

中部山岳域におけるツヤクロマルカスミカメによる ツリガネニンジンへの加害

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Introduction

When monophagous and oligophagous insect herbivores colonize new areas, they sometimes use novel hosts. The availability of the new hosts can facilitate further expansion into regions beyond the geographic range of the original hosts, resulting in specialization on different host plant taxa in different parts of the herbivore's geographic range. *Strongylocoris leucocephalus* (Hemiptera: Miridae), which is a plant bug attacking *Campanula* spp., is widely distributed in the Eurasian continent, North Africa, and northern Japan. In the process of geographic range expansion, *S. leucocephalus* may incorporate novel host plants into their host range. The objective of this study was to identify the host plant species of *S. leucocephalus* in central Japan.

Materials and Methods

To evaluate herbivory by *S. leucocephalus* on *Campanula* spp. in central Japan, more than 600 *Adenophora triphylla* var. *japonica*, more than 800 *C. punctata* var. *hondoensis*, and 50 *Platycodon grandiflorus* shoots were surveyed in the Sugadaira Montane Research Center, in 2013 and 2014. The presence or absence of leaves damaged by *S. leucocephalus* on each shoot were recorded. In addition, a feeding experiment was conducted to determine whether *S. leucocephalus* feeds on *A. triphylla* var. *japonica* or *P. grandiflorus* in the laboratory. In July 2014, *S. leucocephalus* larvae and the stems of *A. triphylla* var. *japonica* and *P. grandiflorus* were collected in the grassland. Stems with leaves were placed in cotton batting containing water, and three larvae were placed in a plastic container and kept at 15°C and under a 16-h photophase and 8-h scotophase. Containers holding only two larvae in cotton batting and three larvae in cotton batting were used as controls. Plants and cotton battings were sometimes replaced. The number of dead insects was recorded every day.

A generalized linear model (GLM) with a Poisson distribution and log link was used to compare the length of the survival period among the three conditions. Means were compared using Tukey's HSD test.

Results and Discussion

Field surveys revealed that *S. leucocephalus* never fed on *C. punctata* var. *hondoensis* and *P. grandiflorus* but fed on *A. triphylla* var. *japonica* in central Japan (Fig). A GLM revealed that the survival period of individuals feeding on *P. grandiflorus* was significantly shorter than that of individuals feeding on *A. triphylla* var. *japonica*, although no significant difference was observed between the individuals feeding on *P. grandiflorus* and water. Thus, the present study is the first study to report that *A. triphylla* var. *japonica* is the only host plant in central Japan and plants of the genus *Adenophora* as novel host plants for *S. leucocephalus*.

The plant bug *S. leucocephalus* and the novel host plant *A. triphylla* var. *japonica* are not entirely distributed sympatrically, suggesting that the plant bug has expanded its geographic range by incorporating new hosts.



Fig. *Adenophora triphylla* var. *japonica* leaves damaged by the plant bug *Strongylocoris leucocephalus*. Arrows indicate *S. leucocephalus* larvae.

Takagi, E. (2014) Herbivory by *Strongylocoris leucocephalus* (Hemiptera: Miridae) on a novel host plant *Adenophora triphylla* var. *japonica* in Japan. *Journal of Asia-Pacific Entomology*, **17**, 499-503.