

**The fauna of non-biting midges subfamily Chironominae
(Diptera, Chironomidae) of the Anyuiskii Nature Park and neighbouring areas
in the Khabarovskii Krai, Russia**

**Фауна комаров-звонцов подсемейства Chironominae (Diptera, Chironomidae)
национального парка «Анюйский» и сопредельных территорий
Хабаровского края России**

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Ключевые слова: Diptera, Chironomidae, фауна, национальный парк Анюйский, Хабаровский край.

Abstract. Data on the chironomid fauna (subfamily Chironominae) of the Anyuiskii Nature Reserve and neighbouring areas, based on a study of imaginal material are presented. The rivers and reservoirs within the nature reserve support 70 species belonging to 29 genera and two tribes. Three species new to science were found in the reserve and bordering territories: *Polypedium* sp., *Tribelos* sp. and *Tanytarsus* sp. Their descriptions will be published in a separate article. *Microtendipes shoukomaki* Sasa, 1989 is recorded in the Russian fauna for the first time; it was previously known only from Japan. Fifty-four species were reported for the first time in Anyuiskii National Park. Of the 49 species that were identified, 34 (60 %) have a Palearctic distribution and 23 (40 %) have a Holarctic distribution. The greatest diversity of non-biting midges of the Chironominae subfamily was recorded in the Anyui River basin rivers — 34 species, and in an unnamed pond near the ANP office in Troitskoye Settlement — 33 species. Fewer species of chironomids were found in the Gassi Lake basin: Pihtsa, Mulchu and Khar rivers — 17 species. Eighteen species were found in the watercourses of the Hutu River basin in the adjacent territory.

Резюме. Приведены данные по фауне хирономид подсемейства Chironominae национального парка «Анюйский», основанные на изучении имагинального материала. Для водотоков и водоёмов заповедника зарегистрировано 70 видов из 29 родов, 2 триб. Обнаружено 3 новых для науки вида: *Polypedium* sp., *Tribelos* sp. и *Tanytarsus* sp., описание которых будет представлено в других работах. Впервые для национального парка «Анюйский» отмечено 39 видов. По типам распространения, из 54 достоверно определённых до вида хирономид, преобладают палеарктические виды, которых 34 вида или 60% от их общего числа. Голарктических видов зафиксировано 23 или 40 %. Наибольшее разнообразие комаров-звонцов подсемейства Chironominae зафиксировано в бассейне р. Анюй — 34 вида, и в пруде

без названия возле конторы национального парка «Анюйский» — 33 вида, на реках бассейна озера Гасси, таких как Пихца, Хар и Мульчи, найдено 14 видов. На реках бассейна р. Хуту, прилегающих к территории национального парка, зарегистрировано 18 видов.

Introduction

Anyuiskii National Park is the largest specially protected natural area in Russia in the Amur River basin. It was established in 2007 in the Nanai District of Khabarovskii Krai on the western macroslope of the Sikhote-Alin Mountains, covering an area of 429,370 hectares [Pomazkova, 2011]. Within the national park's territory, the largest bodies of water are the Anyui, Manoma, Tormasu, and Pikhtsa rivers and Lake Gassi. They are unique in their location and natural characteristics, as it is in these places that the boundary between different climatic zones passes, and therefore a diversity of landscapes and fauna is noted here [Tselenko, 2019].

The first data on the chironomid fauna of the reservoirs and streams of Anyuiskii National Park appeared in the middle of the last century. Members of the Amur Expedition (1945–1949) were the first to collect adult and benthic material from aquatic insects at Lake Gassi. According to A.S. Konstantinov [1950], the chironomid larvae in the lake were represented by the following forms: *Cryptochironomus* gr. *defectus*, *C.* gr. *viridulus*, *Glyptotendipes* gr. *gripekoveni*, *Polypedium* gr. *scalaenum*, *Stictochironomus* gr. *histrion*, *Tanytarsus* gr. *mancus*, *Cricotopus* gr. *silvestris*. The next study of the chironomine fauna of Lake Gassi was carried out only 68 years later by

N.M. Yavorskaya [2018], as a result of which 22 species from 16 genera of the subfamily Chironominae were registered (including Chironomini — 18 species, 12 genera, Tanytarsini — 4 species, 4 genera). In the work of Vorobyova and Chertoprud [2023], devoted to the analysis of the distribution patterns of macrozoobenthos in the watercourses of the Bakhhal and Anyui river basins, only a few larval forms of chironomina are mentioned.

