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Description of a new louse fly species of the genus *Ornithomya* Latreille, 1802 (Diptera: Hippoboscidae) from Irkutsk, Russia

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Abstract. A new species of the genus *Ornithomya* Latreille, 1802 (Diptera: Hippoboscidae), *O. helvipennis* sp. n., is described from Irkutsk (Russia). The microtrichia of this new species cover the entire wing membrane, as in the species *O. comosa* Austen, 1930. The new species differs from the closest *O. comosa* by light wing membrane and amber-yellow microtrichia, and from *O. greeni* Maa, 1986 by presenting ocelli. The *comosa* species-group for *O. comosa*, *O. greeni* and *O. helvipennis* sp. n. within the genus *Ornithomya* is proposed. An updated key for species of the genus *Ornithomya* occurring in Russia is provided.

Key words: louse flies, Diptera, Hippoboscidae, *Ornithomya*, new species, Russia.

Описание нового вида мухи-кровососки рода *Ornithomya* Latreille, 1802 (Diptera: Hippoboscidae) из Иркутска, Россия

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Резюме. Описан новый вид мухи-кровососки *Ornithomya helvipennis* sp. n. (Diptera: Hippoboscidae) из Иркутска (Россия). У этого вида микротрихии покрывают всю мембрану крыла, как и у вида *O. comosa* Austen, 1930. Новый вид отличается от наиболее близкого к нему *O. comosa* светлой мембраной крыла и янтарно-желтыми микротрихиями, а от вида *O. greeni* Мaa, 1986 – наличием глазков. Предложено создание внутри рода *Ornithomya* Latreille, 1802 группы *comosa* для видов *O. comosa*, *O. greeni* и *O. helvipennis* sp. n. Представлен обновленный ключ видов рода *Ornithomya*, встречающихся в России.

Ключевые слова: мухи-кровососки, Diptera, Hippoboscidae, *Ornithomya*, новый вид, Россия.

Introduction

The representatives of the family Hippoboscidae Samouelle, 1819 are vectors of many dangerous pathogens [Bequaert, 1954; Doszhanov, 1980], both in mammals [Doszhanov, 1980; Peña-Espinoza et al., 2023] and in birds [Ganez et al., 2004; Farajollahi et al., 2005; Khametova et al., 2018; Wawman, 2023] and additionally transport phoretic mites of the family Epidermoptidae [Fain, 1965a, b; Hill et al., 1967; Philips, Fain, 1991] and lice [de Moya, 2019; Lee et al., 2022]. All these parasites are of great veterinary importance, feeding on the blood of their hosts – mammals and birds [Hutson, 1984]. The family includes approximately 213 species [Dick, 2018; Oboňa et al., 2019].

