

NEW PARMELIAE (LICHENS) FROM AFRICA. 2

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PARMELIA DIVERSA Hale, sp. nov.

Thallus ut in Parmelia lobulascens Stein. sed sorediis destitutis differt.

Holotype: Ethiopia: On rock in upper part of Erica zone, mountain pass between Abada and Goba, Bale Prov., elev. 3600 m, H. Krog E 22/19, January 1972 (US; isotype in 0).

With the advent of thin-layer chromatography we are beginning to find much more chemical complexity in the African Amphigymnias than previously suspected (cf. Hale, Phytologia 23:343. 1972). On re-examining the type of P. lobulascens, for example, I detected alectoronic and a-collatolic acids in addition to gyrophoric acid previously reported (Hale, Contr. U. S. Nat. Herb. 36:331. 1965). Now with a greater number of collections from Africa, the nonsorediate counterpart with identical chemistry has been found. This fertile species has large imperforate (or barely perforate) apothecia, up to 15 mm broad, but with poorly developed spores, about 15 X 25 μ and episporium 2 μ thick. It occurs on both rocks and trees in humid high elevation forests in Ethiopia.

Additional specimens examined. Ethiopia. Same locality as holotype, Krog E 22/18; 5 km E of Asela, Arusi Province, elev. 3000 m, Krog E 31/9 (0, US).

PARMELIA PARADOXA Hale, sp. nov.

Thallus corticola, cinereoalbidus, membranaceus, ca. 5 cm latus, lobis rotundatis, 1 cm latis, margine ciliatis, ciliis usque ad 4 mm longis, sorediis isidiisque destitutis, superne planus, nitidus; cortex superior 15-20 μ crassus, stratum

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gonidiale 20-30 μ crassum, medulla alba, 70-100 μ crassa, cortex inferior 20 μ crassus; subtus niger, modice rhizinosus, ambitu nudus, castaneus. Apothecia stipitata, 0.5-1.0 cm diametro, albo-maculata, amphithecio ciliato, disco imperforato, sporis 12 X 24-26 μ , episporio 2 μ crasso.

Chemistry: Atranorin, lividic, physodic, and 4-0-methylphysodic acids, and a high spot (not the colensoic acid group).

Holotype: Uganda: N. edge of Malabigambo Forest, Bukoto County, Masaka District, elev. 1100 m, T. D. V. Swinscow 3U 25/4B, December 1971 (BM; isotype in US) (Fig. 1).

This is the first species in subgenus Amphigymnia proven to contain the lividic acid group, which is typically found in section Hypotrachyna. While the structure of lividic acid is still unknown, it appears to be biogenetically related to alectoronic acid. If we search among Amphigymnia species with similar morphology but containing alectoronic acid, we find no satisfactory counterpart. P. corniculans Nyl. has short cilia and perforate apothecia. P. pachyspora Hale, now known to contain alectoronic acid in addition to protocetraric acid, has sparse short cilia and a more robust, coriaceous thallus. P. wainii A. L. Smith has similar apothecia and a membranous thallus but the cilia are long and dense and spores about 20 μ without a thickened episporium.

PARMELIA PSEUDOGRAYANA Hale, sp. nov.

Thallus saxicola, cinereoalbidus, laxe adnatus, 4-7 cm latus, lobis rotundatis, usque ad 1 cm latis, margine suberectis, crenatis crenatis vel breviter lobulato-dissectis, ciliatis, ciliis 0.5-1.0 mm longis sorediatis, soraliis orbicularibus vel irregularibus, pro parte sublaminibus, superne planus vel rugulosus rimosusque, opacus; cortex superior 14 μ crassus, stratum gonidiale 15 μ crassum, medulla alba, 85-95 μ crassa, cortex inferior 13 μ crassus; subtus niger, modice rhizinosus, marginem versus nudus, castaneus. Apothecia ignota.

Chemistry: Atranorin and fumarprotocetraric acid.

Holotype: South Africa: On sandstone, Nhlonhlo Valley, Cathedral Peak area, Drakensberg, Natal, elev. 1500 m, E. A. Schelpe 1021 (BOL; US, isotype) (Fig. 2).

The closest relative of this species is P. grayana Hue, a widespread species from Africa, India, and Japan. It contains atranorin and protolichesterinic acid. P. pseudograyana, while

virtually morphologically identical, is restricted to Africa. It is the only species in subgenus Amphigymnia with fumarprotocetraric acid as the principle constituent (P. viridiflava Hale produces fumarprotocetraric acid and protocetraric acid together).

Additional specimens examined. Uganda. 1 km E of Lubare Ride Pass, Ankole District, Lye L398 (BM, US); 1 km W of Hamurwa, Kigezi District, Swinscow 3U 46/3 (BM, US). Angola. Rio Coquema, Bie, Degelius (Degelius herbarium, US). Tanzania. Lupembe, Ludeka, Eusebia (F).

