MACROZOOBENTHOS DIVERSITY AND ABUNDANCE OF THE BAHIR-DAR GULF OF LAKE TANA, ETHIOPIA

Wondie Zelalem[1], Alexander Prokin[2]

[1]Bahir Dar Fisheries and other Aquatic Life Research Center, Bahir-Dar, Ethiopia, wondiehm@gmail.com

[2]Papanin Institute for Biology of Inland Waters, Russian Academy of Sciences, Borok, Nekouz district, Yaroslavl Oblast 152742, Russia, prokina@mail.ru

Lake Tana – sourse of the Blue Nil River, situated in north-western highlands of Ethiopia, covering an area of ca 3,050 km^2, with a catchment area of ca 16,500 km^2. It is largest lake in Ethiopia, containing half of the country's fresh-water resourses. Average depth is 8 m, max. – 14. In the main rainy season (July-August) the tributaries carry heavy load of suspended silt into the lake, which increasing the turbidity of water and thereby reduce the primary production (Vijverberg et *al*., 2009). Based on chemistry, lake is mesotrophic (Teshale et *al*., 2001), but based on chlorophyll content and primary production is oligotrophic (Wondie et *al*., 2007). Bahir-Dar city located on the southern border of lake, its population is 180,000 and around the lake and its catchment live about 2 million people (Vijverberg et *al*., 2009). The area around the lake has been cultivated for centuries, but recently the local agriculture became uncontrollably applied mineral fertilizers, pesticides and increased fishing, especially large carnivores barbs, which leads to a cascade effect. We studied macrozoobenthos of 6 sampling sites in Bahir-Dar Gulf near the Bahir-Dar city, using modified Petersen-grab (Welch, 1948) with sampling area 0,016m^2, twice in each site, both in littoral (shore) zone in vegetation and in off-shore area, outside the border of vegetation. Species richness, total abundance and biomass of macrozoobenthos were estimated, without megazoobenthos representatives – bivalves Unio and crabs Potamonautes. In the period of 2013–2014, 21 species were registrated: Oligochaeta – 3, Hirudinida – 1, Bivalvia – 1, Gastropoda – 1, Odonata – 1, Trichoptera – 1, Ceratopogonidae (Diptera) – 1, Chaoboridae (Diptera) – 1, Chironomidae (Diptera) – 11. Maximum species richness (14) registrated near Enfranz mouth river, in sites Shum-Abo and Gerima – 9–10 species, and 4–5 species in others. In most sites, except Shum-Abo and Enfranz, species common for the littoral and open water are absent. Species *Branchiura sowerbyi* Beddard, 1892 (Oligochaeta) and *Chironomus formosipennis* Kieffer, 1908 (Chironomidae) registrated in all sites; *Tubifex tubifex* (Müller, 1774) (Oligochaeta) was found in 4 sites, and other species only from 1 to 3 sites. In most part of sites total abundance and biomass decreased from the dry to the wet season; typically, the abundance was higher in littoral zone as compared with open water, except the Hospital and Enfranz mouth (table), when water transparence was higher in open water zone.

Table. Total abundance, ind./m^2 (above the bar) and biomass, g/m^2 (under the bar) of macrozoobenthos in 2013–2014

Sampling site		Season			
		November 2013	March 2014	August 2014	Average
Shum-Abo	shore	1062,50 12,87	500,00 12,35	187,50 2,59	583,33 9,27
	open	281,25 6,12	375,00 6,44	187,50 0,31	281,25 4,29
St. George	shore	312,50 2,72	0	750,00 1,88	354,17 1,53
	open	0	0	0	0
Resaurt	shore	0	0	281,25 2,81	93,75 0,94
	open	62,50 0,75	0	93,75 0,28	52,08 0,34
Gerima	shore	781,25 9,28	125,00 3,62	125,00 2,16	62,50 5,02
	open	62,50 0,09	0	62,50 0,06	41,67 0,05
Hospital	shore	0	62,50 0,13	31,25 0,16	31,25 0,10
	open	125,00 0,47	825,00 12,69	0	333,33 4,37
Enfranz mouth	shore	218,75 1,22	1812,50 1,25	156,25 0,84	729,17 1,10
	open	1531,25 20,84	2625,00 22,82	593,75 5,41	1583,33 16,36

Maximum biomass in Enfranz mouth open water zone can be explained by organic pollution due to fertilizers runoff from fields: NO_3, mg/l up to 5,28 in August (like Hospital site). Shum-Abo site is located in a densely populated area without fitted sewerage. Thus, high macrozoobenthos biomass here can be explained by PO_4 contamination, up to 5,28 mg/l. Relatively high total biomass near Gerima is probably due to the existence of a birds colony: NH_3, mg/l up to 0,072 – the highest level for lake.

We are grateful for help in field work to Fedor N. Shkil, Andrey A. Darkov (A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Moscow, Russia), and coordination of work of the Joint Ethio-Russian Biological Expedition, which organized our research. Alexander Prokin's studies were financed by the grant of the Russian Science Foundation No 15-14-10020.