New keratinophilic species of *Chrysosporium*

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Received September 9, 1985


Two new keratinophilic species, *Chrysosporium europae* and *C. mephiticum*, are described and illustrated. The differences between these and other similar species are discussed.


[Traduit par la revue]

**Introduction**

Two new keratinophilic species of *Chrysosporium* Corda were encountered during surveys for keratinophilic fungi from soil. During an investigation of soil in Catalunya, Spain, a *Chrysosporium* characterized by its slow growth in culture and by development of chains of truncate, intercalary conidia was isolated on three occasions. *Chrysosporium europae* sp. nov. is described from these collections and from an additional collection from bottom sediments of a polluted river in Katowice, Poland. Because of its development of rhexolytically dehiscing lateral conidia and arthroconidia, *C. europae* could be accommodated in either *Chrysosporium* or *Malbranchea*. The reasons for placement of the species in *Chrysosporium* and the differences between *C. europae* and other species of *Chrysosporium* are discussed.

A second species, *C. mephiticum* sp. nov., isolated by Dr. P. C. Jain from soil in India by the keratin bait technique, is distinguished by its pungent odor and by the sessile, subglobose conidia borne in close proximity to one another on orthotopically branched fertile hyphae. Two additional isolates, preserved as *Trichophyton* sp. in the University of Alberta Microfungus Collection and Herbarium (UAMH), came from other keratinous substrates.

*Chrysosporium europae* Sigler, Guarro & Punsola, sp. nov.

Figs. 1, 3–6

Colonies in agar phytone extracto levedinis ad 25°C, densae, lente crescunt, vinaceae vel luteae in centrum, cumulae, rugosae, ad marginem lobatae, planae, luteae, granuloseae. Ad 37°C incrementum nullum. Hyphae hyalinae deinde flavae, septatae, 2.5–3.5 μm latae. Hyphae fertilia ramosaee. Conidia ultima et a latere locata sunt. Conidia lateralia sessilia vel in protrusionibus cylindrica vel cymbiformae; arthroconidia in catenis brevis vel longis, cylindrica vel doliiformae aut unilateriter inflata. Conidia hyalina vel lutea, leviatunicata vel vermicolosa, 4.5–8.5 × 2.5–3.5 μm, plerunque 6–8 × 2.5–3 μm, cum cicatrice deorsum 1.5–2 μm. Chlamydosporeae et hyphae versus septum inflatae absunt. Teleomorphosis ignota est.

**TYPUS:** UAMH 4587, colonia exsiccata ex solo, Hispania, a J. Guarro (FFBA 298) isolata est.

Colonies on cellophane on phytone yeast extract agar (PYE, BBL) (1) at 25°C slow growing (55–65 mm diam after 5 weeks); in the centre, raised, wrinkled, granular and vinaceous buff; at the margin, flat, lobate, powdery, buff or pinkish buff;

Figs. 3–6. *C. europae*. Fig. 3. Colony on PYE at 5 weeks, UAMH 4599. ×1. Figs. 4–6. Branched fertile hyphae bearing terminal and lateral conidia and chains of alternate arthroconidia. Figs. 4 and 6. UAMH 4735. ×610. Fig. 5. UAMH 4587. ×770. Fig. 7. *C. queenslandicum*, from type (UAMH 4319), showing terminal and lateral conidia and rare intercalary conidia. ×610. Fig. 8. *C. articulatum*, from type (UAMH 4320), showing chains of alternate arthroconidia. ×610.
Figs. 9-12. C. mephiticum, from type (UAMH 4447). Fig. 9. Colony on PYE at 3 weeks. x1. Figs. 10-12. Pyriform to subglobose sessile conidia borne on orthotropically branched fertile hyphae. x830.

vinaceous brown diffusing pigment. Colonies on Pablum cereal agar (CER) (3) on cellophane restricted (17–21 mm diam after 5 weeks), flat, zonate, granular with fimbriate margin, buff. No growth at 37°C; scant growth at 18°C. Strongly keratinolytic, as determined by the method described previously (1, 4).

