

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

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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 & Gazéta 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.

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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

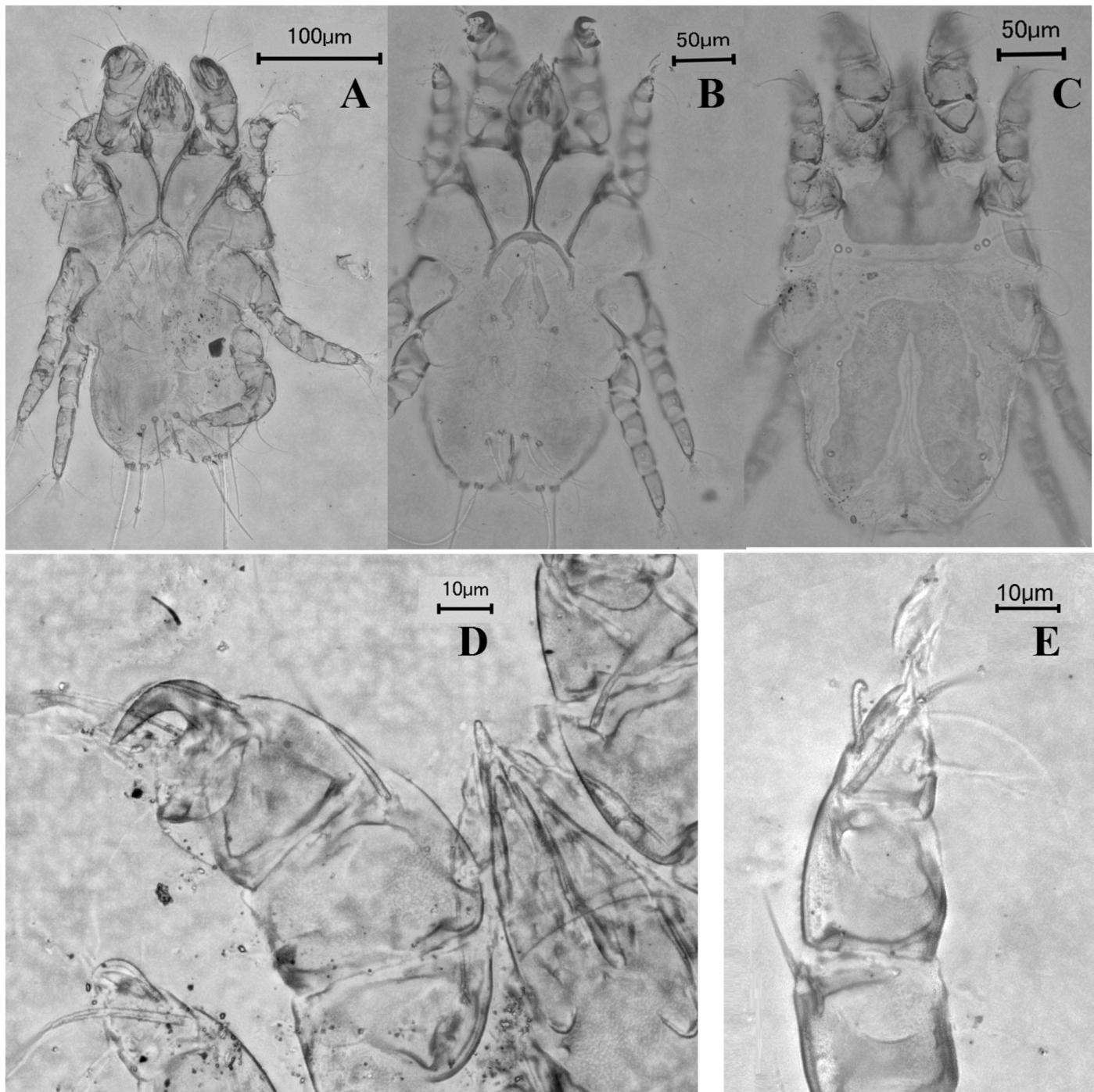


Figure 1 *Promyialges italicus*, female. A – non-engorged female, ventral view, B – non-engorged female, dorsal view, C – tibiae and tarsi I and II, D – tibia and tarsus II.

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.

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