

Short Communication

Enumeration of the genus *Peziza* in Japan: *Peziza limnaea* and *Peziza rifaii*Hideyuki Nagao^{1)*} and Toshimitsu Fukiharu²⁾¹⁾ Faculty of Horticulture, Chiba University, 648 Matsudo, Matsudo-shi, Chiba 271–8510, Japan²⁾ Natural History Museum and Institute, Chiba, 955–2 Aoba-cho, Chuo-ku, Chiba-shi, Chiba 260–8682, Japan

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Two species in the genus *Peziza* are described and illustrated as new to Japan: *Peziza limnaea* and *Peziza rifaii*. These species were collected in the broad-leaved forest mainly with *Castanopsis cuspidata* in Chiba Pref.

Key Words—broad-leaved forest; discomycetes; Japan; *Peziza limnaea*; *Peziza rifaii*.

The genus *Peziza* is characterized by having fairly large and dark-colored apothecium, although there are some exceptions. Twelve species of *Peziza* have been recognized in Japan (Otani, 1989). In the course of a mycological inventory of Discomycetes in Chiba Pref., Japan, we identified five species of *Peziza* as new to this Prefecture: *P. badia* Pers.: Fr., *P. michelii* (Boud.) Dennis, *P. praetervisa* Bres, *P. repanda* Pers., and *Peziza* sp. In addition to these species, *P. limnaea* Maas Geest. and *P. rifaii* J. Moravec et Spooner, were newly found to Japan and to Asia (Ahmad, 1978; Chou, 1996; Korf and Zhuang, 1985; Teng, 1996). We describe and illustrate them here.

Materials are deposited in the Herbarium of the Natural History Museum and Institute, Chiba (CBM-FA). All materials were rehydrated with distilled water. Sectioned materials were observed under the microscope using a $\times 100$ oil-immersion objective, and under a Nomarski interference microscope. Iodine reaction was examined with Melzer's reagent.

Taxonomy

1. *Peziza limnaea* Maas Geesteranus, Persoonia 4: 422. 1967. Fig. 1

Synonyms: *Galactinia castanea* var. *limosa* Grelet, Bull. Soc. Bot. Centre-Ouest 166. 1936.

Galactinia limosa (Grelet) Le Gal et Romagnesi, Rev. Mycol. 4: 176. 1939.

Peziza limosa (Grelet) Nannf. in S. Lundell et Nannf., Fungi exs. succ., praes. upsala. 19–20: 46. 1941.

Apothecia scarcely stipitate, on the ground in woods. Receptacle 20–35 mm in diam, cupulate, yellow-ocher to light grayish brown when dried. Ectal

excipulum 200 μm thick, composed of angular cells, tomentum hyphae arising from outer cell of ectal excipulum, 50–75 \times 7.5 μm . Medullary excipulum 370–390 μm thick, textura globulosa or textura angularis, containing yellow oil droplets. Asci cylindrical, 260–325 \times 10–20 μm (mean 291.3 \times 15.1 μm , $n=20$), operculate, with apical region 15 μm beneath the tip stained blue with Melzer's reagent, 8-spored, at the base slightly narrowed. Ascospores 15–19 \times 7.5–10 μm (mean 16.8 \times 8.5 μm , $n=20$), hyaline, broadly ellipsoid, usually containing one or two guttules, ornamented by short ridges and coarse warts. Paraphyses straight, slender, up to 5 μm thick at the tip, colorless.

On the ground (alt. 300–350 m) of broad-leaved mixed forest with *Quercus acuta* Thunb. and *Castanopsis cuspidata* (Thunb.) Schottky, Kiyosumi, Chiba Pref., 8 July, 1989, collected by Mr. Y. Kita. Specimen examined: CBM-FA 12057.

Note: Dennis (1978) compared several species which have spore ornamentation with *G. limosa* (= *Peziza limnaea*). He noted that *P. limnaea* is characterized by warts elongated into short ridges but not forming a network. Specimen CBM-FA 12057 has remarkable ornamentation. *Peziza succosa* Berk. has similar ascospore ornamentation but its asci and ascospores are larger than those of *P. limnaea* (Breitenbach and Kränzlin, 1984; Dennis, 1978). *Peziza succosa* is known to yield sap when fresh fruitbody is examined. Our specimen was herbarium material, and thus no comment about sap yielding is possible.

