





A new species of the genus *Ornithomya* (Diptera: Hippoboscidae) from the Far East

Новый вид из рода *Ornithomya* (Diptera: Hippoboscidae) с Дальнего Востока

E.P. Nartshuk, A.A. Yatsuk*, A.V. Matyukhin & V.P. Shokhrin

Э.П. Нарчук, А.А. Яцук, А.В. Матюхин, В.П. Шохрин

Emilia P. Nartshuk , Zoological Institute, Russian Academy of Sciences, 1 Universitetskaya Emb., St Petersburg 199034, Russia. E-mail: chlorops@zin.ru

Aleksandra A. Yatsuk , Aleksandr V. Matyukhin , A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, 33 Leninskiy Av., Moscow 119071, Russia. E-mails: sasha_djedi@mail.ru, amatyukhin53@mail.ru

Valeriy P. Shokhrin, United administration of the Lazovsky State Nature Reserve named after L.G. Kaplanov and “Zov Tigra” National Park, 56 Tsentralnaya St., Lazo, Primorskiy Territory 692980, Russia. E-mail: shokhrin@mail.ru

Abstract. A new species of the genus *Ornithomya* Latreille, 1802 (Diptera: Hippoboscidae), *O. strigilis* **sp. nov.**, is described from the Lazovsky Nature Reserve (southern part of Primorskiy Territory, the Far East of Russia). The new species differs from other Palaearctic species of *Ornithomya* in its large body size, the number of long setae on the scutellum, and the arrangement of microtrichia (setulae) on the wings. An updated key to the Palaearctic species of *Ornithomya* is provided.

Резюме. Новый вид рода *Ornithomya* Latreille, 1802 (Diptera: Hippoboscidae), *O. strigilis* **sp. nov.**, описан с территории Лазовского природного заповедника на юге Приморского края России. Новый вид отличается от всех прочих палеарктических видов рода *Ornithomya* крупными размерами тела, числом крупных щетинок на щитке и рисунком микротрихий на крыльях. Приводится дополненный ключ палеарктических видов рода *Ornithomya*.

Key words: Far East, key, louse flies, Diptera, Hippoboscidae, *Ornithomya*, new species

Ключевые слова: Дальний Восток, определительная таблица, мухи-кровососки, Diptera, Hippoboscidae, *Ornithomya*, новый вид

Zoobank Article LSID: [urn:lsid:zoobank.org:pub:56943716-9B95-44A5-AA29-279E34F4E04B](https://zoobank.org/pub:56943716-9B95-44A5-AA29-279E34F4E04B)

Introduction

Louse flies (Hippoboscidae Samouelle, 1819) are widespread blood-sucking ectoparasites of mammals and birds. The family includes 213 spe-

cies (Dick, 2018; Oboňa et al., 2019) and divided into three subfamilies: Ornithomyinae, Hippoboscinae and Lipopteninae (Maa, 1969; Maa & Peterson, 1987; Dick, 2018).

Females and males of Hippoboscidae feed on blood of their hosts. The courtship of the sexes and mating takes place on the host. The develop-

* Corresponding author

ment of larva takes place inside the female. Flies lay prepupae, which immediately form puparia; most species are able to overwinter as puparia (Hutson, 1984).

Hippoboscidae flies are vectors of many dangerous pathogens (Bequaert, 1954; Doszhanov, 1980), both in mammals (Doszhanov, 1980) and in birds (Ganez et al., 2002; Farajollahi et al., 2005; Khametova et al., 2018). Also, louse flies, especially representatives of the genus *Ornithomya* Latreille, 1802, transport phoretic mites of the family Epidermoptidae (Hill et al., 1967; Fain, 1965; Philips & Fain, 1991), which in their turn carry even more diseases (Dubinin, 1953; Gilardi et al., 2001).

The representatives of the genus *Ornithomya* are full-winged, widely specialised parasites of birds. Their hosts are representatives of 47 bird families, but most often these louse flies parasitise Passeridae (Doszhanov, 2003). In the Palaearctic, imagoes of *Ornithomya* species appear in late June, reach their peak numbers in July and disappear in early October (Hutson, 1984).

