Acarologia

A quarterly journal of acarology, since 1959
Publishing on all aspects of the Acari

All information:

<http://www1.montpellier.inra.fr/CBGP/acarologia/>
acarologia-contact@supagro.fr

**Acarologia is proudly non-profit,
with no page charges and free open access**

Please help us maintain this system by
encouraging your institutes to subscribe to the print version of the journal
and by sending us your high quality research on the Acari.

Subscriptions: Year 2023 (Volume 63): 450 €

<http://www1.montpellier.inra.fr/CBGP/acarologia/subscribe.php>

Previous volumes (2010-2021): 250 € / year (4 issues)

Acarologia, CBGP, CS 30016, 34988 MONTFERRIER-sur-LEZ Cedex, France

ISSN 0044-586X (print), ISSN 2107-7207 (electronic)

The digitalization of Acarologia papers prior to 2000 was supported by Agropolis Fondation under the reference ID 1500-024 through the « Investissements d'avenir » programme (Labex Agro: ANR-10-LABX-0001-01)

Supporting agricultural research
for sustainable development

**Acarologia is under free license and distributed under the terms of the
Creative Commons-BY**

The first record of *Promyialges italicus* Faradonbeh et al. 2019 (Acariformes: Epidermoptidae) in European Russia

Alexandr V. Matyukhin^a, Aleksandra A. Yatsuk ^a

^a Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Leninskijprosp.33, 119071 Moscow, Russia.

Short note

ABSTRACT

The skin mite *Promyialges italicus* Faradonbeh et al. 2019 (Acariformes: Epidermoptidae) was found on wings of a louse fly, *Pseudolynchia canariensis* (Macquart, 1840) (Diptera: Hippoboscidae,) from the Domestic Pigeon, *Columba livia* L., 1758 (Aves: Columbiformes). This is the first record of *P. italicus* in Russia.

Keywords feather mites; *Pseudolynchia canariensis*; Diptera

Introduction

Skin mites of the family Epidermoptidae (Astigmata: Analgoidea) are permanent ectoparasites, all stages of which are located on the skin of avian hosts (Dubinin 1953; Fain 1965; Mironov 1987, 1999; Gaud & Atyeo 1996; Mironov *et al.* 2005). Some representatives of these mites belonging to the subfamily Epidermoptinae and all genera of the subfamily Myialginae, have phoretic relations with louse flies (Diptera: Hippoboscidae) parasitizing birds and, more rarely, with chewing lice (Phthiraptera) associated with these vertebrates. Fertilized females of these mites use louse flies and chewing lice for dispersal and infecting other host individuals. While attached to these parasitic insects, females either use them only to transport onto a new host individual, or also lay eggs on the cuticle around the place of attachment. Moreover, females of the subfamily Myialginae gnaw through soft areas of the cuticle and feed on the haemolymph of insects (Büttiker & Černý, 1974; Büttiker 1948; Cooreman 1944; Dubinin 1950; Evans *et al.* 1963; Goater *et al.* 2018; Furman & Tarshis 1953; Hill *et al.* 1967; Hiregaudar 1956, 1957; Macchioni *et al.* 2005; Macchioni 2007; Marcelino *et al.* 2009; Madden & Harmon 1998; Mironov *et al.* 2005; Yamauchi & Kuroki 2009; Valim & Gazêta 2007; Whiteman *et al.* 2006).

The genus *Promyialges* Fain, 1964 (Epidermoptinae) currently includes five species, distributed mainly in the Northern hemisphere and found in associations with louse flies of the genera *Icosta* Speiser, 1905, *Microlynchia* Lutz, 1915, *Ornithomyia* Latreille, 1802, *Pseudolynchia* Bequaert, 1926 and *Stilbometopa* Coquillett, 1899 and on birds of the orders Accipitriformes, Columbiformes, Coraciformes, Cuculiformes, Falconiformes, Galliformes, Passeriformes, and Piciformes (Fain 1965; Philips & Fain 1991; Gaud & Atyeo 1996). The latest described species of this genus, *Promyialges italicus* Faradonbeh *et al.* 2019, was initially found on *Pseudolynchia canariensis* (Macquart, 1840) (Diptera: Hippoboscidae) from the Domestic Pigeons, *Columba livia* Gmelin, 1789, in Italy (Faradonbeh *et al.* 2019).

