

TAXONOMIC STATUS OF *ICOSTA OMNISETOSA* MAA, 1969, STAT. N. (DIPTERA: HIPPOBOSCIDAE) IS UPGRADED TO SPECIES RANK

E. P. Nartshuk¹⁾, A. A. Yatsuk^{2*)}, P. S. Tomkovich³⁾, A. V. Matyukhin²⁾

1) Zoological Institute, Russian Academy of Sciences, Universitetskaya Emb. 1, St. Petersburg, 199034, Russia.

2) A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Leninskiy Av. 33, Moscow, 119071, Russia. *Corresponding author, E-mail: sasha_djedi@mail.ru

3) Zoological Museum, M.V. Lomonosov Moscow State University, Bolshaya Nikitskaya Str. 2, Moscow, 125009, Russia.

Summary. A study of morphology and biology of the louse flies *Icosta holoptera holoptera* Lutz, 1915 and *I. holoptera omnisetosa* Maa, 1969 showed that they are two different species. Specimen of *I. omnisetosa* stat. n., a parasite of migrant pintail snipe *Gallinago stenura* (Bonaparte), is recorded from Chukotka Autonomous Region (Russia) for the first time.

Key words: Diptera, Hippoboscidae, louse flies, taxonomy, Chukotka, Russia.

Э. П. Нарчук, А. А. Яцук, П. С. Томкович, А. В. Матюхин. Повышение таксономического ранга *Icosta omnisetosa* Мaa, 1969, stat. n. (Diptera, Hippoboscidae) до видового // Дальневосточный энтомолог. 2024. N 508. С. 27-32.

Резюме. Изучение морфологии и биологии кровососок *Icosta holoptera holoptera* Lutz, 1915 и *I. holoptera omnisetosa* Мaa, 1969 показало, что они являются двумя самостоятельными видами. Кровососка *I. omnisetosa* stat. n. впервые обнаружена в Чукотском автономном округе на азиатском бекасе *Gallinago stenura* (Bonaparte).

INTRODUCTION

The parasites family Hippoboscidae includes more than 213 species; all of them feed on blood of mammals and birds (Hutson, 1984; Doszhanov, 2003; Dick, 2018; Lee *et al.*, 2022; Oboňa *et al.*, 2022). Hippoboscidae are known as carriers of viruses and diseases such as borreliosis (Hill *et al.*, 1967; Ganez *et al.*, 2002; Farajollahi *et al.*, 2005; Khametova *et al.*, 2018).

The largest genus of family is *Icosta* Speiser, 1905. It includes about 65 species (Maa, 1969) or 53 species (Dick, 2018). Lutz described *Icosta holoptera* from Brazil by female (Lutz *et al.*, 1915). The description of male was given by Bequaert (1957). Maa (1969) in his revision of the genus *Icosta* included *I. holoptera* into the subgenus *Ardmoeca* Maa, 1969 and proposed that *I. holoptera holoptera* is wide distributed in Nearctic and Neotropical Regions and is oligoxenous on Gruiformes, Tinamiformes and Passeriformes. In the same paper Maa

described new subspecies *I. holptera omnisetosa* Maa, 1969 from New Guinea, Philippines, Malaya, and southeast China (Tunglu Checkiang) as parasite of Gruiformes and Charadriiformes. The aim of the present study is to clarify the actual taxonomic status of *I. holoptera omnisetosa* and to report about the northernmost find of this fly on the territory of Russia.

MATERIAL AND METHODS

Bird parasite fly was collected on the pintail snipe *Gallinago stenura* (Bonaparte, 1831) obtained in the vicinity of Meinypilgyno Village. The material is fixed in 96% ethanol. Morphological terminology follows Maa (1969).

As part of the research programs of Birds Russia (<https://birdsrussia.org>) and expedition in 2019 to the Anadyrsky District (Russian Far Eastern) birds were collected for research purposes under permit 87 № 000004, issued to P.S. Tomkovich by the Department of Conservation and Use of Wildlife of the Committee of Nature Resources and Ecology of the Chukotka Autonomous Region. Under this permit, on 2 June 2019, a migrant pintail snipe *Gallinago stenura* (Bonaparte, 1831) was collected on the coastal low shrub tundra with puddles near the border with moraine hills (62.54947 N, 177.01657 E). The skin of this bird is preserved in the collection of the Zoological Museum of M.V. Lomonosov Moscow State University (specimen number R-141821). The names of birds are given in accordance with modern systematic data.

