

GOMPHILLACEAE (LICHENES)

A NEW SPECIES OF *BULLATINA* FROM THE TRANSKEI WILD COAST*Bullatina viridis* Brusse, sp. nov.

Thallus crustosus, foliicola, viridis, usque ad 7 mm diam., laevis, trichomatibus hyphophorisque instructus; prothallus argenteo-albidus. *Trichomata* (Figurae 4 & 5) albida, simplicia, arcuata, usque ad 1.2 mm longa, basi circa 50 μm crassa, ad apicem acuta. *Hyphophora* (Figurae 4 & 5) piliformia, albida, erecta, 0.22–0.30 mm alta, basi 20–30 μm crassa, ad apicem obtusa; ex apicibus fasciculus lacrimiformis conidiophororum et catenarum conidiorum cellulis algarum pendens. *Conidiophora* (Figura 6) hyalina, leviter ramosa, septata. *Cellulae conidiogenae* nonnihil inflatae, terminales. *Conidia* concatenata (Figura 6), holoblastica, acropeta, hyalina, simplicia, ellipsoidea vel clavata, 6.0–8.5 \times 1.3–2.0 μm . *Cortex* (superior) monostratus, 3–5 μm crassus, paraplectenchymatus, cellulis 3–5 μm diam. *Stratum gonidiale* 15–20 μm crassum. *Algae* coccoideae, virides, 4.5–11.0 μm diam. *Apothecia* viridia, sessilia, usque ad 0.4 mm diam. (Figura 4). *Excipulum thalinum* 25–30 μm crassum, cellulas algarum continens, crystallis destitutum. *Excipulum proprium* reductum, hyalinum, prosoplectenchymatum, 10–15 μm crassum. *Hypothecium* destitutum. *Hymenium* hyalinum, J–, 55–80 μm altum. Paraphyses leviter ramosae anastomosaeque vel fere simplices, parallelae, septatae, ecapitatae, bene gelatinosae, luminibus circa



FIGURE 4.—*Bullatina viridis* Brusse, habit. F. Brusse 5864, holotype. Scale in mm.

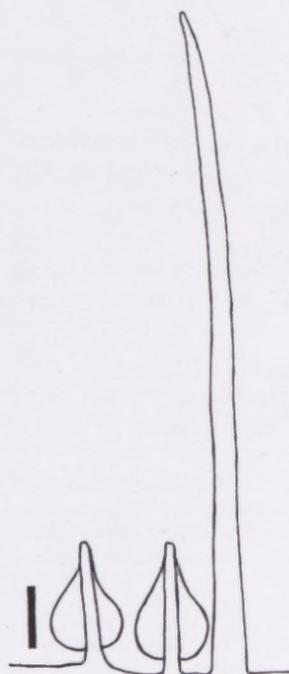


FIGURE 5.—*Bullatina viridis* Brusse, camera lucida drawing of a trichome and hyphophores, showing the teardrop-shaped conidial mass. F. Brusse 5864, holotype. Bar = 0.1 mm.

0.8 μm crassis. Epihymenium 5–8 μm crassum, cum gonocystibus, 2.5–5.0 μm diam., crystallis destitutum. *Asci* late clavati, parietibus J– hyalinis, apici leviter incrassatis, ascoplasmate J vinoso-rubescente. *Ascospores* singulae, 30–60 \times 10–22 μm , hyalinae, muriformes, 11–18 \times 2–5-loculares, halonatae, ovales, extremis obtusis, J–, parietibus tenuibus, cyanophilis, interdum in pycnidia mutantes, vel in spermatia, hyalina, 3–4 \times 0.7 μm , fatiscentes. *Pycnidia propria* non visa.

TYPUS.—Transkei, 3228 (Butterworth): Dwsa Nature Reserve. About 1 km from campsite on road to mPume gate. On living fronds of the cycad *Encephalartos villosus* Lem., in understorey vegetation of coastal forest. Alt. 40 m (–BD). F. Brusse 5864, 1991-01-05 (PRE, holo.; BM, iso.). Figurae 4, 5 & 6.

