

A NEW SPECIES OF NASAL MITES OF THE GENUS *RHINONYSSUS* (MESOSTIGMATA, RHINONYSSIDAE) FROM *ANSER ANSER* AND FIRST RECORD OF CO-PARASITISM OF *RHINONYSSUS RHINOLETHRUM* AND *RHINONYSSUS CALEDONICUS* FROM ICELAND

Ivan D. Dimov^{1*} and Karl Skirnisson²

¹Zoological Institute, Russian Academy of Sciences, Saint Petersburg, Russia

²Institute for Experimental Pathology at Keldur, University of Iceland, Reykjavík, Iceland

*corresponding author; e-mail: doktordimov@mail.ru

ABSTRACT: This study presents the first record of rhinonyssid mites from Iceland. Co-parasitism is fairly common among Rhinonyssidae. A new species of nasal mite, *Rhinonyssus islandi* sp.n., is described and illustrated based on material from *Anser anser* (Linnaeus, 1758). In addition, rhinonyssid mites *Rhinonyssus rhinolethrum* (Trouessart, 1895) and *Rhinonyssus caledonicus* Hirst, 1921 collected from the whooper swan *Cygnus cygnus* (Anseriformes: Anatidae) in Iceland, are reported for the first time.

KEY WORDS: endoparasite; parasitism; Rhinonyssidae; *Rhinonyssus*, nasal mites, birds

DOI: 10.21684/0132-8077-2025-33-1-79-84

INTRODUCTION

Rhinonyssidae is the most diverse family of nasal endoparasite mites found in domestic and wild birds, comprising eleven genera that occur on a wide range of avian hosts worldwide (Fain 1957; Domrow 1969; Pence 1975; Butenko 1984; Knee *et al.* 2008; Knee and Proctor 2010; Vanstreels *et al.* 2018; Sánchez-Carrión *et al.* 2023; Haarder and Dimov 2024). Rhinonyssid mites are endoparasites that live in the nasal cavities of birds, in their tracheas and lungs. Rhinonyssids include more than 600 described species of avian nasal mites worldwide (Domrow 1969; Pence 1975; Beron 2020; Takatsu *et al.* 2021; Dimov 2024; Haarder and Dimov 2025). These mites are ovoviviparous, i.e., they produce larvae in which the nymphs are already developed (Bregetova 1956; Dimov 2018; Dimov 2020a; De Rojas *et al.* 2020). Rhinonyssids generally live in the mid portion of the nasal cavity, which is highly vascularized and covered with a mucous membrane. They are large, lightly sclerotized, sluggish and reddish-brown to transparent in color, depending on the degree of their engorgement with blood (Sixl 1969; Dimov and Knee 2012; Dimov and Spicer 2013; Butenko *et al.* 2019; Dimov 2020b). Co-parasitism (a situation where two or three species infect the same host) is fairly common among Rhinonyssidae (Butenko *et al.* 2010; Dimov 2020b). Rhinonyssids are transmitted either directly via the oral route or when infested adults regurgitate food to their nestlings or to mates during courtship. Indirect transmission through water, perches or other contaminated surfaces has been recorded (Bell 1996). When fed, rhinonyssids injure the nasal epithelium and blood vessels (De Rojas *et al.* 2002),

causing a bird disease called “Rhinonyssoidosis avium” (Dimov 2011). It is hypothesized by some that these mites could be the reservoirs or vectors of various infections, like the Q fever, the *Ehrlichia* infection, Lyme borreliosis and the *Anaplasma* infection (Bregetova 1956).

