Short Communication

KURTZMANOMYCES GEN. NOV., AN ANAMORPHIC YEAST GENUS FOR THE Q₁₀-EQUIPPED ORGANISM WHOSE CONIDIUM IS FREED BY AN END-BREAK IN THE STERIGMA WHICH BRANCHES OR ELONGATES TO PRODUCE ADDITIONAL CONIDIA AND WHOSE CELLS CONTAIN NO XYLOSE¹

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The genus *Fellomyces* Yamada et Banno was introduced with the type species, *Fellomyces polyborus* (Scott et van der Walt) Yamada et Banno ($\equiv$ *Sterigmatomyces polyborus* Scott et van der Walt) (1, 2). To date, the following four species have been recognized (3, 4): *Fellomyces fuzhouensis* (Yue) Yamada et Banno (a new combination proposed in this paper), *Fellomyces nectairei* (Rodrigues de Miranda) Yamada et Banno, *Fellomyces penicillatus* (Rodrigues de Miranda) Yamada et Banno, and *F. polyborus* (the type species). These anamorphic yeast species are characterized morphologically by producing conidia which are freed by an end-break in the sterigmata, and chemotaxonomically by the Q-10 system.

During the course of the analysis of xylose in the whole cell hydrolyzates of these organisms, the genus *Fellomyces* has been divided into two groups based on the presence or absence of xylose in the cells. This paper proposes *Kurtzmanomyces*,

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Table 1. Groupings of *Sterigmatomyces*, *Fellomyces*, and *Sterigmatosporidium* species based on the combination of the Co-Q system and the presence or absence of xylose in the cells.

Species and strain	Other designation	Co-Q ^a system	Xylose ^b (%)
Group I			
<i>Sterigmatomyces</i> Fell emend. Yamada et Banno			
<i>S. elviae</i> Sonck et Yarrow (1969)			— ^c
JCM 1822 ^T	= CBS 5922, IFO 1843	Q-9	
<i>S. halophilus</i> Fell (1966)			—
JCM 6905 ^T	= CBS 4609, IFO 1488	Q-9	
Group II			
<i>Fellomyces</i> Yamada et Banno			
<i>F. nectairei</i> (Rodrigues de Miranda) Yamada et Banno (1984)			—
JCM 6906 ^T	= CBS 6405, IFO 10118	Q-10	
Group III			
<i>F. fuzhouensis</i> (Yue) Yamada et Banno (1988)			
JCM 7367 ^T	= CBS 8243, IFO 10374	Q-10	6.2
<i>F. penicillatus</i> (Rodrigues de Miranda) Yamada et Banno (1984)			
JCM 6907 ^T	= CBS 5492, IFO 10119	Q-10	10.1
<i>F. polyborus</i> (Scott et van der Walt) Yamada et Banno (1984)			
JCM 6908 ^T	= CBS 6072, IFO 10120	Q-10	8.0
<i>Sterigmatosporidium</i> Kraepelin et Schulze			
<i>S. polymorphum</i> Kraepelin et Schulze (1982)			
JCM 6902 ^T	= CBS 8088, IFO 10121	Q-10	7.4

Abbreviations: JCM, Japan Collection of Microorganisms, Institute of Physical and Chemical Research, Wako, Japan; CBS, Centraalbureau voor Schimmelcultures, Delft, The Netherlands; IFO, Institute for Fermentation, Osaka, Osaka, Japan.

^a Coenzyme Q or ubiquinone: Q-9 or Q₉ and Q-10 or Q₁₀, coenzyme Q or ubiquinone homologues with 9 and 10 isoprene units, respectively, in a side chain. The data from YAMADA and BANNO (1) and YAMADA et al. (4).

^b Xylose content in total carbohydrates. The data were obtained as described previously (5) except for using a Toyo Soda TSK-Gel Amide-80 column with a solvent system of acetonitrile-water (7:3, by volume) as a mobile phase.

^c Not detected.

^T Type strain.

a new anamorphic yeast genus for the organism characterized by the absence of xylose in the cells, formerly classified in the genus *Fellomyces*.

