

SAPROPHYTIC COLONIZATION OF A HYPHOMYCETE ON THE AMAZONIAN MANATEE *TRICHECHUS INUNGUIS* (MAMMALIA; SIRENIA)*

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Introduction

Cutaneous mycotic infections have been reported in marine mammals, most notably Lobomycosis in dolphins (MIGAKI et al., 1970; WOODWARD, 1972; DEVRIES & LAARMAN, 1973; POELMA et al., 1974; CALDWELL et al., 1975) and *Candida albicans* in seals and dolphins (RONALD et al., 1970; GERACI, 1977). Although captive Sirenia are frequently known to have fungal infections (TABUCHI, 1974; HUSAR, 1977), rarely have the types of fungi nor subsequent treatment been reported in detail. Recently, skin plaques were observed on a young Amazonian manatee (*Trichechus inunguis*). The plaques were found to be composed of mycelia and conidia. The probable saprophytic nature of the observed fungi is discussed with respect to the maintenance procedures of the animal in this report.

Case report

The infected manatee was a male approximately 1 year old. It had been kept alone in captivity, alternately in an outdoor plastic tank or an indoor tile-lined pool for nearly a year. Water in the

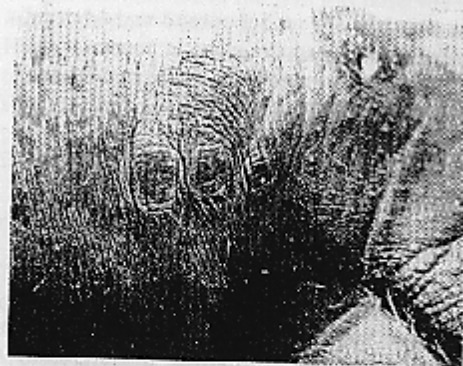


Fig. 1. Oblong, slightly elevated, dark green plaques (2 x 2 cm) on laterol-dorsal surface near head of manatee.

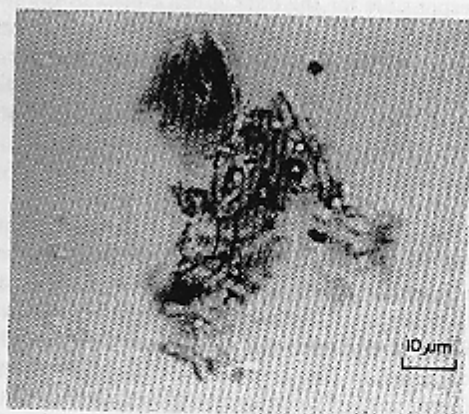


Fig. 2. Hypha with dichotomous branching in the manatee's skin scrapings.

outdoor tank was changed every 2 to 3 days and in the indoor pool daily. Chlorine disinfectant (commercial bleach) was used regularly in cleaning the pools. The diet of the manatee consisted of 8 litres of reconstituted powdered milk (Campo-Verde, Foremost Intn'l, Holland) administered daily by bottle-feeding. A vitamin supplement (Poliplex; Mead-Johnson) was also given daily in the milk. The manatee ate small quantities of grass (*Panicum purpurascens*) and an aquatic plant (*Cabomba* spp.). The plants were left floating in the tank and changed daily. The animal had been used in nutritional and metabolic studies (GALLIVAN & BEST, in press), had an excellent growth rate and no history of illness.

Due to a supply shortage, use of the disinfectant in all pools was temporarily suspended during the first week of April in 1979. Small, round to oblong, slightly elevated, slimy, dark green skin plaques (Fig. 1) were first noticed on April 10. By April 27, a total of 36 plaques had developed on the laterol-dorsal surface of the animal. The mean diameter of 30 plaques was 2.2 cm.

The appearance of the green plaques also coincided with the transfer of the animal from its outdoor tank to the indoor pool. The plaques began to disappear when the manatee was returned to the outdoor tank. On May 2, one week after the second transfer, all the plaques disappeared and the skin appeared normal.

Mycological study

Epidermal skin scrapings were taken on April 21, 26 and May 1. Microscopic examination of lactophenol cotton blue stained sections revealed the presence of dense masses of septate hyphae 2.5 - 4 μ wide, some with dichotomous branching (Fig. 2) in the first two scrapings. Conidia were smooth-walled, multiseptate, predominantly 3 to 4-celled, and occasionally joined to a short racket shaped hypha (Figs. 3 and 4). The size of the conidia ranged from 15 - 50 μ , that of each cell, 5.25 - 10.5 μ , and that of the conidium wall, 0.45 - 0.75 μ . The mycelia and conidia were hyaline and readily stained by the lactophenol cotton blue. Normal epidermal cells and occasional green algal cells were also seen in the skin scrapings. The latter might be responsible for the dark green colour of the plaques.

