The occurrence in southern Africa of the hepatic, *Symphyogyna brasiliensis* (Pallaviciniaceae)

S.M. PEROLD*

**Keywords:** hepatic, Metzgeriales, Pallaviciniaceae, southern Africa, *Symphyogyna brasiliensis*, *S. lehmanniana*

**ABSTRACT**

In Magill & Schelpe's (1979) checklist, *Symphyogyna lehmanniana* is listed as one of the species of *Symphyogyna* occurring in southern Africa.

Subsequently, however, Grolle (1980) concluded that this name, applied to a liverwort reported to be widespread in Africa, is a synonym of *S. brasiliensis*. During the course of his investigations Grolle had compared specimens assigned to both species, their types, as well as spores, and could find no differences. He had also examined a number of other species, previously assigned to several so-called different species of *Symphyogyna* and *Pallavicinia*, all of which he eventually placed in synonymy under *S. brasiliensis*. Three of these species, namely *S. lehmanniana*, *S. valida* and *Pallavicinia capensis*, have types which were collected in southern Africa. The following description of *S. brasiliensis*, which is illustrated with photographs, is given to draw attention to the above information.

**INTRODUCTION**

In Magill and Schelpe's (1979) checklist, *Symphyogyna lehmanniana* is confirmed as occurring in southern Africa. Subsequently, however, Grolle (1980) reported that this name, which has been applied to a liverwort widespread in Africa, is a synonym of *S. brasiliensis*. To draw attention to this synonymy, a description of *S. brasiliensis*, illustrated with photographs, is given here, as well as an account of its distinguishing features and its distribution.

**UITTREKSEL**

In Magill & Schelpe (1979) word die teenwoordigheid van *Symphyogyna lehmanniana* in suidelike Afrika bevestig. Daarna berig Grolle (1980) egter dat hierdie naam, wat vir 'n wydverspreide lewermos in Afrika gebruik is, 'n sinoniem is van *S. brasiliensis*. Om die aandag op hierdie sinonimie te vestig, word 'n beskrywing van *S. brasiliensis*, geïllustreer met foto's, sowel as inligting oor sy onderskeidende kenmerke en verspreiding hier gegee.

**The two Metzgeriales genera, *Symphyogyna* and *Pallavicinia***

The two Metzgeriales genera, *Symphyogyna* and *Pallavicinia* were previously placed in the family Dilaenaceae (Dum.) Warnst. by Arnell (1963) and by Schuster (1964, 1982), but this name is illegitimate (Grolle 1972). They are now classified by Grolle (1983) in the family Pallaviciniaceae Migula and are placed in different subfamilies, the Symphygoneidoideae (Trev.) Schust. and the Pallavicinioidae (Migula) Grolle respectively. They are frondose liverworts, characterized by thinly winged thalli with a thicker midrib, containing a median conducting strand of elongate, tapering cells with thickened, perforated walls. The thalli are often stipitate and are either procumbent or erect; their margins are entire, dentate, undulate or lobate; the epidermal cells are ± rectangular and lack nodular thickenings and the capsules are elongated. The two genera are separated by the type of protection provided for the archegonia and young sporophyte: in *Pallavicinia* the archegonia, and after fertilization, the pseudoperianth and capsule, are surrounded by a short tubular or annular involucre; in *Symphyogyna* the archegonia are subtended by a laciniate, scale-like involucre with the margins of the latter free and directed forward, no pseudoperianth is developed after fertilization and the young sporophyte is enclosed only by the shoot-calypra, which has a cluster of unfertilized archegonia at its tip.

**Symphyogyna brasiliensis Nees & Mont.** in Annales des sciences naturelles, Botanique sér. II:5: 67 (1836). Type: Brazil, Est. Minas Geraes, São João Batista, *Martius s.n.* (STR, lecto.).

