

Studies in the genus *Riccia* (Marchantiales) from southern Africa. 26. A new species in section *Pilifer*, *Riccia radiata*, is described

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ABSTRACT

Riccia radiata Perold, a new species endemic to southern Africa, is described. It is referred to section *Pilifer* O.H.Volk, which is characterized by the dorsal epithelium of the thalli consisting of short or long, free-standing, hyaline cell pillars.

INTRODUCTION

Including this new species, 18 southern African species of *Riccia* have been referred to section *Pilifer*. The previous 17 species were treated in Perold (1999). As I remarked previously in Perold (1990a), the species assigned to this section, with rare exceptions, have \pm rounded, colourless scales and in several the spores have radiating ridges on the distal face. The dorsal cell pillars are composed of two or more hyaline cells: two cells in *R. pulveracea* (Perold 1990b) for example, and up to six cells joined end to end in *R. villosa* (Volk & Perold 1984). Once the thalli have dried out, the cells in the pillars collapse and it is often not possible to reconstitute them, especially if the plants have died. Fortunately, upon keeping some of the thalli of this new species damp in a closed transparent container for two weeks (16 months after collection), the distal parts of the thalli had revived sufficiently and could be studied. The ornamentation on both spore faces proved to be quite distinctive and it was quickly distinguished as a new species, which is described below.

Riccia radiata Perold, sp. nov.

Thalli gregarii caespitiosi, apicem versus laete viridi, superficies dorsalis columnis cellularum munita mox collabentibus, caespites lanosos formantibus. Squamae hyalinae, arcte imbricatae. Sporae unice ornatae: superficies distalis cum cristis pluribus densis e centro radiatis (itaque nomen), areolis completis vel incompletis inter cristas; superficies proximalis granulatis tenuis, interdum coalescentibus, confertim tecta.

TYPE.—Northern Cape, 3219 (Wuppertal): Cederberg, foothills of Bloukop along Luiperdskloof 4x4 route, altitude 1 290 m, on mountain slope, on sandy soil, (–CB), 2002-09-13, M. Koekemoer 2426 (PRE, holo.). Figure 1.

Thalli perennial, in gregarious patches, sometimes overlapping, not forming rosettes, dorsal face apically bright green and glistening, but soon becoming dotted with scattered white tufts of collapsed cell pillars, proxi-

mally shaggy, entirely covered with closely crowded, coarse white woolly tufts (Figure 3A–C); medium-sized, 6–11 mm long, growing from a narrow base, \pm 0.5 mm wide and widening distally to 2.5 mm before bifurcation, in cross section slightly concave above and rounded below, 0.9 mm thick, i.e. nearly 3 times wider than thick (Figure 2C). Branches once or twice symmetrically or asymmetrically furcate, lobes ligulate, narrowly to moderately divergent, terminal segments 1.3–5.0 mm long, up to 2 mm wide, apex ovoid, rounded or wedge-shaped, once or twice shortly grooved (Figure 3B, C, E, F), margins acute, sides steep, with overlapping hyaline scales (Figure 2A). In cross section apically (Figure 2B), thallus branches dorsally V-shaped, only 0.6 mm thick from bottom of groove to ventral face, at erect sides up to 1.2 mm thick and here almost as thick as wide; ventrally rounded, green, hyaline scales barely visible, covered with rhizoids, 5.0–17.5 μ m wide, mostly smooth, rarely tuberculate. When dry, thallus generally white dorsally, sometimes tinged with pale green toward apex, slightly concave, margins erect or partially inflexed, sides white to pale yellow, covered with appressed scales, occasionally with narrow or broad, deep purple band along length of side, tailing off proximally. Scales along sides of thallus (Figure 3C, D), extending 200–250 μ m above dorsal face, closely imbricate, \pm oblong, somewhat forward projecting at leading edge (Figure 2F), rounded above, often sloping at following edge, margins entire, hyaline,

