



Prototheca species – A pathogenic algae

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Introduction

Algae are saprophytic eukaryotic organisms which are widely distributed in the environment especially in water. Infrequently, some species of algae have been implicated in disease of domestic animals. *Prototheca* species, widely distributed, saprophytic, colorless algae, are related to green algae of the genus *Chlorella*. *Prototheca zopfii* has been associated with disseminated protothecosis in dogs and with mastitis in cows. *Prototheca* species grow aerobically forming yeast - like colonies on Sabouraud dextrose agar and on blood agar. During asexual reproduction, 2 to 16 sporangiospores develop within a sporangium. The sporangiospores are released through a split which develops in the sporangial wall. In cultures, the sporangiospores of *P. zopfii* are larger than those of *P. wickerhamii*. Organisms can enter tissues at sites of minor trauma in skin and mucous membranes or through the teat canal.

Clinical infections

Although *Prototheca* species are commonly present in the environment, infections in animals are infrequent. Suppression of cell - mediated immunity may be a factor predisposing to disseminated disease.

Cutaneous protothecosis in cats

A cutaneous form of protothecosis, caused by *P. wickerhamii*, is the only manifestation of the disease reported in cats. Large, firm, discrete nodules occur on limbs and feet. Similar lesions have been described on the nose and ears and at the base of the tail. Microscopically the granulomatous lesions, located in the dermis, contain multinucleate giant cells with engulfed organisms. Surgical excision of skin lesions is the most effective method of treatment.

Disseminated protothecosis in dogs

Infection with *P. zopfii* probably occurs through the intestinal mucosa as dissemination is often preceded by hemorrhagic colitis. Affected dogs may present with protracted bloody diarrhea along with

signs of neurological or ocular disturbance. There may be progressive weight loss and debility. Treatment of disseminated protothecosis is usually unsuccessful. At post - mortem, granulomatous lesions in which protothecal cells may be demonstrated are found in skeletal muscles, brain, liver, kidneys, eyes and cochlea.

Protothecal mastitis in cows

Prototheca zopfii can cause chronic progressive pyogranulomatous lesions in bovine mammary glands and associated lymph nodes. Indurative mastitis may affect a number of quarters. Because of their intracellular location, protothecal cells may be difficult to eliminate from the glands. Although the organisms are excreted intermittently in milk, they may not be demonstrable in samples, and some cases of the disease may be overlooked. *Prototheca zopfii* can persist in the tissues throughout a dry period and may be excreted during the next lactation. Treatment is unsuccessful. Affected cows should be culled because they are potential sources of infection and their milk yields are permanently reduced.

