

Distopyrenis japonica (Ascomycota, Pyrenulaceae), a new lichen-allied lichenicolous fungus from Chiba-ken, central Japan

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Distopyrenis japonica sp. nov. is described from Chiba-ken, central Japan. It is characterized by simple ascomata with a sublateral ostiole, and narrow ascospores (12–15 × 5–6 μm) with a euseptum developed in the median distoseptum. In the holotype, the fungus seems to grow parasitically on a crustose lichen, *Graphis proserpens*. This is the first record of a lichenicolous habit among *Distopyrenis*.

Key Words—*Distopyrenis*; Japan; lichenicolous fungi; new species; Pyrenulaceae.

The family Pyrenulaceae was previously considered to comprise mainly corticolous, crustose lichens, represented by *Pyrenula* A. Massal. and *Anthracothecium* Hampe ex A. Massal., and to have a distribution center in the Tropics. In recent decades, many genera have been added to this family, including poorly lichenized or non-lichenized fungi such as *Distopyrenis* Aptroot, *Granulopyrenis* Aptroot, *Parapyrenis* Aptroot and *Pyrenographa* Aptroot (Aptroot, 1991; Harris, 1995). In Japan, this group of fungi has so far been investigated to only a limited extent, with records of only lichenized species in *Anthracothecium*, *Lithothelium* Müll. Arg., *Parmentaria* Fée, *Pleurotheliopsis* Zahlbr., *Pyrenastrum* A. Massal., *Pyrenula*, and *Sulcopyrenula* H. Harada (Asahina, 1931; Harada, 1997, 1999; Kashiwadani, 1978; Kashiwadani and Kurokawa, 1981a, b). During the course of my taxonomic study on this family in Japan, however, I recently found a non-lichenized species among a collection from Chiba-ken on the Pacific side of Honshu, central Japan. In this paper, it is described as a new species of *Distopyrenis*.

Materials and Methods

Description of external morphology is based on air-dried material observed under a dissecting stereoscope. Sections were made with a razor blade under a dissecting stereoscope, mounted in lactophenol cotton-blue (LPCB), and used for anatomical description except for the color description, which was based on the GAW (glycerol: ethanol: water = 1:1:1) preparations. The I tests were conducted on sections of perithecia by using a diluted Lugol's solution. UV (365 nm) tests were made with the Spectroline EN-140L/J (Spectronics Corp.) on the intact air-dried specimen. The specimen used in this study is deposited in the lichen herbarium of Natural History Museum and Institute, Chiba (CBM).

Taxonomy

Distopyrenis japonica H. Harada, sp. nov. Figs. 1, 2

Ascomycota lichenicola. Perithecia 0.25–0.45 mm diam, basi immersa, hemisphaerica, nigricantia, glabra, nitidula, ostiolis sublateralibus, periphysatis aperta. Clypeus fragmenta corticis arboris continens. Asci cylindraceo-clavati, 8-spore, thoro apicali conspicuo ex locello oculari cylindraceo praediti. Paraphyses plerumque simplices, sursum attenuatae, e basin ad medium lumine 1–1.5 μm lato praesentes, pauciseptatae, hyalinae. Hymenium guttulas olei carens, jodo aurantiaco tinctum. Ascosporeae ovaes, 12–15 × 5–6 μm , laeves, brunneae, cum eusepto in distosepto mediano evolventi, in quoque dimidio una locola a latere quinqueangularem visa et ea basin apicem versus spectanti inclusae, ad apicem endosporio crasso habentes. Pycnidia non visa.

Holotype: JAPAN. Honshu. Chiba-ken, Futtsu-shi, Utougi, 120 m elev., on trunk of *Castanopsis sieboldii* Makino, 18 Oct. 1997, Harada 18445 (CBM-FL-10363).

External Morphology: "Thallus" (present lichenicolous fungus and host lichen not distinguished) ash gray, \pm pinkish, smooth, dull, lacking prominent marginal structure, UV+ yellow. Perithecia usually immersed at base in thallus or substratum, hemispherical or dome-shaped, 0.25–0.45 mm diam, almost black, \pm brownish, smooth, somewhat glossy, \pm thin thalline cover; ostioles sublateral (sometimes apical), generally indistinct. Pycnidia not seen.