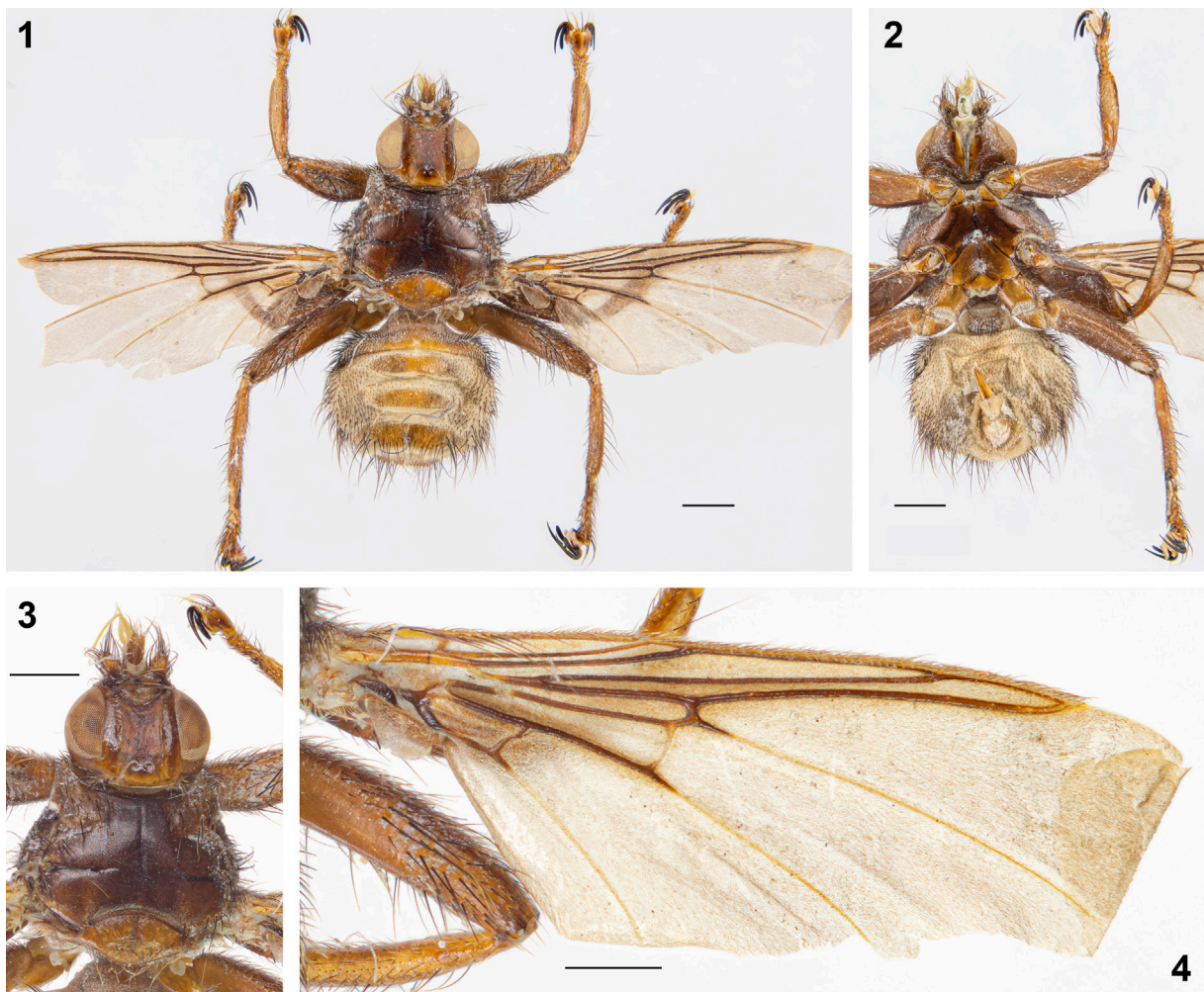
The genus *Ornithomya* Latreille, 1802 includes 31 species [Dick, 2018; Nartshuk et al., 2022; Yatsuk et al., 2023; Matyukhin et al., 2023] and is one of the largest genus in the Hippoboscidae [Dick, 2018]. These flies are distinguished from other genera by the humeral tubercles protruding forward and reaching the sides of the head; fully developed wings with three crossveins and microtrichia; vein R_{2+3} not adjacent to costa; bifid claws; the length of the antennae is one third of the head [Doszhanov, 2003].

Ornithomya flies inhabit mainly the middle latitudes of the Old World [Hutson, 1984]. Species of this genus are divided into five groups [Dick, 2018] isolated on the basis of chaetotaxy and other morphological characters [Maa, 1963]. One of them, *biloba* species-group, includes species from the Old World with wing microtrichia, uniformly covering nearly apical two-thirds of dorsal surface, having three median abdominal tergites and parasitizing Hirundinidae: *Ornithomya biloba* Dufour, 1827, *O. cecropis* Hutson, 1971, *O. comosa* Austen, 1930, *O. fur* Schiner, 1868, *O. greeni* Maa, 1986, *O. inoellata* Ferris, 1930, *O. roubaudi* Seguy, 1938, *O. rupes* Hutson, 1981, *O. sorbens* Hutson, 1971 [Maa, 1963, 1986; Hutson, 1971, 1981].

