Lamprochernes nodosus (Schrank, 1803) (Pseudoscorpiones: Chernetidae) phoretic on *Physiphora alceae* (Preyssler, 1791) (Diptera: Ulidiidae) in West Sussex, United Kingdom

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Abstract: Two specimens of the pseudoscorpion *Lamprochernes nodosus* (Schrank, 1803) found attached to the legs of a female of *Physiphora alceae* (Preyssler, 1791) are illustrated, with a discussion on phoresy as a dispersal method.
Key words: Pseudoescorpiones, Chernetide, Diptera, Ulidiidae, phoresy, phoront, host, United Kingdom.

***Lamprochernes nodosus* (Schrank, 1803) (Pseudoscorpiones: Chernetidae) forética en *Physiphora alceae* (Preyssler, 1791) (Diptera: Ulidiidae) en West Sussex, Reino Unido**
Resumen: Se ilustran dos especímenes del pseudoescorpión *Lamprochernes nodosus* (Schrank, 1803) que se encontraron adheridos a las patas de una hembra de *Physiphora alceae* (Preyssler, 1791), con una discusión sobre la foresía como método de dispersión.
Palabras clave: Pseudoescorpiones, Chernetide, Diptera, Ulidiidae, foresía, foronte, huésped, Gran Bretaña.

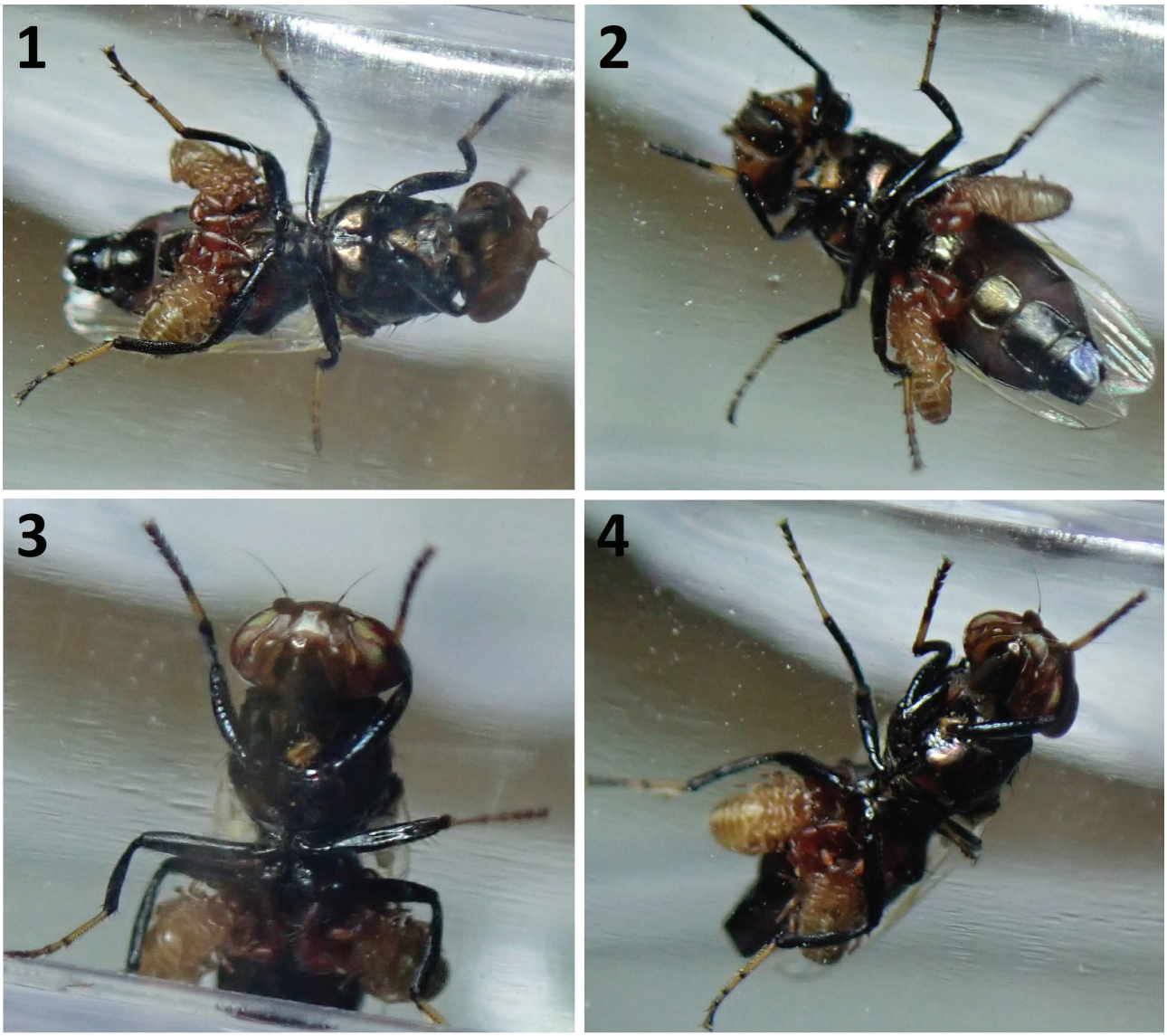
Phoresy is well documented in pseudoscorpions, with relationships associated with dipterans (e.g. Howes, 1971; Meyer, Reisen & Eberle, 1985; Aguiar & Bührnheim, 1998; Poinar, Ćurčić & Cokendolpher, 1998; Santos, Tizo-Pedroso & Fernandes, 2005; de Araujo Lira & Tizo-Pedroso, 2017; Martínez *et al*., 2020), and many other invertebrates (e.g. Nelson, 1971; Hoff & Jennings, 1974; Haack & Wilkinson, 1987; Heurtault, 1994; Aguiar & Bührnheim, 1998; Poinar, Ćurčić & Cokendolpher, 1998). Some authors stated that it is primarily a predatory response (e.g. Vachon, 1940, 1947; Muchmore, 1971a, 1971b) but others have provided evidence to indicate it is a significant (and thus intentional) dispersal mechanism in many species (e.g. Cuthbertson, 1984; Zeh & Zeh, 1992a, 1992b; Poinar, Ćurčić & Cokendolpher, 1998; Opatova & Šťáhlavský, 2018). There is no doubt whilst phoresy provides benefit to the phoront the host can be detrimentally affected. Carl (1994) notes injury to the cuticle of another host fly commonly associated with *Lamprochernes nodosus* (Schrank, 1803), namely *Musca domestica* Linnaeus, 1758.

