Research Note

Two species of deer keds (Diptera: Hippoboscidae) in Miyajima, Hiroshima Prefecture, Japan

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Abstract: Two species of deer keds, Lipoptena fortisetosa Maa and \textit{L. sikae} Mogi, were collected from Miyajima, Hiroshima Prefecture, Japan. This is the first report of \textit{L. fortisetosa} from Hiroshima Prefecture and for \textit{L. sikae} from the Chugoku district. Alate individuals of \textit{L. fortisetosa} were collected during June–October by sweeping; \textit{L. sikae} were similarly collected in November. Both sexes of \textit{L. fortisetosa} often fitted at a low height (5–110 cm above the ground), and sometimes adhered to the outside of the white sweep nets. Apparently, the population density of winged \textit{L. fortisetosa} is unrelated to that of the Japanese deer \textit{Cervus nippon} Temminck. In late December, de-alate forms of both species were collected from the body of the dead host. \textit{Lipoptena fortisetosa} were collected during winter in Japan for the first time. Attention should be paid to deer keds in Miyajima, since they are potential pests for humans. Miyajima can be a valuable field for studying interspecific relationships of these two species of deer keds.

Key words: \textit{Lipoptena sikae}, \textit{Lipoptena fortisetosa}, \textit{Cervus nippon}, Chugoku district, Japan

INTRODUCTION

Deer keds, the genus \textit{Lipoptena}, are external parasites that take blood from their hosts, which are typically deer, antelope, goats, and sheep. The puparia of \textit{Lipoptena} develop into winged flies (alate form). The flies lose their wings and their flight muscles atrophy (de-alate form) when they have reached their hosts (Kim and Adler, 1985). Incidental infestations of humans with deer keds are well-documented (Alekseev, 1985; Gothe and Schol, 1994; Ivanov, 1975). To date, three species-\textit{Lipoptena fortisetosa} Maa, \textit{L. japonica} Bequaert and \textit{L. sikae} Mogi-have been recorded from Japan (Mogi et al., 2002). Little is known of their distribution, life history and behavior.

While conducting faunal surveys of dipterous insects in Miyajima in the Seto Inland Sea, we collected two species of deer keds, \textit{L. sikae} and \textit{L. fortisetosa}, and recorded their biological information.

MATERIALS AND METHODS

Area and locations for deer ked collection

Miyajima, with an area of 30.22 km\textsuperscript{2}, is an island that is famous as a tourist spot in the Seto Inland Sea, Japan (Fig. 1). The virgin forest is maintained in Miyajima because the entire island is under special protection as a religiously significant region; it has the Itsukushima shrine. For that reason, many Japanese deer \textit{Cervus nippon} Temminck are distributed in Miya-
Fig. 1. Location of collection sites in Miyajima, Hiroshima Prefecture. 1, Ōmoto-gawa trail; 2, Momiji-dani trail; 3, Tsutsumigaura.

Table 1. Deer ked collection in Miyajima, Hiroshima Prefecture.

<table>
<thead>
<tr>
<th>Date</th>
<th>Site no.</th>
<th>No. of deer keds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lipoptena fortiseta (male)</td>
</tr>
<tr>
<td>25 Dec. 1999</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>25 June 2003</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>26 June 2003</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>26 June 2003</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>11 Aug. 2003</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>1 Oct. 2003</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>24 Nov. 2003</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

jima, but no deer reside on the mainland bank. Our survey was conducted at three sites on the northern part of the island: 1) Ōmoto-gawa trail, 2) Momiji-dani trail, and 3) Tsutsumigaura. Many deer live in a bright open space on the lawn at the entrance of the Ōmoto-gawa trail, Ōmoto Park. The mountaintop side of the trail (in the virgin forest), shows animal tracks and a col without bottom weeds. Many deer also live in a bright open space at the entrance of the Momiji-dani trail, Momiji-dani Park. The mountaintop side of the trail (on the hillside of the mountain) also has a col with animal tracks. Tsutsumigaura is a campsite. Some deer live there.

Method of collecting deer keds
On 25 December 1999, unwinged deer keds (de-alate form) parasitizing a young female deer were collected directly from the host’s body surface immediately after its death. The deer was attacked by a dog at site No. 3 on 24 December 1999, and was subsequently treated at the Hiroshima City Asa Zoological Park.

Winged deer keds (alate form) were collected by air sweeping at 5–110 cm above the ground, with the net not touching any solid object, at sites No. 1 and 2 on 25–26
June 2003, and at site No. 1 on 1 October 2003. Moreover, winged deer keds were collected by sweeping bushes at site No. 3 on 11 August 2003 and at site No. 2 on 24 November 2003.

RESULTS AND DISCUSSION

In all, 132 adult deer keds (119 L. fortisetosa and 13 L. sikae) were collected by sweeping and from the Japanese deer (Table 1).

*Liptopena fortisetosa* (Fig. 2) are distributed in the Palaearctic Region, and have been recorded from Hokkaido and Honshu (eastern area from the Shimane Peninsula) in Japan (Mogi et al., 2002; Yamauchi, 2003); *L. sikae* (Fig. 3) are endemic to Honshu (Miyagi, Kyoto, and Nara Prefectures) (Kataoka, 2002; Mogi et al., 2002). The present study is the first to record *L. fortisetosa* from Hiroshima Prefecture and *L. sikae* from the Chugoku district. To date, the regions where two species of deer keds occur have been Kin-kasan, Miyagi Prefecture and Nara Park, Nara Prefecture. Therefore, Miyajima is the third locality in which two species of deer keds occur; it can be a valuable field for studying interspecific relationships of deer keds.

At sites No. 1 and 2, deer keds (alate form) were absent at the entrances of both trails, whereas most of them were collected at cols in the virgin forest by air sweeping. Apparently, both sexes of *L. fortisetosa* often flit at a low height (5-110 cm above the ground) because 47 males and 57 females were collected by air sweeping at that height. During our field survey, *L. fortisetosa* sometimes adhered to the outside of the white sweep nets as mentioned by Ohishi and Otobe (2001).

Sonobe (1979) reported that winged *L. fortisetosa* and *L. sikae* were mainly collected in the boundary between woods.
and meadow in Kinkasan. However, most of them were collected in the dark woods in Miyajima. There, near the deer trails in Miyajima, they await a parasitic opportunity. As Sonobe (1979) indicated, the population density of winged deer keds is unrelated to that of the Japanese deer, and must be related to whether the place is suitable for their pupae.

In this field survey, deer keds (alate form) were collected during June–October (L. fortisetosa) and in November (L. sikae) by sweeping. In late December, both species (de-alate form) were collected from the body surface of a Japanese deer captured at site No. 3. Hence, L. fortisetosa were first collected during winter in Japan. As is the case for L. cervi (Linnaeus) pointed out by Haarlev (1964), the fed individuals of L. fortisetosa and L. sikae probably spend the winter on the host and in puparia in the soil.

Sometimes, L. fortisetosa and L. sikae flit to humans (Kataoka, 2002; Ohishi and Araya, 2000). Therefore, careful attention should be paid to deer keds to guard against these insanitary pests in Miyajima, a famous sightseeing spot.

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References


