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An interesting case of phoresy in mite associates of *Hylurgops palliatus* (Gyll.) (Coleoptera: Scolytidae)

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Abstract

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The first record of phoresy in the two mite taxa of the family Trematuridae (Acarina: Mesostigmata) and Histiostomatidae (Acarina: Astigmata) has been documented from the larval galleries of the bark beetle *Hylurgops palliatus* (Gyll.) (Coleoptera: Scolytidae) in Norway spruce forest in West Carpathians, Central Europe. The interesting and rare case of phoresy is briefly discussed.

Key words

Central Europe, *Hylurgops palliatus*, Norway spruce, phoretic mites, West Carpathians

Introduction

Phoresy is a phenomenon where one animal actively seeks out and attaches to the body of another animal to disperse (Athias-Binche, 1993). Phoretic hosts of mites, known as vectors or phoronts, can be insects and numerous other animals occurring in habitats of phoretic mites. Not rarely, phoresy may be observed in the mite associates of beetles (Coleoptera), bark beetles (Scolytidae) included (Pfeffer, 1955; Hirschmann, 1971; Kiełczewski et al., 1983; Kaczmarek et al., 1992; Kofler and Schmölzer, 2000; Mašán, 2001).

This study gives the first evidence of phoresy in the representatives of the two mite taxa of the family Trematuridae (Acarina: Mesostigmata) and Histiostomatidae (Acarina: Astigmata) documented from the larval galleries of *Hylurgops palliatus* (Coleoptera: Scolytidae) in Norway spruce forest in Central Europe.

Material and methods

Uropodine mites were collected in Norway spruce forest near Detvianska Huta in Veporske vrchy Mountains, West Carpathians, Central Europe, altitude 850 m, in August 2006. Uropodids were hand-sampled from the larval galleries of *Hylurgops palliatus* (Coleoptera: Scolytidae) constructed under the bark of moist log of Norway spruce [*Picea abies* (L.) Karst.]. The log (0.2 m thick and 4.0 m long) was positioned on the forest floor. It was completely shaded.

In the laboratory, the uropodids sampled were mounted into permanent microscopic slides using the Liquido de Swan and identified according to Mašán (2001). The material has been deposited in the mite collections of the Institute of Forest Ecology, Slovak Academy of Sciences, in Zvolen.

Results and discussion

A total of 14 individuals of the uropodid *Trichouropoda obscura* (Koch), all deutonymphs, were collected from the larval galleries of *Hylurgops palliatus* under the bark of spruce log. Of them, a single deutonymph of *T. obscura* was carrying another mite identified as the tritonymph (hypopus) of the genus *Histiostoma* Kramer (Acarina: Astigmata). The tritonymph was found attached to the dorsal side of the body of *T. obscura* (Figs 1, 2). Both the deutonymph and tritonymph were

living individuals. The described case of phoresy clearly shows that the tiny representatives of the genus *Histiostoma* can be passively dispersed by their somewhat larger mite associates.

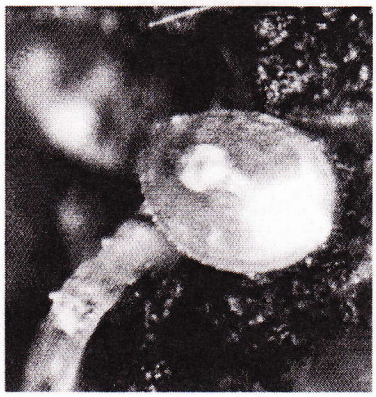

Fig 1. A specimen of *Histiostoma* sp. phoretic on the deutonymph of *Trichouropoda obscura*

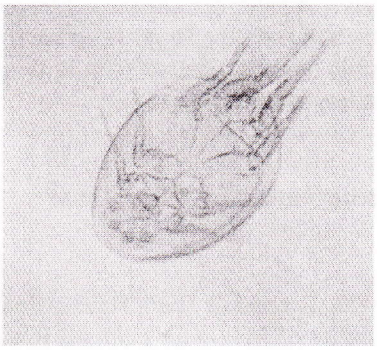

Fig 2. A tritonymph of the genus *Histiostoma*

The uropodid *T. obscura* is the most frequent uropodine mite associate of *Hylurgops palliatus* in West Carpathians (Kršiak and Zach, 2007). Spruce logs checked for the presence of the bark beetle and its mite associates (>50 logs) gave no evidence of *T. obscura* transferring another mite species. Also, a total of 280 individuals of *Hylurgops palliatus* collected by flight window trapping in Tatra Mountains, vectored one or more deutonymphs of *T. obscura* but none of these deutonymphs was carrying the tritonymph of *Histiostoma*. This indicates that phoresy in mite associates of *Hylurgops palliatus* is rare in nature.

Transfers of the tritonymphs of the genus *Histiostoma* may occur in populations of other bark beetle species too. For example, the tritonymphs of the genus *Histiostoma* were found attached to the scolytid *Hylastes cunicularius* Er. (B. Kršiak, personal observation). In this particular case, the tritonymphs formed small aggregations of closely-packed individuals on the lateral side of the prothorax of the bark beetle vector. Rarely, they were found as associates of the deutonymphs of the uropodid *Trichouropoda pecinai* (Hirschmann and Wiśniewski). The cases of hyperphoresy (Bajerlein and Bloszyk, 2003) were not documented.

The observations on phoretic mites contribute to better understanding the ties among mite species in Norway spruce forests in Central Europe.

Acknowledgements

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Zaujímavý prípad forézie u roztoča viazaného na *Hylurgops palliatus* (Gyll.) (Coleoptera: Scolytidae)

Súhrn

Z požerkov *Hylurgops palliatus* (Coleoptera: Scolytidae) v ležiacom, zatienenom a vlhkom smrekovom polene (hrúbka – 0,2 m, dĺžka 4,0 m) bolo získaných 14 jedincov uropodného roztoča *Trichouropoda obscura* (Koch), všetky v štádiu deutonymfy. Jedna z deutonýmf *T. obscura* prenášala tritonymfu (hypopus) jedinca roztoča z rodu *Histiostoma* (Acarina: Astigmata). Tritonymfa bola prichytená na dorzálnej časti deutonymfy *T. obscura*. Oba jedince roztočov, tritonyma i deutonymfa, boli živé. Tento a podobné prípady forézie sú medzi foretickými roztočmi zriedkavé až vzácne. Prezentované výsledky prispievajú k poznaniu ekológie a rozptylových stratégií foretických roztočov.

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