

Short Communication

***Thielavia aurantiaca*, a new species from Japanese soil**

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Accepted for publication 29 January 1998

A new species of *Thielavia* (*T. aurantiaca*) isolated from field soil collected from Osaka is described and illustrated. The fungus is distinguished from other known species by having ascomata covered with yellowish orange mycelium and smaller size of ascomata and ascospores. A chlamydospore-like anamorph is formed.

Key Words—chlamydospore-like anamorph; monilioid cell; soil-borne fungus; Sordariales; *Thielavia aurantiaca*.

In the course of study of fungal flora from soil in Japan, a new species of *Thielavia* Zopf, namely, *T. aurantiaca* Tad. Ito et al., was isolated from field soil at Ikeda, Osaka Pref. The fungus is accommodated in the genus *Thielavia* of the Sordariales, which is characterized by spherical, non-ostiolate ascomata with a brown wall composed of flat cells and ellipsoidal, aseptate, brown ascospores with a distinct germ pore (Malloch and Cain, 1973; Mouchacca, 1973; v. Arx, 1975; Eriksson and Hawksworth, 1986; v. Arx et al., 1988; Ito, 1993).

Since the foundation of the genus *Thielavia* by Zopf (Zopf, 1876), the taxonomical concept of the genus has often been changed.

Malloch and Cain (1973) assigned 25 species to this genus, including 8 species transferred from *Chaetomidium* (Zopf) Sacc., which are characterized by long ascomatal hairs. Thereafter, v. Arx (1975) accepted 18 species in *Thielavia* and transferred 6 species, which were originally assigned to *Thielavia*, to 3 new genera, *Melanocarpus* v. Arx, *Corynascus* v. Arx and *Corynascella* v. Arx et Hodges. More recently, v. Arx et al. (1988) reexamined *Thielavia* and its related genera and recognized 15 species in this genus.

The genus *Thielavia* is most similar to *Melanocarpus* among the related genera, but the latter differs in having oblate, globose or subglobose, less frequently broadly ovoid or broadly ellipsoidal ascospores (v. Arx et al., 1988; Guarro et al., 1996). Even so, the genus *Thielavia* is still considered heterogeneous, since it includes species having smooth to hairy or setose ascomata and is associated with *Acremonium* Link: Fr., *Chrysosporium* Corda and *Myceliophthora* Cost. anamorphs. We, however, propose accommodation of a new species in this genus because of the spherical, non-ostiolate, smooth, thick-walled ascomata and non-septate, brown, rather ellipsoidal ascospores with a germ pore.

