

# REINWARDTIA

BEING A CONTINUATION OF THE  
*BULLETIN DU JARDIN BOTANIQUE DE BUITENZORG*  
(*BULLETIN OF THE BOTANIC GARDENS, BUITENZORG*)

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## MALAYSIAN LICHENS — II\*

P. GROENHART \*\*

## TWO NEW SPECIES FROM JAVA

*Umbilicaria zollingeri* Groenh., *spec. nov.* — Fig. 1.

The Umbilicariaceae are a family of Lichens occurring almost exclusively in temperate regions and moreover frequently growing on rocks. Nevertheless this family is represented in the tropics; it has been reported from tropical America and Africa. As far as data are available they occur on rocks in the upper regions of high mountain-ranges, viz. of the Andes of Bolivia and Peru and of Pico d'Orizaba in Mexico from 10,000 feet upwards. For Africa the data are in accordance: Mount Deschen in Abyssinia (14,200 feet) and Mount Kilimanjaro in Kenya (12,000 feet).

For the tropics of Asia an early record exists of the appearance of a species of *Umbilicaria*; until today, however, this indication has not yet been confirmed and as far as I could gather, it has remained the only one. In Zollinger's "Systematisches Verzeichniss der im indischen Archipel gesammelten Pflanzen," page 8, 1854, one reads: "Ad rupes summi M. Ardjuno (11,000') occurrit *Umbilicariae* spec, sed nunc in herbario caret." In Moritzi's "Systematisches Verzeichniss der von H. Zollinger in den Jahren 1842—1844 auf Java gesammelten Pflanzen," 1845-1846, *Umbilicaria* is not mentioned, although Zollinger climbed Mount Ardjuno in 1844 and the material was collected probably in that year. Later workers on Zollinger's lichens did not describe an *Umbilicaria* from his collections either, so that we may assume it has been lost.

On July 20, 1932 and some years later, on March 27, 1937, I ascended the summit of Mount Ardjuno myself and am rather confident that I collected my specimens of *Umbilicaria* from the same rock as Zollinger did almost a century ago. Up there, just beneath the top at about 3,300 m, there are only a few big rocks on which this species grows. The top itself is 3,339 m. In the somewhat lower surroundings of the top I could not locate any other specimen. On the summits of Mount Welirang (3,156 m), Northern Kembar (3,020 m), Southern Kembar (3,100 m), and Mount Bakal (2,980 m), which all belong to the Mount-Ardjuno complex, I failed to discover *Umbilicaria*, too. The same holds true for Mount Kawi (Butak;

\* For the first paper of this series, see Bull. bot. Gdns Buitenzorg III 17: 198-203. 1941.

\*\* Herbarium bogoriense, Kebun Eaya Indonesia, Bogor (Buitenzorg).

2 868 m), and Mount Andjasmoro (2,282 m); while also from the other high mountains in the Archipelago *Umbilicaria* has never been recorded.

I regret I have not visited the summit of Mount Semeru (3,676 m), but it is not likely that lichens occur there, for the volcano is still active and this circumstance is not favourable for the development of these plants. Generally the lichen flora is very poor in the neighbourhood of active craters and solfataras.

From all these data it might now be concluded that *Umbilicaria* does not occur beneath 3,300 or 3,200 m in the tropics.