TAXONOMY

Family Hippoboscidae

Subfamily Ornithomyiinae

Genus *Icosta* Speiser, 1905

Subgenus *Ardmoeca* Maa, 1969

Icosta (Ardmoeca) omnisetosa Maa, 1969, stat. n.

Figs 1–5

MATERIAL EXAMINED. **Russia:** Chukotka Autonomous Region, Anadyrsky District, Meinypilgyno, on pintail snipe *Gallinago stenura*, 2.VI 2019, 1 ♀, coll. P. Tomkovich. The specimen in ethanol is deposited in the collection of the Zoological Institute of the Russian Academy of Sciences, St. Petersburg.

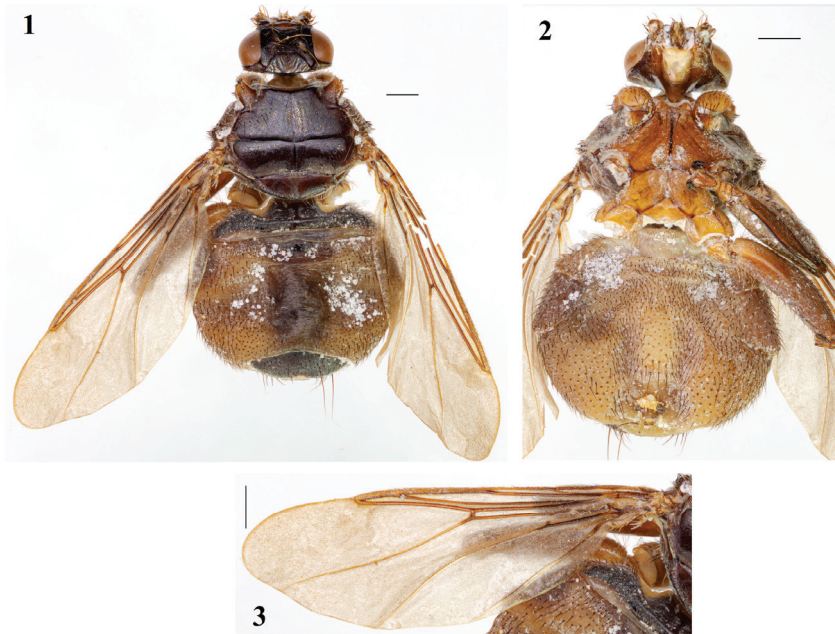
DESCRIPTION (female from Chukotka). *Head and thorax* length combined 2.8–3 mm.

Head dark brown. The width of the eye is one fourth of the width of the head. The vertex on the posterior margin is approximately 2 times wider than the eye. The parafrontals are wide. The setae on the parafrontals are yellow. One of them is strong and long. The forehead front is V-shaped, the horns form a sharp curve. Palpus is 1.5 long as antenna.

Mesonotum dark brown and mostly bare. Humeral tubercles approximately cone-shaped, protruding anterolaterally. Among the small yellow setae, there are 2 long setae – dark and yellow. Prescutum sparsely feebly striate all over. About 20 laterocentral yellow setae on each side on prescutum. About 7 yellow setae on each side of scutum. Large setae are located almost in the middle of the upper row.

Scutellum posterolaterally rounded, posteriorly distinctly convex. Interdistance of bases of scutellar setae more than 2 median length of scutellum. Ventral side of thorax light with brown triangles on sides. Prosternum well sclerotized, semicircular, with 2–3 pairs of setae. Mesosternum roundly shallowly notched.

Wing length 5.0 mm. Wing with 2 transverse veins and correspondingly with 2 closed basal cells *1bc* and *2bc*. 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} . Costa and basicosta covered with hairs. Microtrichia covering almost entire wing except for thin strip at lower edge of wing.



Figs 1–3. *Icosta omnisetosa* stat. n., female from Chukotka. 1 – habitus, dorsal view; 2 – same, ventral view; 3 – wing. Scale bars: 0.5 mm.

Legs brown. Ventral side of femur 3 densely uniformly setose except an oval bare area at base. Claws bifid. Empodium and paired pulvilli not reduced.