Peziza limnaea appears on bare clay round the margins of pools (Dennis, 1978) and on damp mud in swampy, well-wooded areas, or in muddy banks in deep shade (Maas Geesteranus, 1967). This fungus was also observed on lime, sandy or argilliferous ground (Breitenbach and Kränzlin, 1984). The collection site of this fungus, Kiyosumi, was not composed of soils with

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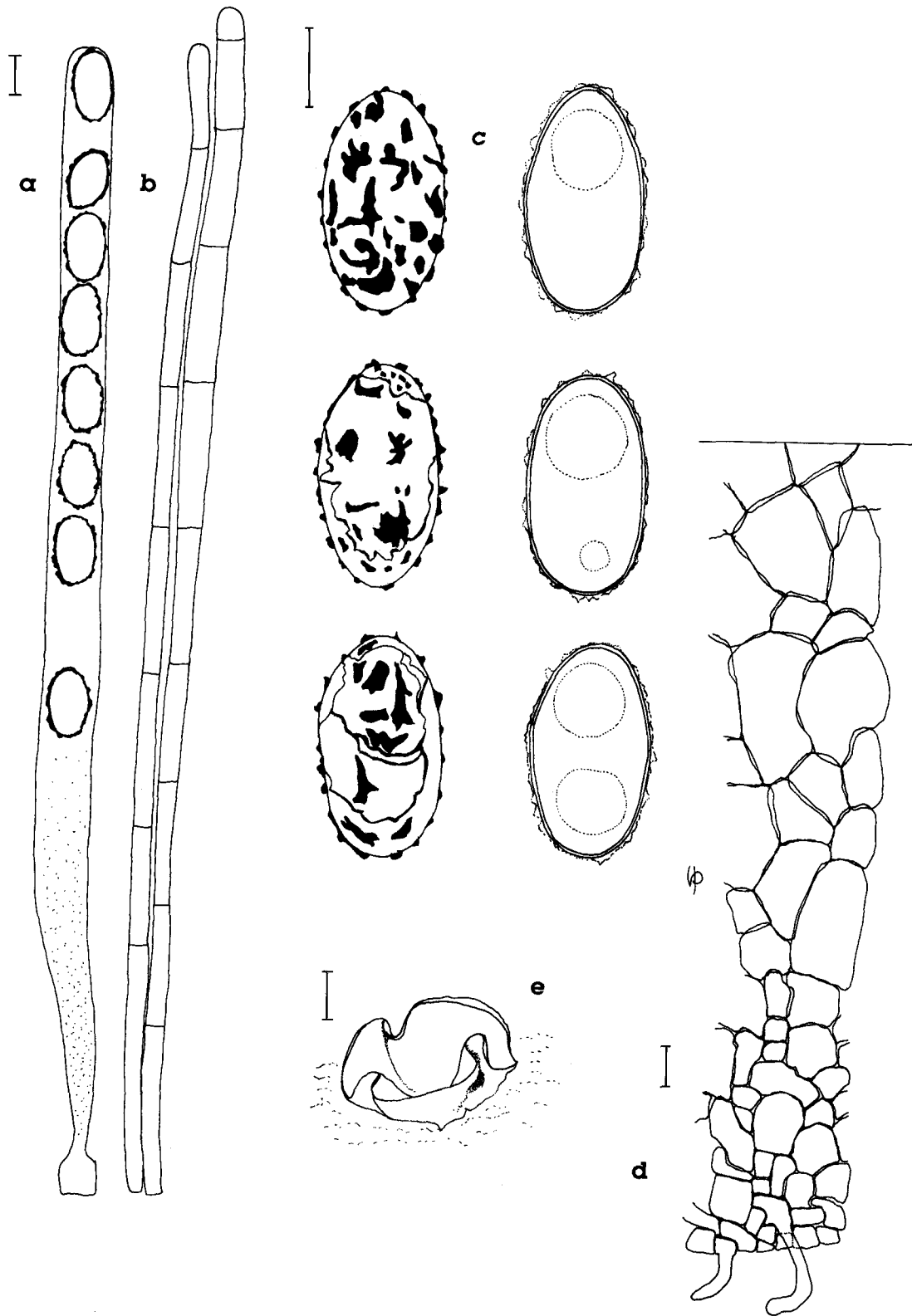


Fig. 1. *Peziza limnaea*, CBM-FA 12057: a. Ascus and ascospores, b. Paraphyses, c. Ascospores, d. Section of a part of ectal excipulum, e. Apothecium. Scales indicate 10 μ m (a and b), 5 μ m (c), 20 μ m (d), and 10 mm (e).

the above combinations. The ecology of *P. limnaea* requires further study.

This is the first documented report of *P. limnaea* from Japan.

2. *Peziza rifaii* J. Moravec et Spooner, Trans. Brit. mycol. Soc. 90: 45. 1988.

Fig. 2
Peziza retiderma auct. non Cooke: Rifai, The Australasian Pezizales in the Herbarium of the Royal Botanic Gardens Kew, p. 250. 1968.