Our study reports *P. italicus* in Russia for the first time and provides some data of egg laying of this mite.

Received 13 January 2021
Accepted 17 January 2022
Published 20 January 2022

Corresponding author
Alexandr V. Matyukhin:
amatyukhin53@mail.ru

Academic editor
Kreiter, Serge

<https://doi.org/10.24349/itvr-wvsl>

ISSN 0044-586X (print)
ISSN 2107-7207 (electronic)

Copyright
Matyukhin A. V. and Yatsuk A. A.

Distributed under
Creative Commons CC-BY 4.0

Material and methods

The material (louse flies with mites) was collected in August–September 2020 in Moscow, Russia, from the Domestic Pigeons, *Columba livia*, died of ornithosis (9 birds), and fixed in 96% ethanol. The mites have been found both on the louse fly *Pseudolynchia canariensis* wings (12 female mites from 10 louse flies) and on the skin of the recently dead birds (3 female mites). The flies and mites from the skin and feathers of dead birds were collected using the electors (Berlese's funnel) with lightbulb (25 watt) for 3 days. The mites were mounted on slides in Hoyer's medium according the standard technique used for small mites (Evans 1992; Krantz & Walter 2009) and examined with a Keyence BZ-9000 microscope. Mite specimens were identified using the key by Fain (1965) and the original description of *P. italicus* by Faradonbeh *et al.* (2019), and fly species based on the keys by Maa (1969) and Doszhanov (1980, 2003). The material used in the study is deposited in the collection of the Severtsov Institute of Ecology and Evolution (Moscow, Russia).

Results and discussion

Of 10 collected *Ps. canariensis* louse flies (females), 7 carried the epidermoptid mites. On each fly, the females of *P. italicus* (Figures 1A–F) were found on the ventral surfaces of the basal parts of wings and surrounded by a wreath of eggs attached to the cuticle around the mite (Figures 2A–C). The number of eggs around *P. italicus* females varied from 5 to 35 (Table 1).

The louse fly *Ps. canariensis* is an obligate species-specific ectoparasite of the Domestic Pigeons; it was reported from this avian host in many countries of the Old World: Africa (Congo, Egypt, South Africa, Uganda, Zaire), America (Cuba, USA), Asia (Afghanistan, Bangladesh, Burma, Cyprus, India, Indonesia, Japan, Malaya, Nepal, Philippines, Taiwan, Thailand, Turkey) and Europe (England) (Maa 1969; Philips & Fain 1991). This louse fly may carry mites of the families Epidermoptidae and Cheyletidae, and rarely chewing lice (Phthiraptera).

According to previous reports, the following mite species have been previously found on *Ps. canariensis*: ovigerous females of *Myialges anchora* Trouessart, 1906, *M. falconis* Fain, 1965, *M. lophortyx* Furman & Tarshis, 1953, *M. macdonaldi* Evans, Fain & Bafort, 1963, and *P. italicus* (Philips & Fain 1991; Feres & Flechtmann 1991; Faradonbeh *et al.* 2019); non-ovigerous females of *Ornithocheyletia hallae* Smiley, 1970 (Cheyletidae) (Bilal 2012; Smiley 1970).

Although the Domestic Pigeon is widely distributed throughout the world, *P. italicus* was previously found only in Italy, the country with a warm climate (Faradonbeh *et al.* 2019). The finding of *P. italicus* in European Russia shows that this species is widely distributed in Europe, essentially further to the north and east (up to 55° N, 37° E) than was originally known. This

Table 1 Numbers of females of *Promyialges italicus* and eggs in clutches.

Egg No	Female No
5	1
9	1
14	1
17	1
25	2
30	1
35	1

Figure 1 *Promyialges italicus*, female. A – non-engorged female, ventral view, B – non-engorged female, dorsal view, C – tibiae and tarsi I and II, D – tibia and tarsus II.

fact encourages further studies of distribution of epidermoptids species, which are able to infect domestic and synantropic birds.

Figure 2 Females and clutches of *Promyialges italicus* on *Pseudolynchia canariensis*. A – *Ps. canariensis*, ventral view; B– *P. italicus* females on ventral side of fly's wings, C –wreath of eggs of *P. italicus* on the ventral side of fly's wing. Arrow indicate mites on ventral side of wing.