The aim of the present work is to describe a new species of the genus *Ornithomya*.

Material and methods

Bird parasite flies were collected by A.N. Gryaznova in 2018 in a mixed colony of *Riparia diluta* (Sharpe et Wyatt, 1893) and *Riparia riparia* (Linnaeus, 1758) during mass bird ringing in Southern Siberia. The material is fixed in 96% ethanol. The particular fly specimen we



Figs 1–4. *Ornithomya helvipennis* sp. n., male, holotype.

1–2 – general view: 1 – dorsal side, 2 – ventral side; 3 – head and thorax, dorsal side; 4 – wing. Scale bars 0.5 mm.

Рис. 1–4. *Ornithomya helvipennis* sp. n., самец, голотип.

1–2 – общий вид: 1 – дорсальная сторона, 2 – вентральная сторона; 3 – голова и грудь, дорсальная сторона; 4 – крыло. Масштабные линейки 0.5 мм.

studied was collected in Irkutsk (Russia) from *R. diluta*. The names of birds are given in accordance with current systematic data. Morphological terminology follows Hutson [1984]. Morphological data for known species are consistent with the studies of Bear and Friedberg [1995], Doszhanov [1980, 2003], Maa [1986], Matyukhin et al. [2023], Nartshuk et al. [2022], Oboňna et al. [2022] and Yatsuk et al. [2023].

Order Diptera Linnaeus, 1758
Family Hippoboscidae Samouelle, 1819
Subfamily Ornithomyinae Bigot, 1853
Genus *Ornithomya* Latreille, 1802
Ornithomya helvipennis
 Yatsuk, Nartshuk et Matyukhin, sp. n.
 (Figs 1–4)

Material. Holotype, ♂ (inventory number INS_DIP_0001108, Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia): Russia, Irkutsk, collected from pale sand martin *Riparia diluta* (Sharpe et Wyatt, 1893), July 2018 (A.N. Gryaznova).

Description. Head and thorax length combined 2.5–2.7 mm.

Head with posterior part located between humeral tubercles and slightly covering anterior margin of thorax. Eye one-quarter as wide as head. Ocelli separated from each other by 1 width of ocellus. Width of inner orbit almost one-third of mediovertex width. 9–10 orbital setae present. Posterior margin of lunula rounded. Lunula horns located between antennae, clearly separated from lunula. Anterior margin of lunula horns notched. Palpus almost equal in length to antennae. Antennae brown. Dorsal side of head changes from amber-brown to dark brown. Ventral side of head dark brown.

Mesonotum dark brown with amber-brown scutellum. Humeral tubercles approximately cone-shaped, protruding anterolaterally. Longitudinal, transversal and scuto-scutellar sutures clearly visible. Transversal suture interrupted in middle. Longitudinal suture almost reaching scuto-scutellar suture. Setae of mesonotum: 6–7 long and 15–17 short humeral setae, 5–7 mesopleural setae, 4 notopleural setae, 2 long and 7 short postalar setae, 1 strong and long and 5–7 thin short prescutellar setae. Setae of scutellum: dark setae forming cluster in center of scutellum, 2 of them strong; thin light setae forming fringes on its anterior and posterior margins; 6 long black setae forming a

transverse row along posterior margin of scutellum. Ventral side of thorax brown.

Wing length 5 mm. Wing with full venation, with 3 transverse and 7 longitudinal veins. Costa interrupted before juncture with Sc. Longitudinal veins R_1 , R_{2+3} and R_{4+5} connecting with costa at acute angle. Section on costa between juncture of R_1 and R_{2+3} twice as long as section between juncture of R_{2+3} and R_{4+5} . Transverse vein between cells 2bc and 1m mostly unpigmented. Vein M_3 interrupted between cells 1bc and 2bc. Costa and basicosta covered with hairs. Wing membrane, including alula, entirely microtrichiate. Microtrichia amber-yellow, wing membrane light.

