

## **Frenkelia sp. from the Brain of a Porcupine (*Erethizon dorsatum*) from Alberta, Canada**

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without cardiac alterations is a common finding in naturally infected birds (Gray, 1958, op. cit.). Other frequently encountered lesions include peritonitis and airsacculitis. In acute cases, the necrotic foci tend to be less marked (Gray, 1958, op. cit.). Histologic lesions in the liver of the wild turkey were consistent with those described by Csontos et al. (1955, Acta Vet. Hung. 5: 261–274), as reported by Gray

(1958, op. cit.). They found foci of necrosis without a marked inflammatory reaction in both liver and spleen. In this case, since *L. monocytogenes*, a known pathogen, was isolated from the affected tissue in pure culture, it seems reasonable to ascribe the lesions encountered as well as the wild turkey's death to *L. monocytogenes*.

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### ***Frenkelia* sp. from the Brain of a Porcupine (*Erethizon dorsatum*) from Alberta, Canada**

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Cysts of *Frenkelia* spp. have been reported in several species of rodents belonging to the families Muridae, Cricetidae, and Chinchillidae (Frenkel, 1956, Ann. N.Y. Acad. Sci. 64: 215–251; Karstad, 1963, Can. Vet. J. 4: 249–251; Krampitz and Rommel, 1977, Berl. Muench. Tieraerztl. Wochenschr. 90: 17–19; Meingassner and Burtscher, 1977, Vet. Pathol. 14: 146–153; Rommel and Krampitz, 1978, Zentralbl. Veterinaermed. Reihe B 25: 273–281). To our knowledge, the present report is the first to document *Frenkelia* as a natural infection in a porcupine.

The life cycle for any *Frenkelia* spp. has only recently been determined (Rommel and Krampitz, 1975, Berl. Muench. Tieraerztl. Wochenschr. 8: 338–340; Krampitz et al., 1976, Z. Parasitenkd. 51: 7–14; Rommel et al., 1976, Z. Parasitenkd. 50: 204–205; Rommel et al., 1977, Z. Parasitenkd. 51: 139–146). Rommel and Krampitz (1975, op. cit.) determined the life cycle and developmental stages of *F.*

*glareoli* (= *F. clethrionomyobuteonis*) in the buzzard (*Buteo buteo*) definitive host and bank vole (*Clethrionomys glareolus*) intermediate host. Other researchers have added to this information, noting that the parasite is specific for the definitive host, but not the intermediate one (Rommel et al., 1976, op. cit.; Rommel and Krampitz, 1978, op. cit.; Tadros et al., 1980, Trop. Geogr. Med. 32: 86). *Buteo buteo* is also the definitive host for *Frenkelia microti*. The specific name for *Frenkelia* spp. in North America is not known (Frenkel et al., 1979, Z. Parasitenkd. 58: 115–139).

On 13 August 1984 a female porcupine, in good physical condition, was trapped near Calgary, Alberta, Canada by personnel of the Fish and Wildlife Division and submitted to the Veterinary Laboratory, Animal Health Division, Airdrie, Alberta for examination. The porcupine was kept in captivity at the Veterinary Laboratory until 18 August, when it died. The brain was removed at necropsy and preserved in 10% buffered formalin. Portions of the brain tissue were prepared for histological examination. Histological examination re-

