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NOTE

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Notes on Japanese Lycoperdaceae. 1: *Lycoperdon umbrinoides*, a tropical fungus newly found in Japan

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Abstract *Lycoperdon umbrinoides*, a tropical fungus previously known from tropical Africa and southern Europe, is reported here for the first time from Kanagawa Prefecture, central Japan. Macroscopic and microscopic features of the Japanese material and its chorological note are given.

Key words Chorology · Gasteromycetes · Japan · *Lycoperdon umbrinoides* · Tropical fungus

During a taxonomic survey of Japanese Gasteromycetes, a *Lycoperdon* collected from Kanagawa Prefecture, central Japan was studied and identified as *Lycoperdon umbrinoides* Dissing & M. Lange. It is reported here for the first time from Japan. This species was previously known from the Congo (Dissing and Lange 1962), Ghana (Dring 1964, as *L. ashantiense* D.M. Dring), and Spain (Vidal and Calonge 1996, as *L. atrum* Pat.; Calonge et al. 2000) as a tropical fungus. In this article, morphological characters of the Japanese material are described and illustrated. Furthermore, its chorological note is also given.

The studied material is deposited in the herbarium of the Natural History Museum and Institute, Chiba (CBM), Japan. Macroscopic features are described from dried specimens. Microscopic features were observed on sections of gleba and peridium of the dried basidiomata mounted in water, 5% KOH, and Melzer's reagent, and examined under the light microscope.

Lycoperdon umbrinoides Dissing & M.Lange, Bull. Jard. Bot. État. Brux. 32:344, 1962. Figs. 1,2

Basidiomata depressed globose to pyriform, 25–35 mm high, 20–30 mm broad, with white rhizomorphs up to 35 mm long at the base. Exoperidium composed of clusters 1–1.5 mm high, dark brown conical spines. Endoperidium soft, papery, pale brown, slightly shining, thin. Gleba cottony, yellowish-white when young, brownish-violet when mature. Subgleba well developed, compact, pale pinkish-cinnamon when young, later pale brown.

Basidiospores globose, warty, (3.5–) 4.5–5.0 μm in diameter excluding ornament or 4.0–5.5 (–6.0) μm in diameter including ornament, pale brown, with a hyaline pedicel, 4.5–6.0 μm long; surface ornamentation of moderate warts, 0.5 μm high. Basidia not observed. Capillitium 3.5–8.0 μm broad, walls 1.0–2.0 μm thick, dichotomously branched, pale brown to brown, devoid of pores. Spines of exoperidium are made of sphaerocysts 10–30 μm in diamter, with thick walls up to 2 μm.

Material studied: Japan; Kanagawa Prefecture, Kiyokawa-mura, Miyagase (35°31′ N, 139°13′ E), growing on the ground under *Quercus* spp., October 15, 2000, leg. H. Sasaki, FB-32780 (CBM).

Japanese name: Nettai-tsubu-hokoritake.

Notes: *Lycoperdon umbrinoides* is characterized by its blackish fruit bodies, strongly spiny exoperidium, and globose, warty basidiospores with a pedicel. The Japanese material has much smaller (10–30 μm) sphaerocysts in the exoperidium than in the Spanish material (12–60 μm in diameter; Calonge et al. 2000), but other macroscopic and microscopic features agree well with descriptions of Dissing and Lange (1962) and Calonge et al. (2000). The locality from which the Japanese material was collected is in a warm temperate area, approximately 500–550 m above sea level. Mean temperature of this area is 15.7°C, and annual precipitation is up to 2078.0 mm. Vegitation is a warm temperate deciduous forest, dominated by *Quercus* spp.

Lycoperdon umbrinoides resembles *L. umbrinum* Pers. but is distinguished from the latter by more conspicuous spines of the exoperidium, the very thick-walled capillitium, and more warty basidiospores. *Lycoperdon juruense* P. Henn. is closely related to *L. umbrinoides*, but the exoperidium of this species consists of blackish thin spines, and their sphaerocyst elements often have thicker walls, up to 4 μm (Calonge et al. 2000). Figure 3 shows the known distribution of *L. umbrinoides* and *L. juruense* in the world.

