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A new species of *Chaetomium* from house dust

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A new species of *Chaetomium*, *C. umbratile*, is described from Japan. The species is based on three specimens isolated from house dust samples in asthmatic patients' dwellings. It is characterized by long, wavy and irregularly branched terminal hairs, which are intermingled with short straight hairs, and nearly globose to broadly ellipsoidal ascospores with a slightly subapical or sometimes lateral germ pore.

Key Words——ascomycetes; *Chaetomium umbratile*; house dust; Japan; systematics.

The health implications of mold growth in domestic environments have recently attracted much attention (Summerbell et al., 1992, 1994; Samson et al., 1994). House dust samples usually contain appreciable amounts of molds and yeasts. As an approach for the evaluation of potential human exposure to allergenic fungi, Toyazaki and Udagawa (1997) compared different analytical methods to assess the presence of mold propagules in house dust samples collected from asthmatic patients' dwellings in Japan.

During the investigation, several species of *Chaetomium* were isolated along with the other ascomycetous fungi. Three isolates, characterized by long, wavy and irregularly branched terminal hairs, which are intermingled with short straight hairs, and nearly globose ascospores, proved to be distinctly different from all species of *Chaetomium* previously described (von Arx et al., 1986; Cano and Guarro, 1987; Carris and Glawe, 1987; Abdullah and Al-Bader, 1989; Moustafa and Ess El-Din, 1989; Horie and Udagawa, 1990; Abdullah and Zora, 1993; Udagawa et al., 1994; Gene and Guarro, 1996; Decock and Hennebert, 1997) and are therefore described as a new species.

Taxonomy

Chaetomium umbratile Udagawa, Toyazaki et Yaguchi, sp. nov. Figs. 1–9

Coloniae in agaro cellulosae effusae, planae, tenues, ex mycelio vegetativo submerso constantes, ascomatibus abundanter formantes, griseo-virentes vel plus minusve viridi-olivaceae; reversum incoloratum.

Ascomata superficialia, dispersa, obscuro-virentia, postea denigricantia, subglobosa vel obovoidea, 180–250 × 130–200 μm, ostiolata, pilosa; peridium atrobrunneum, tenue, ex "textura intricata" et "textura angularis" compositum; pili terminales vulgo numerosi, dilute brunnei vel atrobrunnei, biformes; (1) breves, recti, ad 100 μm longi et 3–4 μm lati, non ramsi, asperati, crassiusculi, aliquot septati, circa ostiolum aggregati; (2) extendentes, sinuosi vel laxe spirales, 320–700 μm longi et 3–5 μm lati, septati, asperati, gradatim decrescentes, in superiore parte irregulariter ramosi et saepe articulati, capitulum implexum formantes; pili laterales numerosi, longi, recti vel irregulariter undulati, 250–600 × 2.5–4 μm, prope basim leves et incrassati, leves vel asperati, septati, gradatim decrescentes. Asci 8-spori, clavati, 40–50 × 14–20 μm, brevi-stipitati, evanescentes. Ascosporae biseriatae, valde olivaceo-brunneae vel atrobrunneae, fere globosae vel late ellipsoideae vel aliquot complanatae, 8–11 × 8–9.5 μm, leves, crassiusculae, cum poro germinationis plus minusve subapicali vel interdum laterali praeditae. Anamorphosis abest.

Holotypus. SUM 3059: colonia exsiccata in cultura ex materia pulveris in domu, Tokyo in Japonia, 10–16.ix.1993, a N. Toyazaki isolata et ea collectione fungorum Musei et Instituti Historiae Naturalis Chiba (CBM) conservata. Isotypus. TRTC.

Etymology: Latin, *umbratilis* = indoor, referring to the habitat in dwellings.

Colonies on cellulose agar (CA) growing rapidly, attaining a diameter of >85 mm after 14 d at 25°C, plane, thin, consisting of a spreading, submerged vegetative mycelium, producing abundant ascomata of granular appearance on the agar surface which are surrounded and overgrown by a loose network of aerial hyphae, Greyish Green (M. 1D4, after Kornerup and Wanscher, 1978) or somewhat Greenish Olivaceous (Rayner, 1970); exudate clear, scattered; reverse uncolored.

