)	Thick walled (2–10 μm)
Width of leaf lobule and underleaves	14–25 cells	8–10 cells
Perianth shape	Long-clavate, obpyriforme, widest in its upper third	Ovate to ovate-clavate, widest in its lower third
Perianth length	1800–2400 μm	1500–1900 μm
Perianth cell walls (except mouth)	Slightly incrassate (1–3 μm)	Strongly incrassate (2–5 μm)

is typically southern temperate of Gondwanian origin. The two species represent a closely related vicariant pair, which could have evolved after the separation of the parts of southern Gondwana, probably during the past 40–80 million years. This type of distribution is manifested in Madagascar and in the other Indian Ocean islands among several taxa at the generic or specific level. This type of southern temperate distribution is even more interesting when the concerned taxa are not represented in tropical Africa or even on the African continent. For example, *Schistochila alata* (Lehm.) Schiffn. occurs in temperate South America, South Africa and Madagascar (map in Gradstein *et al.* 1984, Madagascar occurrence in Pócs 1995). *Cryptochila grandiflora* (Lindenb. & Gottsche) Grolle is distributed in Réunion Island, Cape, Natal, all over the South Sea Islands, southern Australia, New Zealand and in the Americas from the lowlands of southern Chile through the heights of the Andes to Guatemala (see map in Grolle 1971), but does not occur in tropical Africa. The temperate Australasian *Lepidozia ulothrix* (Schwaegr.) Lindenb. occurs sporadically in Mauritius (Pócs 1984), while *Allisoniella nigra* (Rodway) R. M. Schust., with a similar distribution although much rarer, occurs from New Zealand through Tasmania to Réunion Island (Schuster 1972; Váňa 1985). The more widespread southern temperate *Marsupidium limbatum* (Steph.) Grolle, although very rarely occurring in East African mountains (Bizot & Pócs 1974), is really common in South Africa and in the Mascarene Islands (under the name *Tylimanthus wilmsii*; see Arnell 1963 and Pócs 1995). In the Manongarivo Massif, apart from the genus *Amphicephalozia,* three such southern temperate species can be found.

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