Opusc. Zool. Budapest, 2011, 42(1): 95–98

First record of *Promyialges uncus* (Vitzthum, 1934) in Slovakia (Acarina: Epidermoptidae) with new host record

J. JAMRIŠKA[1], R. ZAMEC[2], Z. ORSZÁGHOVÁ[2] and T. LUČENIČOVÁ[2]

Abstract. In this paper the feather mite *Promyialges uncus* (Vitzthum, 1934) is recorded for the first time in Slovakia. Specimens were found on nestlings of *Turdus merula* Linnaeus, 1758 and in nests with nestlings of *Hirundo rustica* Linnaeus, 1758, where mite specimens were observed on the wings of lousefly *Ornithomya avicularia* Linnaeus, 1758. Description of the mite positioning on louseflies and number of eggs laid supported by drawings are given. Samples collected on nestlings of *T. merula* as hosts are recorded for the first time. We also confirm that louseflies are successful vectors of feather mites among birds.

Keywords. Astigmata, feather mites, lousefly, phoresy, *Turdus merula*.

INTRODUCTION

Feather mites are permanent ectosymbionts living on the feathers of birds. Cohort Astigmatina, suborder Oribatida consists of 37 families, belonging into two superfamilies: Analgoidea and Pterolichoidea. Three families of dust mites (previously separated as the superfamily Pyroglyphoidea) were commingled with superfamily Analgoidea (O'Connor, 2009). The feather mite *Promyialges uncus* (Vitzthum, 1934) belongs to family Epidermoptidae Trouessart, 1892, subfamily Epidermoptinae (Mironov *et. al*., 2005). They are world-wide distributed and associated with most avian orders (Fain, 1965; Dabert & Mironov, 1999). These mites are mainly living on ventral or dorsal surface of wing or tail feathers, or on the bird's skin. They are feeding on bacteria, fungal spores or on oil impregnating the feathers (O'Connor, 1982), and some species of the mite subfamily Epidermoptinae even burrow into the upper skin layers of their avian hosts and cause lesions on skin or dermatitis (Evans *et al*., 1963; Fain, 1965). Feather mites can be transmitted between two birds by body contact however, they are unable to leave their host and crawl for longer distances. Therefore external factors, such as phoretic insects, are mainly responsible for the transmission.

Promyalges uncus is known from several sites in Belgium, France, Germany and Great Britain. Several specimens supposedly belonging to this species were also found in Denmark, Sweden and some additional sites in Great Britain (Dubinin 1953; Fain, 1965). Here we present the first record of *P. uncus* in Slovakia and also a new host, *Turdus merula,* according to the available literature.

MATERIAL AND METHODS

The material was collected from two sites within the Bratislava city. Mite specimens were obtained manually and stored in 75% ethanol. Before identification the specimens were mounted on permanent microscopic slides, using the Liquido de Swan medium. The material was identified according to Fain (1965). Louseflies were obtained using exhauster and stored in 75% ethanol, later identified according to Chvála *et al.,*

[1]*Jan Jamriška*, Department of Pathological morphology and Parasitology, Faculty of Veterinary Medicine, University of Veterinary and Pharmaceutical Sciences Brno, Palackého 1-3, 612 42 Brno, Czech Republic and Department of Zoology, Comenius University in Bratislava, Mlynská dolina B-1, 842 15 Bratislava, Slovakia.. E-mail: *jamriska@fns.uniba.sk*

[2]*Richard Zamec*, *Dr. Zlatica Országhová, Terézia Lučeničová,* Department of Zoology, Comenius University in Bratislava, Mlynská dolina B-1, 842 15 Bratislava, Slovakia. E-mail: *zamec.richard@gmail.com*

(1980). Pictures were drawn using a Zeiss stereomicroscope, ZeissCam 3Mp camera and Axio Vision ver. 4.7.

