

Studies in the genus *Riccia* (Marchantiales) from southern Africa. 25. A new species in subgenus *Ricciella*, section *Ricciella*

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ABSTRACT

Riccia sibayenii Perold is a new species, recently collected in Mpumalanga, near Sibayeni and has been named for this town, which is close to the Mozambique border and is in the summer rainfall area. *R. sibayenii* is distinguished by lime-green, medium-sized to quite large thalli with a chlorophyllose dorsal epidermis, air pores that soon enlarge and lead into mostly 6-sided air chambers below; ventrally with a thin median layer of storage tissue; ventral scales absent and the rhizoids all smooth. The spores are winged and polar, the distal face completely or incompletely reticulate and the proximal face ornamented with fine to coarse, sometimes spinose granules.

Riccia sibayenii Perold, sp. nov.

Thalli dioici, annui, subdense turbati, rosulas non formantes, prasini sine ullo colore purpureo, ramis usque ad 16 vel 17 mm longis, 1.05–3.75 mm latis, oblongis vel apicem versus angustatis. Cavernulae supra poris aperientes, apicem versus parvis, proximaliter maioribus, aetate disintegrantes; tela penaria solum in parte media carinata, 4–6 cellulas profunda. *Squamae ventrales* absentes, rhizoideae omnes glabrae. *Capsulae* exsertae, ventraliter aperientes. *Sporae* 77.5–100.0 µm diametro, triangulari-globosae, atrobrunneae, alis cum duabus seriebus granularum secus marginem, anisopolares, superficie distali cum alveolis completis vel incompletis, cristis cum duabus seriebus granularum grossarum asperatis; superficie proximali cum nota triradiata prominente, in quaque superficula cum granulis tenuibus vel grossis dispersis ornata. *Numerus chromosomatum* ignotus.

TYPE.—Mpumalanga, 2531 (Komatipoort): ± 10 km south of Komatipoort, between the Kaftan fence and Komati River, near Sibayeni town, altitude 270 m, on black loamy soil, (–DB), 2000-07-12, *Jean J. Meyer* 2875 (PRE, holo.). Figure 1.

Thallus medium-sized to fairly large, annual, quite densely massed in patches, not forming rosettes, sometimes with branches overlying, occasionally covering old thalli from previous season, usually closely adherent to substrate, lime-green, without any purple coloration; branches never simple, mostly twice to several times furcate (Figure 2A), total length up to 16–17 mm long, segments narrowly to moderately divergent, 3–7 × 1.05–3.75 mm, 700–1250 µm thick medianly, thinner toward winged margins, in section 1.5–3 times wider than thick; oblong to tapering toward apex, shortly once or twice emarginate, flat to slightly concave above, not medianly grooved, margins winged, blunt, rather irregularly scalloped, flanks sloping obliquely, ventral face rounded and keeled, giving rise to perennating stolons,

scales absent; when dry, margins sometimes slightly raised, not inflexed.

Dorsal epidermis (Figures 2B; 3B) covering air chambers flat, delicate and translucent, cells unistratose, 4–6-sided, 50–80 × 42.5–67.5 µm; air pores distally small (Figure 3A), soon enlarging to 80–125 × 50–75 µm or more in older parts, irregular in shape, bordering cells not differentiated (Figure 3C), breaking down with age and air chambers below becoming exposed. *Assimilation tissue* up to 875 µm thick, occupying most of thickness of thallus, air chambers 12–14 across width of thallus, from above mostly penta- or hexagonal, but in cross section polygonal and variable in size, the enclosing chlorophyllose, unistratose walls with cells 80.0–87.5 × 75–100 µm, vertically to obliquely arranged, here and there intersecting, air chambers then in 2 or 3 layers, except at margins, where only 1 layer deep; storage tissue confined to median keeled part, 4–6 cell layers or 200–250 µm thick, cells dorsiventrally flattened, 50.5–62.5 × 77.5–102.5 µm, sometimes with smaller cells wedged in between. *Ventral scales* absent. *Rhizoids* all smooth, 15–35 µm wide.

