

CHIRONOMID FAUNA OF THE RIVER ANGARA

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Introduction

The Angara is the main river of Eastern Siberia. It flows out of the oligotrophic Lake Baikal and after 1779 km joins the river Yenisey. The water of the Angara remains baikalian for a significant distance. Even at the mouth of the river 45% of the total water is baikalian. According to R. A. GOLYSHKINA (1970) the substratum is composed mainly of stones, due to relief and geological structure. The Angara previously was a mountain river with a high current velocity of 7 km h⁻¹ in depositing areas and 12 - 15 km h⁻¹ in eroding areas.

Different authors have studied the chironomid fauna of the Angara. 144 species and forms of Chironomids (Tanypodinae - 10, Diamesinae - 10, Prodiamesinae - 2, Orthocladiinae - 63, Chironominae - 59) have been found in it. 5 species (*Diamesa baicalensis* CHERN., "*Orthocladius compactus* LINEVICH", *O. gregarius* LINEVICH, *O. setosus* LINEVICH, *Neozavrelia minuta* LINEVICH) are endemics of Baikal; *Cricotopus angarensis* LINEVICH is an endemic of the Angara.

Chironomid fauna before the dams

A. A. LINEVICH (1953, 1957, 1981) studied the chironomid fauna over the region from its outflow from Lake Baikal to the city of Bratsk (670 km) from material collected during the 1940-s. Later, in the middle of 1960-s N. V. VERSHININ (1967) studied the chironomids from the city of Svirsk to Bratsk (470 km). The chironomid fauna of the lower part of the Angara from the settlement Motygin to its mouth (123 km) was studied by I. I. GREZE (1953) in the 1950- s.

The Angara from the Lake Baikal outflow to Bratsk is divisible into three parts: 1) from outflow to Irkutsk, 2) from Irkutsk to the inflow of the river Kitoy, 3) from the mouth of Kitoy to Bratsk.

According to A. A. LINEVICH (1953, 1957, 1981) over the first part representatives of the subfamilies Diamesinae and Orthocladiinae dominated (listed in order of abundance): *Diamesa baicalensis* CHERN., "*Par-orthocladius tridentifer* LINEVICH", "*Orthocladius compactus* LINEVICH", *O. frigidus* (ZETT.), *O. trigonolabis* ED W., *Eukiefferiella coerulea* KIEFF., *E. clypeata* KIEFF., "*E. longicalcar* KIEFF.", *E. similis*

GOETGH., *Diplocladius cultriger* KIEFF., *Pagastia lanceolata* (TOK.), *Potthastia longimana* (KIEFF.), *Pseudodiamesa nivos* (GOETGH.), *Lauterbornia* sp., *Polypedilum* sp. (*Chironomina genuina* N3 LIPINA), "*Stictochironomus psammophilus* CHERN.", i. e. mainly lithorheophilic species.

The second part was dominated by the following species: *D. baicalensis*, *O. trigonolabis*, *O. frigidus*, *O. compactus*, *Polypedilum convictum* (WALK.), *Pagastia lanceolata*, *Potthastia gaedii* (MEIG.), *Pseudodiamesa nivos*, *E. coerulea*, *O. consobrinus* (HOLMG.), *C. angarensis*, *Eukiefferiella* sp., *Pagastia orientalis* (CHERN.). So, over the second part most species of the genus *Eukiefferiella* are absent, but lithorheophilic species (subfamilies Diamesinae and Orthocladiinae) continue to dominate.

Over the third part the following species are mentioned: *Pagastia lanceolata*, *Potthastia gaedii*, *Eukiefferiella coerulea*, *O. trigonolabis*, *O. compactus*, *O. frigidus*, *Polypedilum convictum*, *Pseudodiamesa nivos*, *Monodiamesa bathyphila* (KIEFF.), *Stictochironomus psammophilus*, *Polypedilum bicrenatum* KIEFF., *O. consobrinus*, *Cryptochironomus* gr. *defectus* (KIEFF.) *Harnischia curtilamellata* (MALLOCH), *Paracladopelma camptolabis* (KIEFF.), *Paratendipes "connectens"* N3 LIPINA, *Tanytarsus exiguus* JON., *Parorthocladius nudipennis* (KIEFF.), *D. baicalensis* and *Brillia bifida* (KIEFF.) In terms of numbers *P. lanceolata* and *P. gaedii* are first; in terms of the number of species, the subfamily Chironominae dominates.