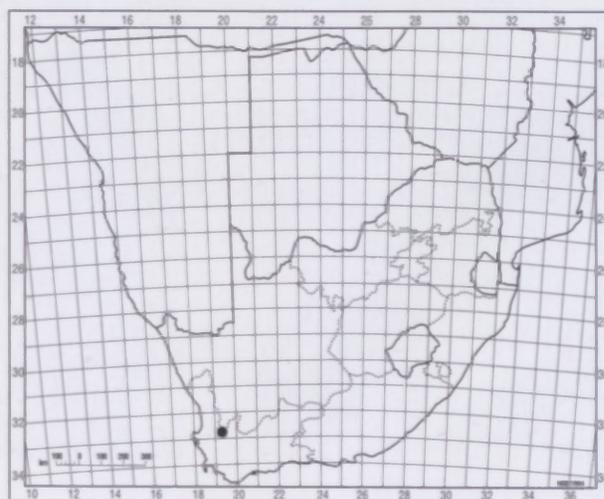


FIGURE 1.—Locality of *Riccia radiata* in southern Africa.

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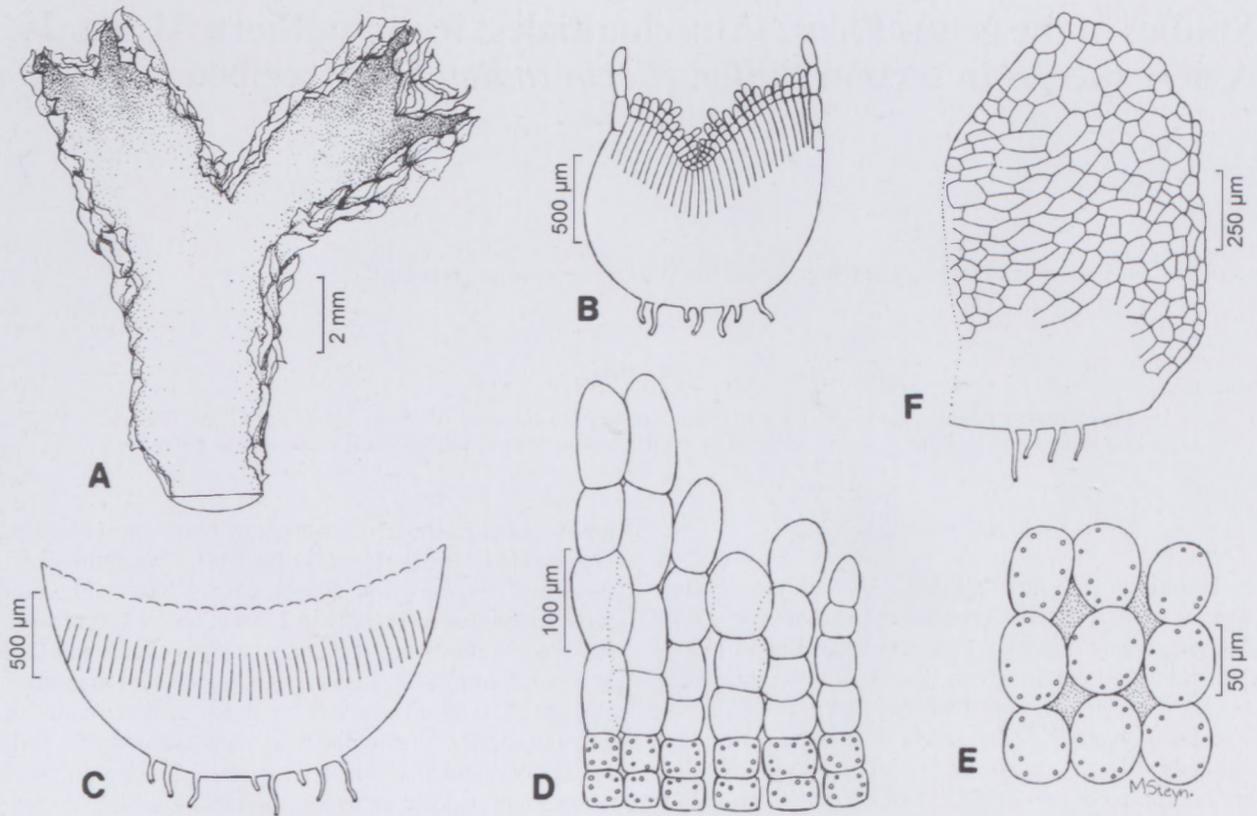


