

Taxonomic Notes on the Lichen Family Verrucariaceae in Japan (III).
***Agonimia tristicula* New to Japan**

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日本産アナイボゴケ科地衣類分類ノート (III).
Agonimia tristicula, 日本に産す

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Agonimia tristicula (Nyl.) Zahlbr. (Lichenes, Verrucariaceae) is reported for the first time for Japan. A description and figures are given in this paper on the basis of a specimen collected in Hachijo Isl. of Izu Isls.

On a collecting trip to Hachijo Isl. of Izu Isls. In February 1992, I found a lichen thallus composed of very small squamules with almost completely exposed black perithecia growing over mosses on the trunk of *Alnus sieboldiana*. It belongs to *Agonimia* in the family Verrucariaceae because it has the following diagnostic characters of the genus (Coppins and James 1978): (1) thallus composed of small squamules paraplectenchymatous throughout (2) with minute papillae, (3) exposed dark-colored perithecia with (4) periphyses as only hamathecial element, (5) three-layered perithecial wall composed of an outer paraplectenchymatous zone with dark brown inclusions, an inner hyaline paraplectenchymatous zone and an intermediate zone, and (6) muriform spores. Only two species are known for the genus: *A. tristicula*

(Nyl.) Zahlbr. and *A. octospora* Coppins et James. The specimen from Hachijo Isl. can be identified with *A. tristicula*, since it has 1-spored asci and perithecia with a rough surface. The identification was also confirmed by comparing with the holotype of *A. tristicula*. This species is previously known from Europe, the Azores Isls., North America, and the Philippines (Coppins and James 1978, Egan 1987, Aptroot and Sipman 1989). The range is now extended to Japan. The following description and figures are based on the specimen collected in Hachijo Isl., Japan.

Agonimia tristicula (Nyl.) Zahlbr., Oesterr. Bot. Zeitschr. **59**: 351 (1909).

Verrucaria tristicula Nyl., Flora **48**: 356 (1865).
Type: Europe, supra muscos in Aberdeenshire

(H-NYL 2295 – holotype).

External Morphology: Thallus squamulose; squamules lobate and attached to the substratum only with the basal end, scattered or slightly aggregated; lobes irregularly or pinnately branched a few times, or dissected, ca. 0.1 mm wide, discrete; upper surface greenish gray (fresh material) with or without pale to dark brown tinge, dull, smooth, somewhat convex; lower surface whitish, rough and granulose (soredia-like), exposing whitish medulla, lacking rhizines. Perithecia common, scattered, almost completely exposed, black and more or less glossy, ovoid, or obpyriform, constricted at the base, 0.2–0.5 mm high \times 0.15–0.3 mm wide, with (4–)5–6 latitudinal ridges (prominent in the upper part, disappearing in the lower part). Pycnidia not found.

Anatomy: Thallus 50–100 μm thick, almost homoiomerous, covered with apparent cortical layer on the upper surface, euparaplectenchymatous, frequently with intercellular spaces; lumina of hyphae almost isodiametric, 3–5 μm in diameter; cortical cells with several prominent papillae or almost lacking; phycobiont cells grass-green, scattered. Perithecia obpyriform, 280–450 μm high \times 220–250 μm wide; exciple rough on the surface, ca. 50 μm thick, composed of three layers, the inner layer hyaline, the middle layer mottled with very dark brown to almost black grains, the outer layer very dark brown to almost black; periphyses almost simple, 20–25 μm long and extending more or less towards the ostiole in the upper parts of the perithecium, ca. 10 μm long and extending centripetally to the median of the perithecium in the middle and lower parts of the perithecium; subhymenium biconvex, 25–30 μm thick at the center; hymenial algae absent; asci clavate, bitunicate, 130–200 \times 35–50 μm ; spores 1 in each ascus, hyaline to very pale brown, strongly

muriform, universally thin-walled, oval to almost fusiform, or bacilliform, 135–180 \times 30–40 μm .

Remarks: The specimen from Hachijo Isl. in Japan differs from the European material in some minor morphological characters as follows. (1) The Japanese specimen produces obviously larger spores (135–180 \times 30–40 μm) than those found in specimens collected in Europe and the Azores (“(60–)80–120(–150) \times 30–50 μm ” (Coppins and James 1978). The difference does not seem to be significant to separate species. It should be noted here that the Japanese specimen produces constantly one spore in an ascus, whereas either one or two spores are produced in an ascus in specimens from Europe and the Azores. When spores are produced in reduced number in an ascus as in the genus *Pertusaria* (Oshio 1968), the spore size tends to be almost in inverse ratio to the number in each ascus. (2) Periphyses of the Japanese specimen tend to be shorter than those in European material. Those in the upper part of the perithecium are 20–25 μm long in the former, but are 30–50 μm long in the latter. (3) The subhymenium is lenticular in the Japanese specimen, whereas in the European material it is frequently concave to almost flat on upper side as usually found in the Verrucariaceae.

Specimen examined: Japan, Izu Isls., Hachijo Isl., Miharayama (1.2 km East of the summit), 560 m alt., on mosses on trunk of hardwood, *Alnus sieboldiana*, 17 Feb. 1992, H. Harada 12290 (Natural History Museum and Institute, Chiba).

Additional specimens examined: U. K. East Sussex, Coppins s.n. (E); Scotland, Coppins & Tibell, in herb. Coppins 2315 (E); Brecon, Coppins 10965 (E); Island of Wight, Coppins s.n. (E).

