

LICHENES

PSATHYROPHLYCTIS, A NEW LICHEN GENUS FROM SOUTHERN AFRICA

***Psathyrophlyctis serpentaria* Brusse**, gen. et sp. nov.

Thallus crustosus, terricola, usque ad 60 mm diametro, 0,5–1,0 mm crassus, olivaceus, omnino in sorediis dissolutus. *Soredia* 20–40 μm diametro. *Algae* chlorococcaleae, 4,5–10 μm diametro. *Apothecia* lecideina, atra, convexa, laeves vel verrucata, usque ad 1,5 mm diametro. *Excipulum* stramineum vel pallide brunneum, radiatim et anticlinate scleroplectenchymatum (Figures 8e & 9), 60–120 μm crassum. *Hypothecium* brunneum, collenplectenchymatum

(Figure 8a), 30–45 μm crassum, cellulis 4–8 μm diametro. *Hymenium* hyalinum vel stramineum, circa 100 μm altum, interruptum. *Asci* clavati vel late clavati, cum tholis et parietibus externis J+ caeruleis (Figure 10). *Ascosporae* unicae vel binae, hyalinae, muriformes, septis incrassatis, J–, 35–45 $\times$ 17–18,5 μm , loculis 10–14-seriatis, locellis 4–5-seriatis. *Pycnidia* non visa. *Thallus* materiam ignotam continens (Table 1).

TYPE.—Cape Province, 3321 (Ladismith): 17 km N of Riversdale, Garcia's Pass, SW side of Ka-

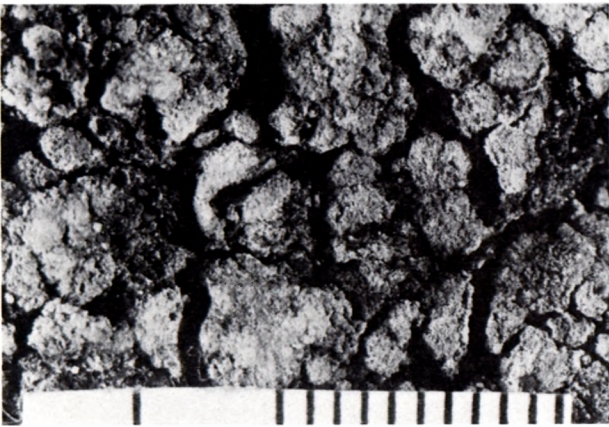


FIGURE 7.—*Psathyrophlyctis serpentaria* Brusse, habit. *F. Brusse 3612*, holotype. Scale in mm.

reekop, in the Langeberg, on soil near rock on a steep S slope (–CC), *F. Brusse 3612*, 1981.05.10 (PRE, holo.). Figure 7.

Thallus crustose, on soil, up to 60 mm across, 0,5–1,0 mm thick, olive green, completely dissolved into soredia. *Soredia* 20–40 µm diam. *Algae* chlorococcalean, 4,5–10 µm diam. *Apothecia* lecideine, black, convex, smooth to warted, up to 1,5 mm across. *Excipulum* stramineous or pale brown (some

of the interstitial spaces are dark brown and are indicated in Figure 8 by heavy lines), radiately and anticlinally scleroplectenchymatous (Figures 8e & 9), 60–120 µm thick. *Hypothecium* brown, collenplectenchymatous (Figure 8a), 30–45 µm thick, cells 4–8µm diam. *Hymenium* hyaline to stramineous, about 100 µm high, interrupted by areas of sterile hymenium with more branched paraphyses and more deeply brown colour. *Asci* clavate to broadly clavate (mature asci), one- or two-spored, tholus and outer wall J+ blue (Figure 10). *Ascospores* hyaline, muriform, septa thickened but J–, 35–45 × 17–18,5 µm, 10–14-loculate, 4–5-locellate. *Pycnidia* not seen. *Chemistry*: an unknown substance present (Table 1), which is invisible in daylight and longwave ultra-violet light.