References

- Bilal D. 2012. The First Record of *Ornithocheyletia hallae* Smiley, 1970 (Acariformes: Actinedida: Cheyletidae) and Its Prevalance on *Pseudolynchia canariensis* (Mcquart, 1840) (Diptera: Pupipara: Hippoboscidae) in Turkey. *Turkiye Parazitol. Derg.*, 36: 169-73. <https://doi.org/10.5152/tpd.2012.40>
- Büttiker W. 1948. Phoresiebei Lausfliegen. *Mitt. Schweizer. Ent. Ges.*, 21: 481.
- Büttiker W., Černý V. 1974. Phoresiebei Hippobosciden (Diptera) von Säugetieren und Vögeln in der Schweiz. *Mitt. Gesell.*, 47: 319-326.
- Cooreman J. 1944. Un nouveau cas d'hyperparasitisme parmi les Acaridae: *Myialgopsis trinotoni* n. gen. n. sp. parasite d'un mallophage. *Bull. Mus. R. Hist. Nat. Belgique*, 20 (26): 1-11.
- Doszhanov T. N. 1980. Mukhi-krovososki (Diptera, Hippoboscidae) Kazakhstana [Louse flies (Diptera, Hippoboscidae) in Kazakhstan]. Alma-Ata: Nauka, KazSSR, 280 pp. (In Russian).
- Doszhanov T. N. 2003. Mukhi-krovososki (Diptera, Hippoboscidae) Palearktiki [Louse flies (Diptera, Hippoboscidae) of the Palearctic region]. Almaty: Nauka, 277 pp. (In Russian).
- Dubinin V. B. 1950. Mites of the subfamily Myialgesinae on blood-sucking flies and bird lice *Entom. Obozr.*, 31: 123-131 (In Russian).
- Dubinin V. B. 1953. Feather mites (Analgesoidea). Part II. Families Epidermoptidae and Freyanidae. *Fauna SSSR, Paukoobraznye*, 6: 1-411 (In Russian).
- Evans G.O. 1992. Principles of Acarology. Wallingford, Oxon: CAB International, 563 pp.
- Evans G. O., Fain A., Bafort J. 1963. Découverte du cycle évolutif du genre *Myialges* avec description d'une espèce nouvelle (Myialgidae : Sarcoptiformes). *Bull. Ann. Soc. Roy. Ent. Belgique*, 99 (34): 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, Letteren en Schone Kunsten Van Bergie*, 84: p. 1-176 (Part I): 1-144 (Part II).
- Faradonbeh M. M., Ostovan H., Oconnor B. M., Gheibi M., Joharchi O., Macchioni F. 2019. *Promyialges italicus* sp. Nov. (Astigmata: Epidermoptidae) with redescrptions of mites of the families Epidermoptidae and Cheyletidae (Prostigmata) associated with *Pseudolynchia canariensis* (Diptera: Hippoboscidae) from Iran and Italy. *Persian J. Acarol.*, 8 (1): 27-46. <https://doi.org/10.22073/pja.v8i1.41265>
- Feres R. J. F., Flechtman C. H. W. 1991. Ocorrência de ácaros "parasitos-foréticos" (Acari: Epidermoptidae, Cheyletiellidae) sobre moscas hipoboscídeas de pombo, em São José do Rio Preto. *Naturalia*, São Paulo, 16: 155-160.
- Furman D. F., Tarshis I. B. 1953. Mites of the genera *Myialges* and *Microlichus* (Acarina Epidermoptidae) from avian and insect hosts. *J. Parasitol.*, 39 (1): 70-78. <https://doi.org/10.2307/3274062>
- Gaud J., Atyeo W. T. 1996. Feather mites of the World (Acarina, Astigmata): the supraspecific taxa. *Ann. Mus. Roy. Afr. Centr. Sci. Zool.*, 277: 1-193 (Pt. 1, text): 1-436.
- Goater C. P., Dyck J., Proctor H., Floate K. D. 2018. Hyperparasitism of an avian ectoparasitic hippoboscid fly, *Ornithomya anchineuria*, by the mite, *Myialges* cf. *borealis*, in Alberta, Canada. *J. Parasitol.*, 104 (2). <https://doi.org/10.1645/17-171>
- Hill D. S., Wilson N., Corbet G. B. 1967. Mites associated with British species of *Ornithomya* (Diptera: Hippoboscidae). *J. Med. Entomol.*, 4: 102-122. <https://doi.org/10.1093/jmedent/4.2.102>
- Hiregaudar L. S. 1956. A record of *Myialges anchora* (Myialgesidae) on *Pseudolynchia maura* (Hippoboscidae) from India. *Indian Vet. J.*, 33: 134-135.
- Hiregaudar L. S. 1957. A new species of Myialgesid mite parasitic on *Pseudolynchia maura* (Diptera: Hippoboscidae) from India. *Proceedings of the Indian Science Congress*, 43 (4): 29.
- Krantz G.W., Walter D. E. 2009. A manual of acarology. 3rd ed. Texas, USA: TexasTech University Press. 807 p.

