

## New cases of phoresy of *Lamprochernes nodosus* (Pseudoscorpiones: Chernetidae) on Diptera observed in Slovakia

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**Abstract.** New cases of phoresy of pseudoscorpion *Lamprochernes nodosus* (Schrank, 1803) on Diptera are documented from Slovakia. From one to five females were attached on the second and the third legs of the hosts. Multiple phoresies of *L. nodosus* are recorded for the first time in Slovakia. Records of ulidiid fly *Physiphora alceae* (Preyßler, 1791) increase the number of known hosts for the *L. nodosus* in the studied country.

**Key words:** carrier, Diptera, *Lamprochernes*, Malaise trap, phoresy, *Physiphora alceae*, Pseudoscorpiones, Slovakia.

The most reported phoretic associations between pseudoscorpions and arthropods involve carriers in the Diptera (Poinar et al. 1998) that corresponds with the known cases from Slovakia. Until now phoresy of only five taxa was observed in the studied country. Mašán & Krištofík (1992) documented single males of *Lamprochernes nodosus* on *Hydrotaea similis* Meade, 1887 (Diptera, Muscidae) and *Lucilia caesar* (Linnaeus, 1758) (Diptera, Calliphoridae). Another male of *L. chyzeri* (Tömösváry, 1882) was attached on true fly leg (Christophoryová et al. 2011b). Few years later the phoresy of females of the genus *Lamprochernes* and the species *Allochernes peregrinus* Lohmander, 1939 on Diptera was recorded (Christophoryová et al. 2017a). The last known phoresy brings along the first record of the genus *Rhacochelifer disjunctus* (L. Koch, 1873) from Slovakia, a female was attached on proboscis of Lepidoptera (Krajčovičová et al. 2017).

The faunistic research was held in the vicinity of Agricultural Cooperative Šenkvice in Trnavská pahorkatina Hills in western Slovakia (48.304333 N, 17.360589 E; 165 m a.s.l.). Malaise trap was operating continuously from 30 March 2015 to 21 October 2015. It was installed in small meadow, 29 m from cowhouse, 42 m from dunghill, 33 m from small forest timber and 15 m from clover field (Fig. 1). Ethanol was used as killing and preservative agent.

On 09<sup>th</sup> June 2015, a true fly (Diptera, Calyptrata, Muscoidea, unidentified family) was collected with one attached pseudoscorpion (Figs 2A–B). On 08<sup>th</sup> July 2015, an ulidiid fly *Physiphora alceae* (Preyßler, 1791) (det. M. Semelbauer) was collected with five attached pseudoscorpions (Fig. 2C) and on 24<sup>th</sup> July 2015 the same species with two pseudoscorpions (Fig. 2D). All pseudoscorpions were studied as a temporary slide mounts using lactic acid, and then returned to 70% ethanol. The specimens were identified as females of *Lamprochernes nodosus* (Schrank, 1803) using the key in Christophoryová et al. (2011c). The material is deposited in the zoological collections of the first author on Department of Zoology, Comenius University, Bratislava.

Poinar et al. (1998) summarized data about pseudoscorpion phoretic association; *L. nodosus* was observed phoretic on five Opiliones species, one Coleoptera species and 28 Diptera taxa. The host in the cases of the present multiple phoresies was identified as *Physiphora alceae* from the family of Ulidiidae. This association for the species is already



Figure 1. Malaise trap situated at locality Šenkvice in Slovakia (September 2015).

