

## Scientific note

# First record of a phoretic relationship between *Lophochernes bicarinatus* (Pseudoscorpionida: Cheliferidae) and *Batocera davidis* (Coleoptera: Cerambycidae) in Taiwan

首次記錄台灣產雙首冠擬蠍(擬蠍目:蟹擬蠍科)與  
大衛天牛(鞘翅目:天牛科)之攜播關係

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## Abstract

Pseudoscorpions are tiny arachnids with limited ability to disperse on their own. Through phoresy, they attach themselves onto arthropods, mammals, or birds to transport to new habitats. This article is the first record of a phoretic relationship between *Lophochernes bicarinatus* and *Batocera davidis*, which were collected from Taiwan.

**Key words:** phoresy, *Lophochernes bicarinatus*, *Batocera davidis*, pseudoscorpions

## 摘要

擬蠍是一種微小的蛛形綱動物，具有有限的播遷能力。透過攜播關係，擬蠍能攀附在其他的節肢動物、哺乳動物或鳥類身上，以遷徙至新的棲地。本文首次記錄台灣產雙首冠擬蠍與大衛天牛與之間的攜播關係。

**關鍵詞：**攜播、雙首冠擬蠍、大衛天牛、擬蠍

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Pseudoscorpions are small arachnids ranging from 0.7 mm to 12 mm in size (Beccaloni 2009). They can be found under rocks, or in gaps of bark, as well as on humid forest floors. Because of their tiny size, pseudoscorpions have limited ability to disperse on their own. Through phoresy, non-parasitic hitchhiking, the pseudoscorpion attaches itself onto arthropods, mammals, or

birds to disperse to a new habitat. Legg (1975) mentioned that phoresy is the reason why members of the Chernetidae and Cheliferidae families have such a worldwide distribution.

The phoretic relationship between pseudoscorpions is common within a wide range of arthropods; at least three families of arachnids and 44 families of insects are

included. How the phoretic behavior originated is still unknown (Poinar *et al.* 1998). Weygoldt (1969) had suggested that the phoretic relationship between Coleoptera and pseudoscorpions is stable. Also, members of Chernetidae family can be found under the elytra of Coleoptera. The species of Chernetidae not only uses the Coleoptera for transportation, but also prey upon



**Fig. 1.** The elytra of *Batocera davidi* from Fushan, Yilan County, was uncovered with four male and 18 female *Lophochernes bicarinatus* individuals on its abdomen.



**Fig. 2.** *Lophochernes bicarinatus* (Simon 1878) was found in the gap of the bark in Beitou, Taipei. Photographed by Hsi-Hsuan Liu.

parasitic or phoretic mites that live on the Coleoptera.

However, evidence from Asia is scarce. The phoretic relationship of Coleoptera between *Lissochelifer superbis* and *Batocera celebiana* was the only confirmed record in Asia (Beier 1948; Poinar *et al.* 1998). Recently, we have found in Taiwan up to 22 pseudoscorpions on one single *B. davidis* (Fig. 1), a common longicorn beetle in South Asia, including China, Vietnam, Laos, and was introduced into Hawaii (Saha *et al.* 2013). The pseudoscorpions under the elytra of *B. davidis* were identified as *Lophochernes bicarinatus* (Simon 1878). *L. bicarinatus* can be found in Japan and Taiwan (Ellingsen 1912), particularly in the gaps of bark (Fig. 2) or in household items.



**Fig. 3.** *Lophochernes bicarinatus*, male.

Furthermore, they are likely to consume some small arthropods like mites and booklice in their habitats (Morikawa 1960). This is the first recorded discovery of the phoretic association between *L. bicarinatus* and *B. davidis* in the world.

The phoresy of *L. bicarinatus* on *B. davidis* was observed on four dried specimens and one living specimen, which were collected by a light trap. One dried specimen was collected by S. P. Wu on 3 June 1995 in Shang-Baling (上巴陵), Taoyuan County, with two male and six female *L. bicarinatus* individuals; one was collected by S. P. Wu on 17 May 1996 in Fushan (福山),



**Fig. 4.** *Lophochernes bicarinatus*, female.

Yilan County, with four male and 18 female *L. bicarinatus* individuals; two were collected by S. P. Wu on 29 May 1998 and 3 June 1998 in Taman (塔曼), Taoyuan County, with 21 female and one male *L. bicarinatus* individuals. One living specimen was collected by B. X. Guo on 10 May 2018 on Li-Jia forest road (利嘉林道), Taitung County, with three male and two female *L. bicarinatus* individuals.

Salient measurements (length and width in mm) and observations of the male

(Fig. 3) *L. bicarinatus* individual included the following details: body length: 2.24 and carapace: 0.72/0.65. For the male's pedipalps, the following measurements were noted: femur: 0.73/0.21; patella: 0.75/0.26; chela (with pedicel): 1.13/0.40; chela (without pedicel): 1.01; hand: 0.55/0.40; and movable finger: 0.50. For the female (Fig. 4) *L. bicarinatus* individual, we noted the following (using the same units of measurement as for the male): body length: 2.72 and carapace: 0.80/0.76; the female's pedipalps had the following measurements: femur: 0.69/0.21; patella: 0.76/0.25; chela (with pedicel): 1.26/0.40; chela (without pedicel): 1.13; hand (without pedicel): 0.57/0.40; and movable finger: 0.53. All the specimens are deposited in the Arachnological Collection of the Department of Life Science, National Taiwan Normal University, Taipei, Taiwan.

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