New records of phoretic associations between pseudoscorpions and their hosts in Slovakia (Pseudoscorpiones: Aetemnidae, Chernetidae)

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Abstract. New cases of phoresy of pseudoscorpions (Pseudoscorpiones: Aetemnidae, Chernetidae) are recorded from Slovakia. The phoresy of the species Atemnus politus (Simon, 1878) involving owl moth (Noctuidae) as a host is documented for the first time not only in Slovakia, but also worldwide. One phoretic female of Lamprochernes chyzeri (Tömösváry, 1883) was attached to the leg of a lance fly (Lonchaeidae). It represents the second known phoresy of the species from Slovakia and the record of a new host.

Keywords: Central Europe, Diptera, lance fly, Lepidoptera, owl moth, phoresy

Zusammenfassung. Neue Nachweise phoretischer Beziehungen zwischen Pseudoskorpionen und ihren Wirtarten aus der Slowakei (Pseudoscorpiones: Aetemnidae, Chernetidae). Neue Phoresie-Fälle bei Pseudoskorpionen wurden in der Slowakei verzeichnet (Pseudoscorpiones: Aetemnidae, Chernetidae). Die Beobachtung der Phoresie der Art Atemnus politus (Simon, 1878) an einem Eulenfalter (Noctuidae) ist nicht nur die erste in der Slowakei sondern auch weltweit. Ein phoretisches Weibchen von Lamprochernes chyzeri (Tömösváry, 1883) hatte sich an das Bein einer Lanzenfliege (Lonchaeidae) gehängt. Dies ist der zweite Fall von Phoresie der Art in der Slowakei und der Nachweis eines neuen Wirtes.

Material and methods

Pseudoscorpions and their hosts were collected using Malaise traps at the locality of Virt in Slovakia (leg. J. Kodada, S. Krčmářík, D. Selnekovič). All pseudoscorpions were studied as temporary slide mounts using lactic acid and then rinsed in the water and returned to 70% alcohol. The pseudoscorpion specimens were identified using the key in Christophoryová et al. (2011a). Hosts were identified only to genus level by specialists as mentioned in the Results part. Digital photographs were taken using a Canon EOS 5D Mark II camera attached to a Zeiss Axio Zoom V16 stereomicroscope. Image stacks were produced manually, combined using the Zerene Stacker software and subsequently edited in Adobe Photoshop CC.

The material is deposited in the zoological collection at the Department of Zoology, Comenius University in Bratislava.

Results

SLOVAKIA, Virt, sand dune, Malaise trap in Robinia pseudoacacia L. and Gleditsia triacanthos L. (47.76066°N, 18.33747°E; 125 m a.s.l.), 13. Sep. 2018, 1 ♀ of Atemnus politus (Simon, 1878) on Ta III of owl moth (Lepidoptera: Noctuidae, Euxoa Hübner, 1821; det. J. Šumpich; Fig. 1).

SLOVAKIA, Virt, sand dune, Malaise trap in managed meadow (47.76316°N, 18.34019°E; 113 m a.s.l.), 18. Jul. 2019, 1 ♀ of Lamprochernes chyzeri (Tömösváry, 1883) on Fe III of lance fly (Diptera: Lonchaeidae, Lonchaea Fallen, 1820; det. M. Tkoč and I. MacGowan; Fig. 2).

SLOVAKIA, Virt, sand dune, Malaise trap in unmanaged vineyard (47.76052°N, 18.33591°E; 120 m a.s.l.), 27. Aug. 2019, 1 ♀ and 1 ♂ of Atemnus politus on Ta I and Ta II of owl moth (Lepidoptera: Noctuidae, Euxoa; det. J. Šumpich; Fig. 3).
Discussion

To the best of our knowledge, the phoresy of *Atemnus politus* is documented here for the first time not only in Slovakia but worldwide. Records of pseudoscorpions on moths are exceedingly rare, and this applies also to atemnids. Only Beier (1930) recorded adults of *Diplotemnus balcanicus* (Redikorzev, 1928) taken from moths attracted to light in Algeria [as *Atemnus piger* (Simon, 1878)]. For atemnids, the majority of phoresies are known on hosts from Coleoptera, Hemiptera or Hymenoptera (e.g. Beier 1932, 1948, Muchmore 1971, 1972, Aguiar & Bührnheim 1998, Poinar et al. 1998).

A phoresy of a male of *Lamprochernes chyzeri* was observed in Slovakia on Diptera, Muscidae (Christophoryová et al. 2011b). From Europe, only a few phoresy cases of this species were recorded. Vachon (1954) found the species attached to Lepidoptera and Meinertz (1964) on Diptera, Muscidae. Jones (1978) published an attachment to Diptera, Lonchaeidae. Legg & Jones (1988) mentioned that the species is phoretic on flies and Drogla & Lippold (2004) recorded seven phoretic specimens without specific hosts.

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