Before the present work, the genus *Ornithomya* included 29 species (Dick, 2018) inhabiting mainly the middle latitudes of the Old World (Hutson, 1984). According to Doszhanov (1980, 2003), five species of *Ornithomya* were previously found on the territory of the former Soviet Union: *O. avicularia* Linnaeus, 1758, *O. biloba* Dufour, 1827, *O. chloropus* Bergroth, 1901, *O. comosa* Austen, 1930 and *O. fringillina* Curtis, 1836. *Ornithomya rupe*s Hutson, 1981 is known from Switzerland, *O. candida* Maa, 1967, from the northern Japanese Islands (Maa, 1967; Doszhanov, 2003).

The aim of this article is to describe a new species of *Ornithomya*, which was found during the study of the louse flies in the Lazovsky Nature Reserve in the south of the Primorskiy Territory of Russia.

Material and methods

The flies were collected from birds in the Lazovsky Nature Reserve. The material is kept in 96% ethanol. Morphological terminology follows Hutson (1984).

Results

Order Diptera

Family Hippoboscidae

Subfamily Ornithomyinae

Genus *Ornithomya* Latreille, 1802

Ornithomya strigilis Nartshuk, Yatsuk et Matyukhin, **sp. nov.**

(Fig. 1)

Holotype. Male, **Russia**, *Primorskiy Terr.*, Lazovsky Nature Reserve, collected from brown hawk-owl *Ninox scutulata* (Raffles, 1822), 21.X.2020, V.P. Shokhrin leg.

The holotype in ethanol is deposited in the collection of the Zoological Institute of the Russian Academy of Sciences, St Petersburg (inventory number INS_DIP_0001101).

Description. Head and thorax length combined 4.30 mm.

Head with posterior part located between humeral tubercles and slightly covering anterior margin of thorax. Width of head equal to its length. Eye one-third as wide as head. Ocelli separated from each other by width of ocellus. Inner orbits slightly widened posteriorly. Width of inner orbit equal to one-third of mediovertex width. Length of mediovertex equal to half of head length. Seven orbital setae present. Posterior margin of lunula rounded. Lunula horns located between antennae, clearly separated from lunula. Palpus equal in length to lunula horns and to second antennal segment. Antennae dark-coloured, with long setae. Ventral side of head light.

Mesonotum amber-brown, with anterior margin slightly concave. Humeral tubercles approximately cone-shaped, protruding anterolaterally. Longitudinal, transversal and scuto-scutellar sutures clearly visible. Transversal suture interrupted in middle; longitudinal suture not reaching scuto-scutellar suture. Setae of mesonotum: eight long humeral setae, six long mesopleural setae, one long notopleural seta, one long and three short postalar setae, and one prescutellar seta. Setae of scutellum: fringes of short setae on its anterior and posterior margins; short setae forming a triangle in centre of scutellum; six long setae forming a transverse row along posterior margin

