

## **F. N. Kirillov – an outstanding scientist, the founder of ichthyological and hydrobiological branches of Yakut science**

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In the 1930s and 1940s, the development of fish resources in the North of Russia began. One of the bright young talents who devoted his life to this important cause was Fyodor Nikolaevich Kirillov, an outstanding scientist, founder of the ichthyological and hydrobiological branches of Yakut science (1911-1994). In the mid-1930s, Fedya Kirillov, a student at Perm State University, was an intern with the expedition of the Arkhangelsk Regional Station of the All-Russian Research Institute Fisheries and Oceanography, which studied the fish resources of the islands of the Arctic Ocean - Kolguev, Vaygach and Novaya Zemlya. Based on the materials of this expedition, the young ichthyologist published a special article in the Reports of the Academy of Sciences. It was an unprecedented case when a student's work is published by the most prestigious academic journal. The fate of Fyodor Kirillov was determined. And, naturally, upon graduation, he was enrolled as a junior researcher at the All-Union Arctic Institute of Glavsevmorput (The Chief Directorate of the Northern Sea Route), and the next 58 years of his life were devoted to his favorite cause - the study of fish life in the Arctic and subarctic regions of the country. For three years, the young ichthyologist took part in the work of the Taimyr and Khatanga expeditions of the Institute. In 1939 F.N. Kirillov, the young, but quite experienced in ichthyological studies of the Arctic, was sent to work independently as the head of the Indigirsk fishery-biological reference station of the Polar Farming Institute of the The Chief Directorate of the Northern Sea Route.

Fedor Nikolaevich, after three years of work in the village of Russkoye Ustye of Allaikhovsky district, was transferred to the All-Union Institute of River and Fisheries in 1942. The Great Patriotic War was going on. New fish factories Bykovsky, Trofimovsky, Tit-Arynsky, Oleneksky, Govorovsky were opened in the delta and lower reaches of the Lena River. It was necessary to provide scientific support for their activities, and F. N. Kirillov was involved in this urgent and important work. When the Yakut branch of the All-Union Research Institute of River and Lake Management was organized in 1943, Fyodor Nikolaevich became one of the first employees of this department. From 1942 to 1947 F. N. Kirillov collected a huge amount of material on the ichthyofauna of the Indigirka River basin and the lower reaches of the Lena River. They were immediately in demand by life, becoming the scientific basis for the activities of fish factories established in these areas.

In 1947, the newly organized Yakut base of the Academy of Sciences of the USSR invited the young ichthyologist Kirillov, already known for his work, to work in the then-opened department of zoology, where in 1947–1951 he took an active part in the study of the ichthyofauna of the Middle Lena basin and the Aldan River. By order of Yakutgosrybtrest, he carried out a comprehensive study of the ichthyofauna and hydrobiology of Lake Beloye in the Namsky district.

In 1952 Fedor Nikolaevich took part in the organization of the Institute of Biology of the Yakut branch of the USSR Academy of Sciences. Fyodor Nikolaevich served as the academic secretary of the new institute. At the end of 1971, F. N. Kirillov defended his doctoral dissertation on the topic "Fishes of Yakutia", which he published in 1972 as a monograph. Unlike his predecessors, Fyodor Nikolaevich described in detail the fish resources of all major river basins and the most important lakes in the region. The name of the ichthyologist has received All-Union recognition and international fame. From the very beginning of its opening in 1966, the laboratory of ichthyology founded by Fyodor Nikolaevich began to actively engage not only in ichthyological, but also in serious hydrobiological and hydrochemical research. These works played a special role in the new period, when human intervention in nature began to cause irreparable damage on

natural ecosystems. The leader of Yakut ichthyology F. N. Kirillov witnessed the first ecological disaster in Yakutia, when in 1942-1946, as a result of intensive fishing in the delta, lower reaches, and middle reaches of the Lena River, fish stocks of the great Siberian River were undermined and, unfortunately, to this day not fully recovered. In subsequent years, Fyodor Nikolaevich actively defended the Lena River, especially its delta part, from the too strong desire of economic entities to continue fishing at the same rate as in wartime. As a result of the speeches of F. N. Kirillov and his supporters, since 1955, fishing in the delta was stopped, and the only local collective fishery "Arktika" was engaged in fishing.

