Short Communication

A Large-Scale Survey of *Trichinella* spp. Infection in Japanese Wild Boars

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SUMMARY: This study presents the results of a large-scale, one-year survey of *Trichinella* spp. in Japanese wild boars (*Sus scrofa*). We analyzed the tongues of 1,168 wild boars captured by hunters in 30 prefectures of Japan, most of which were boar habitats, from October 2014 to January 2015. The samples were digested, and the prevalence of *Trichinella* spp. muscle larvae was examined. Examination of pooled samples from 10 individuals (15 g per head) or 117 randomly selected samples (10% of the total number of samples) that were individually processed showed no larval infection. Thus, our data suggests that Japanese wild boars do not play a major role in the sylvatic cycle of *Trichinella* parasites.

In Japan, damage to agricultural products caused by wildlife, especially wild boar and deer, has become a serious issue, amounting to approximately 20 billion yen in 2014 (1). Although game-meat consumption, including that of wild boar, promoted the control of wildlife populations, processing and distribution systems for game meat are still under development. Trichinellosis is an important meat-borne zoonotic disease that is caused by consumption of undercooked or raw meat infected with *Trichinella* larvae. Clinical cases of this disease that were caused by consumption of wild boar meat have been reported and summarized in a review by Murrell and Pozio (2). In Japan, human outbreaks of trichinellosis have occurred in Aomori Prefecture in 1974 as well as in Hokkaido and Mie Prefecture in 1980, and all of these cases were due to consumption of bear meat (3). Since then, there have been no reports in Japan, with the exception of a few sporadic cases such as in travelers returning from overseas (3–5). In contrast, by 2007, there were same case reports of *Trichinella* infection in Japanese wildlife, including the sable (*Martes zibellina*) (6), black bear (*Ursus thibetanus*) (4), brown bear (*Ursus arctos*) (7), red fox (*Vulpes japonica*) (7), raccoon dog (*Nyctereutes procyonoides albus/viverrinus*) (7,8), and raccoon (*Procyon lotor*) (8). Although wild boar is widely considered to be an important indicator of *Trichinella* infection in the field (9), only 2 regional reports with the negative results for *Trichinella* infection are available to date (4,8).

In this study, we analyzed *Trichinella* spp. infection in wild boars that were hunted throughout Japan from October 2014 to January 2015. Tongue samples from 1,168 wild boars captured by hunters were collected in 30 prefectures of Japan. To avoid assessment of juveniles, we primarily used boars with an estimated body weight of at least 40 kg in this study. Each black dot in Fig. 1 represents a hunting location in an area inhabited by wild boar (indicated in gray) in 2014 (data provided by the Ministry of the Environment), indicating that the tested samples cover most of Japan's wild boar habitat.

To inspect the presence of *Trichinella* spp. larvae in the muscle tissues of wild boar, the base of the tongue was excited and digested within a week of sample collection, according to previously described methods.
animals, including insects, earthworms, and frogs, even in winter. They occasionally consume small material, such as bamboos, dicotyledons, and tubers, of Japanese wild boars is mainly comprises vegetable related to T9 (8,14). Of these species, the prevalence of could cause human trichinellosis. Based on our data, wild boars for over 10 weeks after experimental infection (15). Thus, if a wild boar population were widely infected with Trichinella spp.

In this large-scale survey, Trichinella spp. infection was not detected in Japan’s wild boar population; in contrast, muscle larvae are relatively common in other indigenous wildlife (4,6–8). Rodents are generally considered to be potent sources of infection for both carnivores and omnivores, however, no larvae were detected in rodents captured from the same area where the infected wildlife lived (4,7), suggesting that they might not be involved in the sylvatic cycle of Trichinella parasites in these areas. Preying on infected animals is essential for the Trichinella life cycle. However, the diet of Japanese wild boars is mainly comprises vegetable material, such as bamboos, dicotyledons, and tubers, even in winter. They occasionally consume small animals, including insects, earthworms, and frogs, indicating that they are herbivorous omnivores (11–13). Previous studies reported that most Trichinella species isolated in Japan were Trichinella nativa or genotype T9 (8,14). Of these species, T. nativa has relatively low infectivity and lacks persistence in wild boars compared to other Trichinella species, which include Trichinella spiralis and Trichinella britovi (15), indicating that T. nativa poses a relatively lower risk to human health. In contrast, Trichinella murrelli, which is phylogenetically related to Trichinella T9 (14), was reported to persist in wild boars for over 10 weeks after experimental infection (15). Thus, if a wild boar population were widely contaminated with T9, consumption of wild boars could cause human trichinellosis. Based on our data, the prevalence of Trichinella spp. in the Japanese wild boar population is very low or negligible; however, continual surveys targeting these animals to monitor the status of Trichinella infection in the population would be required to minimize the risk of infection from wild boars.

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Conflict of interest None to declare.

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