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ROMANIAN FISHERY RESEARCH IN THE WORLD OCEAN

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ABSTRACT

This paper aims to be an overview of the research performed by Romanian scientists in the World Ocean, aimig at enriching the knowledge of fishery resources. This activity started in 1964, continuing the tradition of the first investigations performed by scientists Emil Racovita and Grigore Antipa and ceased completely in 1997. Numerous reference papers resulted from this endeavor, which can now serve as information sources.

Key-Words: research, Romanian fishery, World Ocean

AIMS & BACKGROUND

By its position at the shore of an inner sea, dependent through the Bosphorus and Dardanelles on the Mediterranean Sea, which indirectly connect it to the Atlantic and Western Indian Oceans, Romania can be considered as a maritime country unfavourably affected from the geographical viewpoint concerning the access to the exploitation of the large fishing grounds of the World Ocean. The investigations beyond the Pontic area were incidental and occasioned by working visits of our scientiscts to the laboratories of foreign research institutes and their participation in elucidating the systematic position of some marine species gropus. By the middle of the 20th century, Romania had not major interest in the Ocean, and the national commercial fleet included cargo and passenger vessels, operating especially in the pontic and Mediterranean area.

EXPERIMENTAL

The papers is based on bibliographic review, mainly in the archives of the National Institute for Marine Research and Development "Grigore Antipa" Constanta (NIMRD), as well as on open discussions with scientists who performed research in fishing areas around the World Ocean. Some of the photographs come from personal archives and are cited accordingly.

RESULTS & DISCUSSIONS

The presence of the Romanian researchers on the seas and oceans began with the development of marine biological research in Romania, which started by the end of the 19th century. That beginning aproximatelly coincided with similar international concerns, such as, for example, the Belgian expedition to Antarctica (S.Y. "Belgica" - 1897-1898) (Lecointe, 1903) (Fig. 1), with the participation of Emil Racovita (1868-1947), the most remarkable Romanian biologist. The nine months expedition organized by Grigore Antipa (1867-1944) in 1893 on board the RRN cruiser "Elisabeta" (Fig. 2) was continued in 1984 and 1895 and raised a special regional interest.

Even from the beginning of the Romanian oceanology, the scientific interests have gone beyond the regional limits of the Black Sea territorial waters. A proof in this regard is that Romania was invited among the other countries to the foundation of the International Commission for the Scientific Exploration of the Mediterranean Sea (CIESM) since 1910 and was represented by the brilliant ichthyologist Grigore Antipa. Due to his efforts, the CIESM enlarged the ground of its oceanographic research by including the Black Sea basin.

The historical period between the Dobrogea annexation to the national territory and the end of the Second World War is characterized by the orientation of the Romanian research to the knowledge of the Black Sea. The investigations beyound the Pontic area are incidental and occasioned by working visits of Romanian scientists to the laboratories of foreign research institutes and their participation in elucidating the systematic position of some marine species groups, often working on material received from abroad.

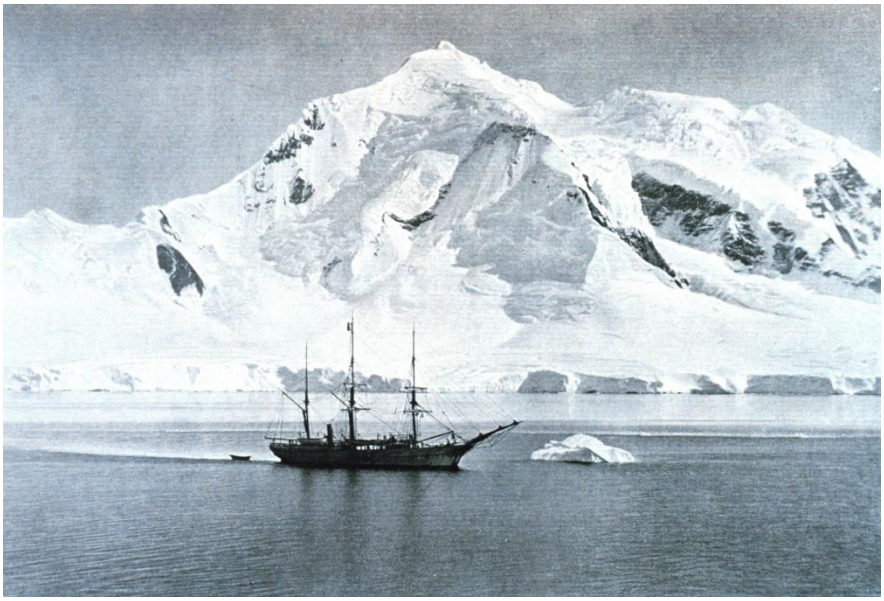

Fig. 1: S.Y."Belgica"
(source: http://www.photolib.noaa.gov/htmls/corp2838.htm).