Taxonomy

Thielavia aurantiaca Tad. Ito, Okane et Nakagiri, sp. nov. Figs. 1–5

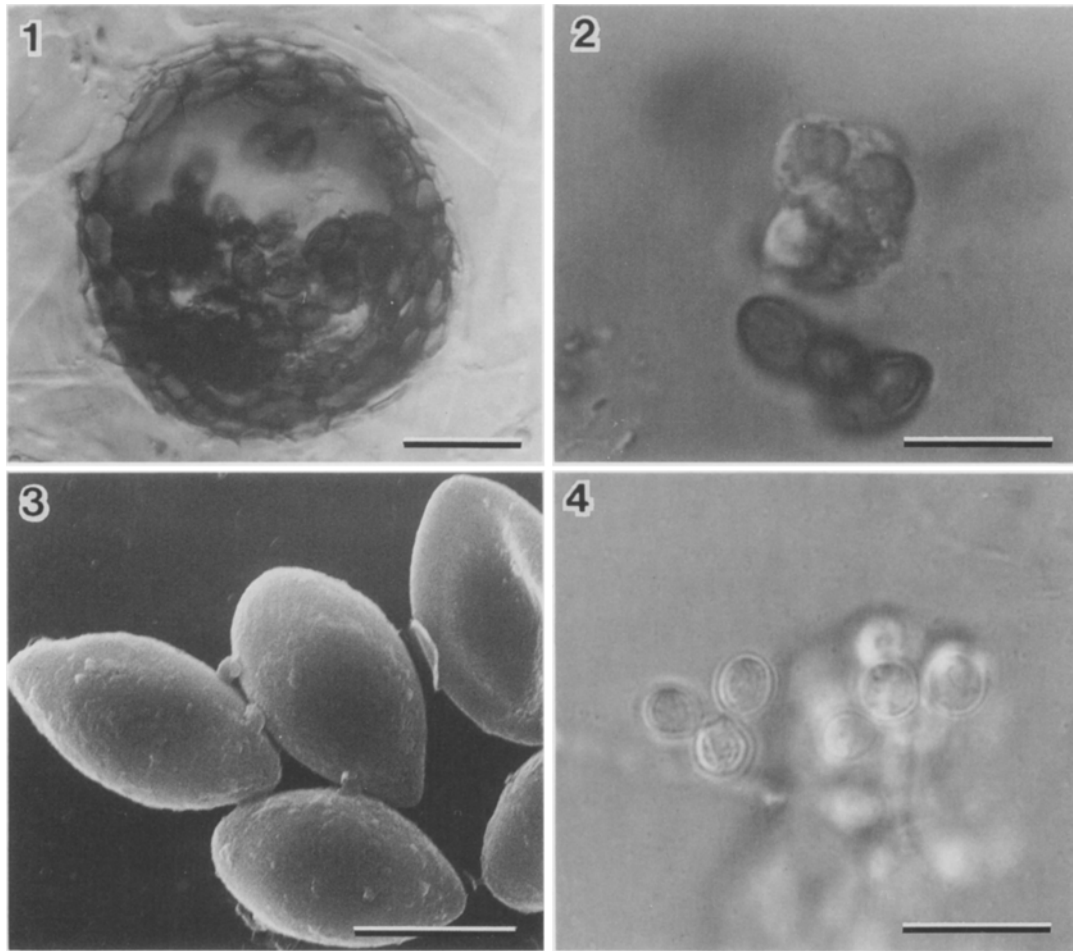
Coloniae in PCA velutinae, tenues, pallide luteolae vel pallide brunneae; reversum pallide brunneum vel brunneum. Ascomata discreta, non ostiolata, globosa, 45–80 μm diam, brunneo-nigra, cum mycelio aurantiaco obtecta; peridium ex cellulis 3–4 stratis complanato-angularibus compositum. Asci breviter catenulati, 8-sporei, ovoidei, 14–16 \times 8–11 μm , evanescentes. Ascosporeae hyalinae vel brunneo-nigrae, ellipsoideae, 8–10 \times 5–6 μm , leves, poro germinationis apicali praeditae. Conidia in hyphis vegetativis formata velutina, sessilia, globosa vel pyriformia, levia, crassitunicata, hyalina.

Ubiquinum principale: Q-10(H₂).

Holotypus: IFO H-12163, colonia exsiccata e cultura isolata ex solo, Ikeda, Osaka, Japonia, 22. v. 1990, e cultura IFO 32594 (T. Ito H2-2-5-13).

Etymology: from the Latin *aurantiacus*=yellowish orange; referring to the ascomatal covering of yellowish orange mycelium.

Colonies on potato carrot agar (PCA) growing moderately, attaining a diameter of 48–52 mm within 3 wk at 24 °C, velvety, thin, immersed in the medium, zonate, pale luteous to pale brownish vinaceous (17f–5" f; Rayner, 1970), with mycelium containing yellowish orange particles; reverse pale orange-yellow to umber (17f–15m). Ascomata discrete, non-ostiolate, globose, 45–80 (\bar{x} =55.8) μm in diam, hard, brown to dark brown, covered with yellowish orange mycelium; ascomatal wall consisting of 3–4 layers of brown, thick-walled, "textra angularis" cells (Figs. 1, 5A); ascomatal initials consisting of an intercalary segment of swollen cells and later becoming loosely spiral coils. Asci 8-spored, ovoid to obovoid, with a short stalk, clustered, 14–16 \times 8–11 μm , evanescent (Figs. 2, 5B). Ascospores at first hyaline, becoming dark brown, ellipsoidal, 8–10 \times 5–6 μm , with a thick-walled membrane, with a single germ pore at one



Figs. 1–4. Light and scanning micrographs of *Thielavia aurantiaca* (IFO 32594).