Legs brown, darker at base half. Femora strong. Claws bifid. Empodium and paired pulvilli not reduced.

Abdomen covered with short setae in center and with more longer setae along edges. Tergites 1 + 2 with almost straight posterior margin. Tergites 3, 4, 5 approximately one-third as wide as abdomen. Tergite 5 slightly wider with row of long setae on posterior margin. Tergite 6 divided into two oval sclerites, each with approximately 14 setae.

Comparison. The new species differs from all related species of the genus. It differs from *O. greeni* by presenting ocelli, from *O. comosa* by light wing membrane and amber-yellow microtrichia. In addition, *O. comosa* is characterized by 1 prescutellar seta and section on costa between juncture of R_1 and R_{2+3} 3 times longer than section between juncture of R_{2+3} and R_{4+5} , what also distinguishes this species from the new one.

Ornithomya helvipennis sp. n. differs from other *Ornithomya* species from the Eastern Palaearctic by microtrichia covering all wing cells. Additionally, in particular, *Ornithomya* species differ from the new one in the following features:

– *O. avicularia* (Linnaeus, 1758) in head and thorax length combined (3–3.5 mm), wing length (5.5–7 mm) and number of long black scutellar setae (8);

– *O. biloba* in thoracic colour (light brown) and palpus length (palpus longer than antennae);

– *O. candida* Maa, 1967 in number of scutellar setae (4) and ratio of section of costa between junctions of R_1 and R_{2+3} to the section between junctions of R_{2+3} and R_{4+5} (1.5 times);

– *O. chloropus* Bergroth, 1901 in colour of ventral side of thorax (light brown), tergites 3, 4 width (approximately one-half as wide as abdomen) and ratio of section of costa between junctions of R_1 and R_{2+3} to section between the junctions of R_{2+3} and R_{4+5} (subequal);

– *O. fringillina* Curtis, 1836 in eye width (one-third as wide as head), number of scutellar and humeral setae (4 long scutellar setae and 2 humeral setae);

– *O. krivolutskii* Yatsuk, Matyukhin et Nartshuk, 2023 in head and thorax length combined (3 mm), wing length (4 mm) and legs colour (light);

– *O. strigilis* Nartshuk, Yatsuk et Matyukhin, 2022 in head and thorax length combined (4–4.3 mm), wing length (7.5–8 mm) and eye width (one-third as wide as head);

– *O. triselevae* Matyukhin, Yatsuk et Nartshuk, 2023 in wing length (5.8–6 mm), eye width (one-third as wide as head) and number of long scutellar setae (4).

Hosts. The new species was collected from the pale sand martin *Riparia diluta*.

Etymology. The new species is named for its amber-yellow microtrichia on the wings.