TABLE 1.—Thin-layer chromatographic data for the unknown substance in *Psathyrophlyctis serpentaria* (Culberson 1972; Culberson & Johnson 1982)

	A	B	C
R _f class	6	5	6
R _f value	70/54,80	44/36,76	57/33,67

A = benzene:dioxane:glacial acetic acid (180:45:5 by volume)
B = n-hexane:methyl *tert.*-butyl ether:formic acid (140:72:18 by volume)
C = toluene:glacial acetic acid (200:30 by volume)

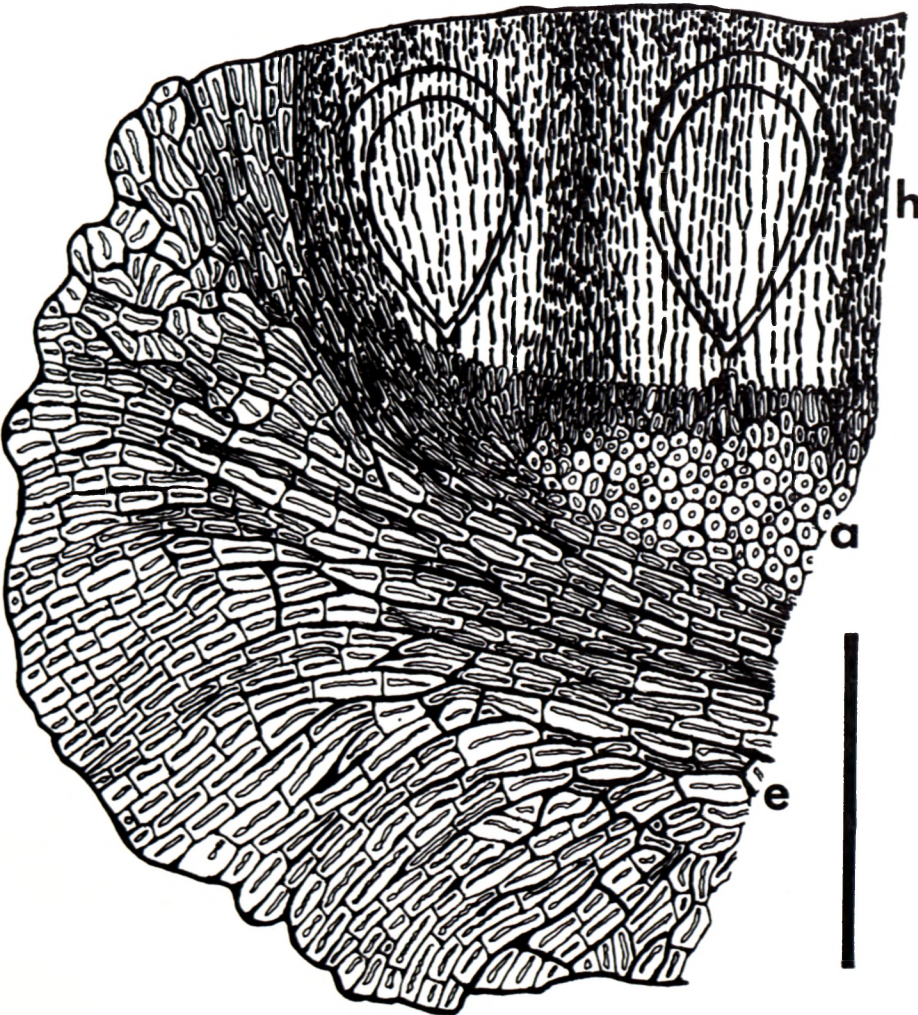


FIGURE 8.—*Psathyrophlyctis serpentaria* Brusse, section of apothecium edge, showing exciple (e), hypothecium (a), and hymenium (h). *F. Brusse 3612*, holotype. Bar = 100 µm.

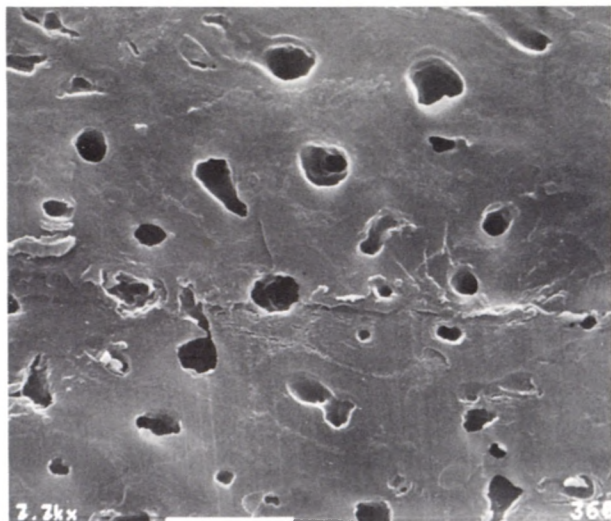


FIGURE 9.—*Psathyrophlyctis serpentaria* Brusse, scanning electron micrograph of the exciple, showing its sclerotized tissue. F. Brusse 3612, holotype. Bar = 6 µm.

