

A Psychrophilic Yeast from Mammoth Cave, Kentucky

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In the course of our study of the indigenous microflora of Mammoth Cave, Mammoth Cave National Park, Kentucky, we have repeatedly encountered a yellowish, mold-like organism growing on dead crickets (*Hadenoeus subterraneus* Scudder), dead cave rats (*Neotoma magister* Baird), and on meat and fish baits placed in the cave to attract arthropods. The organism has been observed throughout the upper regions of the cave, especially in those areas which receive vadose waters percolating downward from the surface. The mean temperature of these areas is 13°C. and the relative humidity is very near saturation at all times.

A sample of the organism was collected aseptically from a section of the cave (Radio Room, near Frozen Niagara) which is not open to the public and was subjected to microbiological examination. Pure cultures were obtained by plating on Difco Cornmeal agar and incubating at 20° and 37°C. The organism, which was not pigmented in the culture, proved to be diphasic, producing yeast-like colonies at 37° and filamentous growth at 20°. Direct observation of microcultures incubated at 20° revealed pseudohyphae with chlamydospores, while microcultures incubated at 37° revealed budding, ovoidal cells. Good growth was obtained on Sabouraud's agar and on sterilized chopped beef after 24 hours at 13°. These cultures contained ovoidal cells and pseudohyphae.

After three transfers on Cornmeal agar, the organism ceased growing at 37°, but growth was readily obtainable at 20° and at 13°.

The organism fermented glucose, galactose, and maltose, but not sucrose or lactose, and produced a "feathery" mycelial growth on eosin-methylene blue agar.

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Since the organism had many of the characteristics of *Candida albicans* (Lodder and Krieger-Van Rij, 1952), we attempted to determine its pathogenic potential in both warm- and cold-blooded animals. One ml. of a saline suspension of the cave yeast was injected intravenously into a rabbit and intraperitoneally into frogs. The known pathogen *Candida albicans* (Coyle strain) was injected into other animals and served as the control. The rabbits were held at room temperature for 12 days and the frogs at 13° for one month. None of the animals died. After sacrifice, internal organs of the animals were examined; only the rabbit injected with the Coyle strain exhibited pathological conditions. The cave yeast, while not pathogenic and not recoverable from the rabbit, was cultured from the livers and peritoneal exudates of the frogs.

These results suggest that this yeast is a psychrophilic strain of *C. albicans* which – at least in rabbits – is non-pathogenic but shows a low grade parasitism in frogs.

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SUMMARY

Samples collected in Mammoth Cave, Kentucky, revealed the presence of a psychrophilic yeast, tentatively identified as a strain of *Candida albicans*. The yeast is saprophytic on dead animal tissues and exhibits a pale yellow color when growing in the cave. In vitro, the yeast grows poorly at 37°C. and well at 13° and 20°, but loses its pigmentation. It is non-pathogenic in rabbits but appears to show low-grade parasitism in frogs.

ZUSAMMENFASSUNG

Proben aus der Mammut-Höhle (Kentucky) zeigten, daß eine psychrophile Hefe, wahrscheinlich eine *Candida-albicans*-Rasse, in dieser Höhle vorkommt. Die höhlenbewohnende Hefe existiert als Saprophyt auf Geweben toter Tiere und zeigt eine überall bleichgelbe Farbe. In vitro wächst diese Hefe dürrig bei 37°C, aber rüstig bei 13° und 20°, unter Verlust des Pigments. Bei Kaninchen ist sie nicht pathogen, und bei Fröschen zeigt sie nur milden Parasitismus.

REFERENCE

- LODDER, J., and KRIEGER-VAN RIJ, N. J. W. (1952) – The Yeasts: A Taxonomic Study. Amsterdam: North-Holland Publ. Co. Pp. 471–474, 536–538.