Discussion

Ornithomya helvipennis sp. n. was collected in July, when louse flies brought by birds from other places are no longer found and only local species remain. Its distribution area may be limited to the area around the Baikal Lake. On the other hand, it was found on swallow. These birds are attractive hosts for many species of louse flies. Sixteen *Ornithomya* species, including *O. comosa* and *O. greeni*, prefer to parasitize on them [Doszhanov, 1980, 2003; Maa, 1969a]. It is likely that the hosts determine the distribution area of louse flies. For example, *O. greeni* lives only in Tasmania and parasitizes on *Hirundo neoxena* Gould, 1843 [Maa, 1986], that inhabits some parts of Tasmania, New Zealand, Australia and nearby islands. *Ornithomya comosa* described from India is known from Nepal, Thailand, Malaya, Kazakhstan, Kyrgyzstan, Russia [Doszhanov, 2003], Japan and Europe [Oboňa et al., 2022; Le Guillou, Chapelin-Viscardi, 2022]. In Russia, it parasitizes on *Delichon urbicum* (Linnaeus, 1758), *Cecropis daurica* (Laxmann, 1769), *Hirundo rustica* Linnaeus, 1758, *Otus scops* (Linnaeus, 1758), *Riparia diluta* and *R. riparia* which inhabit Europe, North Africa and tropical Asia. Some species are also found in the New World. At the same time, *Ornithomya comosa* from India and Nepal was collected only on *Riparia chinensis* (J.E. Gray, 1830), which is found in Tajikistan, Afghanistan and Indian subcontinent to southern China, Taiwan, and the northern Philippines [Oboňa et al., 2022]. Maa [1969b] stated that *O. comosa* specimens from Nepal, Thailand and Malaya are markedly different from paratypes collected in India. Doszhanov [1980, 2003] who studied about 1900 females and 1650 males of *O. comosa* from the territory of the former USSR, clarified the morphological features for this species based on his collection. Apparently, this author identified *O. comosa* by dark wings entirely covered with microtrichia, without taking into account other features. We suggest that the species *O. comosa* may be a composite group. In the future, it would be interesting to compare specimens of *O. comosa*, collected by Maa [1969b], Oboňa et al. [2022] and Doszhanov [1980, 2003] with the holotype from India. Currently *O. comosa*, *O. greeni* and now apparently *O. helvipennis* sp. n. belong to the *biloba* species-group. We believe that species in which microtrichia completely cover the entire wing should be classified as the separate *comosa* species-group. In this case, the *comosa* species-group would include *O. comosa*, *O. greeni* and *O. helvipennis* sp. n., and the *biloba* species-group – *O. biloba*, *O. cecropis*, *O. fur*, *O. inoellata*, *O. roubaudi*, *O. rupes* and *O. sorbens*.

A modified key to species of the genus *Ornithomya* listed in Russia, based on Doszhanov [2003] and Nartshuk et al. [2022]

We agree with Mogi et al. [2023] about the synonymy of *Ornithomya avicularia* (Linnaeus, 1758) and *O. avicularia aobatonis* Matsumura, 1905.

1. Microtrichia covering all wing cells 2
- Microtrichia covering only cells 3r, 1m and apical part of cell 2m 3

2. Microtrichia amber-brown, wing membrane light
 *O. helvipennis* sp. n.
 – Microtrichia black, wing membrane dark *O. comosa*
3. Combined length of head and thorax more than 3 mm
 4
 – Combined length of head and thorax 3 mm or less 5
4. Microtrichia covering most of cell 3r, form 3 stripes in
 cell 1m and 1 stripe in cell 2m. Combined length of
 head and thorax 4–4.3 mm. Scutellum with no less
 than 6 large setae *O. strigilis*
 – Microtrichia covering most of cells 3r and 1m, forming
 3 stripes. Combined length of head and thorax
 3–3.5 mm. Scutellum with at least 7–8 preapical setae
 *O. avicularia*
5. 4 scutellar setae 6
 – 6 scutellar setae 8
6. Wing length 3.5–4.4 mm *O. fringillina*
 – Wing length more than 5 mm 7
7. Wing length 5.2–5.7 mm. Section of costa between the
 junctions of R_1 and R_{2+3} 1.5 times as long as the section
 between the junctions of R_{2+3} and R_{4+5} . Female genital
 opening covered with dense long setae *O. candida*
 – Wing length 5.8–6 mm. Section of costa between
 junctions of R_1 and R_{2+3} 1.3 times as long as section
 between junctions of R_{2+3} and R_{4+5} . Female genital
 opening not covered with dense long setae
 *O. triselevae*
8. Combined length of head and thorax more than 2.6 mm
 *O. krivolutskii*
 – Combined length of head and thorax 2–2.5 mm 9
9. Microtrichia covering cell 1m almost completely
 *O. biloba*
 – 3 microtrichia stripes in cell 1m *O. chloropus*

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