PARMELIA SPILOTA Hale, sp. nov.

Thallus ut in Parmelia subschimperii Hale sed soreidiis destitutis differt.

Holotype: Tanzania: Horombo Hut, Kilimanjaro, elev. 3750 m, H. D. Griffin, 9 January 1969 (US; isotype in O).

The most remarkable feature of this large Amphigymnia is the unusual combination of four acids: atranorin, norlobaridone, and norstictic and connorstictic acids (determined by Dr. C. F. Culberson). This is, in fact, the same chemistry as P. subschimperii (Hale Phytologia 23:345. 1972), a soreciate species, except for a much greater concentration of norstictic acid here. P. spilota is obviously the nonsoreciate counterpart in this population. Both have dirty mottled areas on the upper surface caused by cortical discolorations and clumps of black pycnidia. White maculae are fairly distinct on the upper surface and the marginal cilia are 1-2 mm long. Apothecia are unknown.

PARMELIA SUBTORTULA Hale, sp. nov.

Thallus ut in Parmelia tortula Kurok. sed isidiis munitis differt.

Holotype: Uganda: Near Kakinzi school, E. Mengo District, elev. 1100 m, K. A. Lye L202A, October 1969 (BM; isotype in US) (Fig. 3).

Kurokawa recently determined that P. tortula contains norlobaridone and neoloxodic acid (Journ. Hattori Bot. Lab. 32:214. 1969). The present species, having the same chemistry, can be considered as the isidiate counterpart. These two saxicolous lichens seem to have quite different distributions, however, P. tortula being known rather commonly from South Africa, P. subtortula only in East Africa. Both have a pale brown lower surface.

Additional specimens examined, Uganda, 1 km E Buyaga, Masaka District, Lye L541 (BM, US); Kikagati, Ankole District Burnet 199c (BM). Kenya, 5 km SSW Lake Naivasha, Rift Valley Province, Swinscow K 16/5 (BM); Masai Gorge N of Lake Naivasha, Rift Valley Province, Swinscow K 30/110-1 (BM).

PARMELIA SWINSCOWII Hale, sp. nov.

Thallus cinereoalbus, muscicola supra saxos, laxe adnatus, 3-5 cm latus, lobis sublinearibus, 1.5-2.0 mm latis, imbricatis, margine sparse ciliatis, ciliis 0.5 mm longis, superne planus, nitidus, apicem versus rugosus et rimosus, obfuscans, integer vel minute dissectus, sorediascens vel pustulatus, sorediis crassis; cortex superior 15 μ crassus, stratum gonidiale 15 μ crassum, medulla alba, 65-75 μ crassa, cortex inferior 12 μ crassus; subtus nigricans, dense rhizinosus, rhizinis simplicibus. Apothecia ignota.

Chemistry: Atranorin, salazinic acid, and lobaric acid.

Holotype: Kenya: Near Naro Moru track, Mt. Kenya, Central Province, elev. 3500 m, T. D. V. Swinscow K 31/33, January 1972 (BM; isotype in US) (Fig. 4).

This species was at first identified as an alpine form of P. sorocheila Vain. but the cracked coarsely sorediate areas at the lobe tips and dense rhizines seemed to rule this out. The unusual joint occurrence of salazinic and lobaric acid (already known in certain populations of P. saxatilis (L.) Ach.) was further evidence that P. swinscowii is distinct and not merely a deformed alpine variant of another species. I would tentatively place it in section Imbricaria because of the narrow, sparsely ciliate lobes, but it even intergrades with abnormally small species in the P. cetrata group (section Irregulares).

Additional specimens examined. Kenya. Same locality as the holotype, Swinscow K 31/13 (BM, US); head of Teleki Valley, Central Province, 4100 m, Swinscow K 10/107 (BM); Aberdare Mountain east of Lesatima, Central Province, 3600 m, Swinscow K 25/19-1 (BM, US).