FIGURE 2.—*Riccia radiata*, M. Koekemoer 2426. A, proximal part of thallus and distal branches after bifurcation; B, c/s branch through apical groove; C, c/s proximal part of thallus before bifurcation, tops of collapsed dorsal pillars indicated by broken line; D, c/s dorsal cell pillars and top cells of assimilation tissue cell columns; E, horizontal section through basal cells of cell pillars with air pores dotted; F, scale. Scale bars: A, 2 mm; B, C, 500 µm; D, 100 µm; E, 50 µm; F, 250 µm. Drawn by M. Steyn.

800–950 µm high, 1130–1175 µm across widest part, cells in body of scale mostly elongated, 5- or 6-sided, $92.5\text{--}137.5 \times 50.0\text{--}67.5$ µm, decreasing in size toward upper margin, where small and brick-shaped, in 1 or 2 rows; rhizoids arising from following edge.

Dorsal epithelium (Figure 2D) consisting of free-standing 3- or 4-celled hyaline pillars, fragile, 135–250 µm long, top cells ± spherical, conical or elongated with rounded apex, very variable in size, $50\text{--}150 \times 30\text{--}75$ µm, next cell $50.0\text{--}92.5 \times 45.0\text{--}62.5$ µm, basal cell (if 3 cells

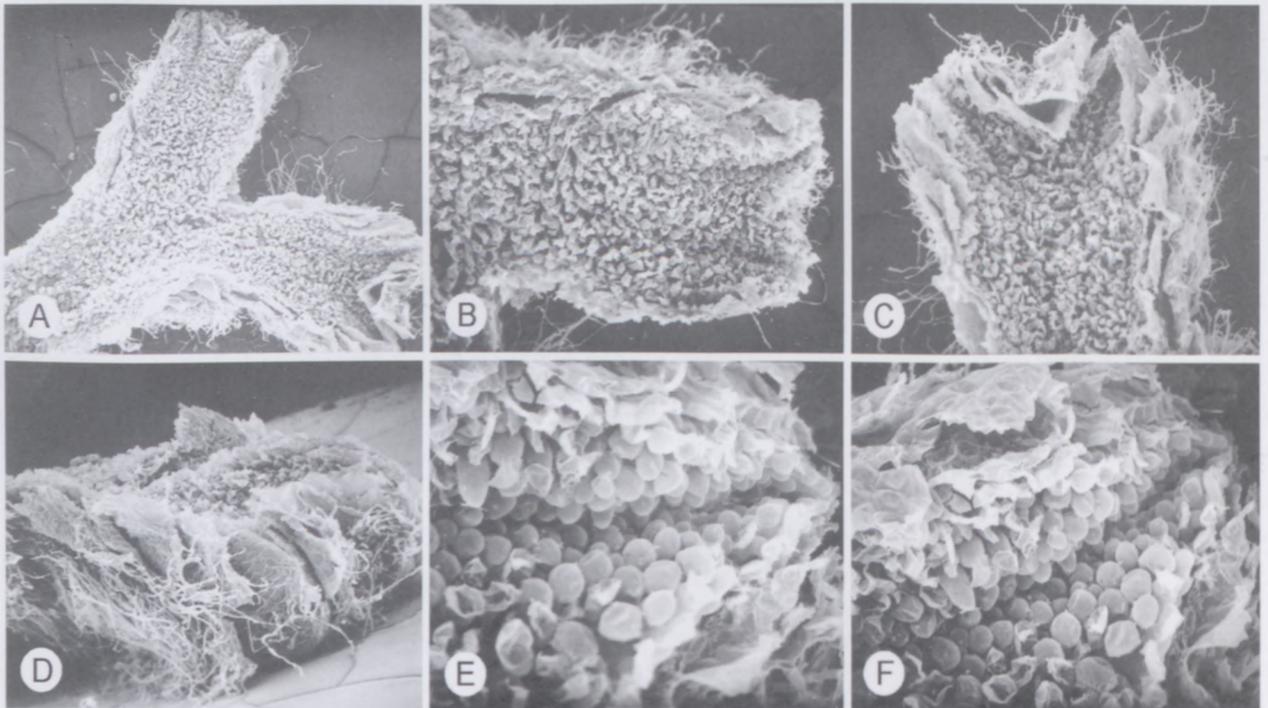


FIGURE 3.—SEM micrographs of *Riccia radiata*, M. Koekemoer 2426. A, distal branches of thallus after bifurcation; B, apical part of left branch (in A) with clumps of collapsed dorsal cell pillars; C, apical part of right branch (in A) and scales along sides; D, side view of branch, showing scales; E, F, groove at branch apex, with intact top cells of dorsal pillars on either side. A, $\times 8.7$, B–D, $\times 16.5$, E, $\times 60.2$; F, $\times 53.8$.