Fig. 2. "Elisabeta" Cruiser (Source: https://upload.wikimedia.org/wikipedia/commons/f/fc/Grigore_Antipa_National_Museum_of_Natural_History._Elisabeta_Cruiser._%28The_ship_that_Dr._Grigore_Antipa_conducted_The_First_Scientific_Expedition_on_Black_Sea%29.JPG).

This modest involvement in the World Ocean was determined by the need of the better knowledge of the marine species in the Romanian waters, on the one hand, and by the scarcity of the financial means for research, which could not allow projects the Bosphorus by the other.

The end of the Second World War and the changes in Romania after the war caused the emigration of many Romanian researchers. Dr. Victor Angelescu (1912-2002) (López *et al.*, 2012) left the country immediatelly after the war and setlled in Argentina, where he studied the regional fisherry and became a well-known specialist in the biology and ecology of the hake species inhabiting the South-East Atlantic Ocean and one of the pioneers of the Argentinian fisheries. Dr. Zaharia Popovici (1907-?) (Coop. Mar. Fishing,1962; Revista de investigacion, 2002), a close student of dr. Grigore Antipa, left the country in the same period and had an important contribution to the organization of the fisheries research in Peru.

The creation of the distant water fleet in 1964, its further quick development by endowment with new fishing vessels, first built abroad and then in the Romanian shipyards, required the organisation and development of the national fishery research sector. By its advanced research programmes, this sector aimed at a better knowledge of the Ocean areas interesting for fishery exploatation, at a better fleet operation and its penetration in new areas for the overseas fishing and also at ensuring the acces of our country to the information flow by international cooperation with specialized institutions. The distant water fleet was a chance for Romania to be involved in the oceanological research of faraway marine areas, to obtain an international recognition of the bio-oceanographic school, trainned at the Black Sea shore.

Naturally, this research sector appeared in 1964-1965 at the Institute of the

Fishing Research and Design, mainly at the Mamaia Station, and after 1970 it was integrated and developed at the Romanian Marine Research Institute from Constanta - RMRI (at the moment, the National Institute for Marine Research and Development "Grigore Antipa" - NIMRD).

In the course of time and especially after 1980, the fisheries research programmes have been enlarged and diversified, including many problems and aiming at attaining the international standards by the steady increase of the fund of scientific data collected, and especially by maintaining an equilibrium between the fundamental and applied research.

In general, the Romanian Ocean fishery research has followed two main directions:

- Uninterrupted scientific investigations in the pre-continental areas, where there was a traditional interest in fishery exploitation, for a better knowledge of the environment conditions influencing the fishery organisation, of the formation and status of the gregary species concentrations, of local ichthyofauna structure, of biology and ecology of intersting species, of assessing the explotable stocks and their evolution in accordance with management measures aiming at maintaining population equilibrum;
- Research - prospecting expeditions on board of fishing vessels under Romanian flag or Romanian specialists' participation in foreign expeditions, in the new zones of activity, in less known pre-continental zones, or in high sea areas.

Excepting the experimental survey of 1964, carried out by the first two Romanian vessels, in the northern and southern Pacific waters, the activity of the Romanian distant fishing fleet, and consequently that of the national fisherry research, was concentrated in the North Atlantic areas, along the West African coasts and sporadically in the East-African area of the West Indian Ocean.

A very important action of the RMRI which was a very succesful from the scientific viewpoint was the contact with A.R. of Libya, including researches carried out in its territorial waters and studies on the exploitable fishery resources. The contract was fulfilled by a complex program of multidisciplinary researches carried out with the trawler "Delta Dunarii" (Fig. 3), hired by the institute, and RMRI's research vessel "Gilortul", during four 40 days expeditions in 1975-1976.

In the North Atlantic, the Romanian fishery researches started in 1965 and ended in 1980, when the last Romanian fishing vessels were removed from this region due to the worsened juridical conditions in the overseas, fishing following the extention of the national waters up to Nm and to the harder conditions imposed by the coastal countries and regional fishery organisation. The researches carried out on board of the Romanian fissing vessels covered a large area, from the north of Labrador up to the central part of the United States shelf, in the west of the North Atlantic, and from the Iceland-Norway Sea up to the South of England, in the North-East Atlantic. They aimed at a complex knowledge of those two ocean areas, studying the seasonal environmental factors dynamic, and from one year to another, at completing the knowledge on topography and the nature of bottom, modifications in the structure of the ichthyological fauna and gregarious fish populations under the impact of the intensive and long-term fishery. To the local species of cephalopoda

was paid a special interest, succeeded in elaborating original methodologies for age reading and applying mathematical models for population assessment.

