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Detection of Echinococcus multilocularis Eggs by Centrifugal Flotation Technique: Preliminary Survey of Soil Left in the Ferryboats Commuting between Hokkaido Island, Where E. multilocularis is Endemic, and Mainland Japan

Kayoko Matsudo, Takashi Inaba† and Haruo Kamiya*

Department of Parasitology, Hirosaki University School of Medicine, Hirosaki 036-8562 and
†Department of Medical Technology, Hirosaki University School of Health Sciences, Hirosaki 036-8564

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Echinococcus multilocularis, a causative agent of alveolar hydatidosis, is considered the most epidemiologically and also clinically serious zoonotic parasite in Japan. The cestode is distributed on Hokkaido, a northern island of Japan, and the increasing prevalence of E. multilocularis in red foxes, Vulpes vulpes schrencki, serving as a definitive host, has become a considerable concern (1). Recently, echinococcosis was found in pigs in Aomori, in the northern part of mainland Japan (2). The source of infection of those pigs has not yet been identified, although an intensive epidemiological survey of wild animals in Aomori was carried out (3,4). Many motor vehicles commute between Hokkaido and Aomori by ferryboat, and cars carrying soil contaminated with E. multilocularis eggs could be a possible vector of infection (5). Though various techniques have been developed to detect taeniid eggs in soil (6,7), no appropriate methods for detecting taeniid eggs in soil are available.

In the experiments presented herein, we applied the centrifugal flotation technique to the detection of Echinococcus eggs in sandy soil. Two kilograms of sandy soil that had been mixed with 10,000 non-infective eggs of E. multilocularis preserved in 70% ethanol since 1969 were put in a bucket, then 3 liters of water or water containing 0.05% Tween-80, water, and sucrose solution with specific gravity of 1.27. The foxes in Hokkaido are heavily infected with E. multilocularis; the maximum number of worms recorded from a fox was 34,000 (1). An average of 300 eggs per gravid segment was counted in E. multilocularis from a fox from this region (8). If a fox heavily infected with E. multilocularis is run over by a car, a huge number of eggs will burst into the environment from the viscera, and that car and subsequent cars passing over the fox could be contaminated with the eggs. In fact, infected foxes are frequent victims of traffic accidents in Hokkaido (5). Although Echinococcus eggs were not detected from the soil investigated in the present survey, surveillance of the transmission of E. multilocularis eggs from Hokkaido to Honshu by motor vehicle on ferries should be monitored to prevent the spread of E. multilocularis from Hokkaido to mainland Japan.

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REFERENCES