*S. lehmanniana* (Mont. & Nees) Gottsche et al.: 483 (1846). Type: Cape Province, Table Mountain, 'in Promontorio Bonae Spei in vertice ad latus boreale montis Tabularis locis umbrosis'. Ecklon s.n. (STR, lecto.).

*S. valida* Steph.: 69 (1895). Type: Tanzania, Usambara, *Holst 689* (JE, W, iso.).

Terricolous, growing on damp soil; thallose, prostrate and creeping (Figures 1A; 2B), in crowded, overlying mats, bright green when fresh, rarely developing a purplish or reddish tinge along margins and over costa, linear, simple or dichotomously branched, sometimes with ventral intercalary branching, medium-sized to large, 10–20 × 2–3 mm, 280 μm thick over ventrally bulging costa, from which arise pale brownish, translucent rhizoids, smooth and mostly ± 12.5 μm wide; apex entire or with a shallow notch (Figure 1B), the two halves very slightly overlapping in centre, bearing numerous 2-celled slime papillae, ± 65 × 20 μm (Figure 1B), these also present ventrally near the apex; margins entire, undulate, without slime papillae. Wings translucent, unistratose,
FIGURE 1.—*Symphyogyna brasiensis*. A, male thallus with androecia; B, apical notch of thallus with slime papillae (indicated by an arrow); C, cross section of thallus showing costa with central conducting strand and unistratose lateral wings; D, marginal and laminal cells seen from above; E, antheridium; F, oil bodies and chloroplasts visible inside cells; G, scale-like involucre which partly covers antheridium.

A–G, Glen 2687. A, × 22; B, F, × 350; C, E, G, × 87; D, × 175.
FIGURE 2. *Symphyogyna brasiliensis*. A, female thallus with cluster of archegonia; B–E, various stages in maturation of capsule: B, C, young capsule enclosed in calyptra; D, capsule and seta emerged from calyptra; E, capsule with ripe spores and long, tenuous seta; F, cross section of seta; G, cross section through middle of shoot-calyptra. A–G, Glen 2687. A, B, E, × 24; C, × 34; D, × 30; F, × 100; G, × 40.
FIGURE 3.—*Symphyogyna brasiliensis*. A, laciniate scale-like involucre which subtends each archegonium; B, cells in capsule wall; C, J, elaters; D, cross section of capsule wall, only outer cells shown; E–I, spores; A–J, Glen 2687. A, × 35; B, D, × 175; C, × 58; E, F, × 1750; G, H, × 1630; I, × 1000; J, × 550. C, E–H, SEM micrographs; A, B, D, I, J, LM photographs, all taken by the author.
medianly 2 or 3 cells thick, rather abruptly grading into the roughly triangular costa; outer row of cells along margin generally rectangular, ± 500 × 27.5 μm, otherwise cells 5- or 6-sided, 50-75 × 30.0-37.5 μm (Figure 1D) and ± 40 μm thick in section, containing numerous chloroplasts and fusiform or ± triangular oil bodies (Figure 1F). Costae with a central conducting strand (Figure 1C), ± 45 μm wide, brownish to purple, formed of strongly elongated, small cells, ± 10.0 × 7.5 μm, with straight, thickened walls, the enclosing cells up to 10 or 11 rows deep, hyaline, much larger, mostly 500 × 27.5 μm, irregular in shape, walls thin and wavy.