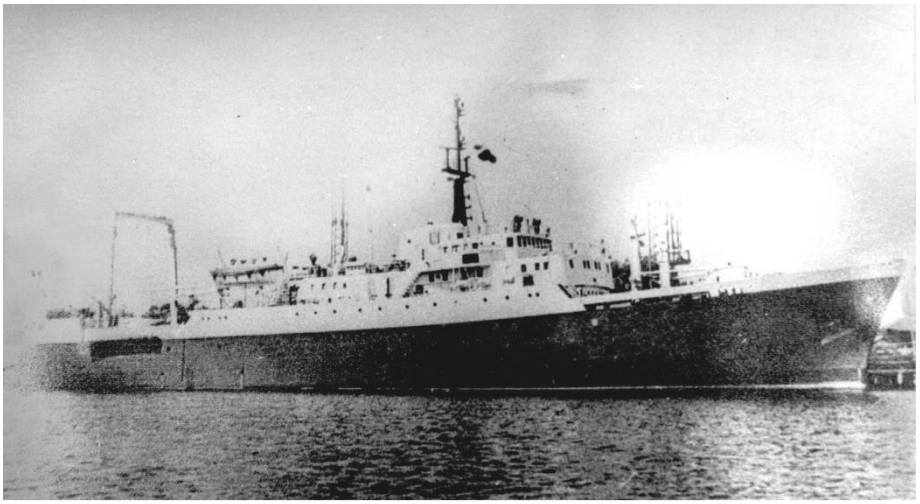

Fig. 3. The trawler "Delta Dunarii", in 1975 (source: NIMRD).

By its investigations, Romania had an important contribution to the North Atlantic Fishery Organisations (NAFO) as a member country and to join research programmes performed in that region by the former socialist countries members of the ex-Fishery Agreement of Warsaw (Warsaw, 28 July 1962, Agreement concerning co-operation in marine fishing).

The most important number of research actions on board the distant water fishing vessels were carried out in the Central East Atlantic (Fig. 4 and 5). As a member country of the Fishery Committee for the Eastern Central Atlantic (CECAF), through the efforts of our institute's researchers, Romania had an important contribution to the fulfilment of the research yearly plans, to the effective management activity of the resources in this area by numerous partcicipations to the speciallists meetings, in the field of fishery assesment and catch prognosis. We had contacts with similar research institutes from Casablanca, Santa Cruz of Tenerife, Nouadhibou, Dakar or Praia.

Between 1965-1993, the surveys carried out covered a very large geographic area, from Marocco until in front of Cape Vert, and sometimes until the Liberia or Guineea waters. The re-establishment of maritime borders and extension of national waters forced the Romanian fishing and research activity to concentrate in the Mauritanian area, on a basis of a long-term agreement. At the beginning of 1993, this agreement was canceled due to the unfavourable circumstaces.

Deeply involved in the CECAF programmes, the Romanian investigations in the North-West Africa area have benefited, after 1980, of the advantages of the interrupted programmes, observations carried out during annual complete cycle, modern research methods and this had as result the priority role of the Romanian research in establishing the evolution of the small pelagic fish stocks in this region. The good knowledge of the regional ichthyofauna and its biology and distribution

enabled, in 1973 and 1983, the elaboration, besides the specific assessment studies, of two monographs on the inventory of the commercially interesting fish and cephalopoda species. To these, we must add the catalogue of geographic distribution maps for these species in 1986 and two sets of fishing maps for the sectors 24° -14° N in 1990 and 1991.

Fig. 4. Romanian supertrawler "Dorna" fishing in the Mauritania area (1983) (source: D. Zaharia).

Fig. 5: Catches realized in the Mauritania area on board of the supertrawler "Dorna" (1983) (source: D. Zaharia).

In 1970-1990, the Romanian investigations included the South-East Atlantic, and they have become continuous in this area after 1977, when Romania was

affiliated to the International Commission for South East Atlantic Fisheries (ICSEAF). During time, 34 missions of complex research have been concentrated in the neritic Namibian area. The activity in this region ended on 21st of March 1990, when Namibia became independent (Fig. 6 and 7).