Thallus crustose, foliicolous, green, up to 7 mm across, smooth, with trichomes and hyphophores; prothallus whitish with a silvery sheen. *Trichomes* (Figures 4 & 5) completely whitish, simple, arcuate, up to 1.2 mm long, about 50 μm thick at base, apex acute. *Hyphophores* (Figures 4 & 5) piliform, whitish, erect, 0.22–0.30 mm tall, 20–30 μm thick at base, apex obtuse, a teardrop-shaped bundle (when wet) of conidiophores and chains of conidia hang down from apex, which contains algal cells in its core. *Conidiophores* (Figure 6) pendant, hyaline, sparsely branched, septate. *Conidiogenous cells* somewhat swollen, terminal. *Conidia* concatenate (Figure 6), holoblastic, acropetal, hyaline, simple, ellipsoid to clavate, 6.0–8.5 \times 1.3–2.0 μm . *Upper cortex* single-layered, 3–5 μm thick, paraplectenchymatous, cells 3–5 μm diam. *Algal layer* 15–20 μm thick. *Algae* coccoid, green, 4.5–11.0 μm diam. *Apothecia* green, sessile, up to 0.4 mm diam. (Figure 4). *Thalline exciple* 25–30 μm thick, containing algal cells, crystals (of calcium oxalate) absent. *Proper exciple* reduced, hyaline, prosoplectenchymatous, 10–15 μm thick. *Hypothecium* absent. *Hymenium* hyaline, J–,

55–80 μm high. Paraphyses lightly branched and anastomosed to nearly simple, parallel, septate, ecapitate, strongly gelatinized, lumens about 0.8 μm thick. Epihymenium 5–8 μm thick, with gonocysts, 2.5–5.0 μm diam., crystals (of calcium oxalate) absent. *Asci* broadly clavate, 1-spored, wall J– hyaline, somewhat thickened towards apex, ascoplasma J wine-red. *Ascospores* 30–60 \times 10–22 μm , hyaline, muriform, 11–18-locular \times 2–5-locellate, halonate, oval, ends obtuse, J–, walls thin, cyanophilic (the walls stain deep blue in lactophenol Cotton Blue), sometimes changing into pycnidia, or disintegrating into hyaline spermatia, 3–4 \times 0.7 μm . *Proper pycnidia* not seen.

This new species is a very distinct species from a macroscopic habit point of view. The whole lichen is green in colour, and the proper exciple does not crack away from the thalline exciple except very rarely in old specimens. The colour may be due to the fact that the whole lichen lacks calcium oxalate crystals, which are common in the greyer species.

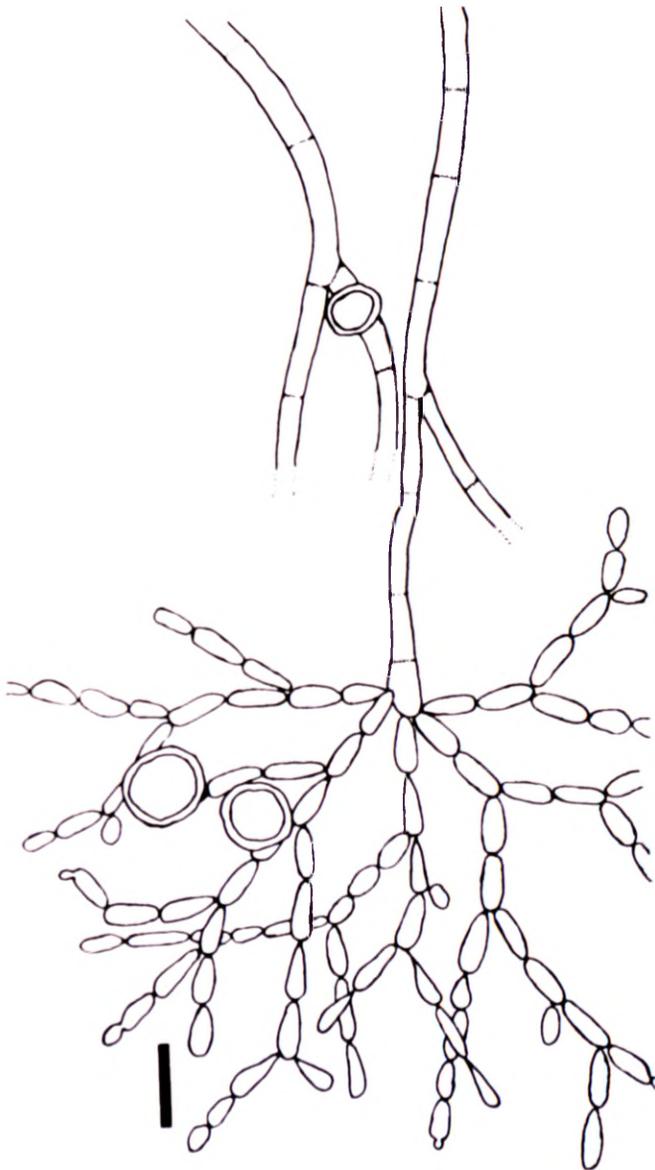


FIGURE 6.—*Bullatina viridis* Brusse, camera lucida drawing of the conidiophores and chains of conidia. F. Brusse 5864, holotype. Bar = 10 μm .