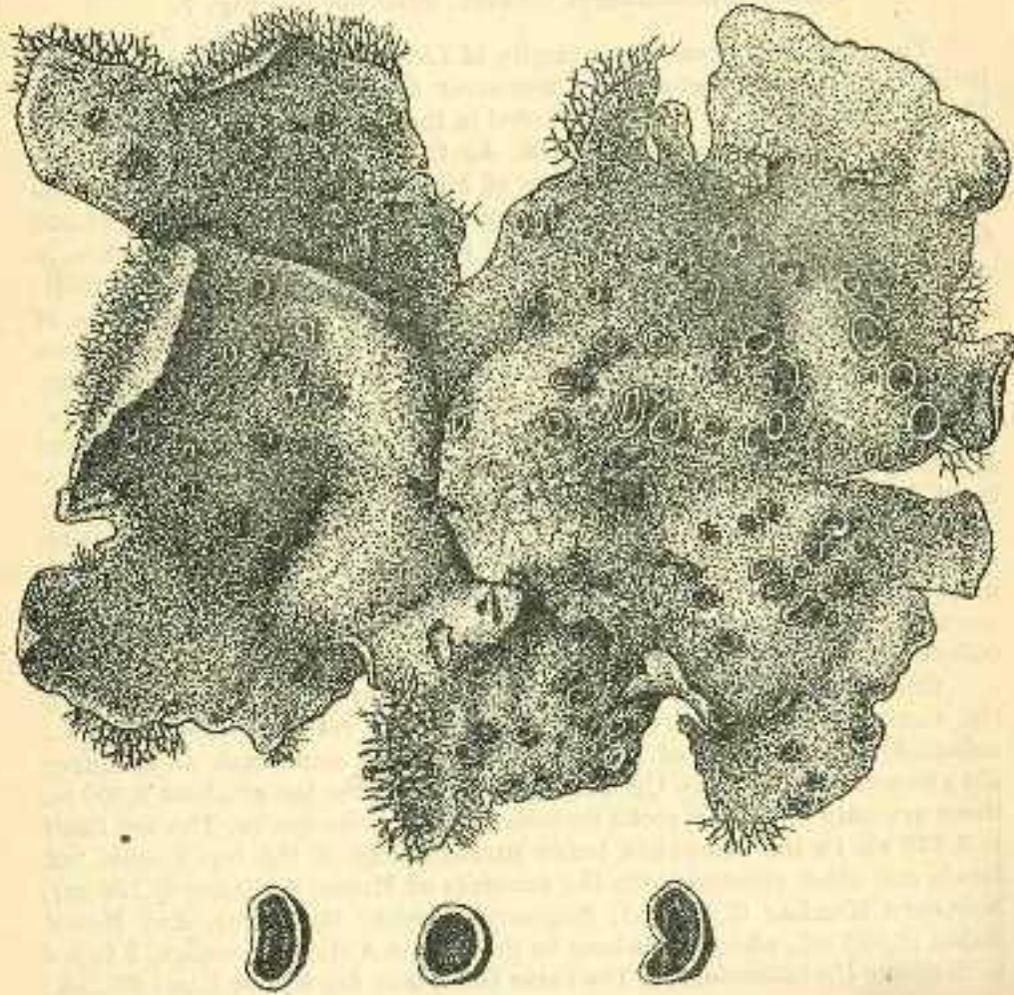


Fig. 1.

FIG. 1. *Umbilicaria zollingeri* Groenh. spec. nov., after type specimen (Groenhart 422). Thallus with apothecia, about 4.5 X; below, apothecia, about 10 X.

By my find, Zollinger's statement is confirmed. Therefore, I have named this lichen in his honour, as I cannot identify this species as one already previously described. With the already known species from America and Africa it completes the circle of tropical species of *Umbilicaria* that links the members of this genus of the northern and southern temperate zones.

*Thallus* monophyllus, 1—3 cm latus, gompho centrali ad substratum affixus, rigidus, durus, irregulariter incisus, margine sinuato-lobata, supra griseus, inaequalis, interdum reticulato-rugosus et in centro plus minusve plicatus; *subtus* laevis vel bullato-inaequalis, carneus, nigro-variegatus et sub margine interdum griseus, *rhizinis* crassis, simplicibus vel ramosis plus minusve abundanter praeditus, rare nudus; soralia et isidia desunt; *medulla* alba.

*Apothecia* dispersa, 1 mm diam., nigra, sessilia vel substipitata; margo niger, tenuis, laevigatus; discus nudus, non-gyrosus vel circulo praeditus; *hymenium* 120 $\mu$ . altum, hyalinum, decolor vel citrinum, J coeruleum; epithecium et hypothecium nigrum; medulla decolor. *Cortex* excipuli in parte inferiore chondroideus, in parte exteriore pseudo-parenchymaticus cellulis minutissimis, strato amorpho, nigro vel brunneo obductus. *Asci* 8-spori, clavati; *spores* biserialis, ovoideo-ellipsoideae, muriformae, 6—7.5 X 13.5—17  $\mu$ . *Paraphyses* simplices.

