Leptus holmiae Southcott 1992 (Acarina, Erythraeidae) ASSOCIATED WITH HARVESTMEN (Opilionida)

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Abstract

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The paper brings the new knowledge of the cohabitation of the mite, *Leptus holmiae* Southcott 1992 (Erythraeidae) with some species of the harvestmen occurring in Slovakia. The host quotients of this mite are presented along with the sexes ratios of the hosts for individual species of harvestmen. The phoresy of *L. holmiae* with the harvestmen *Lacinius ephippiatus* (C. L. Koch 1835), *Lophopilio palpinalis* (Herbst 1799) and *Oligolophus tridens* (C. L. Koch 1836) is exhibited for the first time.

Key words: Erythraeidae, *Leptus holmiae*, Opilionida, phoresy

Introduction

The harvestmen represent a group of the terrestrial arthropods with only 32 species, having been recorded in Slovakia up to the present time (Mašán, Mihál, 1993). Despite the revived interest in the study of the opiliofauna of Slovakia, especially by Astaloš (1993, 1994), Mihál (1995a, 1995b, 1996a, 1996b,1997), Stašiov (1997), and Stašiov, Maršalek (1997), only a small attention was paid to the research of the biotic interactions between the harvestmen and other organisms. One of these interspecific relations is the interaction of some species of harvestmen and the mite, *Leptus holmiae* Southcott 1992 (Fig. 1 and 2).

Several attempts were made to rearrange and rename all the 18 European species of the mite family Erythraeidae including *Leptus holmiae* Southcott 1992, which was previously designated as *Achorolophus ignotus* Oudemans 1912, *Erythraeus ignotus* Oudemans 1903 or *Leptus ignotus* Beron 1975). The occurrence of this holoartic mite species was confirmed from Iceland, Ireland, United Kingdom, Sweden, Denmark, Poland, former U.S.S.R., Czech Republic, and from Slovakia.

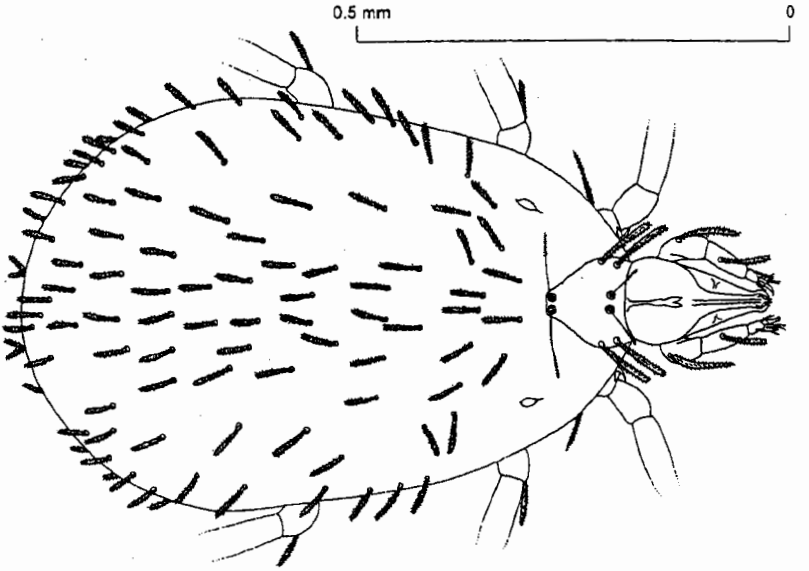

Fig. 1. *Leptus holmiae* – larva. Ventral view, legs omitted beyond trochanters.