- Maa T. C. 1969. A revised checklist and concise host index of Hippoboscidae (Diptera). Pacific Insects Monograph. Honolulu: Bishop Museum, Honolulu, Hawaii, 20: 261-299. <https://doi.org/10.1093/jmedent/6.2.146>
- Macchioni F. 2007. Importance of phoresy in the transmission of Acarina. Parassitologia, 49 (1-2): 17-22.
- Macchioni F., Magi M., Mancianti F., Perrucci S. 2005. Phoretic association of mites and mallophaga with the pigeon fly *Pseudolynchia canariensis*. Parasite, 12: 277-279. <https://doi.org/10.1051/parasite/2005123277>
- Madden D., Harmon W.M. 1998. First record and morphology of *Myialges caulotoon* (Acari: Epidermoptidae) from Galápagos hosts. J. Parasitol., 84 (1): 186-189. <https://doi.org/10.2307/3284558>
- Marcelino V. J. F.C., Arcoverde A.R., Daemon E. 2009. Phoretic association of the mites *Myialges* spp. (Astigmata: Epidermoptidae) and *Ornithocheyletia hallae* Volgin (Prostigmata: Cheyletidae) with the fly *Pseudolynchia canariensis* (Macquart) (Diptera: Hippoboscidae). Neotrop. Entomol., 38 (5): 578-581. <https://doi.org/10.1590/S1519-566X2009000500003>
- Mironov S. V. 1987. Morphological adaptations of feather mites to different types of plumage and skin of birds. Parazitologicheskii Sbornik, 34: 114-132 [In Russian with English summary].
- Mironov S. V. 1999. Feather mites: general morphological adaptations, phylogeny and coevolutionary relationships with birds. Ekologija (Vilnius, Lithuania), 2: 57-66.
- Mironov S. V., Bochkov A. V., Fain A. 2005. Phylogeny and evolution of parasitism in feather mites of the families Epidermoptidae and Dermationidae (Acari: Analgoidea). Zool. Anz., 243: 155-179. <https://doi.org/10.1016/j.jcz.2004.10.001>
- Philips J. R., Fain A. 1991. Acarine symbionts louseflies (Diptera: Hippoboscidae). Acarologia, 32: 377-384.
- Smiley R. L. 1970. A review of the family Cheyletiellidae (Acarina). Ann. Entomol. Soc. America, 63: 1056-1078. <https://doi.org/10.1093/aesa/63.4.1056>
- Valim M. P., Gazêta G. S. 2007. Associação forética dos ácaros *Myialges anchora* Sergent & Trouessart (Acaridida, Epidermoptidae) e *Ornithocheyletia hallae* Smiley (Actiniedida, Cheyletiellidae) com *Pseudolynchia canariensis* (Macquart) (Diptera, Hippoboscidae). Rev. Bras. Entomol., 51(4): 518-519. <https://doi.org/10.1590/S0085-56262007000400019>
- Whiteman N. K., Sánchez P., Merkel J., Klompen H., Parker P. G. 2006. Cryptic host specificity of an avian skin mite (Epidermoptidae) vectored by louse flies (Hippoboscidae) associated with two endemic Galápagos bird species. J. Parasitol., 92(6):1218-28. <https://doi.org/10.1645/GE-918R.1>
- Yamauchi T., Kuroki T. 2009. Occurrence of epidermoptid mites (Acari: Astigmata: Epidermoptidae) in Japan, with its hyperparasitic record on the louse fly *Ornithomya avicularia aobatonis* (Diptera: Hippoboscidae). Compar. Parasitol., 76 (1): 93-99. <https://doi.org/10.1654/4349.1>