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**Correspondence**

# Notes on the chigger mites (Acari: Parasitengona: Trombiculidae) of Hungary with new records on the avian hosts of *Blankaartia acuscutellaris* (Walch, 1922)

PÉTER TAKÁCS[1], KÁROLY ERDÉLYI[2], SÁNDOR HORNOK[3,4], JÓZSEF GYURÁCZ[1], PÉTER MOLNÁR[1], ENIKŐ HORVÁTH[2], TIBOR HADARICS[5], JENŐ KONTSCHÁN[6,7]

*[1]Eötvös Loránd University, Savaria University Centre, Szombathely, Hungary;*
*https://orcid.org/0000-0001-7407-1715; https://orcid.org/0000-0002-1504-3092*
*[2]HUN-REN Veterinary Medicine Research Institute, Budapest, Hungary;*
*https://orcid.org/0000-0002-5992-4844*
*[3]Department of Parasitology and Zoology, University of Veterinary Medicine, Budapest, Hungary;*
*https://orcid.org/0000-0002-1125-5178*
*[4]HUN-REN-UVMB Climate Change: New Blood-sucking Parasites and Vector-borne Pathogens Research Group, Hungary.*
*[5]Fertő-Hanság National Park, Sarród, Hungary.*
*[6]Plant Protection Institute, HUN-REN Centre for Agricultural Research, Budapest, Hungary;*
*https://orcid.org/0000-0001-8274-4238*
*[7]Department of Plant Sciences, Albert Kázmér Faculty of Mosonmagyaróvár, Széchenyi István University, Mosonmagyaróvár, Hungary. E-mail: jkontschan@gmail.com*

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The family Trombiculidae Ewing, 1929 belongs to the terrestrial Parasitengona group and contains more than 3000 described species distributed in all regions of the world. Their richest diversity is visible in the subtropical, tropical, and southern temperate realms (Liu et al. 2013). The deutonymphs and adults are predators in different habitats, but the larvae (chiggers) are one of the most important ectoparasites feeding from the skin of mostly vertebrates (Shatrov 2001). This condition may result in acute inflammation of the skin, known as trombiculosis, trombiculiasis, or trombiodiosis in humans and animals (Santibáñez et al. 2015). The trombiculids are ectoparasites and they have an important vector role as well (Zajkovska et al. 2018), further increasing their medical and veterinary importance.

Despite their importance, our knowledge of the trombiculids of the different countries is far from complete. This is well exemplified by Hungary, where only ten species were reported (Beron 1965, Halitlinger 1979, Kováčik 1982, Ripka & Stekolnikov 2006), which are smaller than other European countries, like Poland (18 species (Moniuszko & Mąkol (2014)) or Turkey (43 species (Stekolnikov & Daniel 2012)), but similar to Israel (7 species (Stekolnikov & Mumcuoglu 2022)). The manuscript aims to summarize our knowledge on Hungarian trombiculids and to report new data on *Blankaartia acuscutellaris* (Walch, 1922).

23 bird species were examined for the presence of trombiculids from the last some years in different regions of Hungary, by the authors and the members of the Hungarian Bird Ringing Group. The collected mites were removed from the infested birds by needle and then stored in 96% ethanol in

plastic vials. The mites were cleared by lactic acid for a week and then slide-mounted in Hoyer medium and investigated under a Leica 1000 scientific microscope using by phase contrast. The photos were taken with a Keyence VHX-5000 digital microscope. All the published data on trombiculids from Hungary were collected and illustrated all known on a map.