Dioicous. *Antheridia* serially arranged in 2 or 3 rows (Figure 3D) and submerged along middle of thallus

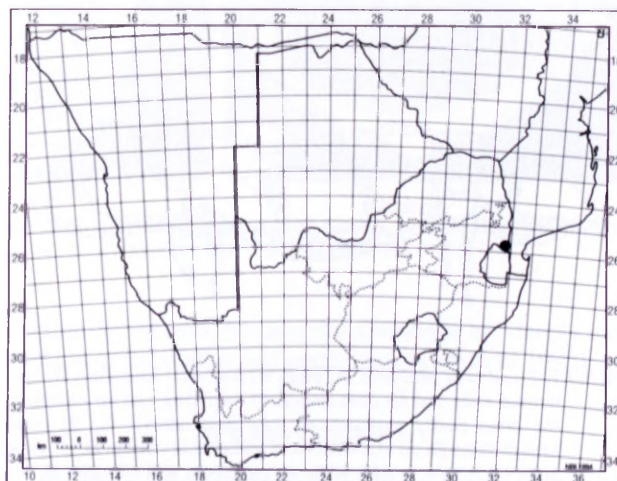


FIGURE 1.—Locality of *Riccia sibayenii* in southern Africa.

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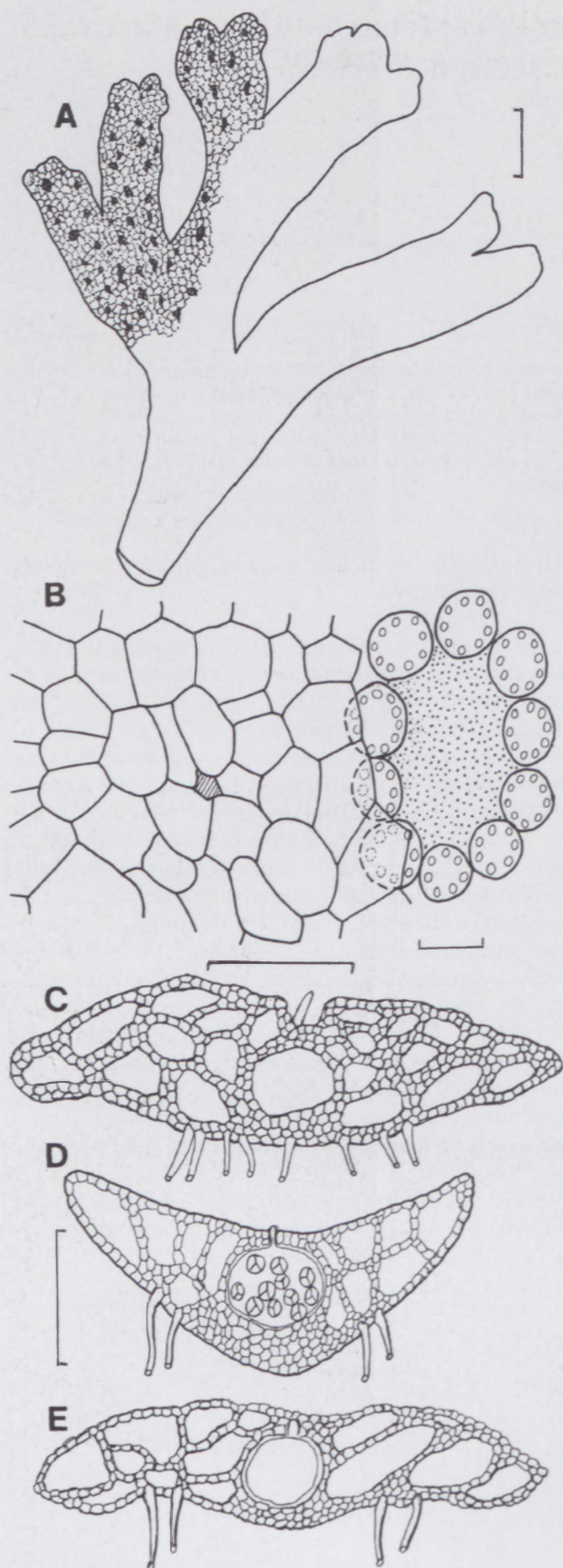


FIGURE 2.—*Riccia sibayenii*. A, plant with several branches; B, epidermal cells and air pore (hatched) overlying one air chamber, the other partly exposed, as seen from above; C, c/s male branch through air chambers and antheridial cavity; D, c/s near apex of female branch with air chambers and capsule; E, c/s nearer to base of female branch with air chambers and capsule. A–E, J.J. Meyer 2875. Scale bars: A, 2 mm; B, 50 μ m; C–E, 1 mm.

