

## Notes on African plants

VARIOUS AUTHORS

### PYXINACEAE

A NEW SPECIES IN THE LICHEN GENUS *HETERODERMIA*, FROM COASTAL NAMAQUALAND

***Heterodermia namaquana* Brusse, sp. nov.**, thallo ut in *H. erinacea* (Ach.) W. A. Weber, sed subtus sorediato.

*Thallus* foliosus vel subfruticosus, ramunculicola vel corticola, usque ad 60 mm longus, laxe adnatus. *Lobi* sublineares, ascendentes, 1.0–3.5 mm lati, 70–200  $\mu\text{m}$  crassi, sympodiales; margines perciliati, ciliis simplicibus, albis, vel interdum apicem versus denigratis, 2–7 mm longis, basin versus 85–110  $\mu\text{m}$  crassis. *Thallus superne* cinereus vel albidus, opacus vel interdum pruinosis, sparse ciliatus, undulatus vel glebosus. *Cortex superior* hyalinus, periclinatus et longistrorsum prosoplectenchymatus, 25–130  $\mu\text{m}$  crassus. *Stratum gonidiale* sinuatum vel conformicatum, in crassitudine pervarians; algis *Trebouxiis*, 7–19  $\mu\text{m}$  diam. *Medulla* albida, demum in sorediis omnino dissoluta, ultimo evanescent. *Cortex inferior* deficiens. *Thallus inferne* albidus, nervatus, sparse ciliatus, ad apicem versus viridi-sorediatus; areae sorediorum diffusae, virides, saepe leviter convexae; soredia 15–40  $\mu\text{m}$  diam. *Apothecia* infrequentia, substipitata, laminalia, usque ad 4 mm diam.; discus carbo-nigrescens vel cinereus; margines ciliati, cinerei vel albi. *Cortex* hyalinus, anticlinatus prosoplectenchymatus, 45–80  $\mu\text{m}$  crassus. *Stratum gonidiale* ut in thallo. *Medulla* albida, laxa. *Hypothecium* hyalinum, 30–50  $\mu\text{m}$  crassum, J-, cyanophilum, granulis inspersum. Epihymenium badium, granulatum. *Hymenium* hyalinum, 55–70  $\mu\text{m}$  altum, J+ caeruleum; paraphyses septatae, capitatae; asci clavati, cum tholis, J+ caeruleis vel pallide caeruleis, typi Lecanorae. *Ascospores* octonae, fuscae, 2(1)-loculares, ad septum leviter constrictae, primum in aqua typi *Pachysporariae*, dein in solutione aquosa hydroxidi kalii typi

Physciae, 14.5–22.0  $\times$  6.5–8.5  $\mu\text{m}$ . *Pycnidia* non visa. *Thallus* atranorinum et zeorinum continens.

**TYPUS.**—Cape, 2917 (Springbok): (–AC), Namaqualand coastal plain, 1.6 km from the first Kleinzee turnoff on the main Port Nolloth-Steinkopf tarmac road, to Kleinzee. Port Nolloth Allotment Area. Common lichen growing on twigs of various shrubs, in gently undulating terrain. Succulent shrubland with *Stoeberia* one of the dominant bushes. Alt. 190 m. *F. Brusse* 5930, 9-9-1991 (PRE, holo.; B, BM, COLO, CTES, E, LD, S, TNS, UC, UPS, US, iso.). Figurae 1, 2 & 3.

Thallus as in *Heterodermia erinacea* (Ach.) W. A. Weber, except lower surface sorediate.

*Thallus* foliose or subfruticose, on twigs or corticolous, up to 60 mm long, loosely adnate. *Lobes* sublinear, ascending, 1.0–3.5 mm broad, 70–200  $\mu\text{m}$  thick, sympodial; margins abundantly ciliate, cilia simple, white, to sometimes blackened towards the tips, 2–7 mm long, 85–110  $\mu\text{m}$  thick near base. *Upper surface* ash-grey to whitish, opaque or sometimes pruinose (frosted), sparsely ciliate, undulate to lumpy (lumps corresponding to pockets on the lower surface). *Upper cortex* hyaline, periclinally and longitudinally prosoplectenchymatous, 25–130  $\mu\text{m}$  thick. *Algal layer* vaulted, very variable in thickness; algae *Trebouxia*, 7–19  $\mu\text{m}$  diam. *Medulla* whitish, at length completely degenerating into soredia, finally vestigial. *Lower cortex* lacking. *Lower surface* whitish, veined, sparsely ciliate (the cilia originating from the lower side of the upper cortex), green sorediate at the lobe tips; sorediate areas diffuse, green, often mildly convex (corresponding to a concavity in the upper surface of the