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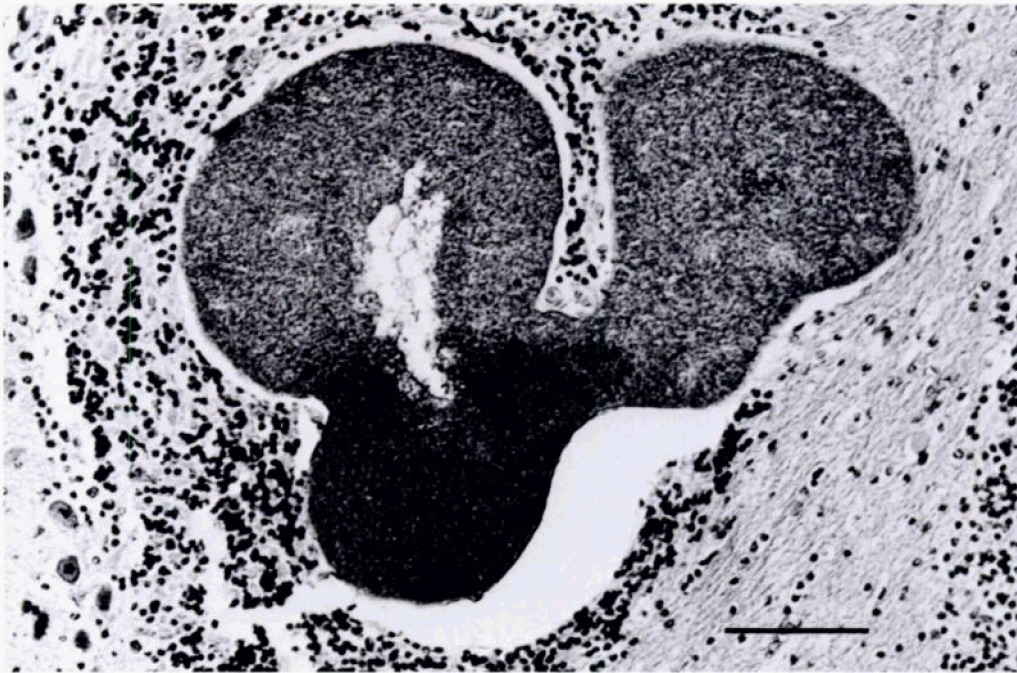


FIGURE 1. Cysts of *Frenkelia* sp. in the brain of a porcupine. H&E. Bar = 100  $\mu$ m.

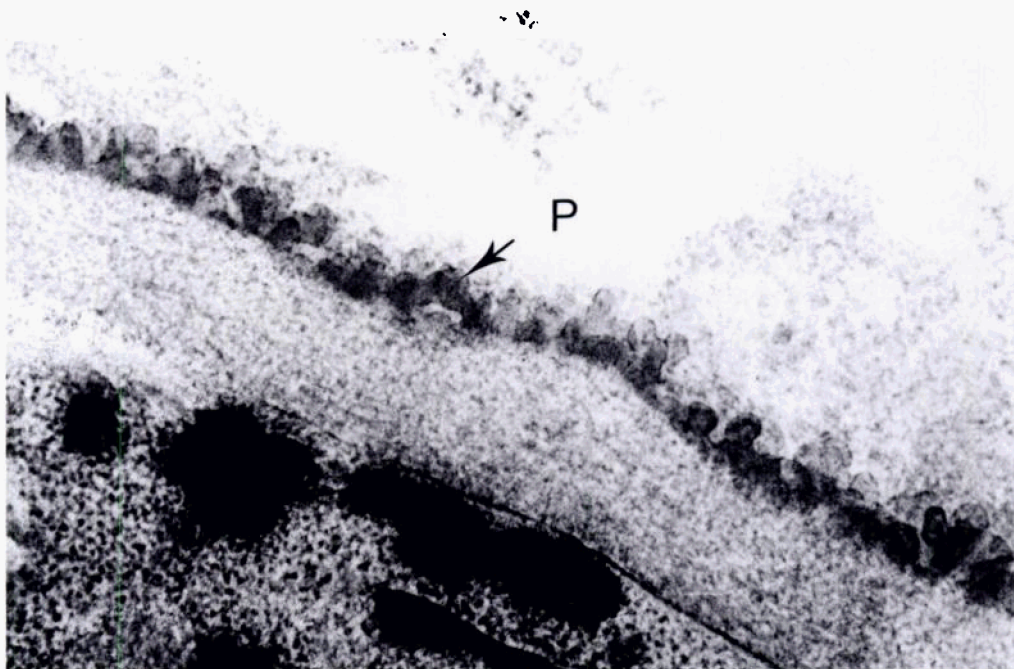


FIGURE 2. Transmission electron micrograph of the cyst wall of *Frenkelia* sp. Note the thin wall and small rounded protrusions (P).  $\times 39,312$ .



