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A survey of botanical investigations of the waters of the Soviet Baltic in the 19th century and in the first half of the 20th century

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The earliest data of the marine plants of the Eastern Baltic date from the beginning of the 19th century (GRINDEL 1803, GERMAN 1805, FRIEBE 1805) and represent the descriptions on floristic lists of some macroalgae.

Further publications until the seventies of the previous century contain floristical data on planktonic as well as on benthic species (POSTELS and RUPRECHT 1840, EICHWALD 1844, 1847, 1849, 1852, BRANDT 1845, GOEBEL 1854, DIETRICH 1856, 1859, WEISSE 1861, BUHSE 1866, WINKLER 1877).

Later, beside the collection of floristical data, the study of the distribution of species in connection with ecological factors requiring different investigation methods became more important. These were followed by investigations of phytoplankton and phytobenthos which were carried out separately and began to turn into independent branches of science. The terms "plankton" and "benthos" were coined by HENSEN and HAECKEL in 1887 and 1893, respectively.

The seventies of the past century after the publication of a number of papers by GOBI (1874, 1877a, b and others) can be regarded as the beginning of the phytobenthos research in the waters considered. GOBI sailed the sea and gathered macrophytes from various depths with the help of a dredge. It was different from the methods used by his predecessors and many following investigators, who collected their material from shallow coastal waters and curative mud or studied the plants washed ashore. GOBI had collected the data on the vertical and horizontal distribution of macrophytes (in particular on brown and red algae from the Gulf of Finland and some other areas of the Baltic). He also characterized factors such as depth, salinity or substratum.

After GOBI the investigations of the phytobenthos were neglected for decades, in the Gulf of Finland even for a century. Among few exceptions were a thorough survey of the phytobenthos in the surroundings of Hogland (HÄYRÉN 1940) and HERLIN's paper (1945) on the algalflora of Vyborg Bay. The dwarf forms of *Fucus vesiculosus* were investigated by ARTSIKHOVSKY (1905) in the Kuressaare Bay (Gulf of Riga).

Of great importance is the investigation of SKUJA (1924) carried out in the Gulf of Riga. This study included the list of 119 macro- and microalgae and valuable data on their distribution and ecological factors. The species of marine charophytes and some algae of the geolittoral were dealt with in two of SKUJA's studies (1928a, b).

Data on the marine benthic algae and their distribution can be found in DANNENBERG's survey of the algal flora of the Eastern Baltic countries (1927).

During 1900–1940 several papers were published by foreign botanists who had visited the Estonian shores. SVEDELIUS (1902) recorded 16 algal species from the shores of Hiiumaa (Dagö) Island, and the works on the flora of Hiiumaa and Vormsi Islands (EKLUND 1927–1928, 1929) and GRÖNTVED (1927) described some marine phanerogams.

The investigations of HÄYRÉN are of particular significance. The data on 43 taxa of marine algae in the surroundings of Tallinn, in the vicinity of Paldiski and on the shores of some islands were published and 3 associations of blue-green and green algae were described (HÄYRÉN 1930). The list of 159 taxa of algae collected from Saaremaa (Oesel) and some neighbouring islands was published in 1936–1937.

Two local authors are also worth mentioning. The floristic list of FROMHOLD-TREU (1935–1936) included 12 marine phanerogams habiting in the surroundings of the small islets between Hiiumaa Island and the mainland.

A comprehensive paper on the benthic marine plants in the Estonian coastal waters was published in 1936 by LIPPMAA. It contained some thoroughly elaborated and well analysed material and gave an information about 23 taxa of marine plants and of their ecological demands. After World War II the main attention was directed to the estimation of the stocks of the red algae valuable from the industrial point of view. A wider use of the aqualung in the sixties of this century enabled to make direct underwater observations and to study the marine vegetation. On the basis of the international research program in 1908–1909 a Russian-Baltic expedition was organized. We consider those years to be the beginning of the phytoplankton study in the areas of the Soviet Baltic. The samples of phytoplankton and hydrological and hydrochemical data were collected in the Baltic Proper, in the Gulfs of Riga and Finland (KRABBI 1913a, b, LEBEDINTSEV 1910).

Soon after the mentioned expedition, the phytoplankton study was started in Neva Bay. It was repeated several times in the further decades with the aim to characterize the state of the bay concerning pollution (VISLOUCH 1911, 1921, KISELEV 1924). The materials of these investigations were partly published only after World War II (SOKOLOVA 1949, KISELEV 1948, KISELEVA 1949).

In the second, third and fourth decades of this century some papers on the phytoplankton of the Estonian and Latvian waters were published (TAUBE 1911, RAPOPORT 1929, BERZINS 1932, RIIKOJA 1925, 1928, 1929, 1931, MÖLDER 1938).

Beginning with 1946, the complex fishery investigations in the Baltic Proper and in the Gulf of Riga were organized. The study of the phytoplankton formed a separate part in this research program. Floristic composition, seasonal and annual dynamics, ecological-geographical complexes and some other problems were dealt with in the numerous publications by NIKOLAYEV, published mostly in the second half of this century.

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