Vegetative hyphae sparsely branched, septate, 2.5–3.5 μm wide, occasionally forming alternate arthroconidia measuring 4.5–13 × 2.5–3 μm. Aerial fertile hyphae 2–2.5 μm wide, repeatedly branched, bearing lateral conidia which are sessile or borne on short pedicels, and chains of 2 to several, alternate arthroconidia; arthroconidia occasionally occurring adjacent to each other. Intercalary and terminal conidia similar to each other in size, measuring 4.5–8.5 × 2.5–3.5 μm, mostly 6–8 × 2.5–3 μm, and released by rhexolytic dehiscence. Terminal and lateral conidia cylindrical to cymbiform with broad basal scar, 1.5–2 μm wide; arthroconidia cylindrical to barrel shaped, occasionally asymmetric; initially hyaline, in age yellow, smooth to minutely warty. Racquet hyphae and chlamydospores not observed. Teleomorph unknown.

Chrysosporium europae, which produces rhexolytically dehiscing alternate arthroconidia and lateral conidia, is intermediate between Malbranchea, characterized by narrow (1.5–4 μm), alternate arthroconidia, and Chrysosporium, characterized by sessile conidia, or conidia borne terminally, at the ends of short or long lateral branches. These conidia may intergrade with alternate arthroconidia. Where intergrades occur between the blastic development of conidia and the fragmentation of fertile hyphae, the distinctions between the form-genera Chrysosporium and Malbranchea are not clear cut. Intergrades also occur between Chrysosporium and other similar form-genera such as Trichophyton, Emmonsia, and Myceliophthora.

Sigler and Carmichael (4) used the width of the conidium compared with the diameter of the fertile hypha to distinguish Malbranchea from Chrysosporium. In Malbranchea, the arthroconidia are cylindrical and there is little enlargement of the arthroconidia before disarticulation. They (4) used this criterion to include in the genus, Malbranchea chrysoporoida...
Sigler & Carmichael, in which the lateral conidia are the same width as the supporting hypha.

In *Chrysosporium*, the terminal and lateral conidia are usually subglobose, pyriform or clavate, and broader than the diameter of the fertile hyphae. The conidia of *C. europae* are only slightly broader than the width of the fertile hyphae. Therefore the decision to include the species in *Chrysosporium* is somewhat arbitrary and is based on the similarity between conidium development in this species and in *C. articulatum* Scharapov, which also produces chains of alternate arthroconidia. *Chrysosporium europae* differs from *C. articulatum* by its slow-growing vinaceous buff pigmented colonies on PYE, and the terminal and lateral conidia measuring 7-15 x 12(14) pm, another similar species &

K. Ulfig 2; Guarro FFBA 300; UAMH 4724, scrapings, circular lesion on horse by Halinst, 1965 (CBS 280.77). With its clusters of subglobose conidia on orthotropically branched fertile hyphae, *C. mephiticum* resembles *C. lobatum* Scharapov (2) and *Trichophyton mentagrophytes* (Robin) Blanchard (microconidial anamorph). In *C. lobatum*, the conidia are sometimes sessile but more often occur on short narrow projections which give the fertile hyphae a striking appearance. *Chrysosporium lobatum* is further distinguished by its greenish to vinaceous colonies and its conidia which are echinulate and reddish brown when mature.

In granular forms of *T. mentagrophytes*, microconidia are more frequently borne from swollen pedicels and the fertile hyphae are rather thick, 2.5-4 µm wide. The presence of macroconidia and spiral hyphae, and good growth at 37°C, further distinguish this species from *C. mephiticum*.

**Acknowledgements**

We thank Drs. C. Ramirez and R. Currah for checking the Latin diagnoses, and J. W. Carmichael for reading the manuscript. The senior author also thanks Dr. K. Ulfig, Environmenta Pollutio Abatement Centre, Katowice, Poland, for allowing the inclusion of his isolate of *C. europae* in this study, and Dr. P. C. Jain, Department of Botany, University of Saugor, Sagar, India, for sending his interesting fungus to UAMH for examination.