

Short communication

Nem1004

Some additional bionomic characters of *Deladenus nitobei*

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Deladenus nitobei Kanzaki, Tanaka, Fitza, Kosaka, Slippers, Kimura, Tsuchiya & Tabata, 2016 was originally described as an internal parasite of a woodwasp species, *Sirex nitobei* Matsumura, that emerged from dead logs of Japanese red pine, *Pinus densiflora* Sieb. & Zucc. collected from Takko, Aomori, Japan (Kanzaki *et al.*, 2016). During the collection of material for the species description, the emergence date and sex of the wasps were recorded, and the dissected wasp bodies were fixed in 100% ethanol and vouchered at the Forest Pathology Laboratory of Forestry and Forest Products Research Institute, Tsukuba, Japan. We re-examined the vouchered materials of the wasps and measured their body size, comparing it with the presence/absence of nematode parasitism to provide additional information about the relevance of parasitism in relation to the emergence season of the wasps.

Forty-two individual wasps comprising 13 males and 29 females emerged from the dead logs during 23 July to 5 September 2015 (Fig. 1). Amongst those wasps, 11 males (85%) and 16 females (55%) were parasitised by *D. nitobei* (Fig. 1), but the difference was not significant ($P = 0.089$; Fisher's exact Test).

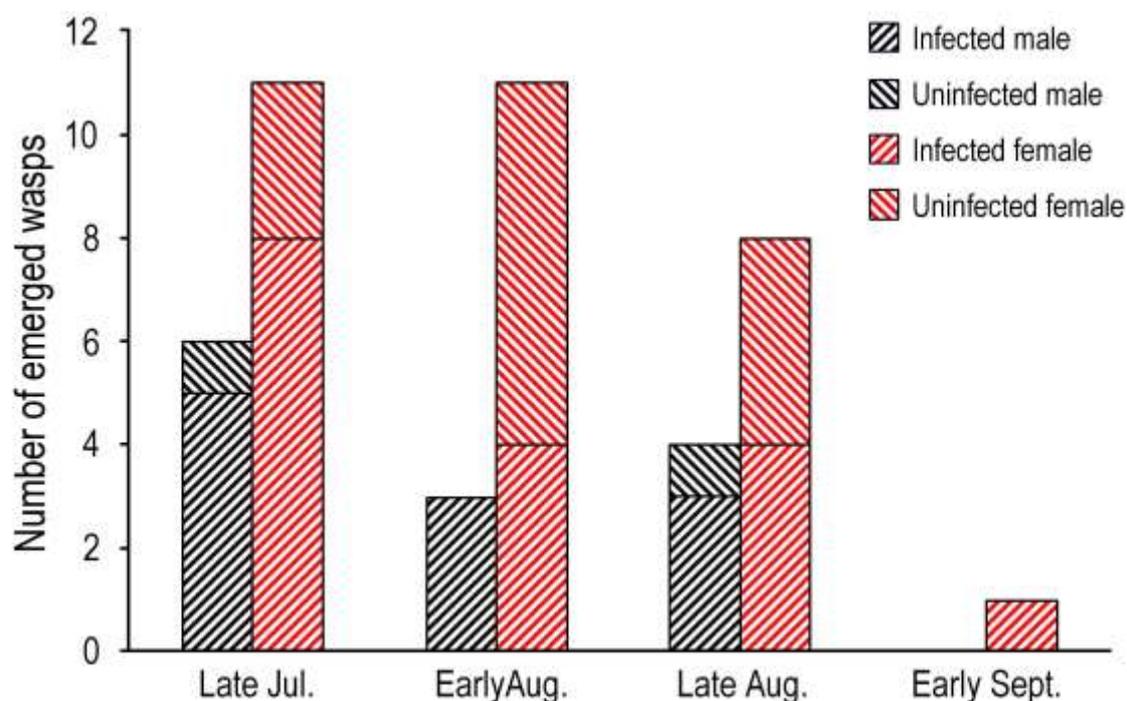


Fig. 1. Emergence season of *Sirex nitobei* and the rate of *Deladenus nitobei* infection of male and female hosts. The seasons: late Jul., early Aug., late Aug. and early Sept., correspond to 23-31 July, 1-15 August, 16-31 August, and 5 September.

Nematode parasitism was consistently observed throughout the emergence season. The majority (31 out of 42 individuals) of the wasps emerged relatively early in the season (late July to early August). The rate of parasitism also seemed higher in the early part of the season, although this was not supported statistically.

To determine the impact of parasitism, the body size of the wasps was measured. Because only dissected bodies were available, forewing length, which was applicable to all individual wasps, was employed for the body size index. The average lengths were compared between parasitised and unparasitised individuals within each sex. The average lengths of parasitised females, healthy females, parasitised males, and healthy males were 13.4, 16.7, 9.7 and 8.8 mm, respectively. Body size of parasitised females was significantly smaller than that of healthy females ($P = 0.0015$; Student's t-test). Parasitised males were larger on average than unparasitised males, but because most of the males (11 out of 13) were parasitised, statistical analysis could not be. In the relationship between *D. siricidicola* Bedding and *S. noctilio* (Fab.), nematode parasitism causes various negative effects on the wasp, typically the reduction of the number of eggs (or sterilisation) and reduction of flight velocity and distance (Bedding, 1967, 1972; Villacide & Corley, 2008; Kroll *et al.*, 2013; Gaudon *et al.*, 2016). Further, similar negative effects are known in the relationship between *D. proximus* Bedding and *S. nigricornis* (Fabricius) (Bedding, 1974; Zieman *et al.*, 2015). In addition, the reduction in body size of female *S. noctilio* has been reported in relation to *D. siricidicola* parasitism (Villacide & Corley, 2008). Thus, although the flight and reproductive abilities were not examined in the present study, the reduction of female body size suggests that the relationship between *D. nitobei* and *S. nitobei* is similar to that of other reported *Deladenus*-woodwasp systems.

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