RESULTS

Promyialges uncus (Vitzthum, 1934)

Microlichus uncus Vitzthum, 1934: 1-20., Collart 1934: 1-6., Thompson 1936: 315-320., Cooreman 1944: 8-9., Büttiker 1948: 481., 1949: 76., Johnsen 1948: 288. and 290., Ash and Hughes 1952: 753-757., Bequaert 1953: 143-145.
Myialges (Promyialges) uncus: Fain 1965: 67-69.
Promyialges uncus Fain 1964: 186., Gaud & Atyeo 1996: 63.

Material examined. Slovakia, Sad Janka Kráľa, (N 48.136153^0, E 17.108384^0) 12.vii.2008, nestlings of *Turdus merula* Linnaeus, 1758, 2 specimens, leg. Jamriška, Lučeničová., Slovakia, Zoological garden in Bratislava, (N 48.161567^0, E 17.072883^0) 24.vii.2008, nestlings of *Hirundo rustica* Linnaeus, 1758, 8 specimens attached on two of the louseflies., Slovakia, Zoological Garden in Bratislava, 18.viii.2008, nestlings of *Hirundo rustica*, 4 specimens attached on louseflie., Slovakia, Zoological garden in Bratislava, 15.v.2009, nestlings of *Hirundo rustica*, 2 specimens attached on louseflie.

Diagnosis. Body of female wide and oval, with rounded hysterosoma. Idiosoma 345 µ long. Coloration is pale-yellow, sclerotized shields are darker. Propodosomal shield wide and triangle-shaped. Side shields of propodosoma and hysterosoma are small. Fine striation of some body parts may be observed, especially on the dorsal body side (Fig. 1). All epimera free, coxal fields not developed. Two pairs of very long setae (d–5 and l–5) present on posterior margin of idiosoma (projecting dorsally).

Characteristics, distinguishing *P. uncus* from similar species are as follows. Body is small (idiosoma about 350 µm long). Hysterosomal shield clearly divided in two separated parts, which are longer then wide. Epimera I not fused, but connected by means of a small transversal stripe (Fig. 2). Epigynum not extending beyond epimera II (Fain, 1965).

DISCUSION

Here we present the first record of *P. uncus* from Slovakia and also a new host *T. merula* according to the available literature. The 16 specimens of *P. uncus* (Fig. 1) were recorded as follows: two specimens were on nestlings of *T. merula* in Sad Janka Kráľa, and 14 specimens were associated to wings of *Ornithomya avicularia* Linnaeus, 1758, recorded on nestlings of *H. rustica* in the Zoological garden of Bratislava. Altogether 12 specimens of *O. avicularia* were collected and four of them were carrying mites on their wings. Two specimens of the *P. uncus* were on the lower side of each fly-wing surrounded by group of eggs. So there were four specimens on each fly. In one case there were just two mite specimens, each separately on one fly-wing.

The average number of eggs laid on louse fly-wing was from 18 to 28 (mean 22.86, SD 2.93) while the total number of eggs in mite clutches on both flies was 320 eggs. No sucking disc and no body plates were found on the surface of the egg. The body itself was milk white but transparent and sometimes with visible juveniles in it. Pair of mites, each surrounded by group of eggs, was situated proximally on the lower surface of each wing in area bounded by Cu1+1A wing vein from the inferior margin and by R4+5 wing vein superiorly. The first specimen was situated nearby, under the cross vein h and the second one was abreast of the cross vein m-cv (Fig. 3). No male adults were recorded. Faded wing veins were around attachment place of mite females.