Attempts to isolate the fungus from the skin scrapings were made on Sabouraud and Mycosel agars (BBL) at 25° C. Cultures were negative after 60 days. When the mycotic nature of the plaques was discovered, similar attempts at isolating the fungus from the *P. purpurascens* and the *Cabomba* spp. plants were made. These attempts were also unsuccessful.

Discussion

The macroscopic appearance of the skin plaques was suggestive of hyperkeratosis. However, this possibility could not be determined in the absence of histopathological studies. Lack of abnormal epidermal cells in the microscopic examination of superficial skin scrapings pointed to saprophytic fungal colonization. The sudden disappearance of the green plaques was also indicative of temporary colonization of the skin by a saprophyte. The multiseptate conidia observed *in vivo* resembled those of the fungi belonging to the saprophytic dematiaceous (pigmented) Hyphomycete genus *Cercospora* (Ellis, 1971). However, our observed fungal structures were hyaline. The unidentified Hyphomycete might be an aquatic or grass parasite that utilized slime, algae and/or other exudates that covered the manatee and this flourished on the animal's skin.

Temporary suspension of the use of disinfectant in the tanks and the stress associated with moving the manatee to an indoor pool might have been factors that favoured the proliferation of the fungus and its colonization on the animal. Five other manatees, held under similar

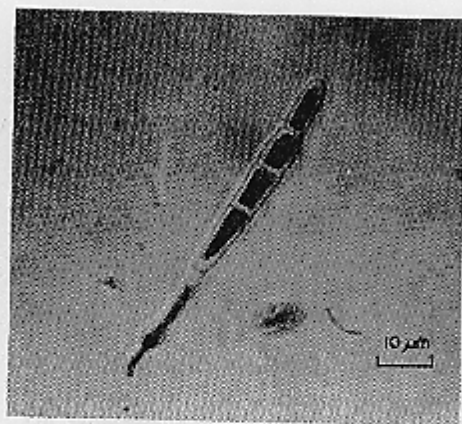


Fig. 3. Four-celled conidium with racket hyphal attachment.

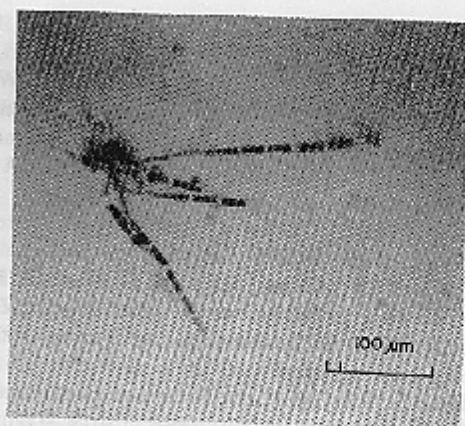


Fig. 4. Multiseptate conidia.

conditions at the same time showed no skin problems, suggesting that the colonization was opportunistic and not highly contagious. We were informed by laboratory personnel that similar plaques had been previously observed on two other young extremely malnourished manatees. Identification of the causative agents had not been sought. These colonizations suggest a relationship between fungal susceptibility and nutritional, physiological or psychological stress factors.

Summary

Fungal colonization of the skin was observed in a young captive Amazonian manatee (*Trichechus inunguis*). The multiseptate conidia seen *in vivo* resembled those of the saprophytic Hyphomycete *Cercospora*. Fungal colonization on the manatee skin was coincidental with the temporary suspension of the use of chlorine disinfectant in its tank and probably related to the stress associated with transferring the animal indoors. Similar fungal plaques had been observed previously on extremely malnourished manatees, indicating that nutritional and psychological factors predispose manatees to superficial colonization by saprophytic fungi.

Acknowledgements

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Note:

On 28 Aug 1980, a young female manatee calf was caught at Tefé, on the Solimões River. It had the same fungal infection as that of the animal reported above, indicating that the same fungus also occurs in wild individuals. Extra care was taken to ensure cleanliness of the outdoor pool where the calf was kept alone. The infection disappeared spontaneously within a few days.

CONWAY (1976) reported that *Cercospora rodmanii* is a normal pathogen of the water hyacinth *Eichhornia crassipes* which is a food plant of the Amazonian manatee. Were the fungus observed *in vivo* in this study a *Cercospora* sp., there might be a more intimate relationship between this fungus and its two known hosts.

CONWAY, K.E. 1976. *Cercospora rodmanii* a new pathogen of water hyacinth with biological control potential. Can. J. Bot. 54: 1079-1083.