Anatomy: Thallus lacking distinct structure; hyphae mostly linear, colorless, but grayish or brownish around perithecia, with 1–1.5 μm wide lumina and ca 0.5 μm thick walls, not penetrating deeply into substratum, \pm interspersed with disorganized *Trentepohlia*. Clypeus well-developed, containing fragments of substratal bark, lacking crystals, very dark brown to almost black for most parts (excl. substratal bark), mostly hyphal (with

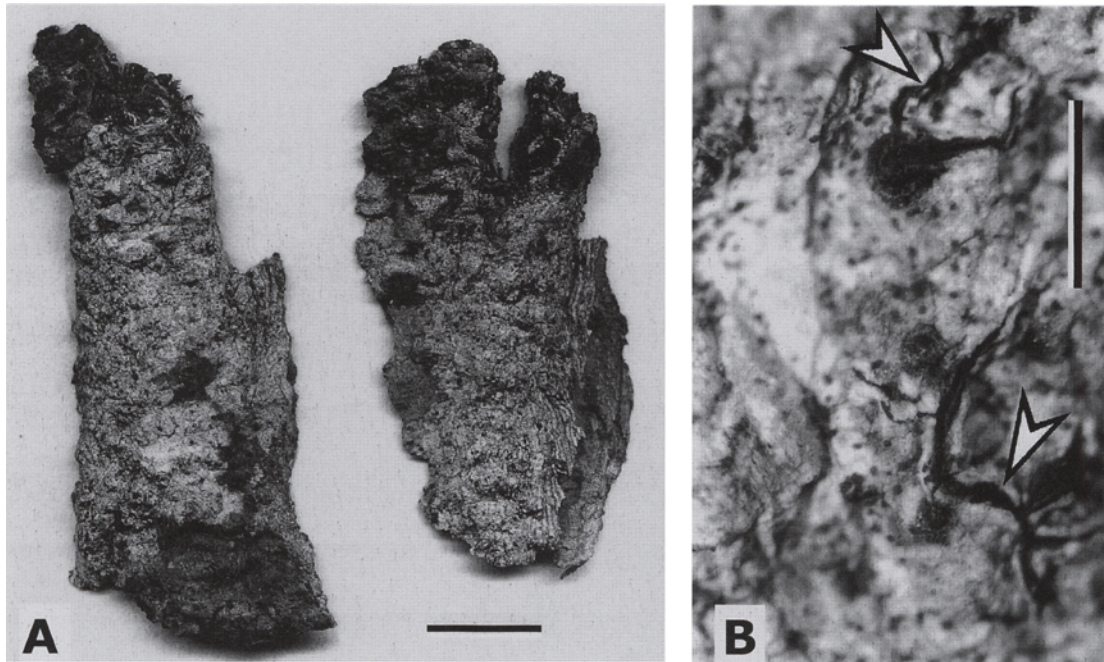


Fig. 1. Habit of *Distopyrenis japonica*. A, general habit; B, perithecia of *D. japonica*, associated with lirelliform ascomata of *Graphis proserpens* indicated by arrowheads. (A, B, holotype, air-dried material) Scales: A, 1 cm; B, 1 mm.

dark brown walls). Ostiolar area of perithecial walls composed of highly conglutinated mycelium, with short hyphae embedded, lacking substratal bark. Exciple thin, very dark brown. Periphyses unbranched or sparsely

branched at base, mostly 5–15 μm long. Hymenium lacking oil droplets, I+ orangish; paraphyses mostly unbranched, generally tapering towards apices, with 1–1.5 μm wide lumina in basal to middle parts, very spar-