(Figure 2C), cavities $330\text{--}350 \times 310\text{--}410 \mu\text{m}$, necks arising above from small hollows and projecting up to $230 \mu\text{m}$ above thallus. *Archegonia* arranged in a row along middle of segments, sometimes obliquely orientated, necks $\pm 160 \mu\text{m}$ long (Figure 3F), dark red. *Capsules* protruding and opening ventrally (Figure 2D, E), up to 6 in an acropetal row along branch, $450\text{--}575 \mu\text{m}$ diam., hardly visible from above (Figure 3E), containing up to ± 350 spores each, those in the youngest capsule near apex sometimes still immature. *Spores* $77.5\text{--}100.0 \mu\text{m}$ diam., triangular-globular, anisopolar, dark brown, semi-transparent to opaque; wing $\pm 7.5 \mu\text{m}$ wide, at marginal angles width $\pm 10 \mu\text{m}$ and perforated by single large pore (Figure 4D), margin finely crenulate with 2 rows of granules, one along edge and the other immediately inward; ornamentation on the 2 faces quite different; distal face (Figure 4A–D) completely to incompletely reticulate: with up to $5 \pm$ complete alveoli, $12.5\text{--}17.5 \times 12.5\text{--}22.5 \mu\text{m}$, across distal face and totalling ± 15 , otherwise with 3 or 4 larger, central alveoli, $\pm 25 \times 17.5 \mu\text{m}$, surrounded by smaller ones that may be confluent or separated, ridges $\pm 5 \mu\text{m}$ high, thick and roughened by 2 rows of granules, coarser than marginal ones, not raised at nodes and not extending across wing; proximal face (Figure 4E, F) with prominent triradiate mark $\pm 2.5 \mu\text{m}$ high, all or some arms extending across wing, each facet ornamented with scattered, fine to coarse granules, some single and spinose, others joined together. *Chromosome number*: unknown, as material no longer living.

Thallus sections from the dry plants that were soaked up, proved quite difficult to prepare. Hopefully, living plants will still come to hand in the future. So far, the species has only been collected once (Figure 1). It grows on black, loamy soil (pH7) derived from weathered basalt of the Letaba Formation (Lebombo group) of the Karroo Sequence (Visser *et al.* 1984), in full sun on a gentle slope in a valley that becomes waterlogged during the summer months, when most of the rain falls. The vegetation type of vascular plants in the area is Lebombo Arid Mountain Bushveld (Low & Rebelo 1996).

The locality is described as disturbed. As it is close to the Mozambique border, there has been an influx of people fleeing from the war and its aftermath. It is possible that the recent floods in the wake of cyclones Hudah and Eline, may have spread the spores of this species further southward, as it must be more widespread than this single, though quite copious collection suggests. The area is, however, very undercollected as far as bryophytes are concerned, in fact, none have previously been recorded for the quarter degree grid 2531DB.

Although related to *R. rubricollis*, which was collected by Duthie in 1929 at Knysna, this new species differs from it by being more delicate and by totally lacking any purple colouration due to anthocyanin pigmentation on the dorsal surface of the thallus, as well as in the antheridial necks. Furthermore, the spores of *R. sibayenii* have double rows of granules along the wing margins and on the alveolar walls on the distal face. The proximal face is ornamented with spinose granules and not with smooth-walled alveoli, which are present in *R. rubricollis* on both faces (Perold 1991). In addition, *R. sibayenii* grows in the subtropics, which has summer rain, not in