1. Section of ascoma. 2. Ascus containing ascospores. 3. Ascospores. 4. Anamorph. Bars: 1, 2, 4=10 μm ; 3=5 μm .

end (Figs. 3, 5C). Anamorph is a chlamydo-spore-like structure, resembling monilioid cells in the genus *Rhizoctonia* DC.; conidia blastic, solitary or catenate, rarely arising from a somewhat swelling cell on the vegetative mycelium, hyaline, globose to rarely pyriform, 3.5–5.0 \times 4.0–5.0 μm in diam, smooth and thick-walled, sometimes with narrow basal scars (Figs. 4, 5D).

At 37°C, growth is restricted; ascomatal production is reduced. At 45°C, no growth.

Hab.: field soil, Ikeda, Osaka Pref., Japan, T. Ito H2-2-5-13, 22 May 1990 (holotype, IFO 32594); T. Ito H2-4-10-21, 21 July 1990 (IFO 32595); T. Ito H2-5-10-18, 23 Oct. 1990 (IFO 32596).

Colonies on each medium show the following growth after 3 wk of incubation at 24°C. On potato sucrose agar (PSA): growing moderately, attaining a diameter of 40–50 mm, velvety, umbonate at the center, thin at the margin, ochraceous to luteous (15'b–17b) with a sector; ascomata not produced; reverse ochraceous to umber (15'b–15m). On malt extract agar (MEA): growing slowly, attaining a diameter of 30–35 mm, velvety, thin, immersed at the submarginal, luteous to ochraceous (17b–15'b) with a sector; ascomata barely produced;

reverse orange to umber (13b–13m) at the central area. On oatmeal agar (OA): growing moderately, attaining a diameter of 62–65 mm, velvety, partly immersed, pale luteous (17f) at the central part, white at the margin; ascomata barely produced; reverse pale olive-buff to pale luteous or pale pinkish buff (21''f–17f or 17''f). On yeast extract phosphate soluble starch agar (YpSs): growing slowly, attaining a diameter of 35–40 mm, velvety, thin, immersed at the peripheral part, luteous (17b) at the central part, white at the margin; ascomata not produced; reverse luteous to umber (17b–13m).

The shape of ascomata and ascospores of *T. aurantiaca* resembles those of *T. polygonoperda* Matsushima and *T. ovispora* Pidoplichko et al. (Matsushima, 1975; Pidoplichko et al., 1973). However, *T. aurantiaca* is readily distinguished from *T. polygonoperda* by having ascomata covered with yellowish orange mycelium and orange to umber (13b–13m) reverse color. Furthermore, the former species has smaller ascomata measuring 45–80 (\bar{x} =55.8) μm in diam and ascospores measuring 8–10 \times 5–6 μm (*T. polygonoperda*: 40–100 μm and 9.5–10.5 \times 6.5–7.5 μm , respectively).