Colonies on potato-carrot agar (PCA) as on CA but growing even more rapidly, Greyish Yellow (M. 2B4) or Citrine Green (R); reverse Dull Yellow (M. 3B3) or Primrose (R).

Ascomata superficial, scattered, dull green to nearly

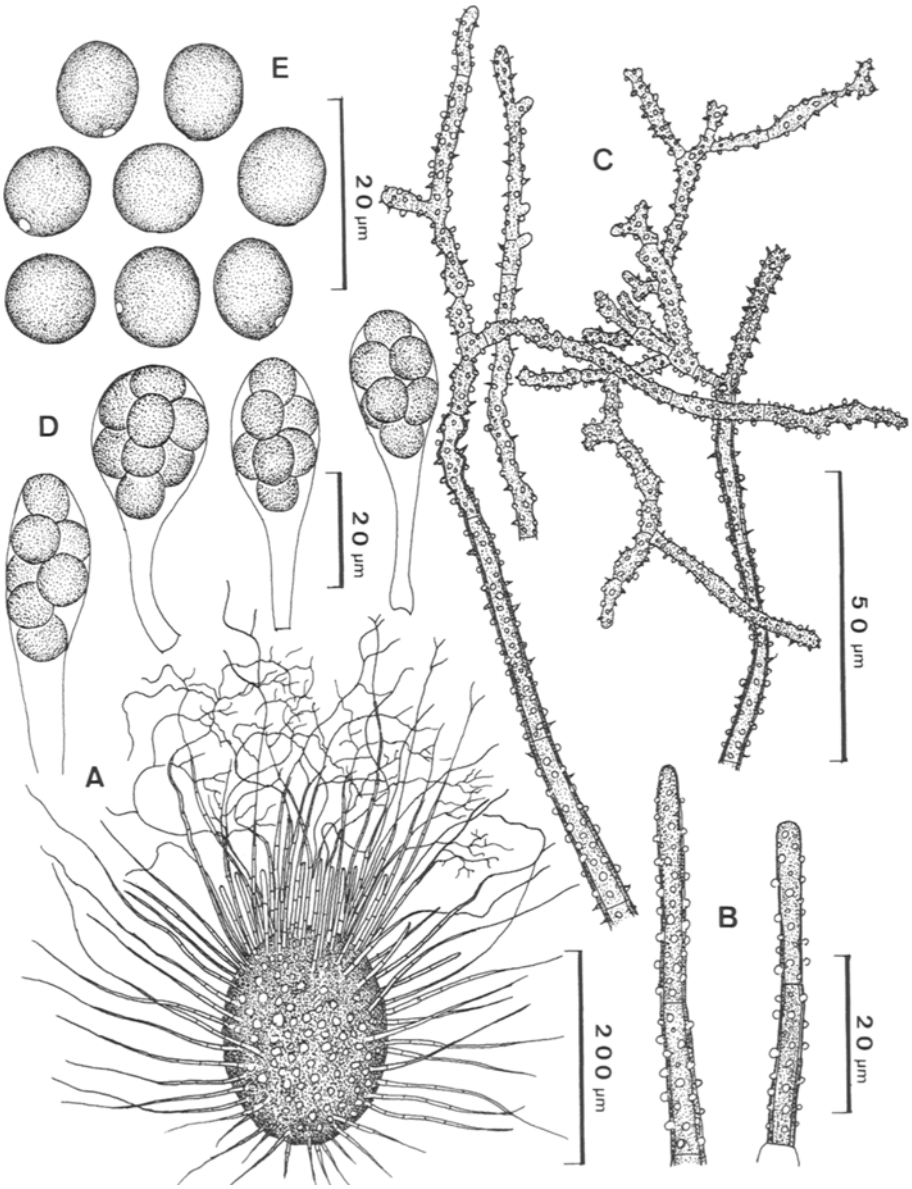
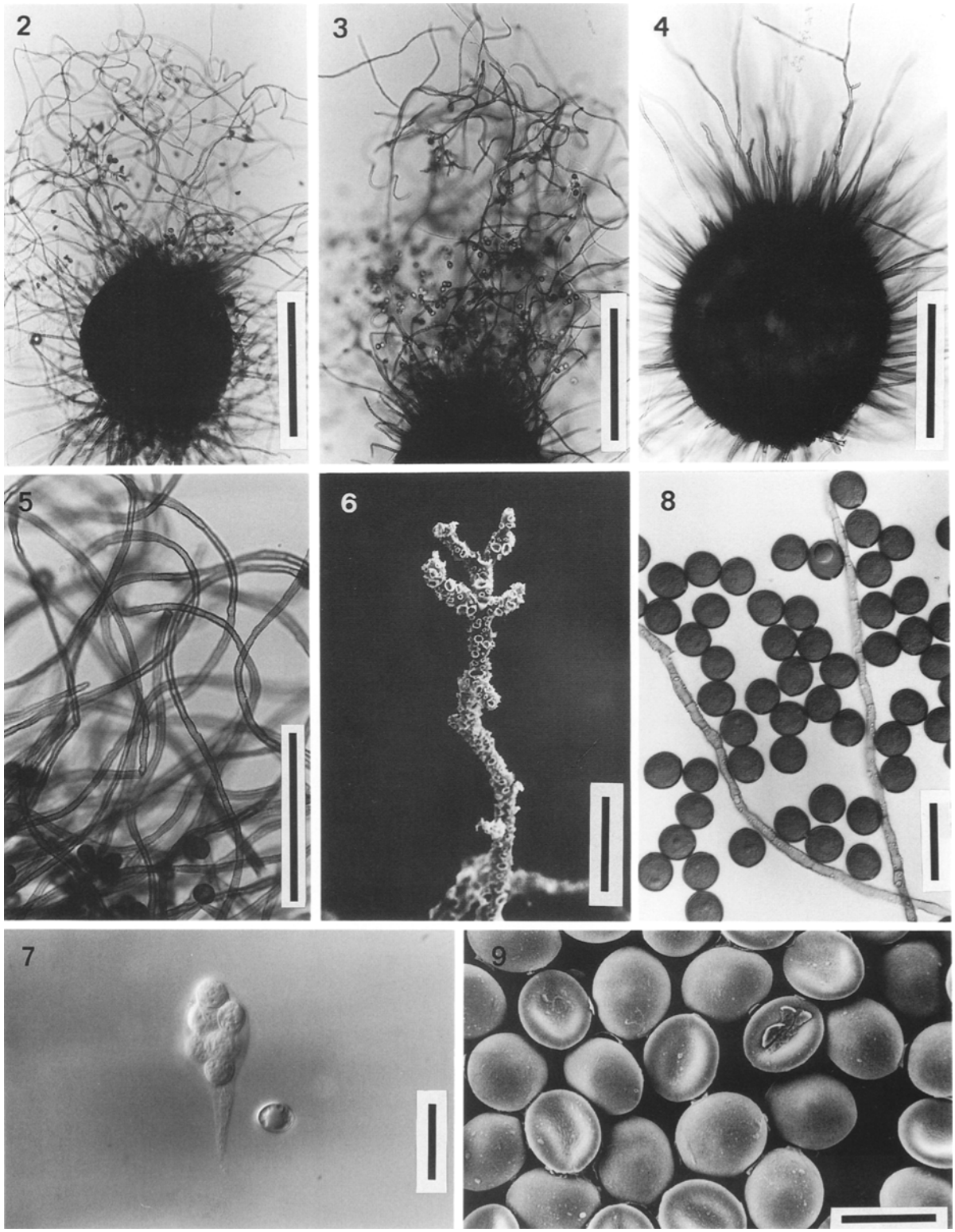


Fig. 1. *Chaetomium umratile*, SUM 3058.
A. Ascoma. B. Short, straight terminal hairs. C. Long, wavy and irregularly branched terminal hairs. D. Asci. E. Ascospores.