MATERIALS AND METHODS

In the collection of the Zoological Institute of the Russian Academy of Sciences, there are 13 adult females and 4 adult males of the genus *Rhinonyssus* from *Anser anser* (Linnaeus, 1758) and *Cygnus cygnus* (Linnaeus, 1758). These specimens were collected from five birds in 2009 by K. Skirnisson. All of the recovered mites were preserved in 70% ethanol, after which they were cleared in 75% lactic acid for 3 hours, placed in 70% ethanol again for 3–4 min, and, finally, mounted in slides with the Hoyer medium. The description is based on the holotype and paratypes. Species-level identifications were made using the identification keys and the descriptions from the primary literature (Hirst 1921; Wilson 1970; Pence 1975; Butenko 1984). The description of the new species follows the modern format used for rhinonyssid mites (Butenko 1984; Knee *et al.* 2008; Dimov and Mironov 2012; Dimov and Spicer 2013; Haarder and Dimov 2025). All measurements are given in micrometers. The chaetotaxy of idiosoma used in the present work is based on the system proposed by Lindquist and Evans (1965) and Butenko (1984). Abbreviations for terms and measurements provided in descriptions of species are adapted from Fain and Hyland (1962) and Dimov (2018, 2020a).

In the species descriptions, the following abbreviations for standardly measured structures are used. LB—length of body including palps; WID—width of idiosoma; LPS—length of podosomal shield; WPS—width of podosomal shield; LGS—length of genital shield; WGS—width of genital shield; LG—length of gnathosoma, ventral view, including palps; WG—width of gnathosoma; Lleg—length of leg, including coxa, excluding ambulacrum (Lleg I to Lleg IV).

The holotypes and the paratypes are deposited in the Zoological Institute of the Russian Academy of Sciences Collection in St. Petersburg, Russia (RASP 17–24).

SYSTEMATICS

The genus *Rhinonyssus* Trouessart, 1894: 723; Vitzthum, 1935: 568; Strandtmann, 1951: 129; Fain, 1957: 42; Domrow, 1969: 324; Pence, 1975: 6; Butenko, 1984: 15; Kaneko *et al.*, 1978: 147; Dimov, 2020: 108.

Somatericola Trägårdh, 1904: 28.

Type species: *Rhinonyssus coniventris* Trouessart, 1894.

Diagnosis: Mites with generally rounded idiosome, length 430–970. Podosomal shield present. Opisthosomal and pygidial shields absent. Stigmata without peritremes, located dorsolaterally. Mesosomal shields present or absent. Poststigmatal shield absent. Gnathosoma located terminally. Deutosternal denticles absent. Tritosternum absent. Genital shield present. Anal shield present or strongly reduced. Anus located on ventral or dorsal side of opisthosoma. Aspero present or absent. Convexities and spines on coxae absent.

Rhinonyssus islandi sp.n.

(Figs. 1–2)

Type materials. Female holotype and 13 paratypes (female and nymphs) (RASP 17–24) from *Anser anser* (Linnaeus, 1758) (Anseriformes: Anatidae). Location: Baer Hrutafjörður, Iceland (65.2088° N 21.0984° W). Date: August 29th, 2009. The bird was collected by K. Skirnisson.

Description. *Female.* LB—530–687; WID—290–315; LPS—176–187; WPS—212–226; LGS—89–85; WGS—46–34; LG—66–69; WG—51–54; Lleg I—221–234; Lleg II—245–251; Lleg III—243–252; Lleg IV—208–226.

Dorsum (Fig. 1). Idiosoma egg-shaped. A medium-sized mite with well denned, reticulate po-

dosomal shield, broadly rounded anteriorly and with wide median lobe posteriorly, surface with 10 setae (j2, j5, z1–z3). Mesosomal shields (MS) are small and thin, their front part starts with symmetrical longitudinal curved folds. Soft cuticle of dorsal idiosoma with 2 pairs of mesolateral setae (s5, s6) and 4 pairs of opisthosomal setae. Setae J2 and Z2 in the central part of idiosoma, setae J4 and Z4 on the caudal part of opisthosoma. Stigmata without peritremes, located dorsolaterally at level of coxae IV.

Venter (Fig. 2). Sternal shield absent. Three pairs of sternal setae (St1–3) present, sternal formula (St1=St2=St3). Genital shield is wide and well-sclerotized, without genital setae. Soft cuticle of the ventral side of opisthosoma with 20 setae (Jv1–3, Zv1–4, UR1–3). Anal shield with indistinct margins of the anterior part. Anus located in the anterior part of anal shield. Two preanal setae (Ad) located on lateral sides of anal shield, postanal seta absent. Aspero absent.