Abdomen rather uniformly covered with moderately long and stout setae. On the dorsal side the median area is largely bare. Tergite 3 is small, well sclerotized to a shiny spot only in the center. Tergite 6 is large, reaching the edges of the abdomen. Its dorsal margin is almost straight, and its apical margin is notched. On the ventral side of the abdomen, bare areas are located only in the basal part and around the genital area. In the upper half of the abdomen the setae are denser. From there, in the apical direction, on each side there is a narrow vertical stripe of dense setae.

REMARKS. Till now *Icosta holoptera* is divided in two subspecies, nominotypical *I. holoptera holoptera* Lutz, 1915 distributed in USA (Massachusetts, Ohio, Pennsylvania, South Carolina, Wisconsin) (Bequaert, 1954), Brazil (State of Rio de Janeiro) (Lutz *et al.*, 1915) and Colombia (Bequaert, 1965) and *I. holoptera omnisetosa* Maa, 1969 known from New Guinea, Philippines, Malaya, China (Chekiang) (Maa, 1969), Japan (Okinawa) (Mogi *et al.*, 2002), and Amur Region in Russia (Meißner *et al.*, 2020). Specimens from the Old World have 1 long seta on the posterior edge of the inner orbit, a postvertex without a distinct depressed spot, the inner corner of the horns is V-shaped, the edge of the ridge on

the dorsal side of the horns with a small projection. Specimens from the New World have two long setae on the posterior edge of the inner orbit, a postvertex with a clearly depressed spot, the inner corner of the horns is U-shaped, and the edge of the ridge on dorsal side of the horns is smooth and straight. The shape of the horns is an important species feature, as shown in Doszhanov (2003). Therefore, we propose that *I. omnisetosa* **stat. n.** should be considered as distinct species.

The specimen from Chukotka differs from *I. omnisetosa* by one seta on humeral tubercles, bare area in the top of basal part, continuing down to sides in upper third of female abdomen ventral side and vertical stripe of dense setae, continuing to sides in down part, and absence of vertical stripe of dense setae.



Figs 4–5. Female head of *Icosta omnisetosa* stat. n., from Chukotka. 4 – frontal view; 5 – dorso-frontal view. Scale bars: 0.5 mm.

HOSTS. The specimen from Chukotka was collected on the pintail snipe *Gallinago stenura* (Bonaparte, 1831). This bird breeds in northern Russia and migrates to spend the non-breeding season in southern Asia (Pakistan, India, Sri Lanka, Southeast Asia, and Indonesia). As the hosts of *I. omnisetosa* were listed *Amaurornis phoenicurus* (Pennant, 1769), *Gallinago stenura*, *Gallinula tenebrosa* Gould, 1846, *Lanius cristatus* (Linnaeus, 1758), *Lewinia striata* (Linnaeus, 1766), *Porphyrio melanotus* (Temminck, 1820), *Rallus pectoralis* Temminck, 1831 and *Zapornia tabuensis* (Gmelin, 1789) (Maa, 1969). In Japan *I. omnisetosa* was found on *A. phoenicurus* and *Gallinago hardwickii* (Gray, 1831) (Mogi *et al.*, 2002).

At the same time, in Brazil, *I. holoptera* was found on red-winged tinamou *Rhynchotus rufescens* (Temminck, 1815), a ground-living bird from central and eastern South America, and on *Aramides saracura* (Spix, 1825), living in Argentina, Brazil, Paraguay and Uruguay (MacArthur, 1948). The male of *I. holoptera* was described from *Thamnophilus unicolor grandior* Hellmayr, 1924 distributed in Colombia, Ecuador, and Peru (Bequaert, 1957).

CONCLUSION

We upgrade the subspecies *I. holoptera omnisetosa* to the species rank. We also report the northernmost find of this species in Chukotka (Russia). This region is situated far from other known localities of *I. omnisetosa*. The small but noticeable morphological differences of the Chukotka specimen from the other Old World specimens are discussed.

ACKNOWLEDGEMENTS

We thank Sergei A. Shchedrin (Moscow, Russia) for the perfect photos. The work was performed as part of the State Research Projects of the A.N. Severtsov Institute of Ecology and Evolution (No. FFER-2024-0018) and Zoological Institute (No. 122031100272-3). The bird host of the described fly specimen was obtained due to field activities of the Birds Russia.