Seven strains of *Sterigmatomyces*, *Fellomyces*, and *Sterigmatosporidium* species were analyzed for xylose in the whole cell hydrolyzates, as described previously (5). As shown in Table 1, the organisms classified in the genera *Sterigmatomyces*, *Fellomyces*, and *Sterigmatosporidium* were chemotaxonomically divided into three groups by combining the Co-Q system with the presence or absence of xylose in the cells. The species in the genus *Sterigmatomyces* Fell emend. Yamada et Banno were discriminated by either the Q-9 system or the absence of xylose in the cells (Group I). In contrast, the genus *Fellomyces* was divided into two groups (Groups II and

III). One, which includes *F. fuzhouensis*, *F. penicillatus*, and *F. polyborus* (the type species), has xylose in the cells. The other group, which includes *F. nectairei* ($\equiv$ *Sterigmatomyces nectairei* Rodrigues de Miranda), has no xylose. *Sterigmatosporidium polymorphum* Kraepelin et Schulze has xylose, as in the former group of the genus *Fellomyces*.

According to FELL et al. (6), *F. nectairei* ($\equiv$ *S. nectairei*) is morphologically unique within the genus *Fellomyces* (and *Sterigmatomyces*): the colonies are salmon to orange in color and mother-daughter cell separation is terminal on the sterigma. However, the sterigma branches or elongates to produce additional daughter cells. This morphological character is different from other *Fellomyces* species, viz., *F. fuzhouensis*, *F. penicillatus*, and *F. polyborus* (the type species).

The presence or absence of xylose in the cells has recently been used as an important criterion for classifying basidiomycetous yeasts and yeast-like fungi at the generic level (7, 8).

Fellomyces nectairei ($\equiv$ *S. nectairei*) should thus be included neither in the genus *Fellomyces* nor in the genus *Sterigmatomyces* and is assigned to a new separate anamorphic yeast genus. The genus is named in honor of Dr. C. P. Kurtzman, Northern Regional Research Center, U.S. Department of Agriculture, Peoria, Illinois, U.S.A., in recognition of his contributions to yeast taxonomy, especially his studies from the view-point of molecular biology.

Kurtzmanomyces Yamada, Itoh, Kawasaki, Banno et Nakase gen. nov.

Genus ad Cryptococcaceae pertinens. Cellulae globosae, ovoideae vel cylindricae. Conidium singulare in apicem sterigmati formatum et ad apicem sterigmati sine projectione liberatur. Interdum sterigma dividitur aut extenditur et conidia additionalia formantur. Mycelium verum producitur. Ballistospores absunt. Probatio diazonii caerulei B positiva. Xylosum in cellulis abest. Systema coenzytatis Q-10 adest.

Species typica: *Kurtzmanomyces nectairei* (Rodrigues de Miranda) Yamada, Itoh, Kawasaki, Banno et Nakase.

Genus belongs to Cryptococcaceae. Cells are globose, ovoid to cylindrical. Single conidium is formed at top of sterigma and freed at top of sterigma without projection. Occasionally sterigma branches or elongates and additional conidia are formed. True mycelium is produced. Ballistospores are absent. Diazonium blue B test is positive. Xylose in cells is absent. Coenzyme Q-10 system is present.

Type species: *Kurtzmanomyces nectairei* (Rodrigues de Miranda) Yamada, Itoh, Kawasaki, Banno et Nakase comb. nov. [Basionym: *Sterigmatomyces nectairei* Rodrigues de Miranda, Antonie van Leeuwenhoek **41**: 193. 1975 (ut *nectairii*)].

Typus: CBS 6405.

In order to make a distinction between the genera *Fellomyces* and *Kurtzmanomyces*, the diagnosis of the genus *Fellomyces* should be emended as

follows.

Fellomyces Yamada et Banno emend. Yamada et Banno

Genus belongs to Cryptococcaceae. Cells are globose, ovoid to cylindrical. Single conidium is formed at top of sterigma and freed at top of sterigma without projection. True mycelium is absent or produced. Ballistospores are absent. Diazonium blue B test is positive. Xylose in cells is present. Coenzyme Q-10 system is present. Teleomorphic state: *Sterigmatosporidium* Kraepelin et Schulze.

Type species: *Fellomyces polyborus* (Scott et van der Walt) Yamada et Banno.

In the genus *Fellomyces*, the following three species including one new combination are presently accepted.

Fellomyces fuzhouensis (Yue) Yamada et Banno comb. nov.

Basionym: *Sterigmatomyces fuzhouensis* Yue, Acta Mycol. Sin. **1**: 81. 1982.

Typus: CBS 8243.

Fellomyces penicillatus (Rodrigues de Miranda) Yamada et Banno, J. Gen. Appl. Microbiol. **30**: 524. 1984.

Fellomyces polyborus (Scott et van der Walt) Yamada et Banno, J. Gen. Appl. Microbiol. **30**: 524. 1984.

Sterigmatomyces tursiopsis Kurtzman, Smiley, Johnson et Hoffman (nom. nud.) is a synonym of *F. fuzhouensis* (2, 4, 6).

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