Gnathosoma: Deutosternal denticles absent. The setae on the gnathosoma are not visible.

Chaetotaxy of legs: coxae: 2–2–2–1.

Male, larva: unknown.

Differential diagnosis. *Rhinonyssus islandi* sp.n. is most similar to the widespread Holarctic species *Rhinonyssus rhinolethrum* (Trouessart, 1895) in the presence of the podosomal shield and mesosomal shields; their shape is approximately the same. The differential characters between the species are given in Table 1.

Etymology. The new species is named after Iceland, which is spelled “islandi” in Icelandic.

Rhinonyssus caledonicus Hirst, 1921

Rhinonyssus caledonicus Hirst, 1921: 357; Strandtmann, 1959: 134; Pence, 1975: 38; Butenko, 1984: 33; Dimov, 2020: 112.

Sternostomum caledonicum, Vitzthum, 1935: 569; Bregetova, 1951: 116.

Materials. Paratype (female) (RASP 25) from *Cygnus cygnus* (Linnaeus, 1758) (Anseriformes: Anatidae). Location: Lake Tjörnin, Reykjavík, Iceland (64.144312° N, 21.941509° W). Date: December 8th, 2009.

Description. *Female.* Dorsum: Idiosoma 965–1,295 µm long. Podosomal shield large, occupies entire central part of idiosoma, posterior part with wide median projection, surface without setae. Soft cuticle of dorsal idiosoma without setae.

