

Rhinosporidiosis in a cat

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Abstract. A polypoid nasal mass from an adult cat was submitted for routine biopsy examination and was found to contain sporangia and sporangiospores consistent with *Rhinosporidium seeberi*. Inflammatory infiltrates were moderate and pyogranulomatous to lymphohistiocytic and were associated with hyperplasia of the transitional nasal epithelium. Apparently, this is the first reported case of rhinosporidiosis in a cat.

Rhinosporidiosis is a rare disease of uncertain phylogeny that has been described in cattle, dogs, horses, swans, and humans and is most often characterized as a disease of South Asian countries; it is considered sporadic or rare in other parts of the world.^{3,4,6,9} Infection results in the production of hyperplastic tumor-like masses of the nasal epithelium. The etiologic agent, *Rhinosporidium seeberi*, is an alga that has, until recently, been classified as a fungus of uncertain phylogeny.

An 8-year-old intact female domestic shorthair cat was presented to the practicing veterinarian (SVB) for removal of a polypoid nasal mass that protruded from the right nostril. According to the owner, the mass had been present for <1 month. A 2-week episode of ataxia with occasional vomiting and a mild cough was reported to have occurred several months previously in this animal, and resolution was considered complete, with no residual neurologic signs. No definitive diagnosis was made for this earlier neurologic disease. The cat was from a horse farm and, with 20 other cats on the premises, was an exclusively outdoor pet. The cats at the farm were vaccinated yearly against the feline respiratory diseases, and there was no known history of infectious disease among the cats at the farm. At presentation, there was mild epistaxis from the affected nostril. Although an upper respiratory rasping was reported, breathing difficulty was not identified at the time of examination, and no other clinical signs were apparent. The mass extended into the nasal passage and was cylindrical and approximately 5 × 15 mm in size, with a narrow stalk. Routine surgical anesthesia and excisional biopsy of the mass were performed, and the patient made an uneventful anesthetic recovery. A follow-up telephone conversation with the owner 10 months after surgery indicated no recurrence of the mass or complications from the surgical procedure.

Portions of the mass were fixed in 10% neutral buffered formalin, processed routinely, sectioned at 5–6 μm, and stained with hematoxylin and eosin stain for subsequent histopathologic examination. The tissue examined consisted of a polypoid mass of hyperplastic transitional nasal epithelium and submucosal stroma that was expanded and elevated by a moderate, focally extensive pyogranulomatous to lymphohistiocytic infiltrate, which was associated with myriad fungal structures identified as the various life cycle stages of *R. seeberi* (Fig. 1). Mature thick-walled, bilamellar sporangia were spherical, 200–300 μm in diameter, and were

filled with several hundred sporangiospores that were round, unilamellar, and 2–8 μm in diameter, depending on the stage of maturity. The walls of the sporangia were 2–3 μm thick, and the amphophilic sporangiospores (endospores) appeared to bud from the walls of the sporangia, with the largest, most mature sporangiospores present at the centers of the sporangia. Small immature sporangia contained flocculant basophilic cytoplasm and central nuclei (karyosomes). Occasional large sporangia (the characteristic mature forms) were intraepithelial, surrounded by small numbers of neutrophils, and open to the hyperplastic mucosal surface, discharging the sporangiospores from surface fistulas (Fig. 2). Occasional sporangiospores were located within the edematous superficial submucosa and were associated with the mixed inflammatory infiltrates. Some empty sporangia were collapsed (Fig. 1), apparently having discharged their contents into the submucosa earlier, and were also suspended within the fibrovascular stroma of the submucosa.