The small thalli of the species are fixed to the substratum with a short, rather thick stalk. They are monophyllous, almost entire or more or less deeply incised; the margin is somewhat bent upward and wavy; the upper side is greyish white, uneven, somewhat warty, in some specimens reticulately costate and in the centre slightly plicate; soredia and isidia are absent; the lower side is rather smooth or slightly bullate-uneven, flesh-coloured, mixed with black, and towards the margins more greyish. In some samples the underside is naked, but generally it is provided with long, rather thick, awl-shaped, unbranched or somewhat branched rhizines. The rhizines are restricted to the underside and never occur at the edges of the thallus.

The scattered apothecia have different forms, they may be round and simple, but there are also round apothecia with a central circular insula, while in other apothecia the margin is bent inwards in various ways at one side, but they are never really gyrose. The spores appear simple at first sight, but the older ones show a muriform structure, with very thin and almost inconspicuous septa, especially when they are dark-brown.

The structure of the cortical layers agrees with that in other species of the genus. They are rather thick compared with the medullar layer; the inner parts are subcartilagineous, while the outer parts are pseudo-parenchymatic with very small cells. The gonidia lie in scattered groups under the upper cortex.

The thallus gives no reactions with K, Ca, and KCa.

The species belongs to the subgenus *Gyrophoropsis*.

TYPE SPECIMEN. — Java, Mount Ardjuno, Groenhart 422.

DISTRIBUTION. — Only known from Mount Ardjuno, Java.

SPECIMENS EXAMINED. — JAVA: Mt. Ardjuno, alt. 3,325 m, 20-VI-1932, Groenhart 161, 422 (type), 27-111-1937, Groenhart 2092, 7659-7663 (all specimens in Herbarium P. Groenhart).

*Mycoblastus endoxanthus* Groenh., spec. nov.

*Thallus* epiphloeodes, crustaceus, uniformis, continuus, griseus, plus minus granuloso-verruculosus, sorediis et isidiis destitutus, pro maxima parte cephalodiis verruciformibus, sordidis praeditus; granulae thalli minutissime flavo-coronatae; marginem non vidi; *medulla* alba, ex hyphis pachydermaticis, intricatis formata; *gonidia* protococcoidea. *Gonidia* cephalodiorum scytonemea.

*Apothecia* biatorina, ad basin bene constricta, sessilia, dispersa, rotunda, simplicia sed inter cephalodia prolifera et botryoso-aggregata; *discus* pallide brunneus, planus, opacus, nudus vel leviter pruinosus; *vtargo* persistens, semper prominulus, laevigatus, osseo-albus vel leviter flavus; *hypothecium* nigrum vel brunneo-nigrum ex hyphis dense intricatis; *medulla* excipuli ex hyphis crassis, pachydermaticis, radiantibus, materia flava amorpho obductis; *cortex* excipuli chondroideus, decolor, hyalinus; *hymenium* 105—110 $\mu$ . altum, decolor, hyalinum, purum; *asci* 4—8-spori, clavati, superne rotundati et hinc membrana incrassata cincti; sporaes biseriales, ellipsoideae, membrano duplice et incrassato cinctae, utrinque bene rotundatae, 15—20 X 27—30  $\mu$ ; endosporium circ. 1  $\mu$ ., exosporium circ. 2,5  $\mu$ . crassum; *paraphyses* simplices, filif ormes, non capitatae, conglomeratae.

*Reactiones*: Thallus K —, Ca —, KCl —; margo et medulla apotheciorum K + citrina; hymenium J + flavum, asci coerulei.

The thin thallus of this lichen is greyish and shows very small warts, which are yellowish-powdery at the top. The medulla within these warts is of the same structure as that of the apothecia, viz. consisting of thick, loosely interwoven hyphae, covered with a yellowish matter. For the greater part the thallus is covered with a crustaceous, warty, dirty brown layer of cephalodia, which contain clusters of *Scytonema-gonidia*.

Normal apothecia occur especially on the uncovered parts of the thallus. On the parts of the thallus covered with cephalodia the apothecia are old, bearing 3—20 young apothecia sprouting out of the disc.

The dark hypothecium is sharply outlined against the medulla, forming a thin parathecium bordering on the hymenium and gradually becoming thicker in the centre of the apothecium. The medulla consists of thick, colourless hyphae which radiate from the hypothecium towards the cortical layer. They are covered with a yellowish, amorphous matter that becomes citrine in KOH. The spores have a thick, double wall, viz. a thin endospore and a thicker exospore. On account of these thick-walled, rather large spores the species belongs to the genus *Mycoblastus*.