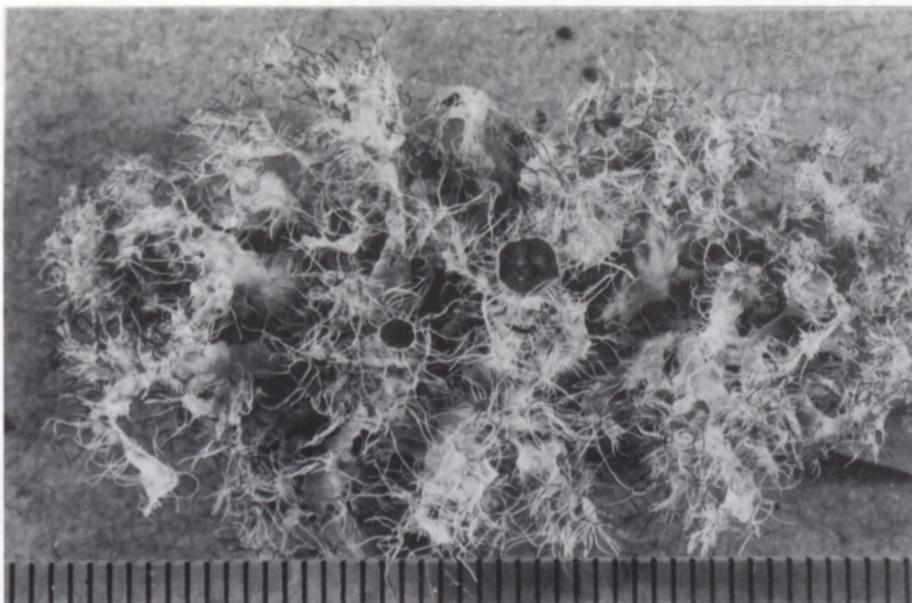


FIGURE 1.—*Heterodermia namaquana* Brusse, habit photograph. *F. Brusse* 5930, holotype. Scale in mm.



FIGURE 2.—*Heterodermia namaquana* Brusse, in habitat, on shrub, *Stoebria beetzii* (Dinter) Dinter & Schwant. The shrub is about 1.5 m tall. F. Brusse 5930, type locality, with Fifteen Miles Mountains in the distance.

lobe tip; lobe tip subinvolute); soredia 15–40  $\mu\text{m}$  diam. *Apothecia* infrequent, substipitate, laminal, up to 4 mm across; disc charcoal to grey (when heavily pruinose); margins ciliate, ash-grey to whitish. *Cortex* hyaline, anticlinally prosoplectenchymatous, 45–80  $\mu\text{m}$  thick. *Algal layer* as in thallus, absent under hymenium. *Medulla* whitish, lax. *Hypothecium* hyaline, 30–50  $\mu\text{m}$  thick, J-, cyanophilic (stains deep blue in lactophenol Cotton Blue), granular interspersed. *Epihymenium* reddish brown, granular. *Hymenium* hyaline, 55–70  $\mu\text{m}$  high, J+ blue; paraphyses septate, capitate; asci clavate, eight-spored, tholus J+ blue or pale blue, Lecanora-type. *Ascospores* greyish brown, 2(1)-locular, slightly constricted at septum, Pachysporaria-type in water, changing to Physcia-type in an aqueous solution of potassium hydroxide, 14.5–22.0  $\times$  6.5–8.5  $\mu\text{m}$ . *Pycnidia* not seen. *Chemistry*: Atranorin and zeorin present (as well as traces of leucotylin and 6 $\alpha$ , 16 $\beta$ -di-O-acetylleucotylin).

This new species was previously thought to be *Heterodermia erinacea* (Ach.) W.A. Weber (Brusse 1988), but material of the American species has since been seen (Sipman, Lichenotheca Latinoamericana no. 23). The most conspicuous difference is that *H. erinacea* is non-sorediate (Kurokawa 1962), whereas *H. namaquana* is sorediate. The soredia in this species are formed at the expense of the medullary tissue, so that older lobes have only vestiges of the medulla left. Consequently, older lobes consist solely of the upper cortex, with very little else. This lichen is also ciliate on all surfaces, which includes the lower surface, which is sparsely ciliate. Interestingly, the cilia on this surface arise from the lower side of the upper cortex, and pass through the medulla and soralia, when these are present. Like *H. erinacea*, this new species has a lower surface with a veined appearance. In *H. namaquana*, this is due to vein-like thickenings in the lower side of the upper cortex. The lobes are mildly pocketed in places which gives the upper side a lumpy appearance. The sorediate lobe tips are also often subinvolute, giving the diffusely sorediate areas of the lower surface a convex appearance.

The ascospores of these two species are of similar size and ascospore-type in an aqueous solution of potassium hydroxide (the recommended observation medium (Mayrhofer & Poelt 1979) for ascospore-types of fresh material), but differ in water. Freshly prepared sections



FIGURE 3.—*Heterodermia namaquana* Brusse, growing on twigs of *Stoebria beetzii* (Dinter) Dinter & Schwant. F. Brusse 5930, type locality.

of the apothecia show ascospores of the *Physcia*-type in *H. erinacea* (same as in KOH), but of *Pachysporaria*-type in *H. namaquana*. The changeover from *Pachysporaria*-type to *Physcia*-type in *H. namaquana* can be observed by allowing a solution of potassium hydroxide to pass under the cover slip of freshly prepared apothecial sections in water. No such changes can be observed for *H. erinacea*. This represents a fundamental difference between the ascospores of these two species, and for this reason, they do not represent a true species pair.

The tholus of both species is fairly pale blue in Lugol's iodine solution, and most of the blue colour of hymenial sections in this solution is due to the hymenial gel. The tholus illustrated by Honegger (1978, 1980) for *Physcia stellaris*, is fairly representative of *Heterodermia namaquana* as well.

In the sterile state this new species may be confused with *Heterodermia comosa* (Eschw.) Follm. & Redon, a similar-looking sorediate lichen (Swinscow & Krog 1988). However, this species is unrelated, because of its larger (30–35 × 13–16 µm), Polyblastidium-type ascospores (Kurokawa 1962).

At present this new species is known from a 250 km stretch of coastal succulent shrubland, ranging from the Klinghardt Mountains in southwestern Namibia to the Port Nolloth area of the northwestern Cape Province.

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