The phylogenetic classification of *R. seeberi* has been the subject of controversy. The organism was, until recently, believed to be either a protozoal or a fungal species of unknown or uncertain classification. Presently, the organism is thought to be the nonpigmented stage of the blue-green alga *Microcystis aeruginosa* or to be within the monophyletic group *Mesomycetozoa*, at the divergence of the animal and fungal kingdoms. Culture of the *R. seeberi* has been successful on medium that supports the growth of *M. aeruginosa*, and further genetic studies of *R. seeberi* should be facilitated by this development.^{1,4} In earlier studies, the organisms were successfully cultivated in cells from an epithelioid human rectal tumor cell line, resulting in proliferation of the tumor cells.⁷

In South Asian countries, where rhinosporidiosis is most prevalent, there is a strong association between infected animals and humans and swimming or bathing in infective pond water.^{1,8} Algal cells, identified as colorless nanocytes of *M. aeruginosa*, have been isolated from pond water and are tentatively considered to be the infective phase of the disease.² The source of infection in the cat of this report is unknown. With multiple horses and possibly other domestic and wild animals at the farm of origin, vertebrate reservoir hosts of the organism could have common contact with water contacted by the cat. The lack of reported cases of rhinosporidiosis in domestic cats could be a function of the usual aversion of cats to bodies of water.

Rhinosporidium seeberi represents an additional differential diagnosis for the clinician and pathologist when presented with feline polypoid nasal lesions.

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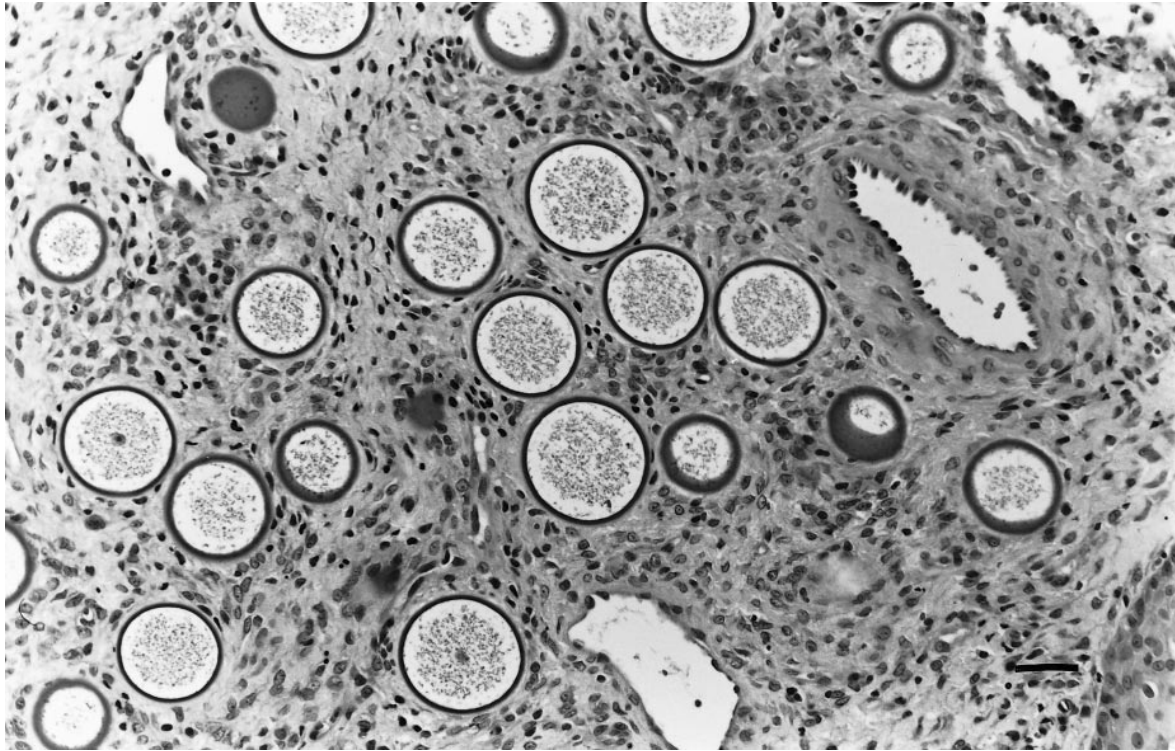


Figure 1. Nasal submucosa; feline rhinosporidiosis. Pyogranulomatous to lymphohistiocytic rhinitis with multifocal immature sporangia of *Rhinosporidium seeberi*. HE. Bar = 50 μ m.



Figure 2. Nasal mucosa; feline rhinosporidiosis. Pyogranulomatous to lymphohistiocytic and hyperplastic rhinitis with a mature sporangium. Note the mature and immature sporangiospores and prominent fistula. HE. Bar = 50 μ m.

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