

Emericella omanensis, a new species from Oman soil

Yoshikazu Horie¹⁾ and Shun-ichi Udagawa²⁾

¹⁾ Natural History Museum and Institute, Chiba, 955–2, Aoba-cho, Chuo-ku, Chiba-shi, Chiba 260, Japan

²⁾ Nodai Research Institute, Tokyo University of Agriculture, 1–1–1, Sakuragaoka, Setagaya-ku, Tokyo 156, Japan

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A new species of *Emericella* isolated from forest soil in the Oman, *E. omanensis*, is described and illustrated. It differs from the other known species of the genus in having bivalvate ascospores with a tuberculate or verruculose convex wall. The new species is compared with the closely related species *E. desertorum* and *E. echinulata*.

Key Words—*Aspergillus omanensis*; *Aspergillus* section *Nidulantes*; *Emericella omanensis*; Oman; soil fungus.

During the course of a survey of soil-borne pathogenic fungi in the Middle and Near East (Oman, Iraq and United Arab Emirates: Abu Dhabi) in 1984, an uncommon *Emericella* was isolated from Oman soil by the soil-plate method. The fungus is characterized by bivalvate ascospores with a tuberculate or verruculose convex wall.

The species proved to be sufficiently different from all previously described *Emericella* species (Christensen and Raper, 1978; Christensen and States, 1982; Christensen et al., 1978; Horie, 1978, 1980; Horie et al., 1989, 1990; Kong and Qi, 1986; Malloch and Cain, 1972; Mehrotra and Prasad, 1969; Raper and Fennell, 1965; Samson and Mouchacca, 1974, 1975; Udagawa and Horie, 1976; Udagawa and Muroi, 1979) to warrant its description as a new taxon. Living cultures of the new species as well as dried materials are deposited at the Natural History Museum and Institute, Chiba (CBM).

Emericella omanensis Horie & Udagawa, sp. nov.

Figs. 1–5

Coloniae in agar Czapekii restrictae, floccosae, planae, ex mycelio coacto tenuiter constantes, flavo-albae vel dilute aurantiacae; cleistothecia dispersa; capitula conidica sparsa; reversum brunneo-aurantiacum vel brunneum. Coloniae in agar maltoso (MEA) effusae, plus minusve floccosae, planae, ex mycelio coacto tenuiter constantes, granulares; cleistothecia abunde formantia, cum “hülle”-cellulis circumcincta, ex hyphis aeriis et capitulis conidicis laxe obiecta; capitula conidica numerosa, viridi-grisea vel griseo-viridia; reversum griseo-aurantiacum vel brunneo-aurantiacum.

Cleistothecia superficialia, dispersa vel aggregata, globosa vel subglobosa, 180–370 μm diam, cum “hülle”-cellulis numerosis, globosis vel subglobosis, crassitunicatis, 10–35 μm diam circumcincta; peridium brunneum vel atrobrunneum, tenue, ex “textura intricata” compositum, bi- vel tri-stratum. Asci 8-spori, globosi vel subglobosi vel ovoidei, 11–13.5 \times 10–11 μm , evanescentes. Ascosporae brunneo-rubrae, lenticulares, totaliter 4.5–5.5 \times 4–4.5 μm , cristis aequatorialibus duabus plicatis

praeditae, parte convexa tuberculata vel verruculosa ornatae. Status anamorphus: *Aspergillus omanensis*.

Holotypus: CBM-FA-700, colonia exiccata in cultura ex solo sylvae, Dorbat, Oman, 5.v.1994, a Y. Horie isolata et ea collectione fungorum, Musei et Instituti Historiae Naturalis Chiba (CBM) conservata.

Etymology: Latinized from the name Oman, referring to the country of the type locality.

Anamorphosis: *Aspergillus omanensis* Horie & Udagawa, anam. nov.