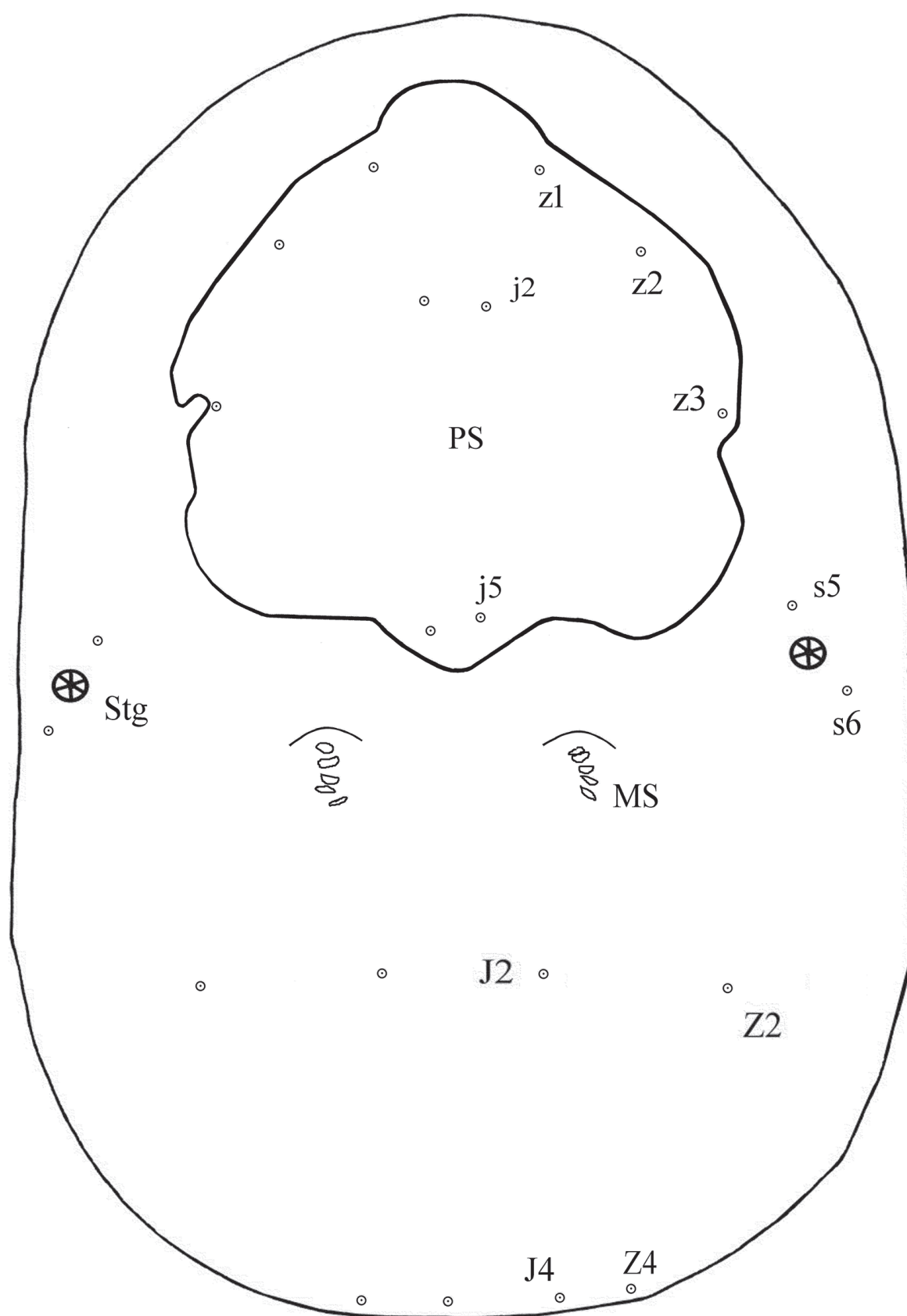


Fig. 1. *Rhinonyssus islandi* sp.n. female—dorsal view.