*Blankaartia acuscutellaris* has only one occurrence in Hungary. The larvae of *B. acuscutellaris* parasitize small mammals and often were collected from birds (Kudryashova 1998) and reptiles (Taufflieb 1969). Til today only 29 *Blankaartia* are described and named (Bassini-Silva et al. 2016), but til to date only two species (*B. acuscutellaris* and *B. rageaui* Taufflieb and Mouchet, 1959) have been recorded from Europe (Ripka and Stekolnikov 2006). *B. acuscutellaris* occurs in Afrotropical, Palaearctic, and Oriental Realms (Kudryashova 1983, Womersley 1948). This species was collected from a human close to Velencefürdő (Ripka & Stekolnikov 2006). This species was found in the following new localities: Hungary, Sarród, Mekszikópuszta, June 2022 to October 2022, from the Wood Sandpiper (*Tringa glareola* L.), from the Bearded Reedling (*Panurus biarmicus* (L.)), from the Sedge Warbler (*Acrocephalus schoenobaenus* (L.)), from the Common Reed Warbler (*Acrocephalus scirpaceus* (Hermann)), from the Mustached Warbler (*Acrocephalus melanopogon* (Temminck)) and from the Common Reed Bunting (*Emberiza schoeniclus* (L.)). Hungary, Dávod, Lake Velence, Lake Földvári, 25. July 2021, from Great Reed Warbler (*Acrocephalus arundinaceus* (L.). Hungary, Izsák, Lake Kolon, 18. July 2021, from *A. arundinaceus*. Hungary, Fenékpuszta 22. July 2021, from *A. arundinaceus*. Hungary, Fenékpuszta, 22. July 2021, from the Savi's Warbler (*Locustella luscinioides* (Savi)). Hungary, Dávod, Lake Földvári, 03. September 2021, from the Common Starling (*Sturnus vulgaris* L.). Hungary, Izsák, lake Kolon, 11–12 July 2021. and 16 July 2021 from the Eurasian Wren (*Troglodytes troglodyte*s (L.)), from the Bluethroat (*Luscinia svecica* (L.)). Hungary, Velence, Lake Velence, 27 August 2021, from the Eurasian Tree Sparrow (*Passer montanus* (L.)). Hungary, Naszály, 22. July 2022, from the Eurasian Blackcap (*Sylvia atricapilla* (L)). Hungary, Ócsa, several occasions during July 2022 and August 2022, from the Blue Tit (*Cyanistes caeruleus* (L)). Hungary, Balatonszepezd, 01 August 2022 and Sumony several occasions in summer 2023, from the Little Bittern (*Ixobrychus minutus* (L)).

In this study, seven bird species were found infested by this species. On these birds, larvae of *B. acuscutellaris* formed a mite-cluster, which contained more than 60 specimens (Fig. 1). The skin surface was elevated and necrotized around the mite-cluster, which was well-recognizable on the birds, often close to the cloaca. The chiggers were found mainly on the birds' chest, abdomen, armpit and cloacal areas, apparently without body region specificity.


**Figure 1.** Mite cluster of *B. acuscutellaris* on Bearded Reedling.

Besides the occurrence of *B. acuscutellaris,* 9 trombiculids were reported from Hungary, but these were collected from small mammals. *Cheladonta costulata* (Willmann, 1955) was found in Dobogókő, Kisinóc, Zsófiapuszta from *Apodemus tauricus* Neuhäuser and *Apodemus sylvaticus* (L.) (Halitlinger 1979). *Hirsutiella zachvatkini* (Schluger, 1948) was collected from *A. tauricus* from Miskolc-Ómassa (Halitlinger 1979). *Hoffmannina danieli* Kolebinova, 1974 was captured from *Clethrionomys glareolus* (Schreber), *Microtus agrestis* L., and *Arvicola terrestris* L. from Kisbalaton (Kováčik 1982). The species *Leptotrombidium russicum* (Oudemans, 1902) was found on a bat species *Rhinolophus ferrumequinum* (Schreber) in Gyöngyös. *Neotrombicula aeris* Kepka, 1964 was reported from *C. glareolus*, *M. agrestis*, and *A. terrestris* from region Kisbalaton (Kováčik 1982). The most common species was the *Neotrombicula autumnalis* (Shaw, 1790), which was found in Dunaszentbenedek, in Foktő, in Iharosberény, in Kisinóc, in Miskolc-Ómassa, Tiszabura and in Zsófiapuszta from several host species (*A. sylvaticus*, *A. tauricus*, *Apodemus uralensis* Pallas, *C. glareolus*, *Microtus arvalis* Pallas, *Pytymis subterraneus* (de Selys-Longchamps)) (Halitlinger 1979). *Neotrombicula inopinata* (Oudemans, 1909) was collected from *C. glareolus*, *Apodemus agrarius* Pallas in Iharosberény, in Kékestető and in Kisinóc (Halitlinger 1979). *Neotrombicula talmienis* (Schluger, 1955) was collected in the following localities: Dobogókő, Dunaszentbenedek, Foktő, Kisinóc, Miskolc-Ómassa on some host species (*A. tauricus*, *C. glareolus*, and *P. subterraneus*) (Halitlinger 1979). *Neotrombicula vulgaris* (Schluger, 1955) was reported from Kisbalaton from two small mammals (*C. glareolus* and *M. agrestis*) (Kováčik 1982).