This paper presents the results of a study of the imaginal material of non-biting midges of the subfamily Chironominae of the Anyuiskii National Park with an analysis of their distribution types and remarks on the taxonomy of some species.

Material and methods

The material for this work originated from the entomological collections of chironomid adults made in the spring and summer of 2018–2020 by N.M. Yavorskaya (Institute of Water and Environmental Problems, Far Eastern Branch of the Russian Academy of Sciences, Khabarovsk) on watercourses and reservoirs of the Anyuiskii National Park and summer of 2011 by E.A. Makarchenko (Federal Scientific Center of the East Asia Terrestrial Biodiversity, Far East Branch of the Russian Academy of Sciences) of the bordering territories.

N.M. Yavorskaya carefully explored such rivers and channels of the Anyui River basin — Oba, Bira, Tomasu, Solomi, Gobilly, Moadi, Mukhe, Bohbasu, Adju, and Passy (Nanai district). N.M. Yavorskaya also collected imaginal material from the rivers Pihtsa, Mulchi and Khar, a tributary of Gassi Lake (Nanai district). The locations for collecting material are indicated in Figure 1 in the article by N.M. Yavorskaya [2021]. Evgeny Anatolyevich Makarchenko collected imaginal material on the rivers adjacent to the Anyuiskii National Park, namely, Chistovodnaya, Sakai-Balu, Mulchi, Buta, and Adjalami (Vaninsky district).

The capture of chironomid adults was carried out by «mowing» coastal vegetation with an entomological net and exposure to light, and fixed them in 96 % ethanol. Types of distribution are given according to K.B. Gorodkov [1984] with our additions. The taxonomic notes use the terminology and abbreviations of O.A. Sæther [1980].

The photographs were taken using an Axio Lab.A1 (Carl Zeiss) microscope with an AxioCam ERc5s digital camera and an Olympus SZX16 stereomicroscope with an Olympus DP74 digital camera, and then stacked using Helicon Focus software. The final illustrations were post-processed for contrast and brightness using Adobe® Photoshop® software.

The list of chironomid species (Diptera, Chironomidae) of the subfamily Chironominae collected from the Anyuiskii National Park and bordering territories in Khabarovskii Krai of Russia is presented in the Appendix (p. 3–6).

The present work is registered in ZooBank (www.zoobank.org) under urn:lsid:zoobank.org:pub:3707B104-57B5-46CD-8CDF-F3D00E055A0B