In 1960-1980, due to the rapid development of the diamond mining industry and the construction of the Vilyuisk hydropower plant, the results of F.N. Kirillov's complex hydrobiological and ichthyological studies in the basins of the Vilyui and Olenek rivers were in particular demand. F.N. Kirillov's hydrobiological and ichthyological works carried out in the Vilyui River basin in the late 1950s and early 1960s had a reference value, the laboratory staff determined the condition of aquatic ecosystems in the region before its active mining development began. It was only thanks to them and the subsequent work of the laboratory that it was established how the destruction of the aquatic ecosystems of the Vilyui River basin occurred during the development of the diamond mining industry and the construction of the Vilyui hydropower plant.

In 1962, under the editorship of F.N. Kirillov, the collection "The Fauna of Fishes and Invertebrates of the Vilyui River" was published, in which a significant part of the ichthyological material was collected by F.N. Kirillov himself. In subsequent years, the ichthyology laboratory carried out the topics "Fishes of the upper reaches of the Vilyui River" and "Fishes of the Olenyok River".

After the creation of the Vilyui reservoir F. N. Kirillov, together with his colleagues, carried out a detailed study of the dynamics of the formation of the biota of this largest artificial sea in the north, the first man-made artificial sea in the permafrost zone. The fundamental work "Biology of the Vilyui Reservoir" carried out by F. N. Kirillov and his laboratory serves an example of a comprehensive large-scale study of the dynamics of the fish population, hydrobiology and hydrochemistry of the newly formed largest reservoir in the North. Thanks to this work, the peculiarities of ecosystem transformation were clarified and recommendations were developed that made it possible to significantly reduce the negative consequences of major mistakes made during the construction of this artificial sea.

Simultaneously with the unique work in the Vilyui River basin in the 1960s and 1980s, Kirillov's laboratory continued its work in Northeastern Yakutia. In 1966, the works on the topics "Fishes of the Kolyma River" were completed and published. F. N. Kirillov paid great attention to the study of fish and hydrobionts in the lakes of the Indigirka-Kolyma lowland. In 1961, on the assignment of the Government of the Republic, Fedor Nikolayevich studied the morphology and biology of fish of the northern Chroma River. He was the first to describe a new form of whitefish for science, the "glacial-lake whitefish," which differs from the common Eastern Siberian whitefish in a number of morphological and biological features.

F. N. Kirillov, together with his collaborators, began interesting studies of fish and wildlife of the Sordonnokhsky plateau in 1962 and published their results in 1964. But especially interesting results were obtained during the study of biological resources of the largest lake Ozhogino, located on the border of Allaikhovsky and Momsky regions. As a result of the work performed, a brochure by D. L. Venglinsky, M. M. Tyaptirgyanov "Recommendations for the rational use of fish resources of Lake Ozhogino" was published.

In the last years of his life, F. N. Kirillov worked extensively on two major problems. Firstly, it is a summing up of the results of work on the development of the region's fish resources in previous years, and secondly, reflections and plans for the development of the fishing industry in conditions of intensive amateur fishing and the expansion of tourism activities. In his office memo "Protection and rational use of fish stocks of the Yakut ASSR

for the XIII five-year plan and until 2005," he provides data on the average annual fish capture in the basins of the main rivers of Yakutia for five-year periods. In it, Fyodor Nikolaevich gave a thorough analysis of the state of aquatic biological resources at the beginning of the 1990s and gave a forecast of the transformation of ecosystems and the development of the fishing industry.

The practical implementation of Kirillov's plans was carried out by his students: ichthyologists, hydrobiologists, hydrochemists. In one of the last articles F. N. F. Kirillov, in collaboration with V. F. Vozin, raised the question of the formation of the ichthyofauna of the northern rivers during the Late Cenozoic of Eastern Yakutia. This idea was later developed in the works of Fyodor Nikolaevich's son, the famous ichthyologist A. F. F. Kirillov, who studied the species composition and distribution of fish in the basins of the Laptev and East Siberian seas and for the first time compiled a complete integrated list of fish in the Lena River basin and the entire North-Eastern Siberia.

F. N. Kirillov's active life position in discussing the crucial issues of development of science and national economy played an exceptional role in the development of young employees as leaders of their generation of researchers, people of high civic and moral responsibility. Hydrobiologists T. A. Salova, R. I. Ogay, V. A. Sokolova, M. M. Tyaptirgyanov V. A. Sokolova, continued their work begun under the guidance of F. N. Kirillov.

The memory of the life and work of the outstanding scientist and organizer of the most important areas of Yakut science - ichthyology and hydrobiology – Professor F. N. Kirillov will always be a living, vivid example for the new generations of our science.