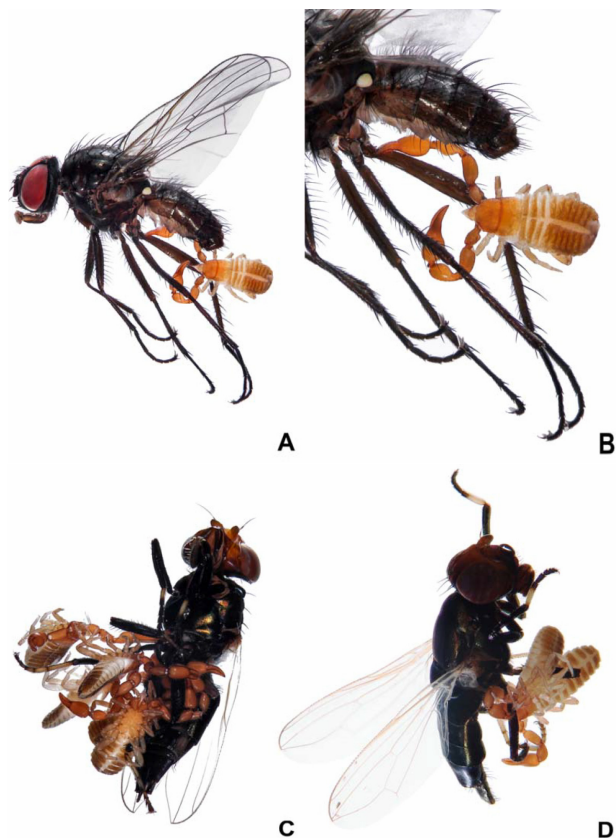


Figure 2. Three cases of *Lamprochernes nodosus* phoresy recorded in Slovakia. A, B: Case of single phoresy on true fly (unidentified family). C, D: Cases of multiple phoresy on *Physiphora alceae*.

known from Europe (Poinar et al. 1998) – as *P. demandata* (Fabricius, 1798) from formerly family Otitidae. From the mentioned family, there is known the second host for *L. nodosus*, concretely *Ulidia erythrophthalma* Meigen, 1826 (Poinar et al. 1998). Droglá & Lippold (2004) mentioned that the phoresy of *L. nodosus* in Germany is quite frequent and that they documented on each occasion one phoront on host. Ressler (1965) collected 124 specimens of the species from 32 true flies; on one host were attached six to ten pseudoscorpions. Jones (1970) found *L. nodosus* attached on the legs of the common house fly *Musca domestica* Linnaeus, 1758, hosts carried as many as four specimens on a single leg. In the present study, both of the phoresy types were recorded, the evidence of the multiple phoresy of *L. nodosus* is documented in Slovakia for the first time.

The phoront tries to remain on the carrier in such a way that it cannot be passively (by movement or flight) or actively (by being brushed off) dislodged by the carrier (Carl 1994). *Lamprochernes nodosus* uses its pedipalps for gripping and attaches itself generally on carrier's legs or antennae. In the present cases, specimens were attached on the basal segment on the second and the third pair of legs of the carriers (Fig. 2). Carl (1994) mentioned that it makes sense for the pseudoscorpion to grip with only one pedipalp but there are existing records of using both of the pedipalps. In the present study, all specimens were using only one pedipalp (Fig. 2).

The most common way for phoretic association is when the phoront and host occupy the same habitat types and they make contact when the host has completed its development and is ready to leave the old habitat (Jones 1970, Poinar et al. 1998). Most of the Diptera carriers have breeding stages in soil, rotting debris, composts or wood galleries, habitats which are usually attractive to pseudoscorpions (Poinar et al. 1998). In the present case, *L. nodosus* searches for similar habitats as its carriers. In Slovakia, *L. nodosus* was collected mainly from composts, bird nests or wood-decay fungi (Krištofik et al. 1995, 1996; Christophoryová et al. 2011a, 2014, 2017b; Krajčovičová & Christophoryová 2014). Jones (1970) mentioned that in *L. nodosus* there is an extensive breeding season from June to October, during which time peak numbers of adults occur. Many of these adults are potentially phoretic females (Jones 1970). That corresponds with the occurrence of the present phoretic females. Both here documented host species are coprophagous and *P. alceae* imagoes occur from April to October (Čepelák 1986).

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