

## Laboratory and Epidemiology Communications

### The First Reported Case of a Dog Infected with *Echinococcus multilocularis* in Saitama Prefecture, Japan

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*Echinococcus multilocularis* is a causative agent of human alveolar hydatidosis. The distribution of the parasite in Japan is thought to be limited to Hokkaido, the northernmost insular prefecture. The life cycle of this parasite is predominantly

sylvatic. In Hokkaido, the red fox (*Vulpes vulpes*) is a definitive host that excretes *E. multilocularis* eggs into its feces. The gray-sided vole (*Clethrionomys rufocanus*) is a principal intermediate host that becomes infected by ingesting the eggs, which develop into larvae in the host viscera. Domestic dogs also become definitive hosts of the parasite after eating voles harboring the larvae. Since human infections follow the accidental ingestion of *E. multilocularis* eggs, a survey of *E. multilocularis* infection in dogs is a crucial for disease

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prevention. Data obtained from an examination of 9,907 dogs in Hokkaido between 1966 and 2004 by the prefectural government revealed that 99 (1.0%) were infected with the adult parasites. The estimated number of dogs that travel from Hokkaido to other prefectures is over 12,000 per year (1). Some of these dogs might constitute important carriers, transmitting the parasite to remote areas. Morishima et al. (2) recently studied the extent of *E. multilocularis* infection in 183 dogs transported by their owners from Hokkaido to other prefectures and found that two of the dogs were infected. Here we describe the first case of a dog infected with *E. multilocularis* in Saitama Prefecture, which neighbors northern metropolitan Tokyo.

The dogs examined in this survey were abandoned and pound animals. A total of 550 dogs kept in the Saitama Prefectural Pet Owner's Guidance Center were examined between April 1999 and September 2005. Staff members at the center collected fecal samples. These were routinely checked for the presence of helminth eggs and protozoan oocysts by microscopy using direct smear, formalin-ether and sucrose flotation techniques. Taeniid eggs (Fig. 1) were found in a fecal sample from a female mongrel dog that was captured in northern Saitama in June 3, 2005. Because *Echinococcus* eggs are morphologically indistinguishable from those of other tapeworms of the family *Taeniidae* (3), they were examined by PCR according to the method of Dinkel et al. (4). The second round of nested PCR produced a single band of the predicted size at 250 bp. Direct sequencing showed that the band was the same as those found in *E. multilocularis*



Fig. 1. *Echinococcus multilocularis* egg found in the fecal sample of a dog captured in Saitama Prefecture, Japan. Scale bar equals 30  $\mu$ m.

isolates from Hokkaido (GenBank accession no. AB244598). These results showed that this dog was infected with *E. multilocularis*.

The source of infection was not identified. No convincing evidence yet supports the notion that wild animals in Saitama and its neighboring prefectures are infected. Since some dogs that move from Hokkaido to the mainland of Japan are infected (2), the dog described herein seems to have been infected in Hokkaido, then taken to Saitama by her owner, and then either abandoned or allowed to escape. Regardless, an extensive epizootiological survey should be conducted on wild animals in suspect areas of the prefecture. The Infectious Diseases Control Law of Japan has classified the significance of this disease to public health as Category IV, which has required the mandatory reporting of not only infected humans but also infected dogs since October 1, 2004. In accordance with this law, this is the first reported instance of a dog infected with *E. multilocularis* in a Japanese prefecture other than Hokkaido.

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