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Validation of *Kwoniella heveanensis*, teleomorph of the basidiomycetous yeast *Cryptococcus heveanensis*SHENG SUN¹, BANU METIN^{1, A}, KEISHA FINDLEY^{1, B},
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ABSTRACT— *Kwoniella heveanensis*, recently published in an electronic journal and without a designated holotype, is validated as the name of the newly discovered teleomorph of *Cryptococcus heveanensis*.

KEYWORDS— Tremellales, mating, ex-type culture

Introduction

Cryptococcus heveanensis (Groen.) Baptist & Kurtzman is a basidiomycetous fungus closely related to the human pathogenic fungus *Cryptococcus neoformans* (Baptist & Kurtzman 1976, Findley et al. 2009, Metin et al. 2010). The sexual life cycle of this species was recently discovered and the teleomorph named as *Kwoniella heveanensis* (Metin et al. 2010). However, this name was invalid, because no holotype was designated (McNeill et al. 2006: Art. 37), and the publication was in an electronic-only journal (McNeill et al. 2006: Art. 29).

We here fulfill the requirements for valid publication of *Kwoniella heveanensis*.

Kwoniella heveanensis Metin, K. Findley & Heitman, sp. nov.

FIG. 1

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“Species heterothallica. Hyphae dikaryoticae, fibulae fusae. Basidia aggregata, primum submersa, deinde superficialia, globosa, 7.5–10.5 µm diam, septis cruciatis divisa,

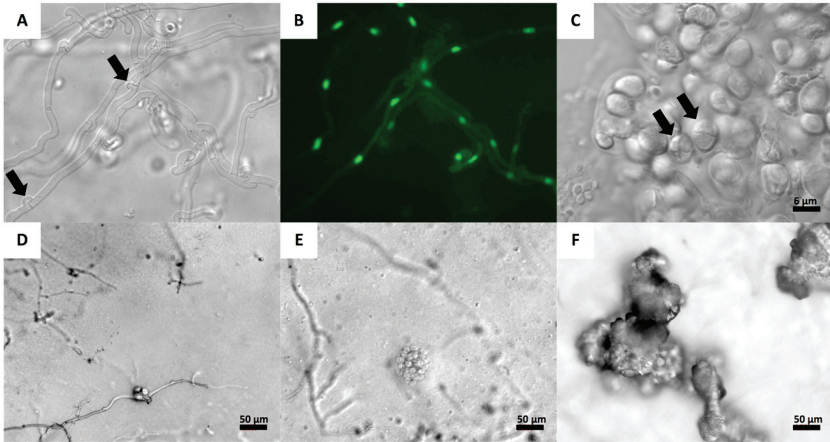


FIG. 1 Different stages of the sexual cycle of *Kwonilella heveanensis*. A, differential interference contrast (DIC) image showing hyphae with fused clamp connections (CC, indicated by black arrows); B, fluorescence image of the same field as in A, stained with Sytox green, showing the dikaryotic hyphae; C, globose basidia with cruciate septa (indicated by black arrows); D–F, DIC images of basidial clusters: D, the early stage (~2 weeks) at which basidial clusters are embedded in the agar; E, a young basidial cluster (~3 weeks) embedded in the agar; F, mature basidial clusters (~4 weeks) on the surface of the agar.

sterigmatibus carentia. Basidiosporae subglobosae, 2.3–3.3 µm diam, cito conidia proferentia.” (Metin et al. 2010: 15).

HOLOTYPE: Sexual product of mating between *Cryptococcus heveanensis* strains CBS 569 and BCC 8398, preserved as a permanent slide (BPI 881007).

“Heterothallic fungus. Hyphae dikaryotic, clamp connections fused. Basidia clustered, submerged initially, finally on aerial hyphae, globose, 7.5–10.5 µm, cruciately septate, sterigmata not observed. Basidiospores subglobose, 2.3–3.3 µm, germinating by conidia.” (Metin et al. 2010: 15).

COMMENTS— Strains CBS 569 and BCC 8398 (also deposited in CBS as CBS 12232) should be designated as the ex-type strain and the isotype strain, respectively, for the teleomorph.

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Literature cited

- Baptist JN, Kurtzman CP. 1976. Comparative enzyme patterns in *Cryptococcus laurentii* and its taxonomic varieties. *Mycologia* 68: 1195–1203. doi:10.1016/S0953-7562(09)80616-3
- Findley K, Rodriguez-Carres M, Metin B, Kroiss J, Fonseca A, Vilgalys R, Heitman J. 2009. Phylogeny and phenotypic characterization of pathogenic *Cryptococcus* species and closely related saprobic taxa in the Tremellales. *Eukaryotic Cell* 8: 353–361. doi:10.1128/EC.00373-08
- McNeill J, Barrie FF, Burdet HM, Demoulin V, Hawksworth DL, Marhold K, Nicolson DH, Prado J, Silva PC, Skog JE, Wiersema J, Turland NJ. 2006. International Code of Botanical Nomenclature (Vienna Code). Adopted by the Seventeenth International Botanical Congress, Vienna, Austria, July 2005. *Regnum Vegetabile* 146. 568 p.
- Metin B, Findley K, Heitman J. 2010. The mating type locus (*MAT*) and sexual reproduction of *Cryptococcus heveanensis*: insights into the evolution of sex and sex-determining chromosomal regions in fungi. *PLoS Genet* 6(5): e1000961. doi:10.1371/journal.pgen.1000961