Phoresy of mites on insects is a well-known phenomenon. Most frequently, mites‘ phoresy is registered on beetles, but it is recorded on many other groups of insects, including Diptera as well. Many authors divide phoretic mites into two groups. First group includes species, which are found phoretic only sporadically, and don’t show any specific affinity for different groups of insects. Mites in the second group frequently show

Figure 1. *Promyialges uncus*. Female from the lower wing surface. Dorsal view of the body

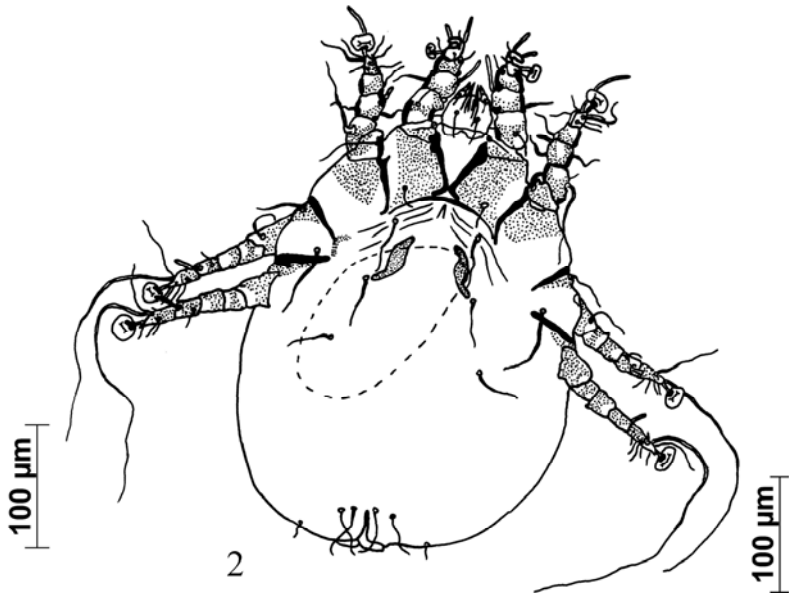

Figure 2. *Promyialges uncus*. Ventral view of the body with egg

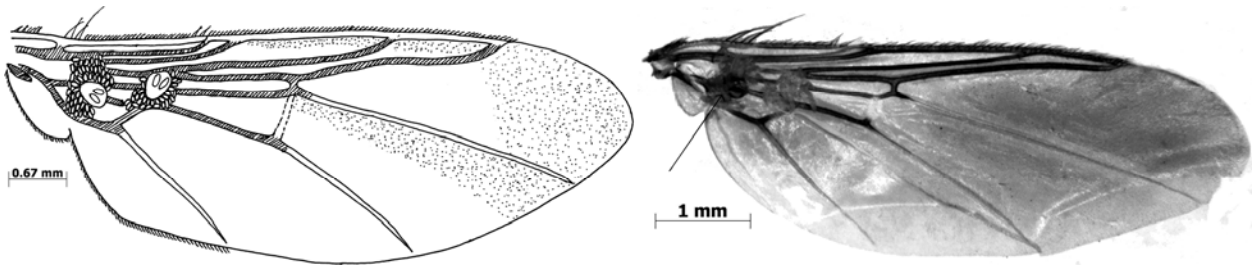

Figure 3. Mite position on the lower side of the wing. Mite females coupled with group of eggs on the proximal part of the wing

host specificity. There is a clear feedback between the mite and its carrier (Mašán, 1993). Thompson (1936) recorded occurrence of *P. uncus* on louse-fly *Ornithomyia fringillina* Curtis, 1836 from sites in Brussels (Belgium) and Marseille (France) – 17 females and 281 eggs were found on a sample of 9 flies. Dubinin (1953) mentioned the fact that part of the wing veins fades out around attachment place of mite females. Probably because mites suck hemolymph from veins, and their salivary secreta partially decompose pigment and chitin of wing veins. Büttiker (1948) found clusters of eggs (belonging to *P. uncus*) attached on the louse fly *O. biloba* Dufour, 1827 and Ash & Hughes (1952) found this species on *O. avicularia* in England and Sweden.