The thallus bears whitish trichomes and much smaller whitish hyphophores, quite abundantly. The hyphophores, which represent the anamorph of this lichen, are of the hanging teardrop type, which is also found in *Bullatina aspidota* (Vain.) Vězda & Poelt, until now the only species of *Bullatina* (Vězda 1979: fig. 9; Vězda & Poelt 1987). However, the hyphophores and trichomes are similar in size in *B. aspidota* (0.5–0.6 mm long), whereas in *B. viridis* they are clearly dimorphic—the hyphophores only reaching 0.3 mm high and being stubble-like, whereas the trichomes are much longer, becoming 1.2 mm long in some cases.

The genus *Gyalectidium* Müll. Arg., closely related to the genus *Bullatina* Vězda & Poelt, produces a completely different anamorph in the form of a small erect scale, which may be variously ciliate or ragged along the upper edge, with the conidial mass in the axil of this scale (Serusiaux & De Sloover 1986; Vězda 1979, 1983).

This new species is not likely to be confused with the only other *Bullatina* species, *B. aspidota* due to the latter's relatively thick thallus which is white due to calcium oxalate crystal encrustation. The apothecia are deeply sunken into the thallus as well (Santesson 1952: fig. 64) and the ascospores are larger (42–80 \times 20–32 μm) than those of *B. viridis* (30–60 \times 10–22 μm).

Superficially *B. viridis* may be mistaken for a *Tricharia* with white trichomes, especially one with epithelial gonocysts present, such as in *T. vulgaris* (Müll. Arg.) R. Sant. *T. vulgaris* has, in fact, got ascospores of a very similar size range to *B. viridis*, but *T. vulgaris* lacks trichomes and possesses a stalked-auriculoid hyphophore (Kalb & Vězda 1988; fig. 2), rather than the teardrop hyphophore of *B. viridis*, and many other *Tricharia* species (Kalb & Vězda 1988; Vězda 1979). *T. vulgaris*, like all other *Tricharia* species, has a well-developed proper exciple which is paraplectenchymatous and 20–30 μm thick under the hymenium, and thicker on the flanks. This degree of exciple development is lacking in *B. viridis*. On the other hand, the apothecia of *Tricharia* lack a thalline exciple and stand clear of any thalline tissue, whereas those of *Bullatina* possess a thalline exciple, usually referred to as being immersed in the thallus (cryptolecanorine). However, whatever the situation is, the flanks of the hymenium have tissue containing algae in *B. viridis*, which is not the case in all *Tricharia* species, including *T. vulgaris*.

Thus far, this new species has only been collected at the type locality, Dwesa Forest on the Transkei Wild Coast, but will undoubtedly be found at other forested localities in warm subtropical and tropical areas.

ACKNOWLEDGEMENTS

The author would like to thank Prof. R. Santesson for his views on this lichen, and Dr A. Vězda for kindly reviewing this manuscript. Prof. Colin H. Dickinson introduced the author to this important locality. Thanks are extended to the Transkei Forestry Department for permits to collect at Dwesa.

REFERENCES

- KALB, K. & VĚZDA, A. 1988. Neue oder bemerkenswerte Arten der Flechtenfamilie Gomphillaceae in der Neotropis. *Bibliotheca Lichenologica* 29: 1–80.
- SANTESSON, R. 1952. Foliicolous lichens 1. A revision of the taxonomy of the obligately foliicolous, lichenized Fungi. *Symbolae Botanicae Upsalienses* 12,1: 1–590.
- SERUSIAUX, E. & DE SLOOVER, J.R. 1986. Taxonomical and ecological observations on foliicolous lichens in northern Argentina, with notes on the hyphophores of Asterothyriaceae. *Veröffentlichungen des Geobotanischen Institutes der Eidgenössischen Technischen Hochschule, Stiftung Rübel, in Zürich* 91: 260–292.
- VĚZDA, A. 1979. Flechtensystematische Studien XI. Beiträge zur Kenntnis der Familie Asterothyriaceae (Discolichenes). *Folia Geobotanica et Phytotaxonomica* 14: 43–94.
- VĚZDA, A. 1983. Foliicole Flechten aus der Kolchis (West-Transkaukasien, UdSSR). *Folia Geobotanica et Phytotaxonomica* 18: 45–70.
- VĚZDA, A. & POELT, J. 1987. Flechtensystematische Studien XII. Die Familie Gomphillaceae und ihre Gliederung. *Folia Geobotanica et Phytotaxonomica* 22: 179–198.

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MS. received: 1991-07-15.