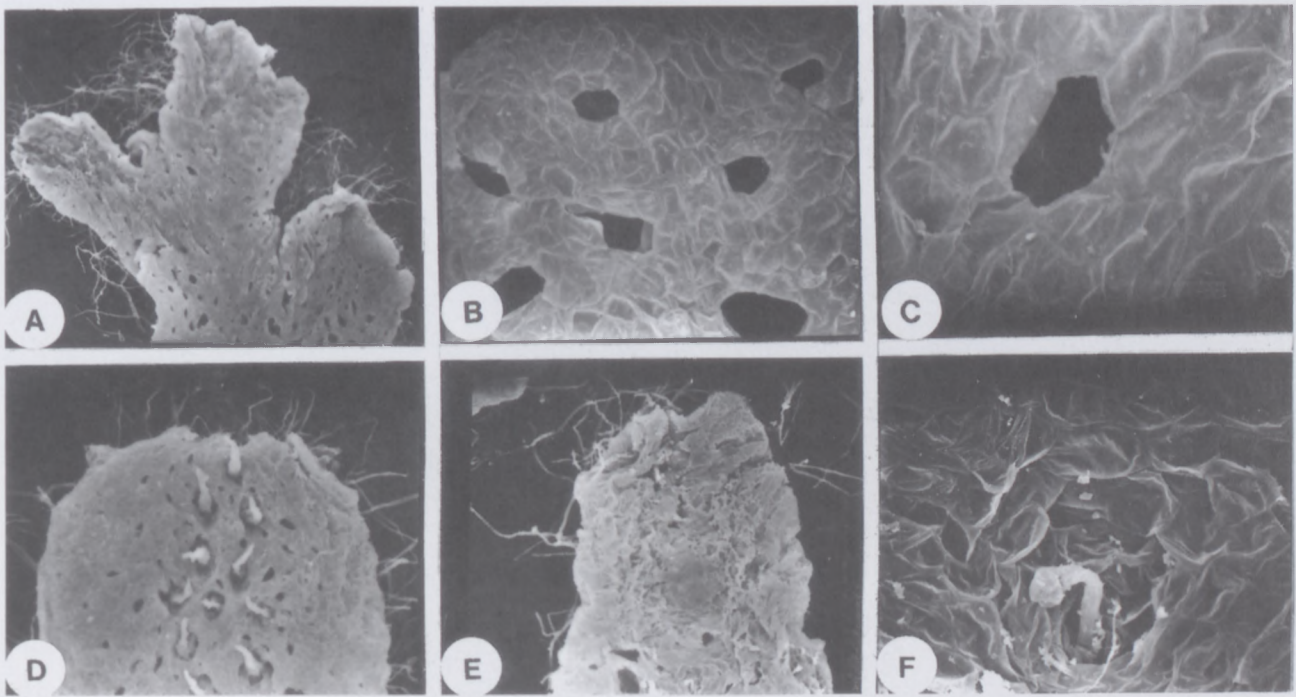


FIGURE 3.—*Riccia sibayenii*. A, distal branches of thallus with air pores gradually increasing in size more proximally; B, pores and dorsal epidermal cells; C, single pore and surrounding dorsal cells; D, 2 or 3 rows of antheridia near apex of male branch; E, toward apex of female branch with capsule only faintly visible from above; F, protruding archegonial neck (no longer erect). A–F, J.J. Meyer 2875. A, $\times 8.3$; B, $\times 58$; C, $\times 202$; D, $\times 20$; E, $\times 18.4$; F, $\times 133$.

