

Professor Otmar KARLOVAC, Ph.D.
(1902-1980)
Ideas and realisation of the HVAR Expedition

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Professor Otmar KARLOVAC was co-organiser and co-leader of the Fishery-biological cruises M.V. HVAR and deserves most credit for its success. He was born on 7 February 1902, in Split. Professor Otmar KARLOVAC worked in the Institute of Oceanography and Fisheries in Split, off and on from its founding in 1930 and permanently from 1946, where he was the head of the Department of Ichthyology and Fisheries in the Institute as well as the head of the Laboratory of Ichthyobenthos until he retired in 1962. Professor KARLOVAC was a thorough scientist, a competent biologist-ichthyologist, an educator, a populizer of marine biology and above all a highly ethical person. In his long scientific and professional work on many marine biology and ecological issues, he published 128 papers out of which 29 original scientific papers, 28 specialised expert papers, 9 science-popular papers and 62 short communications on fishery biology for the Maritime Encyclopaedia.

Key words: Professor Otmar Karlovac, HVAR Expedition, Adriatic Sea

Professor Otmar KARLOVAC was, together with Professor ŠOLJAN co-organiser and co-leader of the Fishery - biological cruises M.V. HVAR and deserves most credit for its success. He was aboard the M.V. HVAR from the very beginning of the expedition to the end. From September 1948 he was in charge of the overall organisation.

The idea of realisation of the Expedition M.V. HVAR was that in the first extensive phase, scientific research and technical tests of bottom trawl net should aim at qualitative-quantitative relations in benthonic stocks, at their horizontal and bathimetric distribution, and to a certain extent of their seasonal dynamics, as well as the possibility of their exploitation. It was mainly aimed at increasing the area of exploitation of bottom fishes and edible invertebrata stocks at greater depths, which had been

inaccessible to trawl fishing until then. That was also the main objective of the expedition.

As the programme was based on ecological principle, in other words it was very up to date, the research on interrelations in the sea as a whole was brought to the surface, so that the observations on the characteristics of the seawater and the bottom together with the observations on qualitative-quantitative relations in the demersal, semidemersal and pelagic populations, that is the living world in general, were planned to be researched as well. During the Expedition the research on the flora and vegetation of algae, phytoplankton, zooplankton, bacterioplankton together with eggs and larvae were carried out, too. Special stress was put on planning the observations on biology and ecology of economically important fishes and invertebrata species. The idea was that these researches should serve as the basis for possible

later researches of interest to the fishing industry, the more so that all the research results realised during expedition M.V. HVAR were submitted to the people in charge of our fishing industry in 1955.

Professor Otmar KAROVAC used his comprehensive knowledge and experience in solving complex scientific problems during the expedition, and at the same time being on the field he acquired new scientific knowledge from the results of the expedition M.V. HVAR, which he published in foreign scientific journals: "Rapports et Procès verbaux des Réunions", "Journées Etud. Planctonol. Comm.int. Mer Médit.", "Proc.gen. Fish Coun. Mediterr.", "Zool. Anzeiger", and national magazines including: "Acta Adriatica", "Izvešća-Reports" of the M.V. "Hvar" cruises-researches into fisheries biology, "Bilješke-Notes" and "Posebna izdanja". His expert papers were mainly published in the journals: "Morsko ribarstvo", "Pomorski zbornik", "Ribarski kalendar", "Ribarski godišnjak", then in other numerous journals of the kind, and in daily press as well. Throughout his work he never hesitated either to criticise or to receive critique.

He was a member of many international organisations such as: Committee of Vertebrata and Cephalopoda of CIESM, Committee GFCM (FAO) and the president of the Group for the Research Co-ordination at the General Council for the Mediterranean Fisheries of the FAO organisation.

Professor KARLOVAC was born on 7 February 1902 in Split where he finished primary and secondary school. He graduated from the University of Belgrade, Faculty of Philosophy, Department of Biology in 1926. As an extraordinary good student he was appointed as an assistant at the same Faculty, which position he held until he got his degree. Then he returned to Split where he lived and worked productively until his death in 1980.

Professor Otmar KARLOVAC worked in the Institute of Oceanography and Fisheries, Split off and on from its founding in 1930 and permanently from 1946. In the meantime from 1941 to 1946 he was curator and director of the Municipal Natural History Museum, Zoo and Aquarium.

He successfully defended his doctoral thesis in 1953 on Norway lobster *Nephrops norvegicus*. It is important to note that within the Institute he founded a special unit biometric laboratory where technical and statistic data of the HVAR Expedition were to be processed. He was the head of the Department of Ichthyology and Fisheries in the Institute as well as the head of the Laboratory of Ichthyobenthos until he retired in 1962. After his retirement he worked as a biology professor at the Faculty of Medicine, Zagreb – High School of Dentistry, Split.

Professor Otmar KARLOVAC was a senior scientist in the Institute of Oceanography and Fisheries, a thorough scientist, a competent biologist-ichthyologist, an educator, a popularizer of marine biology and above all a highly ethical person. In spite of all this he was a very simple and modest man. He was first and foremost a thorough, critical and productive author. Most part of his huge scientific and professional work he dedicated to the systematics, biology and ecology of benthic fish and decapod crustaceans. In his long scientific and professional work on many marine biology and ecological issues he published 128 papers, out of which 29 original scientific papers, 28 specialised, expert papers, 9 science - popular papers and 62 short communications on fishery biology for the Maritime Encyclopaedia. The results he got from his research into the Norway lobster, *Nephrops norvegicus*, are of particular interest. The research clarified many important and until then unknown facts of systematics, biology and ecology, especially reproductive biology of this economically important species. Studying deep waters pink shrimp, *Parapenaeus longirostris*, its horizontal and vertical distribution, biology and economic importance, he contributed to the knowledge of this, until then, hardly known decapod crustacean in the open Adriatic and the northernmost part of the Ionian Sea. In the until then unique and very important work "Exploration of fish stocks and edible invertebrata carried out by trawling in the open Adriatic" he showed the structure of fish catches, edible invertebrata and characteristic inedible by-catch in easy-to-consult tables. This paper is of special importance because it con-