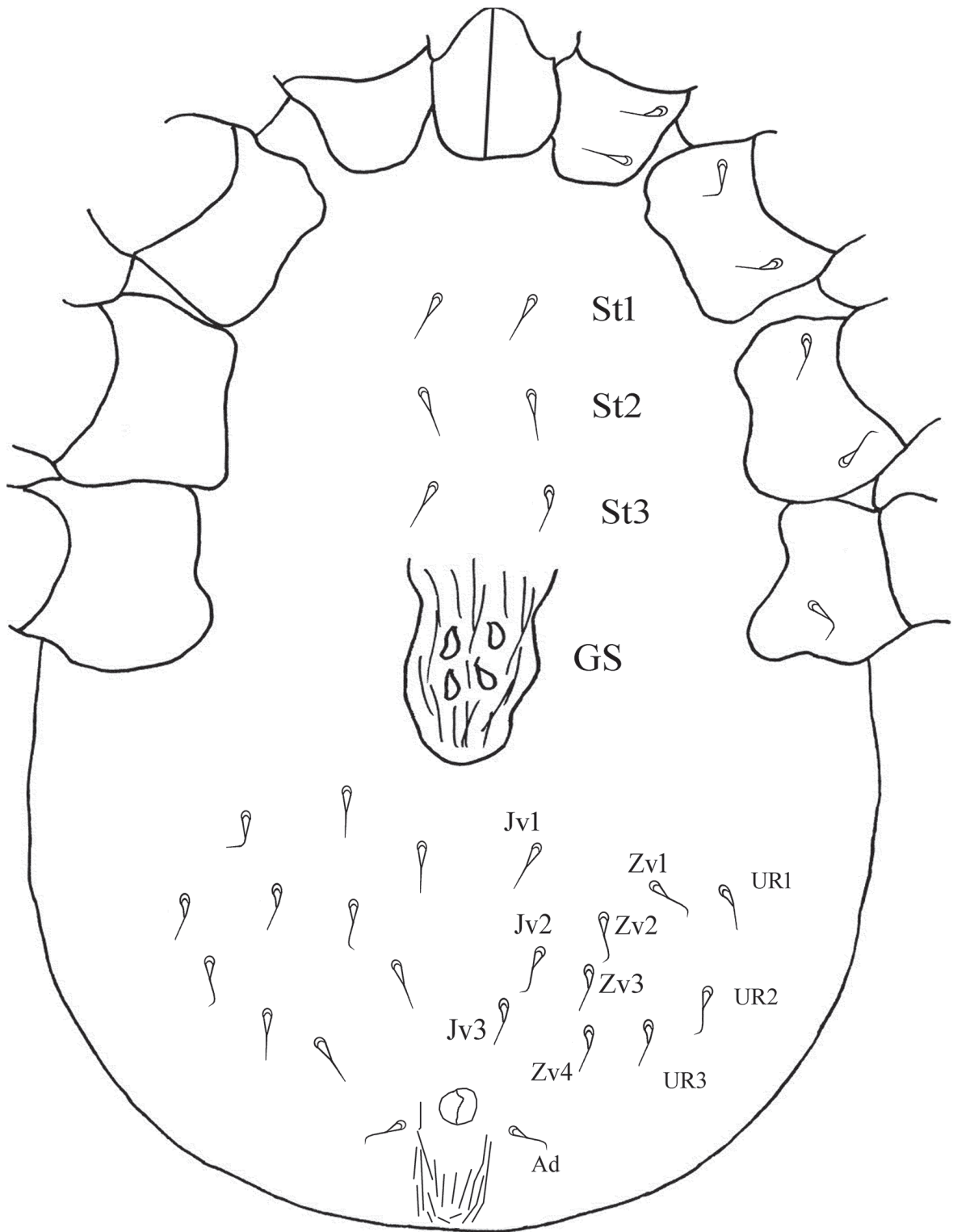


Fig 2. *Rhinonyssus islandi* sp.n. female—ventral view.

Venter: Sternal shield absent, three pairs of sternal setae thin and 25–30 µm long, sternal formula (St1=St2=St3). Genital shield strongly sclero-

tized, genital setae absent. Soft cuticle of ventral opisthosoma with 2 pairs of setae (Jv3, Jv4) similar in shape and size to sternal ones. Aspero absent.

***Rhinonyssus rhinolethrum*
(Trouessart, 1895)**

Materials. Paratypes (females) (RASP 26–27) from *Cygnus cygnus* (Linnaeus, 1758) (Anseriformes: Anatidae). Location: Lake Tjörnin, Reykjavík, Iceland (64.144312° N, 21.941509° W). Date: December 8th, 2009.

Description. *Female.* Dorsum: Idiosoma 860–1,100 µm long with podosomal shield, broadly rounded anteriorly and with small median lobe posteriorly, surface with 12 setae. Mesosomal shields present, without symmetrical longitudinal curved folds. Soft cuticle of dorsal idiosoma with 22 setae. Stigmata without peritremes, located dorsolaterally at level of coxae IV.

Venter: Sternal shield smoothed. Three pairs of sternal setae present, sternal formula (St1=St2=St3). Genital shield is wide and well-sclerotized, without genital setae. Soft cuticle of the ventral side of opisthosoma with 24 setae. Anal shield with indistinct margins of anterior part. Anus located in the anterior part of anal shield. Two preanal setae located on lateral sides of anal shield, postanal seta absent. Aspero present.

Gnathosoma: Large and short, gnathosomal formula 2–0–0.