black in age, subglobose to obovoid, with a bluntly pointed base, 180–250 × 130–200 μm, and a somewhat wide ostiole, to 60 μm in diam; peridium dark brown, opaque, thin, in surface view forming a textura intricata; inner layer consisting of thin-walled textura angularis with cells measuring 5–18 μm in diam. Terminal hairs usually numerous (CA), sometimes few in number (PCA), pale to dark brown, often with yellow pigment, of two forms: (1) short, straight, up to 100 μm long and 3–4 μm wide near the base, unbranched, coarsely roughened, more or less thick-walled and rigid, a few septate, emanating mostly around the ostiole; and (2) extending through and beyond type (1), sinuous or loosely spiral, 320–700 μm long and 3–5 μm wide near the base, septate, coarsely roughened, gradually narrowing to the tips, irregularly branched above and often appearing articulate, tangled and forming an entangled head. Lateral hairs numerous, long, straight to undulate, 250–600 × 2.5–4 μm, smooth and thick-walled near the base, smooth to coarsely roughened, septate, gradually narrowing above. Asci 8-spored, clavate, 40–50 × 14–20 μm (spore part 28–32 μm long), rounded above, short-stipitate, evanescent at an early stage. Ascospores biseriately arranged, dark olive brown to dark brown, nearly globose to broadly ellipsoidal or sometimes flattened, 8–11 × 8–9.5 μm, smooth, relatively thick-walled, with a slightly subapical or sometimes lateral germ pore.

Anamorph. Not observed.

At 37°C, growth is somewhat slow, developing only mycelium.



Figs. 2–9. *Chaetomium umbratile*, SUM 3058.
2. Ascoma (CA). 3. Long, wavy and irregularly branched hairs on an ascoma. 4. Ascoma (PCA). 5. Lower parts of long terminal hairs. 6. Branch of long terminal hair (SEM). 7. Ascus. 8. Ascospores. 9. Ascospores (SEM). Scale bars: Fig. 2=200 μm; Figs. 3, 4=100 μm; Fig. 5=50 μm; Figs. 6, 9=10 μm; Figs. 7, 8=20 μm.

Holotype. SUM 3058: dried culture derived from an isolate of house dust, collected in Tokyo, Japan, 10–16 September 1993, isolated by N. Toyazaki, in the laboratory, Public Health Research Institute of Kobe City, 22 December 1994.

Additional specimens examined. SUM 3059: culture derived from an isolate of house dust, collected in Tokyo, Japan, 18–26 February 1993, isolated by N. Toyazaki, 22 December 1994; and SUM 3060: culture derived from an isolate of house dust, collected in Nagoya, Japan, 21–26 August 1993, isolated by N. Toyazaki, 19 January 1994.

Chaetomium umbratile is easily distinguished from the other taxa by the shape of its ascospores, which are nearly globose rather than limoniform and have a slightly subapical or sometimes lateral germ pore. *Chaetomium globosporum* Ricky et Mukerji (a later homonym of *C. globisporum* Lodha (Lodha, 1964)) produces similar ascospores, but these are larger in size (10–13 μm in diam). In addition, it differs from *C. umbratile* in the character of its ascomatal ornamentation, which is composed of only one terminal type of long, wavy, unbranched hairs and few, short lateral hairs (Rikhy and Mukerji, 1973; von Arx et al., 1986). *Chaetomium coarctum* Sergejeva (Sergejeva, 1961) also shows some similarities but differs in its wavy to loosely coiled, unbranched terminal hairs and slightly larger ascospores with an apical germ pore (10.5–12.9 × 8.7–10.1 μm after Carter and Khan, 1982). The irregularly branched ascomatal hairs of *C. umbratile* are superficially reminiscent of those seen in *C. nozdrenkoae* Sergejeva, although the latter ascospores are larger (10.5–17.4(–23) × 9–13 μm), irregular in shape and usually have two distinct germ pores (Sergejeva, 1961; Gams, 1966; Domsch et al., 1980).

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