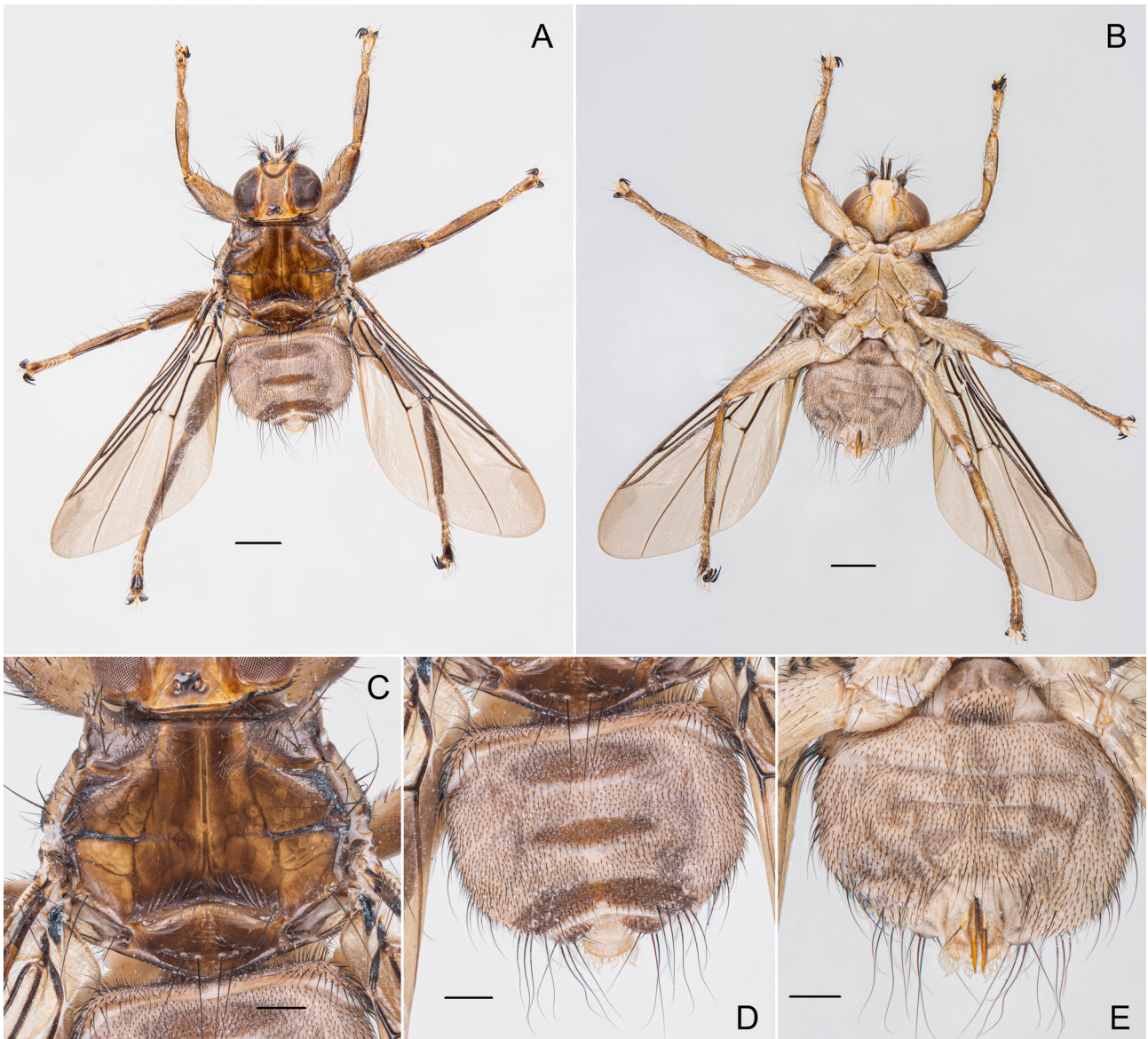


Fig. 1. *Ornithomya strigilis* sp. nov., male (holotype). **A**, general view, dorsal side; **B**, general view, ventral side; **C**, mesonotum, dorsal side; **D**, abdomen, dorsal side; **E**, abdomen, ventral side. Scale bars: 1 mm (A, B), 0.5 mm (C, D, E).

of scutellum; long seta present anterolaterally of this row on either side of scutellum.

Notopleura wedge-shaped, separated from mesonotum by a deep suture. Mesopleura dorsally wide. Ventral side of thorax light, without spots.

Wing length 8.00 mm. Wing with full venation, with three transverse and seven 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 sec-

tion 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. Setulae covering most of cell *3r*. Cell *1m* with three stripes of setulae; cell *2m* with one short narrow stripe of setulae.

Legs light. Femora strong. Claws bifid. Empodium and paired pulvilli not reduced.

Abdomen covered with short setae. Tergite 1+2 with straight posterior margin and long setae on

sides. Tergites 3 and 4 wide, strip-shaped. Tergite 3 half as wide as abdomen; tergite 4 one-third as wide as abdomen. Tergite 5 almost divided into two parts, with tufts of setae on sides, almost reaching lateral margins of abdomen. Each tuft containing five setae. Tergite 6 divided into two oval sclerites, each with four setae. Tergite 7 without sclerites.

Comparison. The new species differs from all known Palaearctic species of the genus *Ornithomya* in its larger body size. Prior to this study, the largest representatives of *Ornithomya* were considered to be the species *O. avicularia* with the combined length of head and thorax 2.70–3.80 mm (Doszhanov, 1980, 2003; Bear & Friedberg, 1995) and *O. gigantea* Bear et Friedberg, 1995, 4.00 mm (Bear & Friedberg, 1995).