Capitula conidica griseo-viridia, brevi-columnaria vel columnaria, 70–190 \times 40–70 μm . Conidiophora ex hyphis aeriis oriunda; stipites breves, plus minusve sinuosi, 50–120 \times 4–7 μm , aurantio-grisei vel brunneo-aurantiaci, leves; vesiculae subglobosae vel ampulliformes, aurantio-griseae, 10–14 μm diam, in summa 1/2 parte fertiles. Aspergilla biseriata; metulae 4–7 \times 2–3 μm ; phialides 5–8 \times 2–4 μm . Conidia globosa vel subglobosa, 4–5.5 μm diam, verruculosa. Status teleomorphus: *Emericella omanensis*.

Holotypus: CBM-FA-700, loc. cit.

Colonies on Czapek’s solution agar growing restrictedly, attaining a diameter of 25–26 mm in 14 days at 25°C, floccose, plane, consisting of a thin mycelial felt, producing scattered cleistothecia, Yellowish White (3A2 after Kornerup and Wanscher, 1978) to Pale Orange (6A3); conidial heads limited in number, not affecting the colony color; reverse Brownish Orange (7C4) to Brown (7E6).

Colonies on MEA spreading broadly, attaining a diameter of 56–57 mm in 14 days at 25°C, more or less floccose, plane, consisting of a thin mycelial felt, granular in appearance due to the production of abundant cleistothecia with hülle cells, overgrown by loose network of aerial hyphae and numerous conidial heads, Greenish Grey (1C2) to Greyish Green (1D3); reverse Greyish Orange (5B3) to Brownish Orange (5C4).

Cleistothecia superficial, scattered or aggregated in a thin layer, globose to subglobose, 180–370 μm in diam, surrounded by a hyaline to pale yellowish brown layer of