REFERENCES

- Bell, P.J. 1996. The life history and transmission biology of *Sternostoma tracheacolum* Lawrence (Acari: Rhinonyssidae) associated with the Gouldian finch *Erythrura gouldiae*. *Experimental and Applied Acarology*, 20: 323–341. <https://doi.org/10.1007/BF00052962>
- Beron, P. 2020. *Acarorum Catalogus VI: Order Mesostigmata. Gamasina: Dermanyssoidea (Rhinonyssidae, Spinturnicidae)*. Advanced Books. Pensoft Publishers, Sofia, Bulgaria. 264 pp.
- Bregetova, N.G. 1956. *Gamazovye Kleshchi (Gamasoidea)* [Gamasid Mites (Gamasoidea)]. Izdatel'stvo AN SSSR, Moscow–Leningrad. 247 pp. [In Russian]
- Butenko, O.M., Stanyukovich, M.K. and Dimov, I.D. 2010. *Co-parasitism of Rhinonyssid Mites (Parasitiformes: Gamasina, Rhinonyssidae) in the Nasal Cavities of Birds*. British Society for Parasitology, Spring Meeting, Cardiff Wales, p. 98.
- Butenko, O.M., Lavrovskaya, K.I. and Stanyukovich, M.K. 2019. Rhinonyssid mites (Acari: Gamasina: Rhinonyssidae)—parasites of birds (Aves) from Russia and adjacent countries. *Trudy Oskogo Gosudarstvennogo Prirodnogo Biosfernogo Zapovednika*, 38: 246–266. [In Russian].
- Butenko, O.M. 1984. *Kleshchi-Rinonissidy Nevorob'inyh Ptits SSSR* [Rhinonyssid Mites of Passerine Birds of the USSR]. Moskovskiy Gosudarstvenniy Universitet, Moscow, Russia, 188 pp. [In Russian]
- De Rojas, M., Doña, J. and Dimov, I.D. 2020. A comprehensive survey of Rhinonyssid mites (Mesostigmata: Rhinonyssidae) in Northwest Russia: new mite-host associations and prevalence data. *Biodiversity Data Journal*, 8: e49535.
- De Rojas, M., Ubeda, J.M., Mora, M.D., Cutillas, C., Navaja, D.C. and Guevara, D.C. 2002. Phylogenetic relationships in rhinonyssid mites (Acari: Rhinonyssidae) based on ribosomal DNA sequences: insights for the discrimination of closely related species. *Parasitological Research*, 88: 675–681.
- Dimov, I.D. 2011. Rhinonyssoidosis avium. *VetPharma*, 3-4: 88–90.
- Dimov, I.D. 2018. *Kleshchi-Rinonissidy Ptits Severo-Zapada Rossii* [Rhinonyssid Mites of Birds in the North-West of Russia]. LLC Zhigulin, Saint Petersburg, 232 pp. [In Russian]
- Dimov, I.D. 2020a. *Morphology of Nasal Mites of the Family Rhinonyssidae—Scanning Electron Microscopy*. LLC Zhigulin, Saint Petersburg, 128 pp.
- Dimov, I.D. 2020b. *Taxonomic Diversity and Morphology of Mites of the Family Rhinonyssidae of the Northwest of Russia*. LLC Zhigulin, Saint Petersburg, 214 pp.
- Dimov, I.D. 2024. First record of two nasal mites genus *Rhinonyssus* (Mesostigmata, Rhinonyssidae) parasitizing birds from Estonia. *Parasitologia*, 4(3): 288–295. <https://doi.org/10.3390/parasitologia4030025>
- Dimov, I.D. and Knee, W. 2012. One new species of the genus *Sternostoma* (Mesostigmata: Rhinonyssidae) from *Cuculus canorus* (Cuculiformes: Cuculidae) from Leningrad Province, Russia. *Journal of the Acarological Society of Japan.*, 21(2): 137–142. <https://doi.org/10.2300/acari.21.137>
- Dimov, I.D. and Mironov, S.V. 2012. Two new species of nasal mites of the genus *Ptilonyssus* (Rhinonyssidae) from sparrows from the Leningrad province, Russia. *Journal of Hellenic Veterinary Medical Society*, 63(2): 167–176. <https://doi.org/10.12681/jhvms.15432>
- Dimov, I.D. and Spicer, G. 2013. A new species of nasal mite of the genus *Rhinonyssus* (Mesostigmata: Rhinonyssidae) from Leningrad Province, Russia. *Systematic and Applied Acarology*, 18(3): 291–296. <https://doi.org/10.11158/saa.18.3.11>
- Domrow, R. 1969. The nasal mites of Queensland birds (Acari: Dermanyssidae, Ereynetidae, and Epidermoptidae). *Proceedings of the Linnean Society of New South Wales*, 93: 297–426.