Ornithomya strigilis sp. nov. differs from *O. avicularia*, *O. candida*, *O. comosa* and *O. fringillina* in the number of preapical setae on the scutellum; from *O. avicularia*, *O. candida*, *O. chloropus* and *O. fringillina* in the head shape; from *O. biloba*, *O. comosa* and *O. rupes*, in the pattern of wing setulae (in three latter species, setulae almost completely cover the cell *1m*). Additionally, *O. strigilis* sp. nov. differs from *O. avicularia* in the absence of green colour on the legs in newly hatched individuals, from *O. chloropus*, in the body coloration, and from *O. comosa*, in the coloration of the ventral side of the head (in *O. comosa*, it is dark), and in the density of hairs covering the body.

Etymology. The new species is named after the bird on which the holotype was found. The species name is derived from the name of the type genus *Strix* Linnaeus, 1758 of the typical owls family Strigidae, with the addition of the Latin suffix *-ilis* indicating a relationship or a pertaining to.

A key to the Palaearctic species of the genus *Ornithomya*, modified from Doszhanov (2003) and Bear & Friedberg (1995)

1. Combined length of head and thorax 4.00 mm or more. 2
- Combined length of head and thorax less than 4.00 mm 3
2. Scutellum with no less than six large setae *O. strigilis* sp. nov.
- Scutellum with four large setae. *O. gigantea*
3. Width of head exceeds its length 4
- Length of head equal to or exceeds its width. 7

4. Wing length 5.7–7.0 mm. Section of Costa between the junctions of R_1 and R_{2+3} 1.5–2.0 times as long as the section between the junctions of R_{2+3} and R_{4+5} 5
- Wing length 3.5–5.5 mm. Section of Costa between the junctions of R_1 and R_{2+3} equal to the section between the junctions of R_{2+3} and R_{4+5} 6
5. Scutellum with at least seven preapical setae. Section of Costa between the junctions of R_1 and R_{2+3} twice as long as the section between the junctions of R_{2+3} and R_{4+5} . Female genital opening not covered with dense long setae *O. avicularia*
- Scutellum with four preapical setae. 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*
6. Wing length 3.5–4.5 mm. Scutellum with 3–5 apical setae. Body light brown with light spot on mesonotum *O. fringillina*
- Wing length 4.5–5.5 mm. Scutellum with six apical setae. Body dark brown *O. chloropus*
7. Setulae covering all wing cells. Body densely covered with long dark setae *O. comosa*
- Setulae covering only the cells *3r*, *1m* and apical part of the cell *2m*. Body setation not dense. 8
8. Mesonotum with 6–10 mesopleural setae, four of which long. Scutellum with short setae, with a transverse row of four (rarely, six) long setae at posterior margin and 3–4 long setae anterior of this row *O. rupes*
- Mesonotum with 16–18 mesopleural seta. Scutellum with short setae, and a transverse row of six long setae at posterior margin *O. biloba*

Acknowledgements

We thank S.A. Shchedrin for the perfect photos, Josef Oboňa and Will Reeves for reviewing the MS and useful comments, and Dimitry Gapon for suggestions about the name of the new species. The work of first author was performed as part of the State Research Project of the Zoological Institute, No. 122031100272-3.

References

- Bear A. & Friedberg A. 1995. Contribution to the knowledge of the *Ornithomyini* of Israel (Diptera: Hippoboscidae). *Israel Journal of Zoology*, **41**: 109–124.
- Bequaert J.C. 1954. The Hippoboscidae or louse-flies (Diptera) of mammals and birds. Part II. Taxonomy, evolution and revision of American genera and species. *Entomologica Americana, new Series*, **34**: 1–232.