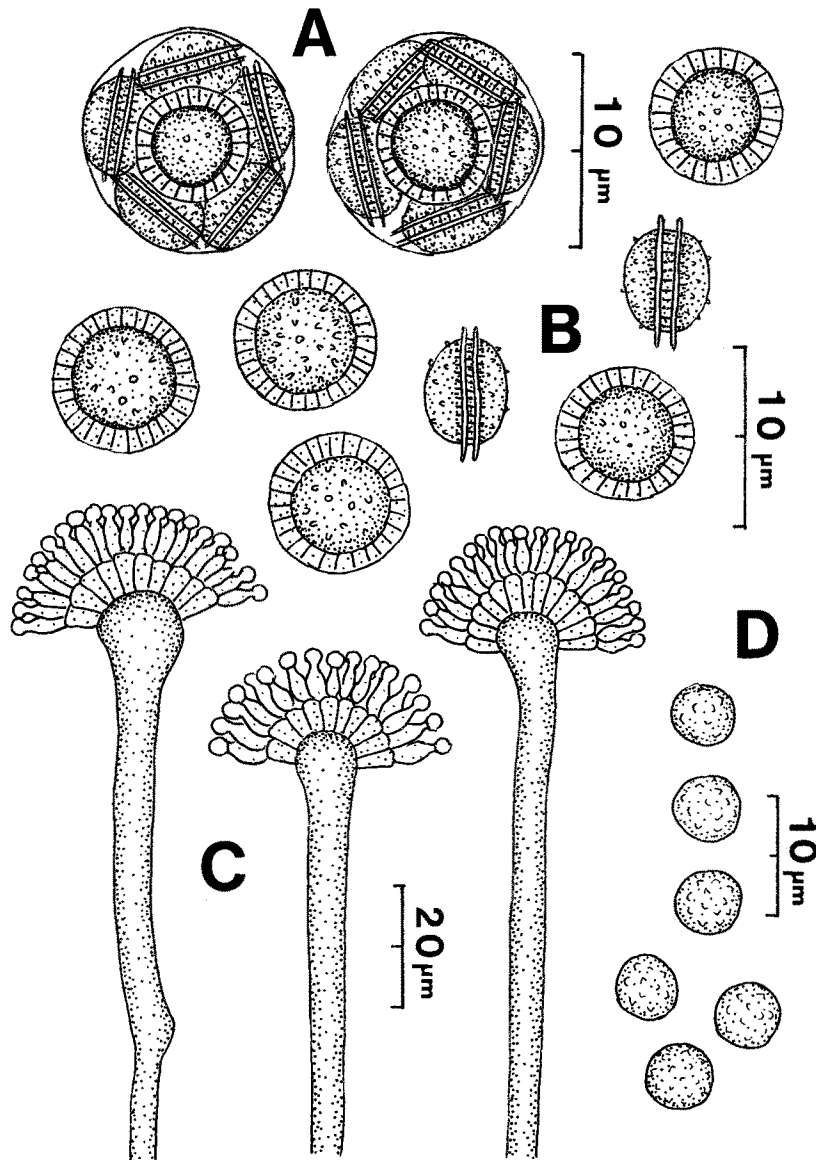


Fig. 1. *Emericella omanensis*, CBM-FA-700.

A. Asci. B. Ascospores. C. Aspergilla. D. Conidia.

scattered hyphae bearing numerous globose to subglobose thick-walled hülle cells measuring 10–35 μm in diam; peridium brown to dark brown, thin, of *textura intricata*, 2–3-layered; outermost layer consisting of hyphal cells measuring 3–17 μm wide. Asci irregularly disposed, 8-spored, globose to subglobose or ovoid, 11–13.5 \times 10–11 μm , evanescent. Ascospores at first hyaline to pale reddish brown, becoming brownish red, broadly lenticular, 4.5–5.5 \times 4–4.5 μm including crests, with two conspicuously pleated equatorial crests measuring about 1 μm wide, with a tuberculate or verruculose convex wall.

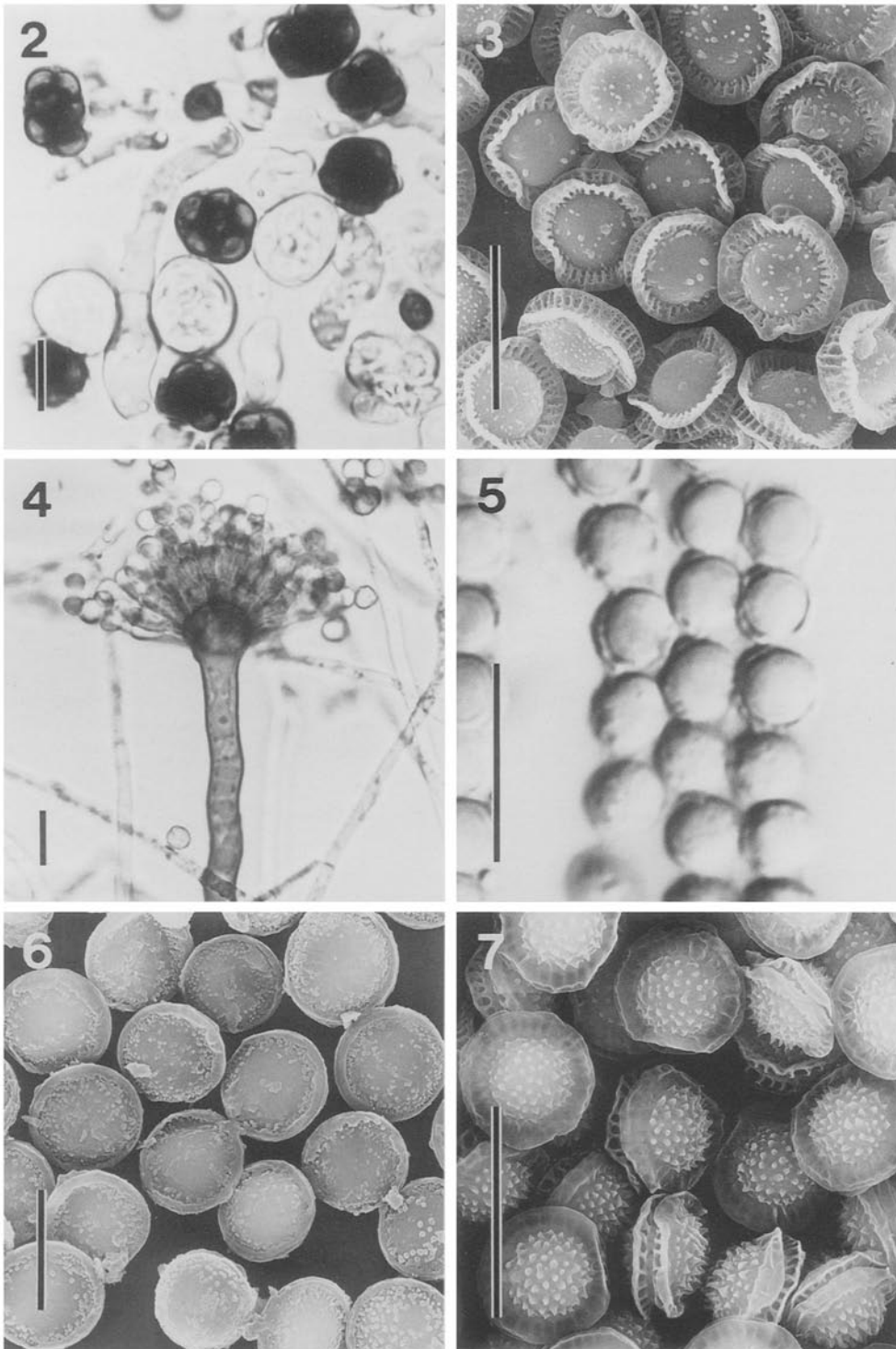
Conidial heads grayish green, short columnar to columnar, 70–190 μm long and 40–70 μm wide. Conidiophores arising mostly from aerial hyphae; stipes short, more or less sinuous, 50–120 \times 4–7 μm , orange gray to brownish orange, smooth-walled; vesicles sub-