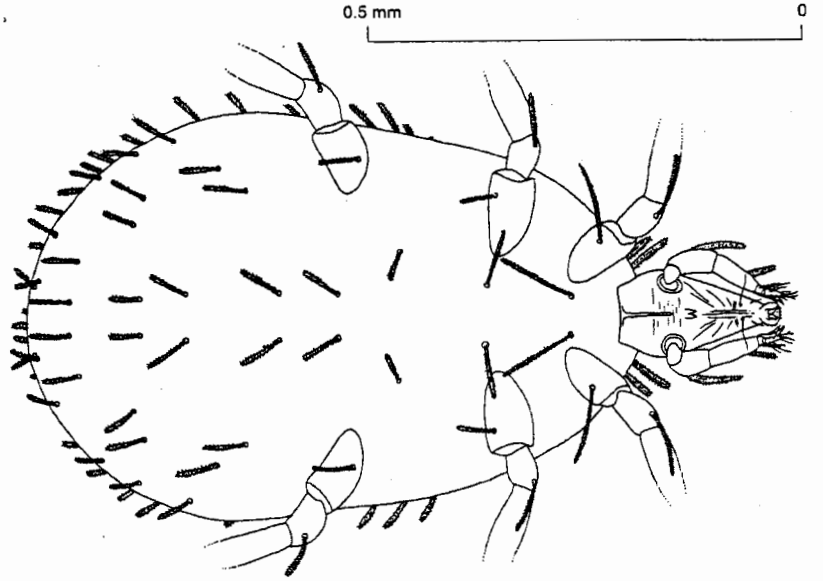

Fig. 2. *Leptus holmiae* – larva. Dorsal view, legs omitted beyond trochanters.

The coexistention of various larval instars of the mite *L. holmiae* with mature harvestmen has been occasionally reported in the literature. The genus *Leptus* was recorded as one of the earliest cases of the association of mites with other invertebrates (De Geer, 1778). Evans et al. (1961) reported on that relation including this genus as well. There are similar relations between some phoretic species of mites and some species of centipedes, flies (Mašán, Országh, 1995).

The larvae of *Leptus holmiae* attach to the extremities and numerous integumental excrescences that cover the dorsal part of abdomen and cephalothorax (including eye protuberances) of harvestmen. They never occur on the smooth ventral body parts.

From among the harvestmen occurring in Slovakia, up to the present time this mite has been found out on the following species: *Phalangium opilio* Linnaeus 1761, *Rilaena triangularis* Herbst 1799, *Mitopus morio* Fabricius 1799 (Southcott, 1992), *Egaenus convexus* L. C. Koch 1835 (Mašán, 1996 in litt.), and *Platybunus bucephalus* C. L. Koch 1835 (Šilhavý, 1956).

Material and methods

The collections of the harvestmen, from which the larvae of *Leptus holmiae* were obtained, were carried out from 1993 to 1997. The studied sites included 11 localities in 8 orographic areas of Slovakia (Moravsko-Sliezke Beskydy Mts, Malá Fatra Mts, Veľká Fatra Mts, Kremnické vrchy Mts, Zvolenská kotlina Mts, Javorie Mts, Veporské vrchy Mts and Slovenský raj Mts). The majority of the material was collected from pitfall traps. Individual traps (jars with the volume of 0.7 l and the diameter of 7.5 cm) were half filled with the 10% solution of formol. The trapped harvestmen were removed at monthly intervals. It is interesting that the mite larvae remained attached to their transport host.

A minority of the material (18.4%) comes from individual hand-collected harvestmen (by tweezers) from the ground cover, litter, ground-floor vegetation, from beneath stones, pieces of wood, etc.

Results and discussion

In total, 3,864 individuals of harvestmen were investigated during the study. The known occurrence of the larval phoresy of *Leptus holmiae* was confirmed in *Platybunus bucephalus* and *Mitopus morio*. On the other hand, in cases of *Lacinius ephippiatus* C. L. Koch 1835, *Lophopilio palpinalis* Herbst 1799 and *Oligolophus tridens* C. L. Koch 1836, the phoresy with *L. holmiae* has been identified for the first time.

Mitopus morio occurs in the entire holoartic area, *Oligolophus tridens* is a Eurosiberian species. The other species are typical of the region of central Europe. All these harvestman species occur commonly in Slovakia.