Results

Thus, the fauna of non-biting midges of the subfamily Chironominae from the Anyuiskii National Park and bordering territories is represented by 70 species from 29 genera, 2 tribes, namely: *Chironomus* sp., **Chironomus (Lobochironomus) storai* Goetghebuer, 1937, *Chironomus (Lobochironomus)* sp., **Cladopelma krusemani* (Goetghebuer, 1935), **Cladopelma viridula* (Linnaeus, 1767), **Cyphomella cana* (Strobl, 1910), **Demicryptochironomus (Demicryptochironomus) chuzequartus* Sasa, 1984 sensu Zorina, 2004, **Demicryptochironomus (Demicryptochironomus) evgenii* Zorina, 2004, *Demicryptochironomus (Demicryptochironomus)* sp., **Dicrotendipes lobiger* (Kieffer, 1921), *Dicrotendipes pulsus* (Walker, 1856), **Einfeldia pagana* (Meigen, 1838), **Endochironomus stackelbergi* Goetghebuer, 1935, *Glyptotendipes* sp., **Microtendipes famiefus* Sasa, 1996, **Microtendipes shoukomaki* Sasa, 1989, **Microtendipes umbrosus* Freeman, 1955, **Omissus caledonicus* (Edwards, 1932), **Parachironomus parilis* (Walker, 1856), *Paralauterborniella nigrohalteralis* (Malloch, 1915), **Phaenopsectra flavipes* (Meigen, 1818), *Polypedium (Pentapedilum) sordens* (v.d. Wulp, 1874), **Polypedium (Pentapedilum) tritum* (Walker, 1856), **Polypedium (Polypedium) albicorne* (Meigen, 1838), **Polypedium (Polypedium) kyotoense* (Tokunaga, 1938), **Polypedium (Polypedium) laetum* (Meigen, 1818), **Polypedium (Polypedium) pedestre* (Meigen, 1830), **Polypedium (Polypedium) tamanigrum* Sasa, 1983, *Polypedium (Polypedium)* sp., **Polypedium (Tripodura) acifer* Townes, 1945, **Polypedium (Tripodura) pullum* (Zetterstedt, 1838), **Polypedium (Uresipedilum) cultellatum* Goetghebuer, 1931, **Polypedium (Uresipedilum) hirosimaense* Kawai et Sasa, 1985, **Sætheria reissi* Jackson, 1977, *Sergia* sp., **Stenochironomus gibbus* (Fabricius, 1794), **Stenochironomus pannus* Borkent, 1984, **Stictochironomus pictulus* (Meigen, 1830), *Stictochironomus* sp.1, *Stictochironomus* sp.2, **Synendotendipes lepidus* (Meigen, 1830), *Tribelos* sp., **Cladotanytarsus nigrovittatus* (Goetghebuer, 1922), **Cladotanytarsus saetheria* Gilka, 2001, *Cladotanytarsus* sp., **Constempellina brevicosta* (Edwards, 1937), **Constempellina tokunagai* Zorina, 2011, **Micropsectra chuzenotescens* Sasa, 1984, **Micropsectra koreana* Ree, 1992, **Micropsectra nana* (Meigen, 1818), **Micropsectra pharetrophora* Fittkau et Reiss, 1999, **Micropsectra recurvata* Goetghebuer, 1928, **Micropsectra schrankelae* Stur et Ekrem, 2006, **Micropsectra togacontralia* Sasa et Okazawa, 1991, **Neozavrelia nadezhdae* Orel, 2021, **Neozavrelia yakuefea* (Sasa et Suzuki, 2000), **Paratanytarsus austriacus* (Kieffer, 1924), **Paratanytarsus tenuis* (Meigen, 1830), **Rheotanytarsus okisimplex* Sasa, 1993, **Rheotanytarsus pentapoda* (Kieffer, 1909), **Stempellinella chirka* Orel, 2023, **Tanytarsus heusdensis* Goetghebuer, 1923, **Tanytarsus agg. lestagei*, **Tanytarsus volgensis* Miseiko in Konstantinov, 1967, *Tanytarsus* sp., **Zavrelia elenae* Zorina, 2008, **Zavrelia pentatoma* Kieffer, 1913 and **Zavrelia pseudopentatoma* Zorina, 2008.