globose to flask-shaped, orange gray, 10–14 μm in diam, fertile over the upper half. Aspergilla biseriate; metulae grayish white to pale grayish green, 4–7 \times 2–3 μm ; phialides grayish white to pale grayish green, 5–8 \times 2–4 μm . Conidia globose to subglobose, 4–5.5 μm in diam, verruculose.

At 37°C, growth and cleistothecial production are better than at 25°C.

Specimen examined: CBM-FA-700 (holotype), a dried culture derived from an isolate of forest soil, Dorbat, the Oman, collected by H. Hagiwara, 14 October 1988 and developed by Y. Horie in the laboratory of the Natural History Museum and Institute, Chiba (CBM), as strain No. ED-35-C, 5 May 1994, deposited in CBM.

In the surface ornamentation which can be readily confirmed in scanning electron microscopy, ascospores of the new species are somewhat similar to those of *E.*



Figs. 2-5. *Emericella omanensis*, CBM-FA-700.

2. Asci; 3. Ascospores (SEM photograph); 4. Aspergillum; 5. Conidia.

Fig. 6. *Emericella desertorum*, CBS 654.73. SEM photograph of ascospores.

Fig. 7. *Emericella echinulata*, CBM-FA-675. SEM photograph of ascospores.

All scale bars = 10 μm .

desertorum Samson & Mouchacca and *E. echinulata* (Fennell & Raper) Horie (Samson and Mouchacca, 1974; Horie, 1980). However, *E. desertorum* differs from the

new species in its much larger ascospores (6.7-8 \times 6-7.5 μm), which are provided with two very low crests (Fig. 6). Furthermore, *E. desertorum* is not accompanied

by an *Aspergillus* anamorph. *Emericella echinulata* and *E. omanensis* are rather distinctly separated on the ascospore ornamentation, because the convex surface in the former is aculeate as shown in Fig. 7.

Emericella undulata Kong & Qi also resembles *E. omanensis* in general aspect (Kong and Qi, 1986). It differs from the new species in its production of 1) ascospores that have dissected equatorial crests by undulate margins and a pearly (pustulate) convex surface, and 2) conidia that are small (2.5–3.5 μm in diam) and smooth-walled.

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