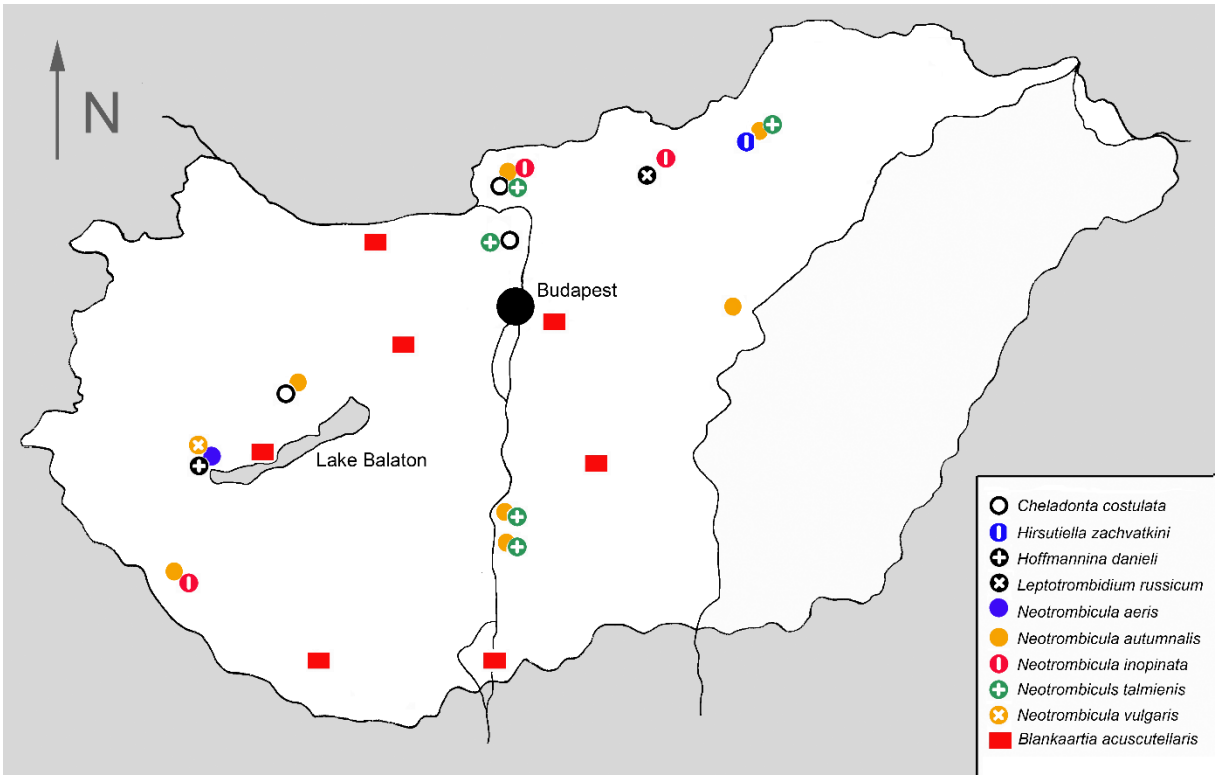


**Figure 2**. All known occurrences of the trombiculid species in Hungary.

Despite of heir high veterinary-medical importance, the family Trombiculidae is one of the most scarcely investigated mite taxa in Hungary. The majority of host records reported so far focused on small mammals (Rodentia and Eulipotyphla) (Kováčik 1982, Halitlinger 1979). In addition, there is one species reported from a bat (Chiroptera) (Beron 1965), and one species mentioned from humans (Ripka & Stekolnikov 2006). Hitherto, trombiculid parasites of birds have not been reported from Hungary. In the present paper, we listed one trombiculid (*B. acuscutellaris*) from 15 bird species from several regions of Hungary (Fig. 2). Among new data reported here, this was the first record of *B. acuscutellaris* on Eurasian Wren, Common Starling, Eurasian Tree Sparrow, Wood Sandpiper, Eurasian Blackcap, Blue Tit and Little Bittern. Wood Sandpiper is the third known shorebird as a host of *B. acuscutellaris*, after

this trombiculid species was found on a Great Snipe (*Gallinago media* (Latham) (Mąkol 2017) and on Ruff (*Philomachus pugnax* (L)) (Kudryashova 1983, 1998). We suppose that the species diversity of trombiculids is much higher than known in Hungary, therefore new potential host species will be intensively investigated in the near future.

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