

Survey of stag beetle-associated nematodes in Japan as basic information for identification of invasive nematodes

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Stag beetles (Coleoptera: Lucanidae) have commercial value as pet insects, i.e., the growing and keeping of stag beetles is a popular hobby in Japan. Many species of stag beetles are imported to Japan from southeastern Asia, Europe, Africa and other areas of the world, and are commercially distributed within Japan. Currently, several different phoretic and parasitic mites have been reported from introduced lucanids in Japan, and there are some evidences that these mite species have switched their hosts to Japanese native lucanids in pet shops. Therefore, similar cryptogenic invasion of lucanid-associated nematodes may occur in Japan. However, no information has been provided for the nematode associates of stag beetles in Japan and the other Asian countries so far. In the present study, we conducted a survey of lucanid-associated nematodes in Japan to provide basic information on the domestic nematode fauna, and preliminary survey of the nematodes associated with imported lucanid beetles. Eight species of stag beetles were collected from 12 localities in Japan. The collected beetles were dissected and examined for nematode associates. The isolated nematodes were used for the establishment of voucher cultures. Successfully cultured nematodes were identified at genus/species level morphologically and molecularly. All investigated lucanid individuals harbored at least one species of nematode, and eight species (*Bursaphelenchus* sp., *Koerneria luziae*, *K. lucani*, *Pristionchus* sp., *Pseudodiplogasteroides composites*, *Pseudodiplogasteroides* sp., *Rhabditoides* sp. and a species belonging to undescribed genus close to *Pristionchus*), were successfully cultured. As a preliminary survey of introduced species, we examined three imported lucanid species obtained from pet shops, and isolated four nematode species (*K. luziae*, *P. compositus*, *Diplogastrellus* sp. and *Halicephalobus* sp.). Considering the recent world-wide trade of living insects, we suggest the use of caution to prevent the invasion of their associated nematodes.

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