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SEASONAL CYCLE OF PHYTOPLANKTON IN THE POPLAVOK POND (KALININGRAD) IN 2015

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This article discusses the cycle of seasonal development of phytoplankton in the Poplavok Pond based on a comprehensive monitoring data carried out in 2015. Environmental monitoring of the reservoir included hydrological, hydro-chemical and phytoplankton investigation. The purpose of this article is to examine the annual cycle of structural and functional parameters of phytoplankton in the water body.

The study determined the taxonomic composition of phytoplankton, dynamics of species diversity, and seasonal changes in abundance and biomass of the algal flora of the pond. The article for the first time details the taxonomic composition of phytoplankton of the reservoir and its distribution pursuant to the basic divisions. 132 taxonomic units were found in the species composition of the phytoplankton community in the Poplavok Pond. The discovered structure of algae belongs to eight divisions (*Cyanoprokaryota*, *Euglenophyta*, *Bacillariophyta*, *Chrysophyta*, *Cryptophyta*, *Xanthophyta*, *Dinophyta*, *Chlorophyta* and *Streptophyta*). The algae belonging to four divisions form the taxonomic core, such as *Chlorophyta*, *Bacillariophyta*, *Cyanoprokaryota*. Such a taxonomic structure of algae is characteristic for reservoirs within urban areas.

The analysis of the dynamics of phytoplankton species diversity showed that green algae species dominated during the winter and the summer, diatoms prevailed the fall and the winter, while blue-green and *Cryptophytae* were represented in relatively equal proportions throughout the study period. The remaining divisions had a smaller share and were not represented at some seasons. The greatest species diversity was recorded in the summer period at a time of maximum water warm-up.

The features of the hydrological and hydro-chemical regimes in the reservoir influenced the level of quantitative development as well as the composition and dominance of phytoplankton within the investigated period.

The curve of the phytoplankton abundance had a double-humped pattern with a maximum in August. The total number changed dramatically from a minimum value at the beginning of the spring to the maximum in the late spring. Then it remained high until the middle of summer, where there is a sharp decline and again a sharp increase to a maximum in the late summer. Over the autumn-winter, there was a gradual decrease to a minimum values in November and December. The species of blue-green algae – *Dolichospermum spiroides* (Klebhan) Wack., L.Hoffm. & Kom., *Dolichospermum planctonicum* (Brun.) Wack., L.Hoffm. & Kom. and *Dolichospermum circinale* (Raben. ex Born. & Flah.t) P.Wack., L.Hoffm. & J.Kom. were dominant in number in nearly all seasons.

The curve of biomass shows the maximum peak in September, during other months it was significantly less. The total biomass increased from the beginning of spring to May, then it was declining until the middle of summer, afterwards the biomass rose to the mentioned highest peak in September and similarly dropped sharply within the autumn-winter. The dominant species in biomass during certain seasons were *Dinophytae* (*Ceratium hirundinella* (OF Mull.) Bergh.), blue-green algae (*Dolichospermum spiroides* (Klebhan) Wack., L.Hoffm. & Kom., *Dolichospermum planctonicum* (Brun.) Wack., L.Hoffm. & Kom. and *Dolichospermum circinale* (Raben. ex Born. & Flah.t) P.Wack., L.Hoffm. & J.Kom.) and green algae (*Pandorina morum* (OF Müller) Bory, *Pediastrum boryanum* (Turpin) Menegh.) and *Streptophyte - Closterium macilentum* Bréb.).

The changes of such factors as water temperature, permanganate value and nutrients content determined the seasonal cycle of phytoplankton and duration of the growing season but there was no close positive correlation observed.

The result of the study revealed that the water of the Poplavok Pond within the investigated period is characterized with a significant content of nutrients. Throughout the growing period of phytoplankton some species of blue-green algae dominated and the annual maximum was observed during the bloom in the reservoir in the late summer - early autumn. At this time, dinoflagellates, in particular *Ceratium hirundinella* (OF Mull. Bergh.) play an important role in the biomass. In the autumn and winter diatoms and green algae dominate in numbers and biomass. Such pattern of seasonal changes of phytoplankton and the average vegetation biomass allowed defining the Poplavok Pond as a eutrophic reservoir.

Keywords: Poplavok pond, phytoplankton, abundance, biomass, water temperature, oxidation, nutrients.

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