- Fain, A. 1957. Les acariens des familles Epidermoptidae et Rhinonyssidae parasites des fosses nasales d'oiseaux au Ruanda-Urundi et au Congo belge. *Annales du Musée Royal du Congo Belge Sér. 8*, 60: 1–176.
- Fain, A. and Hyland, K.E. 1962. The mites parasitic in the lungs of birds. The variability of *Sternostoma tracheacolum* Lawrence, 1948, in domestic and wild birds. *Parasitology*, 52: 401–424.
- Haarder, S. and Dimov, I.D. 2024. A new species of Rhinonyssidae (Mesostigmata) nasal mite (*Ptilonyssus simplex* n. sp.) from the Bohemian waxwing in Denmark. *Acarologia*, 64(3): 961–967. <https://doi.org/10.24349/57ia-6ley>
- Haarder, S. and Dimov, I.D. 2025. A new species of nasal mite genus *Ptilonyssus* (Mesostigmata: Rhinonyssidae) from *Parus major* and the first record of *Rhinoecius brikinboricus* from *Asio otus* in Denmark. *Persian Journal of Acarology*, 14(1): 87–95. <https://doi.org/10.22073/pja.v14i1.85958>
- Hirst, S. 1921. On some new parasitic mites. *Proceedings of the Zoological Society of London.*, 1921: 769–802.
- Knee, W. and Proctor, H. 2010. Interactive HTML-based dichotomous key to female Rhinonyssidae (Mesostigmata) from birds in Canada. *Canadian Journal of Arthropod Identification*, 9: 1–64. <https://doi.org/10.3752/cjai.2010.09>
- Knee, W., Proctor, H. and Galloway, T. 2008. Survey of nasal mites (Rhinonyssidae, Erynetidae, and Turbinoptidae) associated with birds in Alberta and Manitoba, Canada. *Canadian Entomologist*, 140(3): 364–379. <https://doi.org/10.4039/N08-017>
- Lindquist, E.E. and Evans, G.O. 1965. Taxonomic concepts in the Ascidae with a modified setal nomenclature for the idiosoma of the Gamasina (Acari: Mesostigmata). *Memoirs of the Entomological Society of Canada*, 47: 1–64.
- Pence, D.B. 1975. *Keys, Species and Host List, and Bibliography for Nasal Mites of North American Birds (Acarina: Rhinonyssinae, Turbinoptinae, Speleognathinae, and Cytoditidae)*. Texas, 148 pp.
- Sixl, W. 1969. Nasale Milben einheimischer Vogel (1. Mitteilnug). *Mitteilungen der Naturwissenschaftlichen Vereines für Steiermark*, 99: 217–218.
- Sánchez-Carrión, S.A., Dimov, I.D., Márquez Jiménez, F.J. and de Rojas Álvarez, M. 2023. Morphometrical Identification and Phylogenetic Analysis of Rhinonyssidae (Acari: Mesostigmata) Parasitizing Avian Hosts: New Molecular Data. *Microorganisms*, 11(7): 1783. <https://doi.org/10.3390/microorganisms11071783>
- Takatsu, J.C., Bassini-Silva, R., Spicer, G.S., Hingst-Zaher, E. and Jacinavicius de, C. 2021. New records of avian nasal mites (Mesostigmata: Rhinonyssidae) to Southeastern Brazil. *Entomological Communications*, 3, ec03040. <https://doi.org/10.37486/2675-1305.ec03040>
- Vanstreels, R.E.T., Proctor, H., Snyman, A., Hurtado, R., Ludynia, K., Parsons, N.J. and Pistorius, P.A. 2018. Nasal mites (Mesostigmata: Rhinonyssidae) in African penguins (*Spheniscus demersus*). *Parasitology*, 146(1): 121–127. <https://doi.org/10.1017/S0031182018000999>
- Wilson, N. 1970. Acarina: Mesostigmata: Halarachnidae, Rhinonyssidae of South Georgia, Heard and Kerguelen. *Pacific Insects Monographs*, 23: 71–77.

Table 1.
Differential characters of *Rhinonyssus islandi* sp.n. and *Rhinonyssus rhinolethrum*.

Character	<i>Rhinonyssus islandi</i> sp.n.	<i>Rhinonyssus rhinolethrum</i>
Setation on dorsal idiosoma	12	22
Setation on podosomal shield	10	12
Symmetrical longitudinal curved folds	2	no
Setation on ventral idiosoma	20	20–26
Gnathosomal formula	no	2–0–0
Sternal shield	no	yes
Aspero	no	yes