Unfortunately, I.I. GREZE (1953) does not give a full list of the species of the lower part of the river, but only the dominant ones. The dominant species inhabiting vegetation are the larvae of *Tanytarsus exiguus*, *Polypedilum nubeculosum* MEIG., and *O. thienemanni* KIEFF. Vegetation on pebbles is inhabited by *T. exiguus*, *Micropendipes pedellus*, *Polypedilum scalaenum* (SCHRANK) and *Glyptotendipes gripenkoveni* KIEFF.. Sand is dominated by *Chernovskia orbiculus* TOWNES (*Chernovskia ra* ULOMSKY), *Robackia demeijerei* (KRUS.) and *Beckidia zabolotzkyi* (GOETGH.), species not found in the upper parts of the river. There are pelorheophilic and psammorheophilic forms dwelling in silted

sand: the most common among them are *Polypedilum bicrenatum* KIEFF., *P. scalaenum* (SCHRANK), *Cladotanytarsus* gr. *mancus* (WALK.), *Chironomus* gr. *thummi* (KIEFF.), and *Ch. pr. plumosus-reductus* LIPINA. Silt is inhabited by *Chironomus* gr. *thummi*. General features of the chironomid fauna of the lower part seem to be quite different from those of the upper parts. A rheophilic complex, including baikalian species and mainly composed of species belonging to the Diamesinae and Orthocladiinae, inhabits the typical stony biotopes of the upper parts of the river; this is replaced in the lower parts by a common complex of river forms belonging mainly to the Chironominae. In sandy biotopes the psammorheophils *C. ra*, *R. demejerei*, and *Bekidia zabolotzkyi* are found.

Present state of the chironomid fauna after erecting the complex of dams

The river Angara is unaffected initially (about 7 km), from Irkutsk to settlement Telma (about 80 km) and below the dam of the Ust-Ilim hydropower station to its mouth (962 km). Close to its outflow from Lake Baikal the same species that dwelled here before the regulation remain; the 5 baikalian endemic species mentioned above are still to be found. Lithorheophilic forms found in the 40-s dominate. After the regulation in the middle 70-s we have investigated the river near Angarsk (at 10 km). Comparison of the chironomids before and after the regulation has shown some changes in composition (TOMILOV & al. 1977). *O. frigidus*, *P. lanceolata*, *P. gaedi*, *O. consobrinus* and *S. psammophilus* which were here before regulation are no longer to be found. *O. gr. olivaceus* and *P. tridentifer* dominate and *D. baicalensis* occurs in stony substrata. In the bottom vegetation *O. saxicola* and *C. angarensis* prevail. *Polypedilum* sp. (Chironominae sp. N3 LIPINA) and *Monodiamesa bathyphila* (KIEFF.) dominate in silted sand. During 1973-1975 the chironomid fauna near the future Ust-Ilim reservoir over the 302 km from Bratsk to Ust-Ilimsk was investigated. 91 species were found, 42 species belonging to the subfamily Chironominae: *D. baicalensis* and *O. olivaceus* dominate in stony sediments; *Prodiamesa olivacea* and *Chironomus obtusidens* on small pebbles and silted sand; *Cricotopus sylvestris*, *C. biformis*, *O. frigidus* and *Diplocladius cultriger* on stones covered with algae; *Chironomus cingulatus* MEIG., *Paratendipes albimanus* (MEIG.), "*Paratrichocladius inaequalis*

KIEFF." and *Tanytarsus* gr. *gregarius* KIEFF. in silted sediments.

At the end of the 80-s to the beginning of the 90-s we studied the chironomids of the Angara below the dam of the Ust-Ilim power station (KOZHOVA & al. 1993) from the city of Ust-Ilimsk to the mouth of the river Kata (about 90 km). Here there are lot of eroding currents with high velocity: 51 species of Chironomidae were found, about 50 % representatives of the subfamily Orthocladiinae. *D. baicalensis*, *P. lanceolata* and *Pagastia orientalis* dominate on stony sediments; *Cricotopus sylvestris*, *C. biformis* and *O. saxicola* dominate on stones covered with *Ulothrix*; *P. nivosa*, *P. olivacea*, *O. olivaceus*, *Diamesa insignipes* KIEFF., *Eukiefferiella coeruleascens*, *P. inaequalis* and *Micropsectra junci* (MEIG.) in silted sand and pebbles; *Paratendipes albimanus* in silt. *O. frigidus*, *O. consobrinus*, *O. compactus*, *O. gregarius*, *C. angarensis*, *P. inaequalis*, *Cr. gr. defectus*, *Cladopelma viridula* (L.), *Parachironomus pararostratus*, *Polypedilum bicrenatum*, *E. albipennis*, *Microtendipes pedellus* (DE GEER) and *Cladotanytarsus* gr. *mancus* (WALK.) found in upper parts are not found here.

Conclusion

In the river Angara from its outflow from Lake Baikal to its junction with the River Yenisey hydrologic conditions change: decrease of current velocity, increase of water temperature, decrease of transparency, and increase in deposition of sand and silt, i.e. the transformation of a mountain river into the usual Siberian river, and consequent changes in the chironomid fauna take place. In the upper parts of the river lithorheophils of the subfamilies Diamesinae and Orthocladiinae prevail, whereas in the lower part, pelorheophils of the subfamily Chironominae dominate. The main characteristic feature of the river Angara - the influence of Lake Baikal on the fauna (the presence of baikalian endemics) - occurs mainly in the upper part of the river.

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