There has been no record of *P. uncus* from Slovakia yet, and only little is known about its biology. Only egg stage and adult females are known (Dubinin, 1953; Fain, 1965). We collected samples on nestlings of *T. merula* in Sad Janka Kráľa in Bratislava and specimens carried on the wings of the *O. avicularia* on nestlings of *H. rustica* in the Zoological garden in Bratislava. We recorded four flies carrying adult female *P. uncus* coupled with eggs. Therefore we can suggest that louse flies are playing an important role in transmitting feather mites among birds. Infor-

mations on this relationship can help us to understand better its ecology such as distribution in a given locality. It is a question if louse flies are specific carriers, or these mites can also be transmitted by other diptera associated with bird nests, like bird-blow flies. If louse flies are specific carriers, their presence in a habitat is essential for the distribution of *P. uncus* among birds. Further researches should be carried out to answer questions about the prevalence of infection on louse flies and for better understanding its ecology.

Acknowledgement – We thank to anonymous referees for their comments on an earlier draft of this paper. Many thanks to Peter Mašán from Slovak Academic of Sciences, Department of Medical Entomology and to Peter Fenďa from Faculty of Natural Sciences, Comenius University, Department of Zoology for their help with identification. This work was supported by VEGA .1/0124/09.

REFERENCES

ASH, J. & HUGHES, T.E. (1952): Further records of the genera *Microlichus* Trt. et Neum. and *Myialges* Serg. et Trt. *Annals and Magazine of Natural History*, 5(12): 753–759.

BÜTTIKER, W. (1948): Phoresie bei Lausfliegen. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 21: 481.

CHVÁLA M., HŮRKA K., CHALUPSKÝ, J., KNOZ, J., MINÁŘ, J. & ORSZÁGH, I. (1980): *Krevsající mouchy a střečci – Diptera*. Fauna ČSSR sv. 22. Academia, Praha

DABERT, J. & MIRONOV, S.V. (1999): Origin and evolution of feather mites (Astigmata). *Experimental & Applied Acarology,* 23: 437–454.

DUBININ, V.B. (1953): *Paukoobraznye, tom 6, vyp. 6. Perevye klešči (Analgesoidea), časť 2, semejstvo Epidermoptidae i Freyanidae*. Fauna SSSR, novaja serija No. 55. Izd. Akademii nauk SSSR, Moskva & Leningrad.

EVANS, G.O., FAIN, A. & BAFORT, J. (1963): Decouverte du cycle evolutif du genre *Myialges* avec description d'une espèce nouvelle (Myialgidae: Sarcoptiformes). *Bulletin et Annales de la Societé Entomologique de Belgique,* 99: 486–500.

FAIN, A. (1965): *A review of the family Epidermoptidae Trouessart parasitic on the skin of birds (Acarina: Sarcoptiformes)*. Verhandelingen van de Koninklijke Vlaamse Academie voor Wetenschappen, Litteren en Schone Kunsten van Belgie. Klasse der Wetenschappen, No. 84, 27, Part I–II.

MAŠÁN, P. (1993): Mites (Acarina) associated with species of *Trox* (Coleoptera: Scarabaeidae). *European Journal of Entomolog,y* 90: 359–364.

MIRONOV, S.V., A.V. BOCHKOV & FAIN, A. (2005): Phylogeny and evolution of parasitism in feather mites of the families Epidermoptidae and Dermationidae (Acari: Analgoidea). *Zoologischer Anzeiger,* 243: 155–179.

O'CONNOR B.M. (1982): Evolutionary ecology of astigmatid mites. *Annual Review of Entomology,* 27: 385–409.

O'CONNOR B.M. (2009): *Cohort Astigmatina.* In: Krantz G. W. and D. E. Walter (eds.): A manual of acarology. Third edition. Texas Tech. University Press, pp. 565 – 657.

THOMPSON, C. (1936): Some new records of occurrence of *Myialges* spp. (Acarina). A new record of *Microlichus uncus* Vitzth. *Annals and Magazine of Natural History*, (8)10: 315–320.