Southcott (1992) asserts the time of the occurrence of larval *Leptus holmiae* in June and August. The larvae of this mite occurred in collections from Denmark in July and August, and in collections from Poland and U.S.S.R. only in August. In my collections, the larvae of *Leptus holmiae* were attached to the harvestmen from May to August. However, the most

plentiful occurrences were found in the mid summer. On the other hand, in May and June the mite larvae occurred on the harvestmen only very rarely. The most frequent host of the larvae of this mite was *Platybunus bucephalus*.

The maximum numbers of the mite larvae per one host were 1 individual on *Lacinius ephippiatus* (observed in July), 6 and 14 individuals on *Mitopus morio (detected* in July and August, respectively), 4 individuals on *Lophopilio palpinalis* (ascertained for both summer months), 10 and 2 individuals on *Oligolophus tridens*, and 28 and 10 individuals on *Platybunus bucephalus* (in both last mentioned cases, these values were ascertained in July and August, respectively).

The sex relations of individual harvestman species as the hosts the mite larvae in the months of their most frequent occurrence were interesting as well. The hosts of the mite larvae were usually males in *P. bucephalus*. The other species of hosts, however, were mostly females. Some data on the harvestman hosts of *Leptus holmiae* are shown in Table 1.

Table 1. Some data on harvestman hosts of *Leptus holmiae* (% – harvestmen associated with *L. holmiae* in %, x – mean number of the mite larvae found on one host, sr – sex relation (males : females) of mite hosts in %)

Species	July			August		
	[%]	x	sr	[%]	x	sr
Platybunus bucephalus	80.6	5.7	61.9 : 38.1	82.0	4.0	70.8 : 29.2
Lophopilio palpinalis	12.5	4.0	0.0 : 100.0	2.7	4.0	0.0 : 100.0
Oligolophus tridens	5.1	5.5	0.0 : 100.0	11.8	1.4	18.2 : 81.8
Lacinius ephippiatus	9.5	1.0	0.0 : 100.0	–	–	0.0 : 100.0
Mitopus morio	17.5	2.2	20.0 : 80.0	30.6	3.8	45.0 : 55.0

In a single case, I found the carnivorous nympha of bug attached to the dorsal part of a mite larva. The host of this larva was a female of *P. bucephalus* belonging to the hosts with the highest abundance of the attached mite larvae (22 individuals).

The cohabitation of harvestmen with *Leptus holmiae* exhibits the character of the non-parasitic interaction – phoresy. This opinion can be supported by the absence the apparent negative influence of the mite larvae on the vitality of host (despite up to 28 larvae per individual harvestman).

The mite larvae probably temporarily use these polyphagous harvestmen as a vector of their transport to the food. For the larvae of *L. holmiae*, the advancement of this coexistence may result from the considerable activity of foraging harvestmen. The numerous dorsal protuberances of the harvestman body are perhaps helpful to this relationship and the larvae of mite prefer probably the quick-moving species of harvestmen having the long and thorny extremities. A better knowledge of the interspecific connections between these epigeic organisms requires the more detailed bionomic and ecological studies.

Translated by the author

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Stašiov S.: **Spolužitie** *Leptus holmiae* Southcott 1992 (Acarina, Erythracidae) **s koscami** (Opilionida).

Práca prináša výsledky výskumu zameraného na spolužitie roztoča *Leptus holmiae* Southcott 1992 (Erythracidae) s niektorými druhmi kosco v, ktoré sa vyskytujú na území Slovenska. Na Slovensku bol tento foretický roztoč doposiaľ zaznamenaný na 5 druhoch kosco v (*Platybunus bucephalus* (C. L. Koch 1835), *Lophopilio palpinalis* (Herbst 1799), *Oligolopus tridens* (C. L. Koch 1836), *Lacinius ephippiatus* (C. L. Koch 1835) a *Mitopus morio* (Fabricius 1799)). V práci sa osobitne hodnotila preferencia pohlaví u jednotlivých druhov kosco v týmto roztočom. S výnimkou druhu *Platybunus bucephalus* sa *Leptus holmiae* častejšie vyskytoval na samiciach ako na samcoch. Forézia *L. holmiae* s druhmi *Lacinius ephippiatus*, *Lophopilio palpinalis* a *Oligolophus tridens* bola zaznamenaná prvý krát.