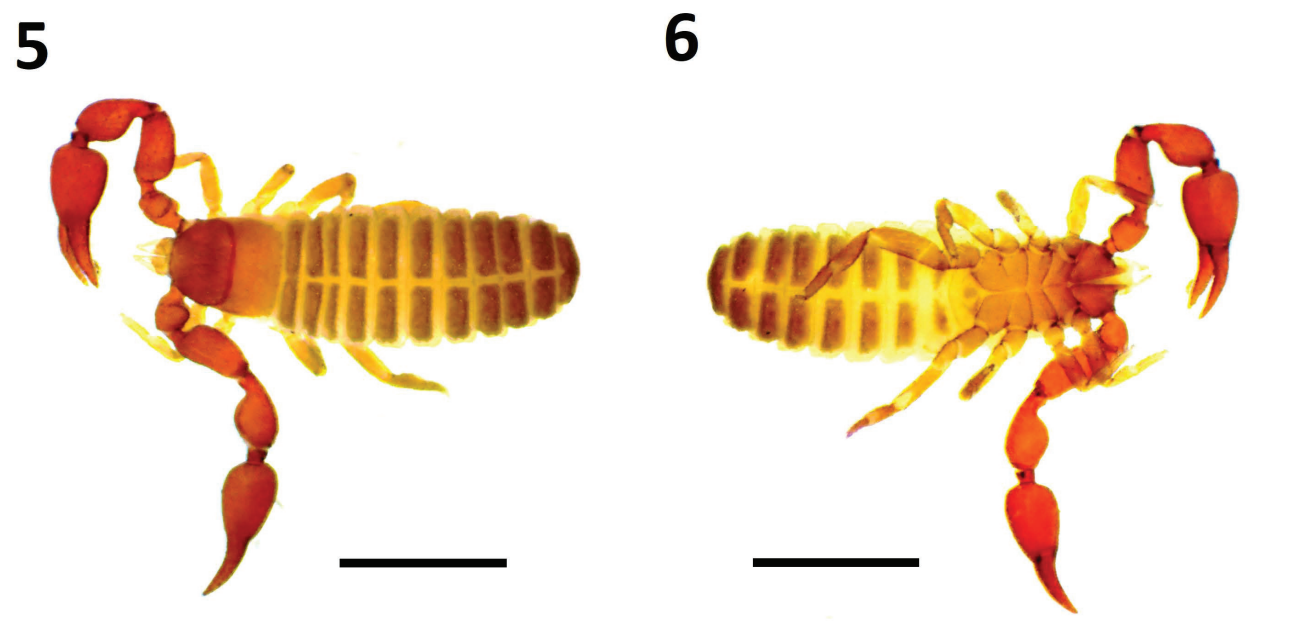
On the evening of 13/08/2020, in West Sussex, United Kingdom, RG noticed a small to medium sized dipteran with (what appeared to be) swollen hind femurs inside a room on the first floor of his house. The dipteran had possibly gained entry through the open window to the room. Thereafter, he discovered what was thought to be swollen hind femurs were in fact two pseudoscorpions one attached to each of the hind femurs of the specimen by a single claw (Figs. 1–4). After capture RG lacking a concise key to dipteran families, could not come to a conclusive identification of the specimen with the few books he had at hand (Colyer & Hammond, 1951, Stubbs & Drake, 2014). The specimens were kept as found for observation, and the pseudoscorpions exhibited catalepsy – when periodically observed and photographed– until the natural death of the fly where they removed themselves from the corpse (RG pers. obs.). All three specimens were then preserved in 80% Industrial Denatured Alcohol. The sample was then sent to DS so that she could identify the phoronts and liaise with a dipterist to obtain a precise identification for the host. The currently recorded British pseudoscorpion fauna span twenty nine species (Legg & Farr-Cox, 2016; Legg, 2020; Teffler *et al*., 2020). Subsequently, based on the morphology of the leg setae, number of setae on the genital operculum, length of the palpal femora, number and position of the leg setae, and the presence of a rounded nodule on the palpal trochanter, the pseudoscorpions were determined to be females of *Lamprochernes nodosus* (Schrank, 1803) (Figs. 5–6). Given that the closely related *Lamprochernes chyzeri* (Tömösváry, 1882) may be under recorded as a phoront due to misidentification in older works (Gerald Legg pers. comm. to DS), it is important to check the nodule of the pedipalpal trochanter on all *Lamprochernes* specimens. To this end, the identification of the pseudoscorpions was also verified by Gerald Legg (Booth Museum of Natural History). Photographs of the dipteran, post-preservation, showing wing venation and the overall habitus of the specimen, were forwarded to Tony Irwin (Norfolk Museums Service) who was able to identify the fly as *Physiphora alceae* (Preyssler, 1791) based on the overall habitus and wing venation (Tony Irwin pers. comm. to DS). All three specimens, presently held in the private collection of the first author, will eventually be deposited in the Natural History Museum, London.