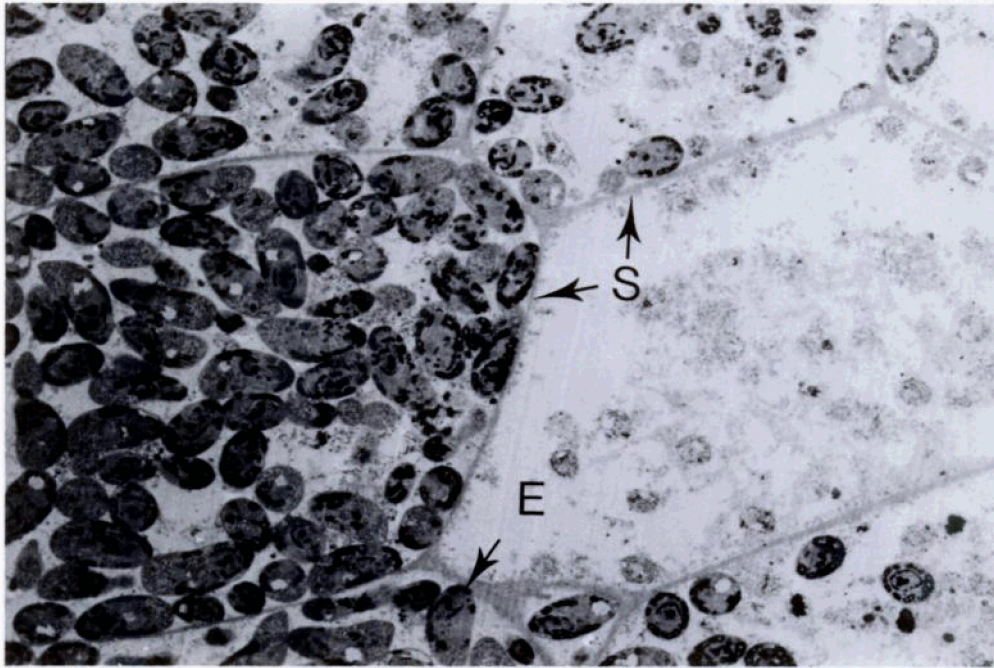


FIGURE 3. Transmission electron micrograph of *Frenkelia* sp. Note the endodyocytes (E) and septa (S).  $\times 3,015$ .

vealed deeply lobed (Fig. 1), thin-walled (Fig. 2), septate cysts (Fig. 3) characteristic of *Frenkelia microti* (Findlay and Middleton, 1932) Biocca, 1966. However, because of the apparent final host specificity of the European species, and the geographic isolation from them, it is unlikely that our *Frenkelia* is the same species. Until the life cycle has been determined, no name is proposed. In the present case, the microscopic changes were similar to those described for other *Frenkelia* spp. from wild rodents (Frenkel, 1956, op. cit.; Karstad, 1963, op. cit.; Hayden et al., 1976, Vet. Pathol. 13: 337-342; Meingassner and Burtcher, 1977, op. cit.; Geisel et al., 1978, Vet. Pathol. 15: 621-630; Geisel et al., 1979, J. Wildl. Dis. 15:

267-270) and included perivascular and meningeal mononuclear cell infiltrates and gliosis. In contrast to wild rodents, granulomatous encephalitis has been reported from naturally infected lab-reared rats (Hayden et al., 1976, op. cit.).

The effects of this parasite on the porcupine were not determined, but it is conceivable that infections with large numbers of cysts could impair the motility of the porcupine as is believed may occur in voles (Geisel et al., 1978, op. cit.), but this has not been tested.

A voucher tissue section of *Frenkelia* sp. from the brain of this porcupine was deposited in the National Museums of Canada Parasite Collection, Ottawa (NMCP 1985-0086).