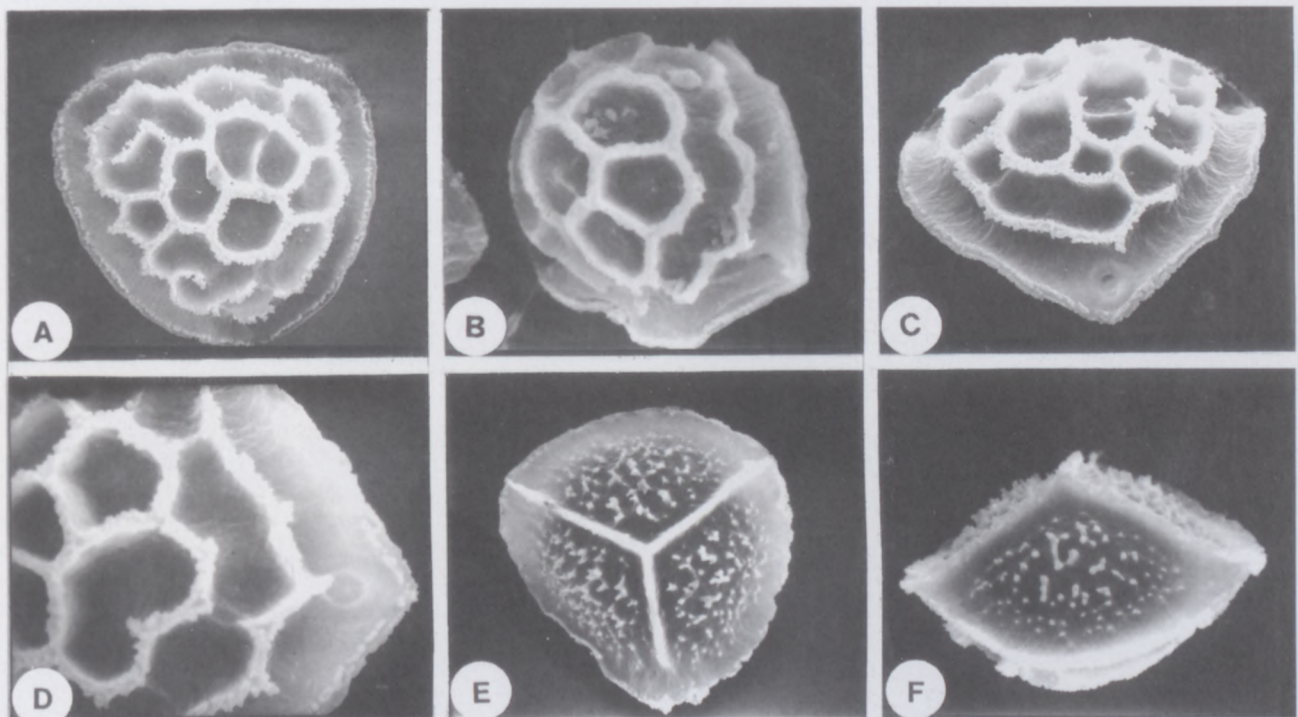


FIGURE 4.—*Riccia sibayenii*. Spores. A–C, distal face: C, side view; D, part of distal face, wing margin and pore; E, proximal face with triradiate mark; F, side view of proximal face. A–F, J.J. Meyer 2875. A, $\times 418$; B, $\times 500$; C, $\times 514$; D, $\times 661$; E, $\times 403.7$; F, $\times 399$.

the temperate southern Cape, known for its fynbos and rain almost all year round.

Because its sporangia protrude and open ventrally, *R. sibayenii* is referred to subgenus *Ricciella* (A.Br.) Bisch., section *Ricciella*, together with *R. stricta* and *R. purpurascens*. *R. rubricollis* was referred to subgenus *Ricciella*,

section *Spongodes*, because the sporangia are deeply embedded in the thallus and open dorsally (Perold 1995).

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REFERENCES

- LOW, A.B. & REBELO, A.G. 1996. *Vegetation of South Africa, Lesotho and Swaziland*. Department of Environmental Affairs & Tourism, Pretoria.
- PEROLD, S.M. 1991. Studies in the genus *Riccia* (Marchantiales) from southern Africa. 22. *R. rubricollis*, now validated, typified and described. *Bothalia* 21: 51–54.
- PEROLD, S.M. 1995. The taxonomic history of the Ricciaceae (1937–1995) and a classification of sub-Saharan Ricciae. *Bothalia* 25: 211–231.
- VISSER, D.J.L. *et al.* 1984. *Geological map of the Republics of South Africa, Transkei, Bophuthatswana, Venda and Ciskei and the Kingdoms of Lesotho and Swaziland*. The Government Printer, Pretoria.