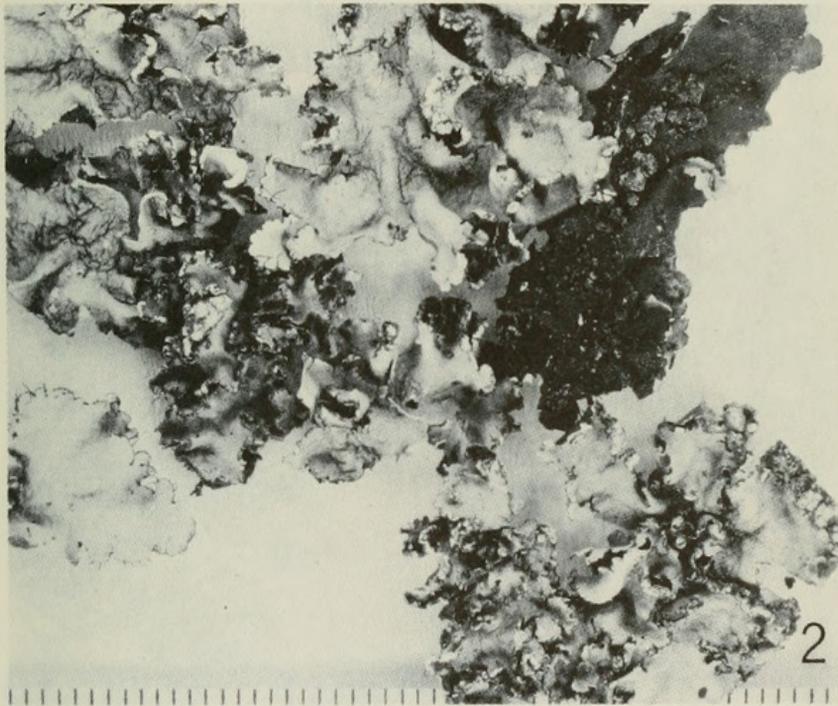
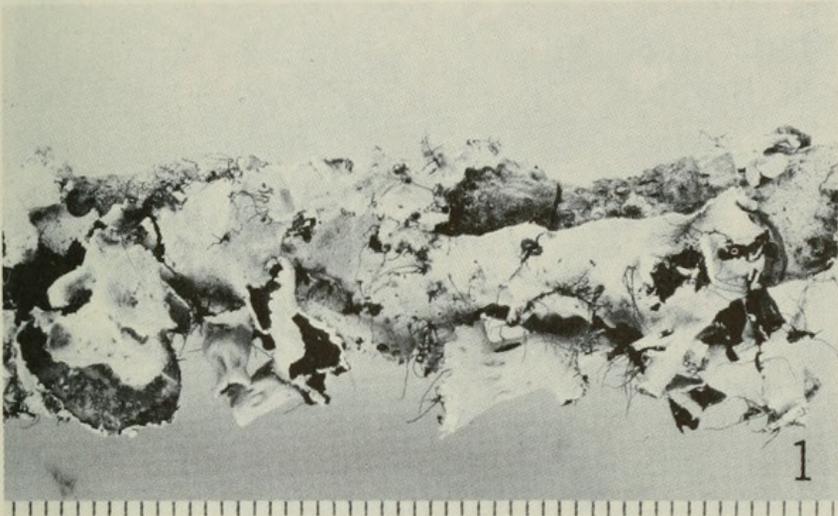


Fig. 1. Isotype of Parmelia paradoxa (US). Fig. 2. Isotype of Parmelia pseudograyana (US). Scale in mm.

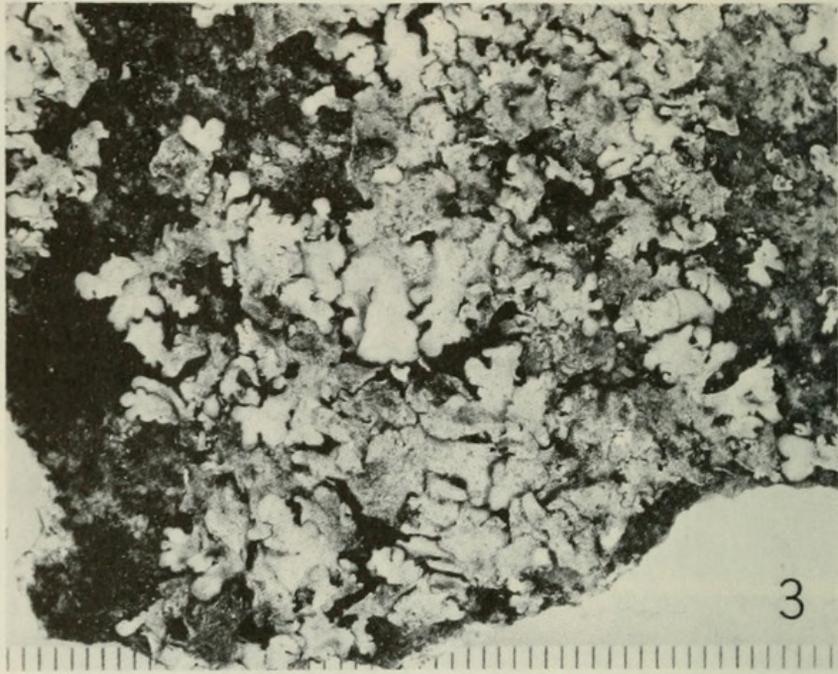


Fig. 3. Isotype of *Parmelia subtortula* (US). Fig. 4. Isotype of *Parmelia swinscowii* (US). Scale in mm.



Hale, Mason Ellsworth. 1973. "New Parmeliae (lichens) from Africa. 2." *Phytologia* 27(1), 1–6.

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