TYPE SPECIMEN. — JAVA: Mt. Gedeh, forest near Rawah Gajonggong near Tjibeureum above Tjibodas, on bark of *Elaeocarpus* sp., 1-IV-1950, S. J. van Ooststroovi 15U88.

NOTE ON THE GENUS *LEPROCAULON* (NYL.) NYL.

The genus *Leprocaulon* was suggested by Nylander in a letter to Lamy, who published the name without a diagnosis of the genus (*in* Bull. Soc. bot. France 25: 352. 1878). It was based on *Stereocaulon nanum* Ach., of which Nylander (*in* Flora 59: 578. 1876) remarks that this lichen has no affinity with *Stereocaulon*. Contrary to Lamy's statement (*I.e.*), Nylander did not use the combination *Leprocaulon nanum* in his remark in "Flora."

A brief English description of the genus, or pseudo-genus, was given by Crombie (*British Lichens* 1: 123. 1894). This description is sufficient to embrace all those somewhat leprarioid, fruticulose lichens with *Protococcus-gonidia*, without cephalodia, and of which the apothecia are unknown.

Though several authors have expressed the opinion that *Stereocaulon nanum* has but little resemblance with a real *Stereocaulon*, the name proposed by Nylander has not become popular and is but seldom used by other authors.

This circumstance made me lose quite a lot of time when I had to find out the name of a lichen that agrees with Crombie's description and it was only by accident that I detected it was *Stereocaulon arbuscula* Nyl. For this lichen, too, has no resemblance at all to a *Stereocaulon*, having no cephalodia, no typical phyllocladia and very tender and soft stalks. The yellow reaction with KOH, too, is absent. I therefore propose to separate these lichens from *Stereocaulon* and to follow Nylander's suggestion.

Like in *Leprocaulon nanum* all specimens of *L. arbuscula* are sterile, so that it is impossible to assign a place to this doubtful genus in Zahlbruckner's system with any certainty. It certainly cannot be connected with the Cladoniaceae, which have well-developed and commonly stiff and hard thalli. The leprarioid character of the thalli of *L. nanum* and *L. arbuscula* rather suggest affinity with the Chrysothricaceae, of which *Leprocaulon* probably represents a primitive fruticulose state. In this respect Zahlbruckner's key (*in* Engler & Prantl, Nat. PflFam., 2. Aufl., 8: 134. 1926) may be changed as follows:—

1. Thallus more or less crustaceus.
  2. Thallus forming small cushions. Spores 1—3-septated.....*Chrysothrix*
  2. Thallus arachnoid-crustaceous. Spores simple.....*Crocynia*.
1. Thallus fruticulose. Spores unknown.....*Leprocaulon*

*Leprocaulon arbuscula* (Nyl.) Nyl. — Fig. 2.

*Stereocaulon arbuscula* Nyl., Synops. Lich. 1: 253. 1860 (as *Stereocaulon nanum* \**S. arbuscula*); Wainio *in* Philip. J. Sci. 4: 662. 1909; Zahlbr., Cat. Lich. Univ. 4: 634. 1927. — *Leprocaulon arbuscula* (Nyl.) Nyl. "Lich. ins. Guin. p. 8" (cited after Hue); Hue *in* Nouv. Arch. Mus. III 4: 134. 1892.

The thallus of this lichen consists of small, tender, branched, erect, 1—3.5 cm high and 0.1—0.5 mm thick stalks forming a soft caespitium on the bark of trees. The primary stems are round to somewhat flattened, entire to slightly fissurated, smooth, more or less brownish; they are fixed to the substratum with thin rhizinae. The secondary branchlets are arachnoid and covered with small, greenish granules containing the gonidia in clusters between the loosely interwoven hyphae; these granules are often of a soresidious nature. The central axis of the primary stems is chondroid, solid and composed of thick-walled, conglutinated hyphae running parallel to the surface; it is covered with a medullar layer of irregularly interwoven, rather thin-walled hyphae; gonidia and cortex are absent in these stems. There are no cephalodia.