tains our first fishing charts where prof. KARLOVAC laid out possibilities of practical use of the open Adriatic for trawling, marking the maps with fishing grounds, the date of trawling, depth and the type of the bottom, direction and duration of hauls, length of trawling and quantity of edible and inedible catches. He also marked the position of entanglement of nets and other obstacles and he described the performance of bottom trawl net in the Expedition stations. The work is in fact the survey of the benthonic species of fishes, cephalopods and crustaceans after a long closure caused by World War II. The so extensively collected material illustrates for the first time the composition of useful fishes and invertebrata stocks in the open Adriatic area, yielding the essential information for any intensive surveying that may follow. These researches also served as the basis for the bilateral agreement with Italy on trawling fishing in some parts of the Adriatic. They are of special interests because they served as the starting point for later more intensive researches, control and comparison in order to establish the influence of fishing on the most interesting and for that reason most exploited bottom trawl fisheries grounds. This paper is still unique and indispensable for all those who deal with the distribution and ecology of fish in the Adriatic.

He also significantly contributed to the knowledge of the *Trachurus trachurus* ecology in the deep waters of the Adriatic. On several occasions in other works he analysed ecology of hake, *Merluccius merluccius*, in particular its diet.

He also studied ecology of species *Gadiculus argenteus argenteus*, *Lophius piscatorius*, *Lepidopus caudatus*, *Boops boops*, as well as *Lepidorhombus* and cartilaginous fish of the Squalidae family. The problems he analysed make greatest part of these works unique for the Adriatic. His reports on the discovery of the fish *Chimaera monstrosa* and crabs-deep sea shrimps *Latreillia elegans*, *Stennopus spiosus*, *Aristaemorphia filiacea*, *Plesionica martia*, *Plesionica acanthonotus*, Prof. KAROVAC contributed significantly to the knowledge of decapoda *Natantia* and *Reptantia* fauna in the coastal area of the Middle

Adriatic as well as to the knowledge of the fauna in the Adriatic in general.

He also solved practical problems of the exploitation of bottom-trawl-net in scientific purposes, finding fish by means of echo as well as problems of artificial breeding of crabs. In his works he also wrote about poison some sea-animals contain, about whales, sea birds, sea snakes and turtles, about eel and distribution of sardine the results of which were obtained by sardine findings in the gut of silver hake caught by bottom trawl net, then about log-legged sea inhabitants, about the importance of sponges and corals. He was a scientist of a wide range of interests. It is less known that he was an excellent illustrator; he illustrated fish in a well-known work of Tonko ŠOLJAN "The Adriatic Sea Fish". He was in charge of setting and arranging first public and experimental aquarium in the Institute of Oceanography and Fisheries the purpose of which was to show the visitors variety, riches and beauty of the Adriatic flora and fauna. The whole generation of young researchers, who are now themselves marine biologists-ichthyologists grew up with Prof. Otmar KAROVAC who unselfishly passed on to them his immense knowledge and experience. In 1971 prof. KARLOVAC got public acknowledgement for his scientific achievements by his native town Split - Award for Life Achievement.

I am going to end up this paper with words spoken by his wife dr Jožica KARLOVAC nee PULEC, senior scientist of the Institute of Oceanography and Fisheries, now retired, who herself has written a number of very important papers using the data of the HVAR Expedition and their son engineer Tonko KARLOVAC. They are as follows:

"A lot of events connected with our people and our country were unjustifiably forgotten. They are nowadays slowly being brought back to light, even though they were recognised and acknowledged both at home and abroad at the time of occurrence. To renew memories of them at jubilees is an act of duty to generations that follow so they are not to be forgotten and to pay respect to the efforts of generations that preceded us."

Otmar KARLOVAC
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Prof. dr. Otmar KARLOVAC (1902-1980) **Ideje i realizacija ekspedicije HVAR**

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SAŽETAK

Prof. dr. Otmar KARLOVAC je uz akademika ŠOLJANA najzaslužniji za uspješno odvijanje ekspedicije HVAR, njezin suorganizator i suvoditelj.

Rođen je 7. veljače 1902. god. u Splitu. U Institutu za oceanografiju i ribarstvo je povremeno radio od sama njegova osnutka 1930., a stalno od 1946. god. Rukovodio je Odjelom za ihtiologiju i ribarstvo, te Laboratorijem za ihtiobentos do umirovljenja 1962. godine. U međuvremenu je od 1941. do 1946. bio kustos Gradskog prirodoslovnog muzeja, zoološkog vrta i akvarija.

Prof. dr. Otmar Karlovac je bio znanstveni savjetnik u Institutu za oceanografiju i ribarstvo, temeljiti znanstvenik, vrsni ribarstveni biolog-ihtiobentonolog, temeljit, kritičan i plodan stvaralac, pedagog, popularizator ribarstveno-bioloških znanosti i danasve čovjek visokih moralnih odlika. Najveći je dio svog obimnog znanstvenog i stručnog rada posvetio problematici sistematike i bioekologije bentoskih riba i dekapodnih rakova. U svojem dugogodišnjem znanstveno-stručnom radu na mnogim ribarstveno-biološkim i ekološkim problemima je objavio 128 naslova, od toga 29 originalnih znanstvenih radova, 28 stručnih radova, 9 radova popularno - znanstvenog sadržaja i 62 priloga iz ribarstvenene biologije u Pomorskoj enciklopediji.