The anamorph of *T. polygonoperda* was tentatively

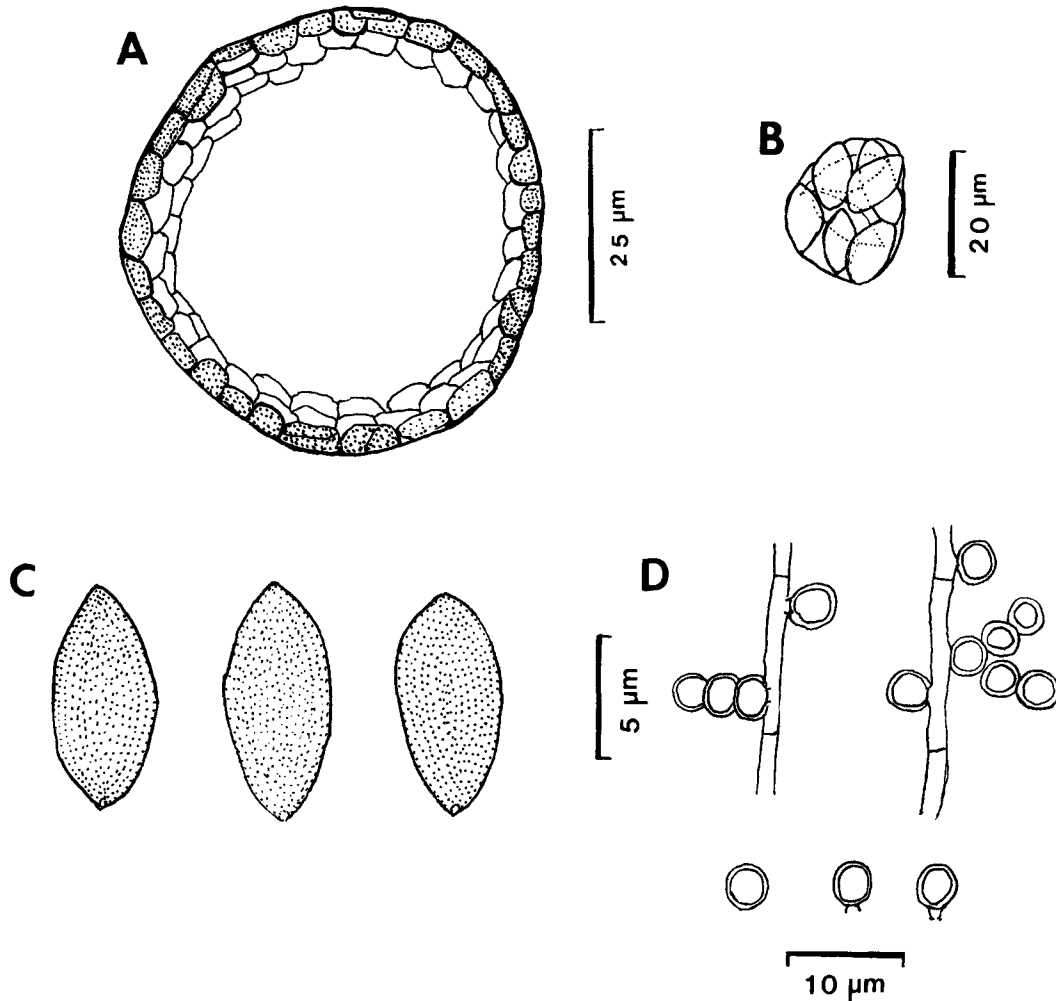


Fig. 5. *Thielavia aurantiaca* (IFO 32594).
A. Ascoma. B. Ascus. C. Ascospores. D. Anamorph.

accommodated in *Trichosporiella* Kamyschko by Carmichael et al. (1980). *Trichosporiella* has been characterized by moist, yeast-like, tough colonies with submerged fertile hyphae and blastic conidia with narrow basal scars (Oorschot, 1980). However, the description of *T. polygonoperda* has not yet been proved to have these characteristics as the anamorph. Our observation revealed that the isolates of *T. aurantiaca* form blastic, catenate and multiple conidia on the vegetative mycelium (Figs. 4, 5D). This character resembles moniloid cells of *Rhizoctonia solani* Kuhn (Watanabe, 1975). Consequently, the generic taxonomy of anamorphs of *T. aurantiaca* remains uncertain. Meanwhile, *T. aurantiaca* has a mesophilic character and is distinguished from *T. ovispora*, which is known as a thermotolerant species that grows in the range of 20 to 50°C with an optimum between 35 and 40°C (Cooney and Emerson, 1964).

The ubiquinone type of *T. aurantiaca* is Q-10(H₂), which accords with other species of the genus *Thielavia* (Kuraishi et al., 1985).

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