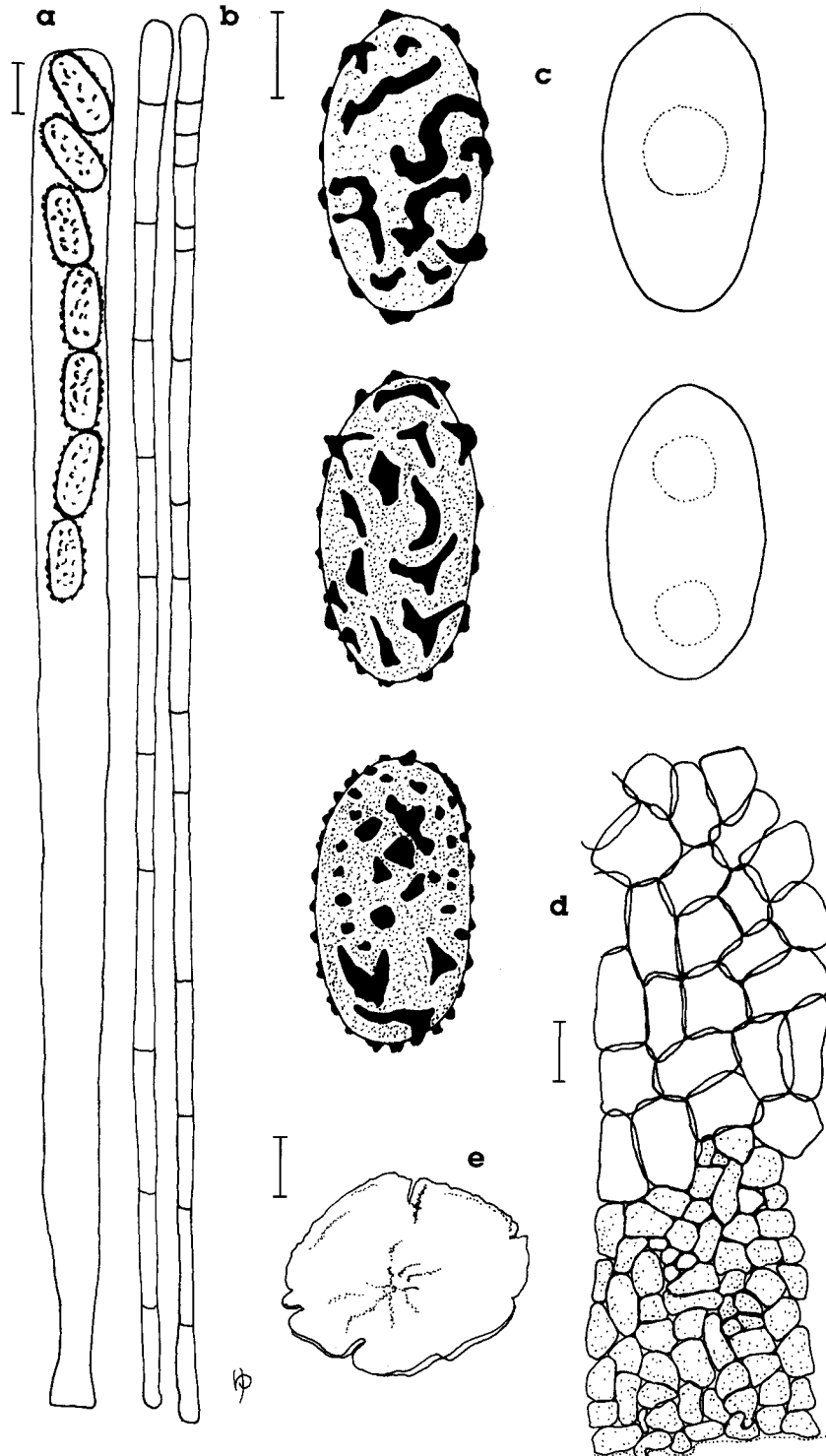


Fig. 2. *Peziza rifaii*, CBM-FA 12130: a. Ascus and ascospores, b. Paraphyses, c. Ascospores, d. Section of a part of ectal excipulum, e. Apothecium. Scales indicate 10 μm (a and b), 5 μm (c), 25 μm (d), and 10 mm (e).

