

## Nematodes associated with invasive insects, some potential cases of cryptogenic invasion of nematodes

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Many species of nematodes are phoretically associated with insects, i.e., the nematodes use the insects for their transmission. One of the most notorious insect-associated nematodes is the pine wood nematode, *Bursaphelenchus xylophilus*, an internationally important forest pathogen. The nematode invaded Japan from North America associating with its vector insect, *Monochamus* spp., which bore into the pine logs. Nematodes are generally very small in size, thus their invasions (introductions) are not detected easily if they do not show any visible activity, e.g., pine wilt caused by *B. xylophilus*. In this context, we surveyed on introduced (invasive) insects for their nematode association in Japan, and found some potential cryptogenic introductions of two bacteriophagous nematodes, *Teratorhabditis synpapillata* and *Acrostichus* sp. *T. synpapillata* was isolated from Kagoshima, Japan as an associate of invasive *Rhynchophorus ferrugineus*, a serious pest of palms. The nematode has been reported from South Asian countries, where it is associated with *R. ferrugineus* emerged from dead palms, and is sometimes found from nitrogen-rich environment, e.g., compost and sewage. The other species, *Acrostichus* sp. was isolated from the body surface of *Sagra femorata* larvae from Mie, Japan as dauer juveniles (insect-associated stage). The insect was recently introduced to Japan from Southeast Asia and has established its population feeding on Japanese native plant species, e.g., *Pueraria lobata*. The original distribution range of *Acrostichus* sp. has not been specified, because the species was first found from Mie, Japan in the present study. However, the insect-association pattern of the nematode, i.e., dauer juveniles, indicates close relationship with *S. femorata*. As these two nematode species are bacteriophagous, their economic risk may be lower than that of plant parasitic nematodes. However, detailed surveys and risk assessments on these nematodes should be required because any information about environmental risks of these cryptogenic invaders has not been obtained.

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