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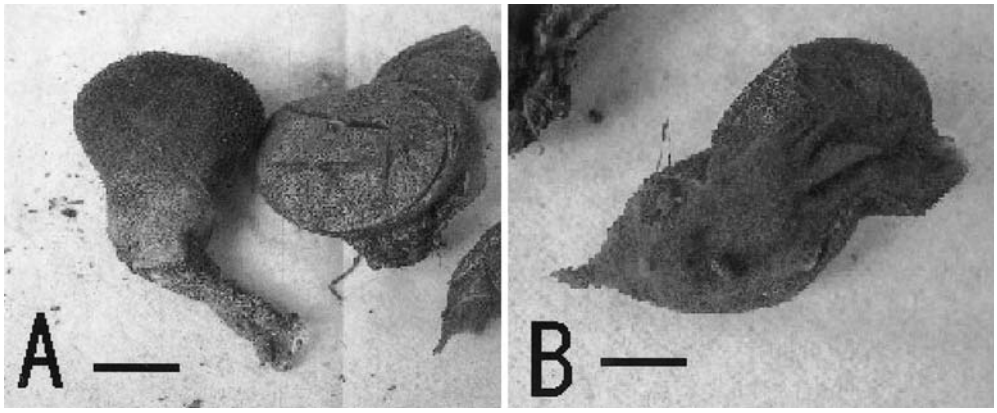

Fig. 1. Basidiomata of *Lycoperdon umbrinoides*. **A** Mature fruit bodies (CBM-FB 32780). **B** Sectioned mature fruit body (CBM-FB 32780). *Bars* **A** 20 mm; **B** 8 mm

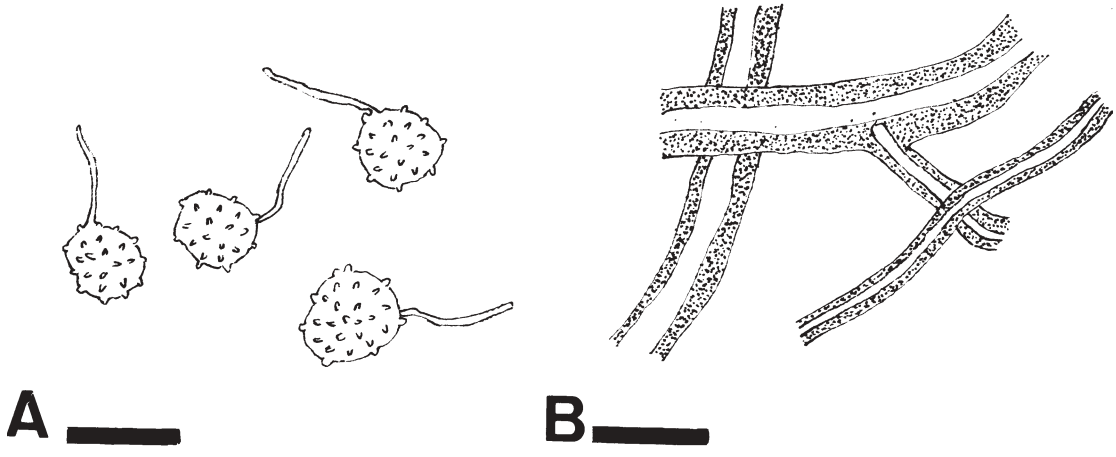

Fig. 2. Basidiospores and capillitium of *Lycoperdon umbrinoides* (CBM-FB 32780). **A** Basidiospores. **B** Capillitium. *Bars* 5 μm

Fig. 3. Known world distribution of *Lycoperdon umbrinoides* and *L. juruense*. *Circles* indicate the distribution of *L. umbrinoides*; *squares* indicate the distribution of *L. juruense*

These species are both recorded from tropical to warm temperate regions (Calonge et al. 2000), but *L. umbrinoides* is from the Old World (tropical Africa, southern Europe, and central Japan) and *L. juruense* is from the New World (Uruguay and southern United States).

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