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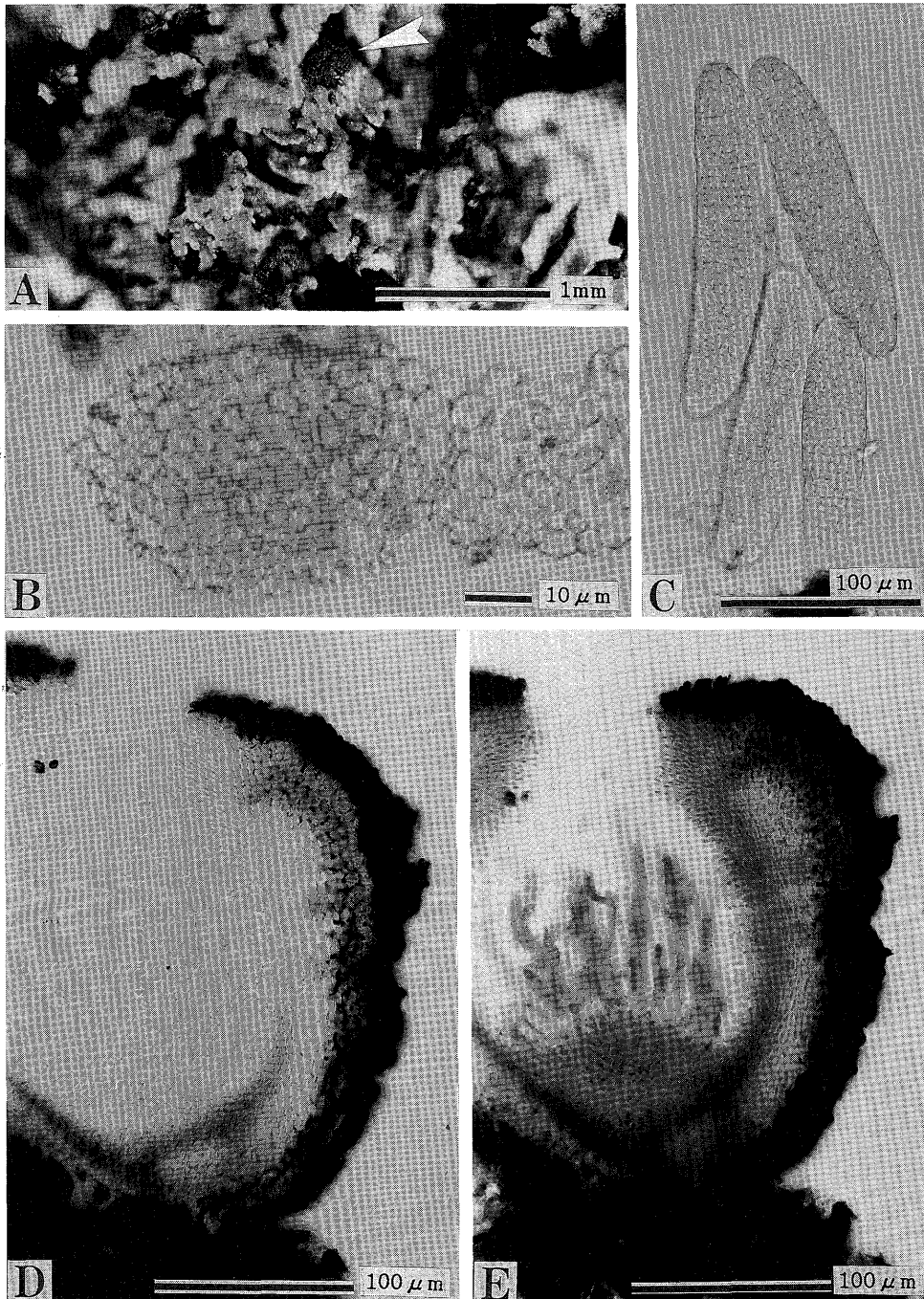


Fig. 1. *Agonimia tristicula* from Japan. A, habit (arrow head indicating a perithecial); B, cross section of thallus; C, spores; D, vertical section of a perithecial; E, the same as D. (A-E, Harada 12290. A, air-dried material; B-D, GAW preparations; E, LPCB preparation)

ing loan specimens. Deep thanks are extended to Dr. S. Kurokawa in Toyama and Dr. H. Kashiwadani of National Science Museum, Tokyo for critically reading the manuscript, and to Prof. T. L. Esslinger of North Dakota State University for correcting the English text.

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要 旨

1992年2月、八丈島三原山山頂近くの稜線に立つオオバヤシャブシの樹幹上の蘚苔類のマット上に、これまで日本からは知られていなかったアナイボゴケ科の鱗片状地衣を採集した。これは以下に挙げる特徴を示すことから *Agonimia* 属に属するものであった：(1) 被子器は黒く、地衣体から裸出する；(2) hamathecium として周糸のみを持つ；(3) perithecial walls は異型菌糸組織で、透明な内側と、暗褐色の外側と、中間層からなる；(4) 胞子は石垣状多室；(5) 地衣体は極めて小さな鱗片状で、異型菌糸組織からなり、(6) 表面にパピラを生ずる。これまで本属として知られる2種のうち、胞子を1子囊中に1個しか生じない点で *A. tristicula* (Nyl.) Zahlbr. と似ており、胞子を8個生ずる *A. octospora* Coppins et James とは明らかに異なる。更に *A. tristicula* のタイプ標本等と比較検討した結果、同種と判明した。ただし、八丈島産の標本は、欧州産のものと比べると、胞子が大きい、周糸が短い、子囊下層がレンズ形になる傾向が強いなど、若干の差がみられる。