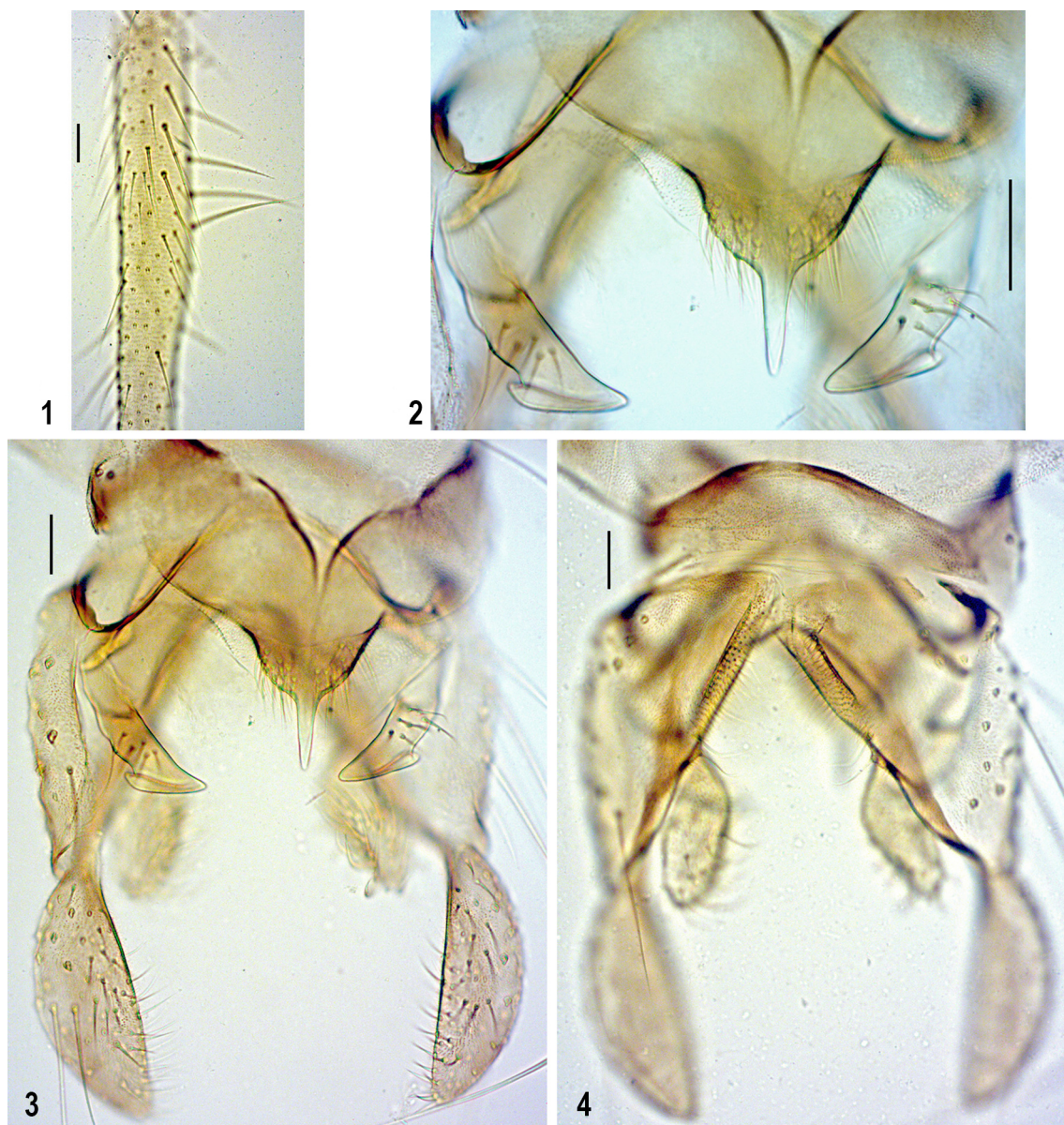
On the territory of the reserve and bordering territories 3 species new to science from the genera *Polypedilum*, *Tribelos* and *Tanytarsus* are revealed, their descriptions will be published in a separate article. *Microtendipes shoukomaki* Sasa, 1989 is indicated for the fauna of Russia for the first time, previously it was known only from Japan. Details of the male structures of *Microtendipes shoukomaki* Sasa, 1989 are given in Figs 1–4.

Fifty-four species turned out to be new to the Anyuiskii National Park and bordering territories (marked with an asterisk in the list of species above). A number of unidentified adult male species from the genera *Chironomus*, *Glyptotendipes*, *Polypedilum*, *Sergentia*

and *Tribelos* listed above will be identified in the future using DNA analysis.

According to the types of distribution, out of 57 reliably determined to the species of chironomids, Palearctic species predominate, of which 34 or 60 %. Of these, 15 species belong to the eastern Palearctic continental-island, 14 to the Palearctic trans-Eurasian polydisjunctive, 4 to the eastern Palearctic continental, and 1 to the Palearctic amphi-Eurasian type of distribution. Holarctic species accounted for 23 or 40 % of all species.

The greatest diversity of non-biting midges of the subfamily Chironominae was recorded in the rivers of the Anyui River basin (34 species), namely, Oba canal — 21 species, a significantly smaller number of



Figs 1–4. Details of the male structure of *Microtendipes shoukomaki* Sasa, 1989. 1 — fore tibia; 2–3 — hypopygium, dorsal view; 4 — hypopygium, ventral view. Scale bar 50 μ m.

Рис. 1–4. Детали строения самца *Microtendipes shoukomaki* Sasa, 1989. 1 — бедро передней ноги; 2–3 — гипопигий, дорсально; 4 — гипопигий, вентрально. Масштабная линейка 50 мкм.

species were noted on the rivers: Tormasu (7), Solomi (6), Gobilli (6), Moadi (6), Anyui (4), Mukhe (4), and Bohbasu (3). Thirty-three species have been recorded on an unnamed pond near the ANP office (Troitskoye Village). Fewer species of chironomids were found in the Gassi Lake basin — Pihtsa, Mulchu and Khar rivers (17). We found 18 species in the watercourses of the adjacent territory in the Hutu river basin.

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