The association between *L. nodosus* and *P. alceae*, as phoront and host respectively, has been recorded several times in the prior literature (e.g. Jones, 1970; Christophoryová, Gruľa & Krajčovičová, 2017; Christophoryová, Vidlička & Krajčovičová, 2018). Within British taxa it has been described and/or discussed in a number of works (Cloudsley-Thompson, 1956; Jones, 1970, 1978; Howe, 1971; Cuthbertson, 1982, 1984; Carl, 1994; Legg. 2015). In contrast to Jones (1970) who considered phoresy ought to play a significant role in dispersal, Muchmore (1971a, 1971b) stated that further data needed to be provided to unequivocally establish this as a significant method for dispersal. However, it is now clear that from more recent works this does appear to be a targeted dispersal method for *L. nodosus* and not a case of numerous "chance" occasions where they have attached to a dipteran following a mistaken predatory response. Indeed, if this were the case, then instances where multiple specimens of *L. nodosus* have been found on a single fly on multiple occasions are almost statistically improbable. Indeed, some studies already provided an implicit link between maturation seasons and instances of phoresy (and thus dispersal) in pseudoscorpions (Zeh & Zeh, 1992b). Cuthbertson (1984) goes further, asserting that catalepsy is the predominate behaviour involved in phoresy with dipterans.

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Figs. 1–6: 1–4. Two female specimens of *Lamprochernes nodosus* (Schrank, 1803) phoretic on a female *Physiphora alceae* (Preyssler, 1791) in West Sussex, United Kingdom, **5**. *Lamprochernes nodosus* (Schrank, 1803) habitus of one female specimen, dorsal, **6**. *Lamprochernes nodosus* (Schrank, 1803) habitus of one female specimen, ventral. Scale bars = 1mm. Photo credit: R. Gabriel (1–4), D. Sherwood (5–6).

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