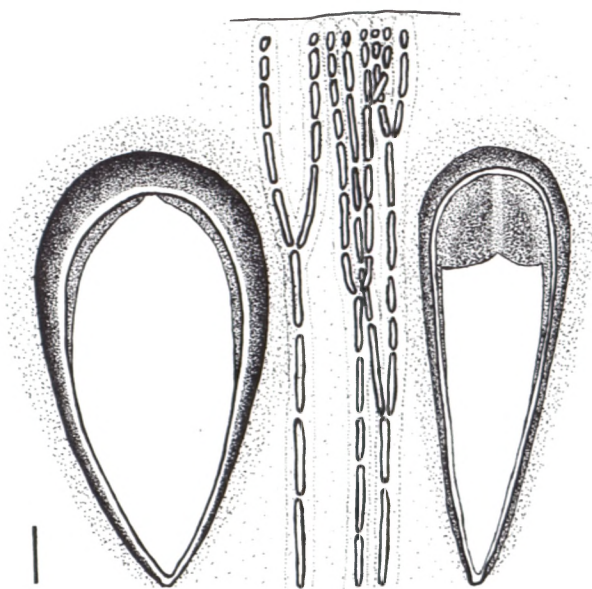


FIGURE 10.—*Psathyrophlyctis serpentaria* Brusse, asci and paraphyses. The ascus on the right is immature. F. Brusse 3612, holotype. Bar = 10 µm.

This new lichen superficially resembles a *Phlyctis*, because of the J+ strongly blue, thick outer wall, and hyaline muriform spores (Poelt 1969). However, the ascospores of *Phlyctis* are thin-walled, and the tholus is J– and not well developed (Poelt 1973). The exciple is also truly paraplectenchymatous, whereas this lichen only appears to be paraplectenchymatous, due to the dark brown interstices. The exciple of *Psathyrophlyctis* is in fact scleroplectenchymatous, as can be seen from a scanning electron micrograph of a section (Figure 9), and also from sections in lactophenol cotton-blue stain, under the light microscope (Figure 8).

The interrupted hymenium, and the sclerotized exciple tissue reminds one of certain genera in the

Graphidaceae, such as *Medusulina*, but here the often elongated apothecia are seated in stromata and the interruptions are of stromal tissue, not sterile hymenial tissue. The ascospores of *Medusulina* are thick-walled as well, but as is typical of this family, the walls become brown and sometimes even blue-brown in Lugol's iodine solution (Redinger 1933). The paraphyses of the Graphidaceae are generally simple or only sparingly branched and *Trentepohlia* is a common photobiont.

Psathyrophlyctis may be related to *Phlyctidia* Müll. Arg. ex Zahlbr. (1907), but the ascospores are only transversely septate in the latter (Zahlbruckner 1907, 1926).

As stated in the description, the thallus of this lichen is completely sorediate and is quite thick, and resembles the thallus of *Lecidea crassa* Nees ex Stiz. somewhat. However the thallus of *Lecidea crassa* is yellow, due to usnic acid, and also contains a series of terpenes. *Psathyrophlyctis serpentaria* has an olive green thallus, and looks yellowish in places under a dissecting microscope, but no yellow pigments were detected in an acetone extract of this lichen. Only two substances were detected by TLC (Culberson 1972; Culberson & Johnson 1982) in *P. serpentaria*, one was a small grey terpene spot, and the other was an evenly pale orange spot, after sulphuric acid and heat treatment. The latter substance seems to be new, and the TLC data for it is shown in Table 1.

This species is presently known only from the type locality, the seaward slopes of the Langeberg Range near Riversdale, on soil near rock. The slopes are heavily covered with fynbos vegetation, and this may explain its occurrence near rock, where some light and perhaps some fire protection may be available.

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