REFERENCES

- Bequaert, J.C. 1954. The Hippoboscidae or louse-flies (Diptera) of mammals and birds. Part 2. Taxonomy, evolution and revision of American genera and species. *Entomologica americana*, 35: 233–416.
- Bequaert, J.C. 1957. The Hippoboscidae or louse-flies (Diptera) of mammals and birds. Part 3. *Entomologica americana*, 36: 417–611.
- Bequaert, J.C. 1965. The family Hippoboscidae. P. 916–921. In: A. Stone. C.W. Sabrosky, W.W. Wirth, R.H. Foot and J.R. Coulson. *A catalog of the Diptera of North America north of Mexico*. Washington.
- Dick, C.W. 2018. *Checklist of World Hippoboscidae (Diptera: Hippoboscoidea)*. Department of Zoology, Field Museum of Natural History, Chicago, 7 pp.
- Doszhanov, T.N. 1980. *Louse flies (Diptera, Hippoboscidae) in Kazakhstan*. Nauka, Alma-Ata. 280 pp. [In Russian]
- Doszhanov, T.N. 2003. *Louse flies (Diptera, Hippoboscidae) of the Palaearctic region*. Nauka, Almaty. 277 pp. [In Russian]
- 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. DOI: 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. DOI: 10.3201/eid1012.040167
- 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. DOI: 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. Vol. 10. N. 7*. Royal Entomological Society of London, London. 43 pp.
- 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. DOI: 10.33092/0025-8326mp2018.4.33-39 [In Russian]
- Lee, L., Tan, D.J.X., Oboňa, J., Gustafsson, D.R., Ang, Y. & Meier, R. 2022. Hitchhiking into the future on a fly: Toward a better understanding of phoresy and avian louse evolution (Phthiraptera) by screening bird carcasses for phoretic lice on hippoboscid flies (Diptera). *Systematic Entomology*, 47(3): 420–429. DOI: 10.1111/syen.12539
- Lutz, A., Neiva, A. & Lima, A.Da C. 1915. Sorba ‘Pupipara’ ou ‘Hippoboscidae’ de aves brasileiras. *Memorias do instituto Oswaldo Cruz*, 7(2): 172–190.
- Maa, T.C. 1969. Revision of *Icosta* Speiser (= *Lynchia* auctt.) with erection of a new related genus *Phthona* (Diptera: Hippoboscidae). *Pacific Insects Monograph*, 20: 25–203.
- MacArthur, K. 1948. The louse flies of Wisconsin and adjacent states (Diptera: Hippoboscidae). *Bulletin of the Public museum of the city of Waukeez*, 8(4): 367–440.

- Meißner, B.R., Rodríguez-Vera, F., Hawlitschek, O., Heim, W. & Jentsch, M. 2020. Incidence of louse flies on birds from the Russian Far East (Diptera: Hippoboscidae) and investigation of the status of some taxa by DNA barcoding. *Russian Entomological Journal*, 29(3): 327–335.
- Mogi, M., Mano, T. & Sawada, I. 2002. Records of Hippoboscidae, Nycteribiidae and Streblidae (Diptera) from Japan. *Medical Entomology and Zoology*, 53(2): 141–165. DOI:10.7601/mez.53.141
- Oboňa, J., Fogašová, K., Fulín, M., Greš, S., Manko, P., Repaský, J., Roháček, J., Sychra, O. & Hromada, M. 2022. Updated taxonomic keys for European Hippoboscidae (Diptera), and expansion in Central Europe of the bird louse fly *Ornithomya comosa* (Austen, 1930) with the first record from Slovakia. *ZooKeys*, 1115: 81–101. DOI: 10.3897/zookeys.1115.80146

© **Far Eastern entomologist (Far East. entomol.)** Journal published since October 1994.

Editor-in-Chief: S.Yu. Storozhenko

Editorial Board: A.S. Lelej, S.A. Belokobylskij, M.G. Ponomarenko, V.A. Mutin, E.A. Beljaev, E.A. Makarchenko, A.V. Gorochoy, T.M. Tiunova, M.Yu. Proshchalykin, S.A. Shabalin, V.M. Loktionov

Address: Federal Scientific Center of the East Asia Terrestrial Biodiversity (former Institute of Biology and Soil Science), Far East Branch of the Russian Academy of Sciences, 690022, Vladivostok-22, Russia.

E-mail: storozhenko@biosoil.ru

web-site: <http://www.biosoil.ru/fee>