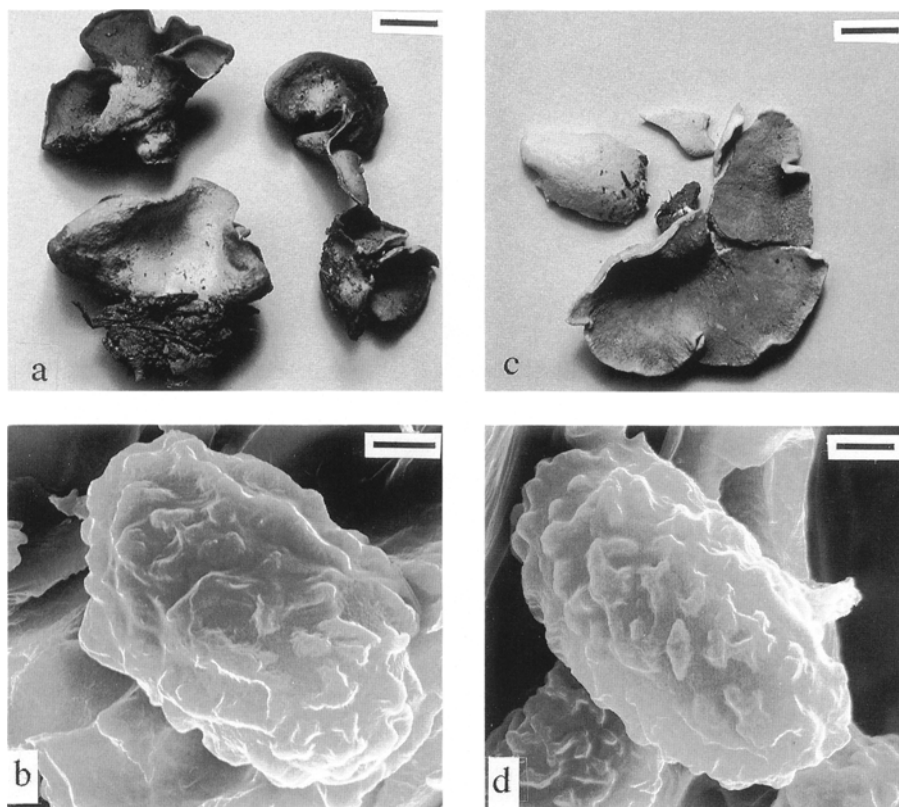


Fig. 3 a, b. *Peziza limnaea*, CBM-FA 12057: a. Apothecium, b. Ascospores. Fig. 3 c, d. *Peziza rifaii*, CBM-FA 12130: c. Apothecium, d. Ascospores. Scales indicate 10 mm (a and c) and 2 μm (b and d).

Apothecia sessile, on the ground in forest. Receptacle 40 mm in diam, flattened, dull yellow or light grayish brown when dried. Ectal excipulum 190–300 μm thick, composed of angular cells, 15–25 \times 7.5–12.5 μm . Medullary excipulum 400 μm thick, textura globulosa or textura angularis, 45–62.5 \times 32.5–50 μm , including yellow oil droplets. Asci cylindrical, 227–307 \times 10–15 μm (mean 268.6 \times 13.1 μm , $n=20$), operculate, with apical region stained blue with Melzer's reagent, 8-spored, at the base slightly narrowed. Immature asci colored garnet by treating with Melzer's reagent. Ascospores 12.5–18.5 \times 6.5–9 μm (mean 16.6 \times 8.2 μm , $n=20$), hyaline at first but eventually becoming faintly brown, ellipsoid, usually containing one or two guttules, ornamented by large interrupted wavy ridges. Paraphyses (Fig. 2-b) straight, slender, up to 7.5 μm thick at the tip (mean 6.3 μm , $n=20$), colorless.

On the ground (alt. 20 m) of *Castanopsis cuspidata* var. *sieboldii* (Makino) Nakai forest, Hie-jinja, Oomiya-cho, Wakaba-ku, Chiba Pref., 12 October, 1993, collected by Mr. F. Koshino and Ms. R. Onuma. Specimen examined: CBM-FA 12130.

Note: In the genus *Peziza*, several species are known to have ornamented ascospores. Of these, *P. badia* (Imai, 1938; Otani, 1989), *P. michelii* (Otani, 1979), and *P. praetervisa* (Otani and Omori, 1986) have been reported in Japan. Our specimen was distinguished from these species by brown pigmentation and prominent

interrupted wavy ridges of ascospores. The fungus described by Rifai (1968) has many similarities with *P. retiderma* in respect of apothecia, brown ascospores with ornamentation, and habitat but differs in ascospore size and mode of ornamentation. However, Moravec and Spooner (1988) found that the fungus described by Rifai (1968) is distinct from *P. retiderma* and cannot be matched with any previously described taxa. This fungus was described as *P. refaii*, having non-anastomosing ridges on ascospores and narrower ascospores than *P. retiderma*. Most ascospores of our specimen were ornamented with large interrupted wavy ridges. Ascospores ornamented with large warts were rarely observed (Fig. 2 c). Ectal excipulum of our specimen was composed of angular cells, and medullary excipulum was composed of textura globulosa or angularis. Tomentum hyphae or hyphoid cells were not observed on the outer layer cells.

Moravec and Spooner (1988) and Rifai (1968) have provided line drawings of this fungus. This is the first report of *P. rifaii* from Japan.

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