Dioicous. *Androecia* usually in 2 crowded (Figure 1A), more or less parallel rows over the costa and lateral to it on either side, each short-stalked antherium (Figure 1E) partially covered by an irregularly shaped, dentate or entire, forwardly-directed, scale-like involucre (Figure 1G), ± 800 × 450 μm, its cells mostly 67.5 × 450 μm, with age antheridia turn yellow and cell walls of scales darken. *Gynoecia* generally one to several per frond, in acropetal succession, situated dorsally over the costa and containing several archegonia in a cluster (Figure 1A), which is subtended by a posteriorly inserted, scale-like involucre (Figure 2B), sometimes partly double toward the base, generally deeply laciniate (Figure 3A), 850-110 × 500-750 μm, its cells ± 72.5 × 500 μm. *Capsule* thickening and enlarging into a fleshy shoot-calyptus, up to 3 mm long and as much as 10 cell rows or 260 μm thick in cross section (Figure 2G), with several unfertilized archegonia at the tip (Figure 2C), before it is perforated by the capsule (Figure 2D). *Capsule* cylindrical (Figure 2E), 2250 × 650 μm, opening with 4 valves, wall brown, several cell layers thick, outer cells irregularly elongate (Figure 3B), ± 200 × 20-30 μm, with cell walls evenly thickened (Figure 3D), inner cells thin-walled. *Seta* when young, erect, ± 290 μm in diameter, with ± 18 cortical cell rows and ± 16 medullary cells (Figure 2F), eventually becoming long and tenuous (Figure 2E). *Spores* light brown, ± globular, 25-30 μm in diameter, ornamentation with low, irregularly branched, short or long, curly ridges (Figure 3E, G, H), on proximal face a discrete round area with the ornamentation much more densely arranged (Figure 3F). *Elaters* bright brown, tapering to the ends, up to 195 × 7.5 μm wide in the centre, 2-spiral (Figure 3C, J).

*Symphyogyna brasiliensis* is widespread throughout Africa, occurring in Sierra Leone, Ghana (Jones & Harrington 1983), the Cameroons, Zaire, Rwanda, Burundi, Tanzania, Angola, Zimbabwe, as well as on the islands of Madagascar, Mauritius, Réunion, Saint-Benoit, St Helena and Ascension (Grolle 1980; Váňa et al. 1979, reported as *S. lehmanniana*). In the Neotropics it is known from Mexico to Bolivia, Uruguay and Brazil (Grolle 1980).

Gradstein *et al.* (1983) reported it to be widely distributed in the tropical mountains of the two continents, Africa and South America, at altitudes between 1 500 and 3 000 m, whereas in subtropical Brazil, the Cape Province and on the Galapagos Islands it descends to near sea level.

In southern Africa it has been collected in northern, eastern, central and southern Transvaal, in Swaziland, Natal and Zululand, as well as in the southwestern and southern Cape (Figure 4).

---

**FIGURE 4.** —The distribution of *Symphyogyna brasiliensis* in southern Africa.

*Symphyogyna brasiliensis* is terrestrial, growing on damp streambanks, along footpaths or in forested areas. It differs from the other species in the genus by its procumbent habit, by the entire margins of the thallus, by its slightly larger spore size and by its somewhat finer spore ornamentation. *S. filicum* Nadeaud from Cameroon Mountain is similar to *S. brasiliensis*, except that the small cells in the central strand are thin-walled (Jones 1990) and the spore sculpture is different. It was recently segregated as a separate genus, *Symphyogynopsis*, by Grolle in Grolle & Pippo (1986). *Symphyogyna volkensii* Steph. is more robust (Vanden Berghen 1965) than *S. brasiliensis* and has scattered slime papillae along the wing margins and different spore ornamentation (Grolle pers. comm.).

As vegetative propagation is unknown, dispersal of *S. brasiliensis* must be by long range aerial transport of its spores. Its presence on young volcanic islands would support this assumption.

---

**SPECIMENS EXAMINED**


ACKNOWLEDGEMENTS

I wish to express my gratitude to Dr E.O. Campbell, New Zealand, and Dr R. Grolle, Germany, for critically reading the manuscript and for their helpful suggestions; also to Dr H.F. Glen, NBI, for collecting fresh material that could be photographed. Thanks also to Mrs A. Romanowski, photographer, for developing and printing the photographs and Mrs J. Mulvenna, typist, for her valued contribution.

REFERENCES


STEPHANI, F. 1917. Species hepaticarum 6: 1–693.