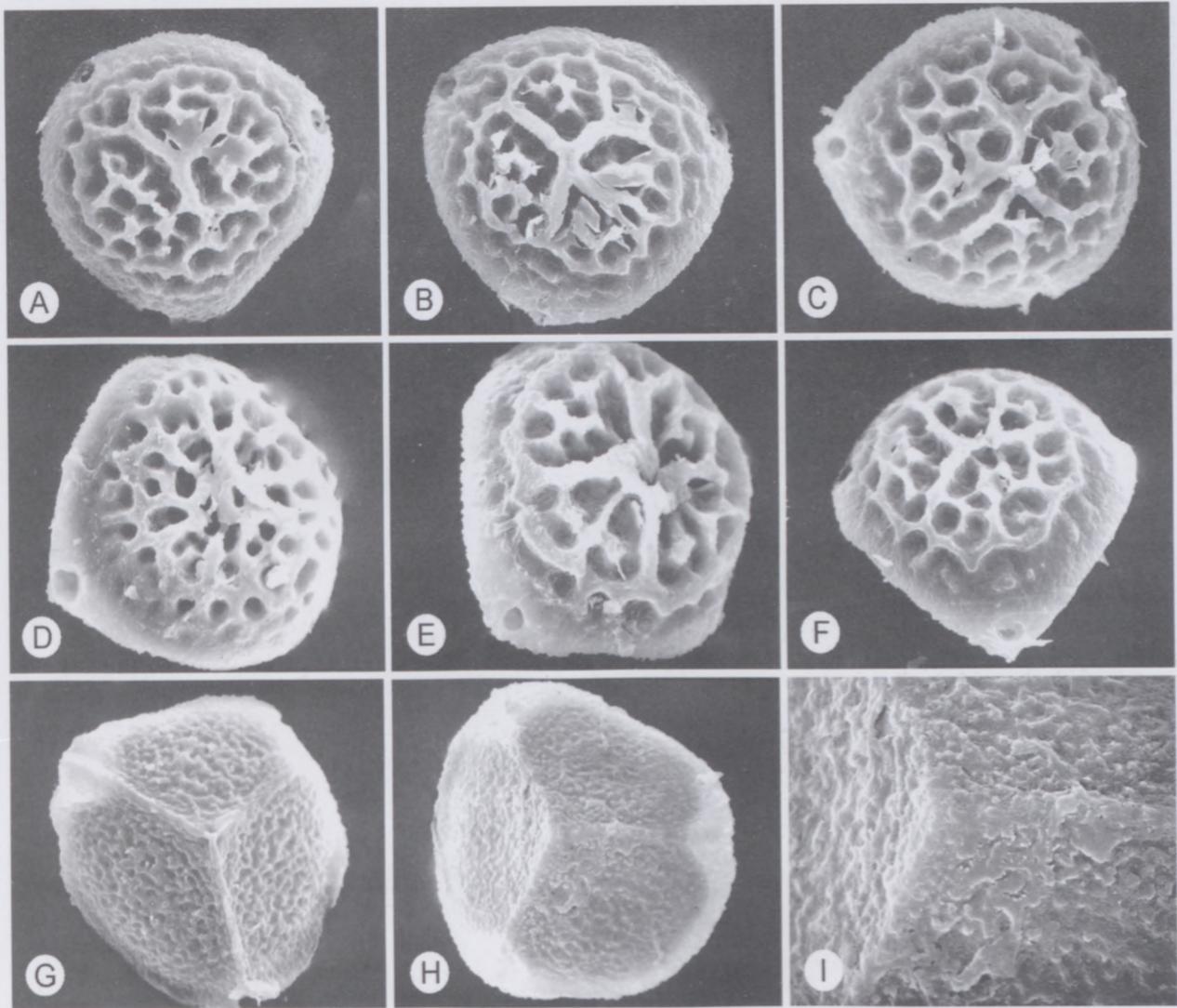


FIGURE 4.—*Riccia radiata*, M. Koekemoer 2426. Spores. A–F, distal face: F, side view. G, H, proximal face; I, apex of triradiate mark. A, H, $\times 435$; B, F, G, $\times 440$; C, $\times 468$; D, $\times 460$; E, $\times 525$; I, $\times 920$.

in pillar) $37.5\text{--}72.5 \times 35.0\text{--}57.5 \mu\text{m}$, (if 4 cells in pillar) $37.5\text{--}50.0 \times 30.0\text{--}32.5 \mu\text{m}$; air pores small (Figure 2E), often 4-sided, $\pm 20 \times 20 \mu\text{m}$, obscured by cell pillars. *Assimilation tissue* $250 \times 300 \mu\text{m}$ thick in section, $\pm \frac{1}{3}$ the thickness of thallus and consisting of vertical columns of ± 8 cells, $35\text{--}50 \times 35\text{--}40 \mu\text{m}$, enclosing narrow, 4-sided air canals; storage tissue $350\text{--}400 \mu\text{m}$ thick, up to $\pm \frac{1}{2}$ the thickness of thallus, cells crowded together, rounded to slightly angular, $\pm 45 \times 50 \mu\text{m}$; rhizoids arising from ventral epidermal cells.

Monoicous? *Antheridia* not seen; hyaline necks probably obscured by woolly tufts of collapsed dorsal cells of thallus. *Archegonia* with dark red-brown necks, persistent and prominently projecting from bulging sporangia. *Sporangia* not very common, mostly single, $800\text{--}875 \mu\text{m}$ wide, rarely up to 3 in close proximity near bifurcation of thallus. *Spores* $92.5\text{--}110.0 \mu\text{m}$ diam., triangular-globular, polar, fairly