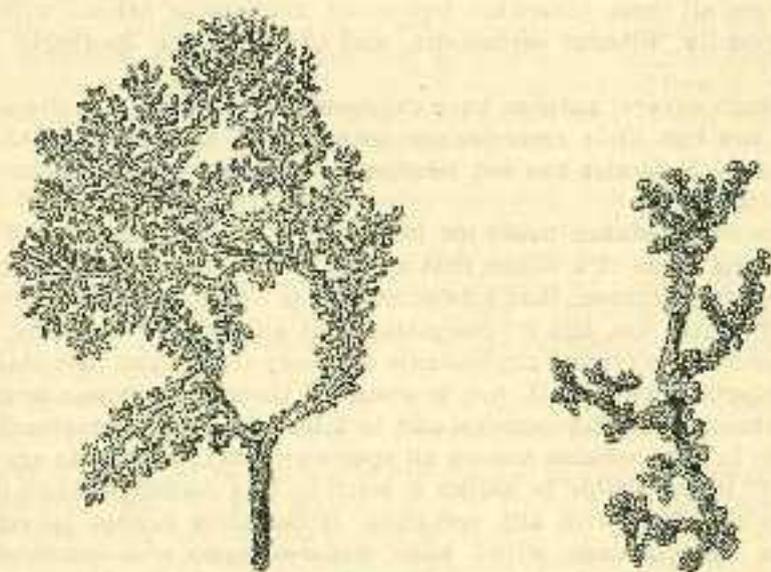


Fig. 2.

FIG. 2. *Leprocaulon arbuscula* (Nyl.) Nyl. At left, thallus, about 2 X; at right, branch, about 4 X-

The species is not rare in the higher mountain forests above about 1,200 m, but it may be easily overlooked on account of its smallness.

SPECIMENS EXAMINED.—JAVA: West Java: Puntjak Pass, Telaga Warna, alt. about 1300 m, 7-IV-1939, *Groenhart* 3268 (in Herb. Groenhart); Mt. Gegerbentang, alt. 1600 m, 13-VI-1949, comm. *Neervoort* 1079 (*Bg* 5555); Ravine of Tjibatulawang River, alt. 1600 m, 10-IX-1949, comm. *Neervoort* 2600 *pr. p.* (*Bg* 3908); Rawah Denok, alt. 1680 m, 8JX-1949, comm. *Neervoort* 2329 (*Bg* 3886); Mt. Gedeh, Tjibodas-Tjibogo, alt. 1415 m, 24-VII-1949, comm. *Neervoort* 1832 (*Bg* 3771); Mt. Gedeh, Nature Reservation, alt. 1495 m, 29-III-1949, comm. *Neervoort* 92 (*Bg* 3219); *ibid.*, alt. 1840 m, 6-VII-1949, comm. *Neervoort* 1779 (*Bg* 3748); *ibid.*, alt. 2425 m, 14-V-1949, comm. *Neervoort* 61\*3 (*Bg* 3374); Mt. Gedeh, Lawang Saketeng, alt. 2140 m, 12-V-1949, comm. *Neervoort* 385 (*Bg* 3285); Mt. Gedeh, Lebak Saat, alt. 2390 m, 12-V-1949,

comm. *Neervoort* 450 (*Bg* 3308); Mt. Gedeh, trail to Mt. Pangerango, alt. 2740 m, 13-V-1949, comm. *Neervoort* 551 (*Bg* 3344); Mt. Pangerango, summit, alt. 3019 m, 13-V-1949, comm. *Neervoort* 617 (*Bg* 3365); Mt. Tangkubanprahu, Hooglandweg, alt. about 1600 m, 11-VII-1941, *Groenhart* 2284 (in Herb. Groenhart); East Java: Mt. Kawi, Tjemoro Kandang, alt. 2700 m, 16-IV-1929, *Docters van Leeuwen-Reijnvaan* 12286 (*Bg* 1427); Mt. Kawi, trail to Mt. Butak, alt. 2000—2500 m, 21/22-VII-1937, *Groenhart* 657 (in Herb. Groenhart); Mt. Ardjuno, trail from Sumber Brantas to Mt. Kembar, alt. 2200 m, 26-III-1937, *Groenhart* 373 (in Herb. Groenhart). — SAMOA: Tutuila, Matafao, XII-1894, *Reinecke* 58a (*Bg* 4.90).

This lichen is mentioned as occurring in the Philippines by Wainio.

*Stereocaulon nanum* Ach. *sensu* Mont. & V. d. Bosch., *Lich. Jav.* p. 29 — Junghuhn, *Plant. Junghuhniana*. Fasc. 4: 455. 1855, belongs probably to this species.