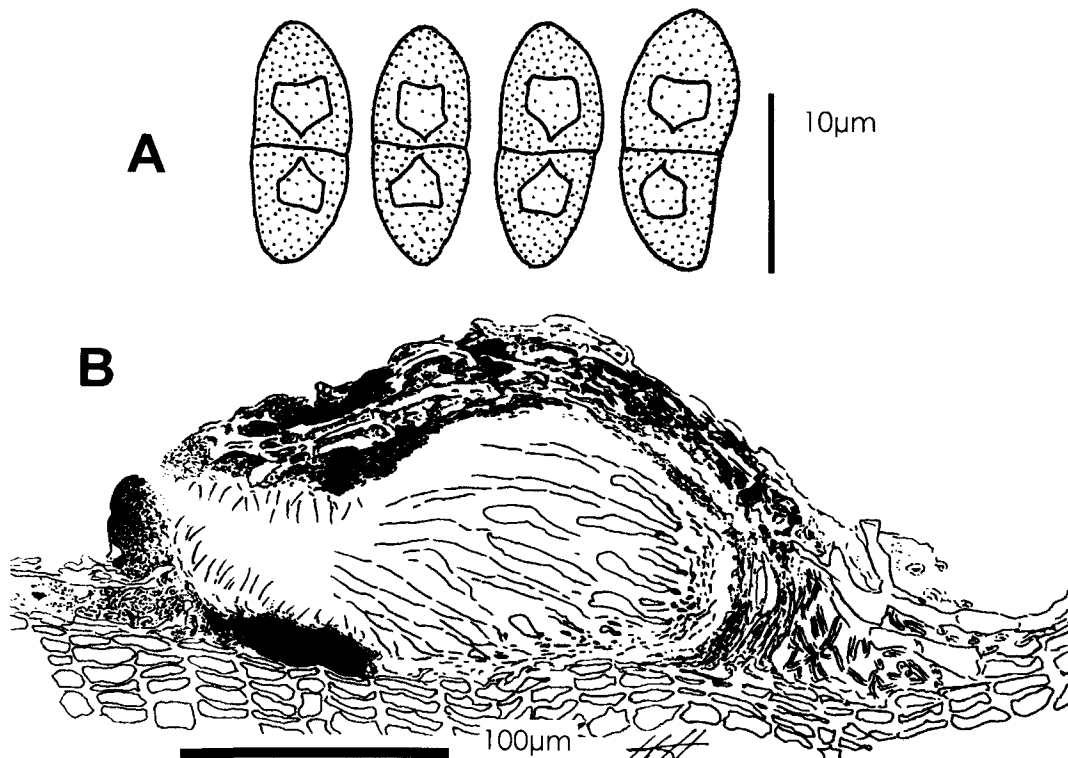


Fig. 2. Anatomy of *Distopyrenis japonica*. A, ascospores; B, vertical section of perithecium. (A, B, LPCB preparations from holotype)

sely septate, with colorless thin (usually up to 0.5 μm) walls. Asci cylindrical-clavate; apical dome prominent, with cylindrical ocular chamber, 1-. Ascospores 8/ascus, oval, 12–15 \times 5–6 μm , smooth on surface, lacking epispore, brown, with euseptum developed in median transverse distoseptum, 1-; each half with one locule (pentagonal with one side facing the apex of the spore in side view), with thick endosporium in apical parts.

Distribution: Known only by the type from Chiba-ken on the Pacific side of Honshu, central Japan.

Habitat: On bark of evergreen hardwood, *Castanopsis sieboldii* in shade along a stream through forest in gorge in the warm temperate zone; on a crustose lichen, *Graphis proserpens* Vain.

Remarks: The present fungus is similar in ascomata anatomy to many species of the lichen genus *Pyrenula* s. str. in Pyrenulaceae, e.g. *Pyrenula japonica* Kurok., except it has sublateral ostioles. However, it is placed in *Distopyrenis* (Aptroot, 1991) of the same family by the following characters: (1) thallus not lichenized, (2) ascospores with one distoseptum, with endosporium much thickened. It also resembles *Parapyrenis* of Requinellaceae (Aptroot, 1991), but differs in having true paraphyses rather than pseudoparaphyses.

Distopyrenis japonica differs from the seven previously described species of this genus (Harris, 1995) in having (1) simple ascomata with (2) a sublateral ostiole, and (3) narrow ascospores (12–15 \times 5–6 μm) with a euseptum developed in the median distosepta. This new species resembles an undescribed species from Cuba, "*Distopyrenis* sp. Buck 23459" reported by Harris (1995), but since he notes that the material is "a rather poor collection", a comparison with the present new species should await further material being available.

Ascomata of a crustose lichen, *Graphis proserpens* Vain. are found on "the thallus" of *Distopyrenis japonica* in the holotype (Fig. 1B). "The thallus" shows the features of *G. proserpens*: "thallus epiphloeodal, continuous, smooth, sometimes much spreading and granular, grayish or whitish, more or less yellowish-green" (Nakanishi, 1966). In my observation, the thalli of this lichen in this area tend to be darker and more shiny in

comparison with the present specimen. This change might have been brought about by *D. japonica*. Sections of "the thallus" of the holotype revealed the presence of collapsed cells of *Trentepohlia* Martius, a known phycobiont of *Graphis*. Thus, *D. japonica* seems to have parasitized *G. proserpens* in this case. This is the first report of a lichenicolous habit among *Distopyrenis*.

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