dark brown, semitranslucent; wing sprinkled with granules, $\pm 6 \mu\text{m}$ wide, gradually widening to $15 \mu\text{m}$ at notched or perforated marginal angles, margin often minutely crenulate; ornamentation on distal face quite variable (Figure 4A–F), usually with 3–6 heavy ridges, up to $5 \mu\text{m}$ wide, radiating from centre, in between ridges complete or incomplete

areolae, $7.5\text{--}15.0 \times 7.5\text{--}12.5 \mu\text{m}$, also thick-walled, sometimes with a central boss; proximal face (Figure 4G–I) with clearly defined triradiate ridge extending to margin, all 3 facets densely covered with fine granules, some coalescing.

This species has only been collected once. It was found growing on sandy soil on a mountain slope in the Northern Cape, at the border with Western Cape. This is a winter rainfall area with vegetation types Northwestern Mountain Renosterveld and Mountain Fynbos (Low & Rebelo 1996). The type locality is in a rather inaccessible place, along a newly opened 4×4 route. It is recognized as a new species mainly by the unique spore ornamentation which is characterized by exceptionally heavy ridges, and is referred to section *Pilifer* because of the free-standing cell pillars dorsally on the thalli. The specific epithet was chosen because of the radiating ridges on the distal face of many of the spores, quite different from those previously studied.

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