- Dick C.W.** 2018. *Checklist of World Hippoboscidae (Diptera: Hippoboscoidea)*. Chicago: Department of Zoology, Field Museum of Natural History. 7 p.
- Doszhanov T.N.** 1980. *Mukhi-krovososki (Diptera, Hippoboscidae) Kazakhstana* [Louse flies (Diptera, Hippoboscidae) in Kazakhstan]. Alma-Ata: Nauka. 280 p. (In Russian).
- Doszhanov T.N.** 2003. *Mukhi-krovososki (Diptera, Hippoboscidae) Palearktiki* [Louse flies (Diptera, Hippoboscidae) of the Palaearctic region]. Almaty: Nauka. 277 p. (In Russian).
- Dubinin V.B.** 1953. *Per'evye kleshchi (Analgesoidea). Chast' II. Semeystva Epidermoptidae i Freyanidae* [Feather mites (Analgesoidea). Part II. Families Epidermoptidae and Freyanidae]. *Fauna SSSR, Paukoobraznye*, 6(6). Moscow, Leningrad: Nauka. 411 p. (In Russian).
- 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: 1–176 (part I), 1–144 (part II). <https://doi.org/10.1163/22977953-0170102009>
- Farajollahi A., Crans V.J., Nickerson D., Bryant P., Wolf B., Glaser F. & Andreadis T.G.** 2005. Detection of West Nile virus RNA from the louse fly *Icosta americana* (Diptera: Hippoboscidae). *Journal of the American Mosquito Control Association*, 21(4): 474–476. [https://doi.org/10.2987/8756-971X\(2006\)21\[474:DOWNVR\]2.0.CO;2](https://doi.org/10.2987/8756-971X(2006)21[474:DOWNVR]2.0.CO;2)
- Ganez A.Y., Baker I.K., Lindsay R., Dibernardo A., McKeever K. & Hunter B.** 2002. West Nile virus outbreak in North American owls, Ontario. *Emerging infectious Diseases*, 10(12): 2135–2142. <https://doi.org/10.3201/eid1012.040167>
- Gilardi K.V., Gilardi J.D., Frank A., Goff M.L. & Boyce W.M.** 2001. Epidermoptid mange in Laysan albatross fledglings in Hawaii. *Journal of Wildlife Diseases*, 37(1): 185–188. <https://doi.org/10.7589/0090-3558-37.1.185>
- Hill D.S., Wilson N. & Corbet G.B.** 1967. Mites associated with British species of *Ornithomya* (Diptera: Hippoboscidae). *Journal of medical Entomology*, 4: 102–122. <https://doi.org/10.1093/jmedent/4.2.102>
- Hutson A.M.** 1984. Hippoboscidae and Nycteribiidae (keds, flat-flies and bat-flies). *Handbooks for the Identification of British Insects*, 10(7). London: Royal Entomological Society of London. 43 p.
- Khametova A.P., Pichurina N.L., Zabashta M.V., Romanova L.V., Orekhov I.V., Borodina T.N., Adamenko V.I. & Zabashta A.V.** 2018. Biocoenotic structure of natural focus of borreliosis in the Rostov Province. *Medical Parasitology and parasitic Diseases*, 4: 33–39. (In Russian). <https://doi.org/10.33092/0025-8326mp2018.4.33-39>
- Maa T.C.** 1967. A synopsis of Diptera Pupipara of Japan. *Pacific Insects Monograph*, 9: 727–760.
- Maa T.C.** 1969. A revised checklist and concise host index of Hippoboscidae (Diptera). *Pacific Insects Monograph*, 20: 261–299. <https://doi.org/10.1093/jmedent/6.2.146>
- Maa T.C. & Peterson B.V.** 1987. Hippoboscidae. In: **McAlpine J.F., Peterson B.V., Shewell G.E., Teskey H.J., Vockeroth J.R. & Wood D.M.** (Coordinators). *Manual of Nearctic Diptera*, 2. Research Branch Agriculture Canada Monograph, 28: 1271–1281. Ottawa.
- Oboňa J., Sychra O., Greš S., Heřman P., Manko P., Roháček J., Šestáková A., Šlapák J. & Hromada M.** 2019. A revised annotated checklist of louse flies (Diptera, Hippoboscidae) from Slovakia. *ZooKeys*, 862: 129–152. <https://doi.org/10.3897/zookeys.862.25992>
- Philips J.R. & Fain A.** 1991. Acarine symbionts louse-flies (Diptera: Hippoboscidae). *Acarologia*, 32: 377–384.

Received 18 June 2022 / Accepted 4 October 2022. Editorial responsibility: A.A. Przhiboro