Fig. 6. Romanian trawler "Semenic" (type B419) fishing in the Namibia area (1981) (source: D. Zaharia).

Fig. 7. Catches realized in the Namibia area on board of the Romanian trawler "Semenic" (1981) (source: D. Zaharia).

Romania had a major contribution to ICSEAF programmes, comparable to the research results of Republic of South Africa, Spain and ex-USSR in this area. Besides the oceanographic and fishery researches, some intersting observations were made on the impact of the commercial fishing on the fish-feeding avifauna, on the local population of Cape seal, in cooperation with the specialized institutes of Cape Town. The results of those observations constituted an intersting museum collection

which was presented at the exhibition "Namibia and the Environment" organized at Galati, Romania, in August-September 1994. In this respect, NIMRD has constituted an exceptional museum collection by the joint efforts of researchers and technicians aboard the ocean fishing vessels, mainly during 1970-1989. The collection is located in an appropriate room and is used as a tool on non-formal education, during the numerous visits carried-out by pupils, students, scientists, teachers etc (Fig. 8).

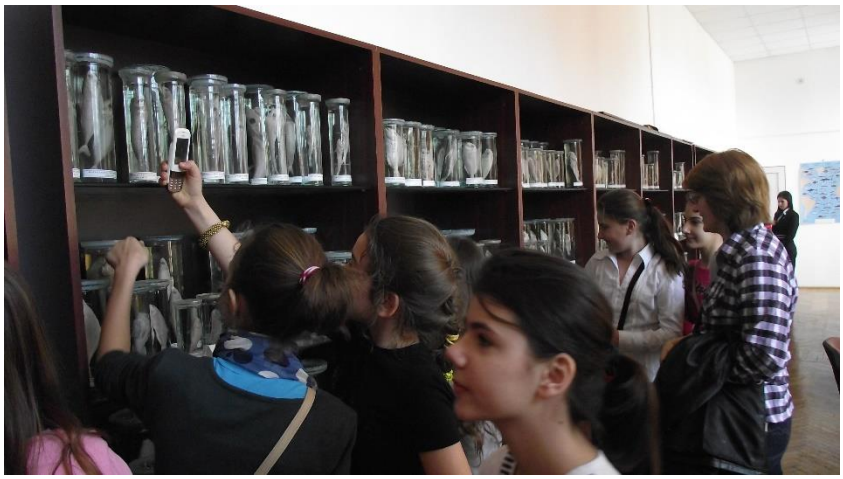

Fig. 8: NIMRD's ichthyological collection from the World Ocean (source: NIMRD).

Due to its researches, Romania had an important role in the management of the horse mackerel and hake in the Namibian area. The pool of scientific data gathered enabled the publication of a catalogue of fish and cephalopoda species of that region in 1991 and of a set of fishing maps in 1980 and then completed in 1991. Beginning with 1983, the Romanian specialists have been involved in the scientific substantiation of ICSEAF fishing legislation and in the international monitoring of the enforcement of this legislation.

In the East African area of the West Indian Ocean, Romania carried out two research and prospecting actions, in 1979 and 1980, in Mozambique waters, and a complex research program in 1984-1985 in the Somaliland waters aiming at identifying a new fishing ground.

In 1978, there was a research cruise to the Atlantic offing in front of the Argentinian coasts, within the frame of an international programme, in which the Romanian vessel "Sinoe" (Fig. 9) participated together with the Russian vessel "Stvor", the German vessel "Ernest Haeckel", the Bulgarian vessel "Alfeus" and the Polish vessel "Professor Siedletski". The vessels entered in the Atlantic Sub-Antarctic area and investigated the areas in the neighbourhood of Falkland and South Georgia. Two years later, in 1980, the vessel "Tarnava", having a research team on board, carried out a Romanian reseach mission in the African Sub-Antarctic area, up to 56^{o} S, searching for the Atlantic krill.

Fig. 9: Romanian trawler Sinoe (type B22) going to the Falkland area (1978) (source: D. Zaharia).

The research activities in the offing of the far South Atlantic include the Romanian participation in the German expeditions "Weiskopf", in 1981, in South Georgia waters and "Peter Neel" and "Junge Welt" in 1985 (Fig. 10), in the neighbourhood of the Falkland Islands, the Russian-Romanian expedition on board the vessel "Patriot" in 1982 (Fig. 11) in the South-Antarctic African waters above the southern sector of "Whales Ridge". In March-April 1990, the Romanian vessel "Rodna" having a research team on board, carried out a new fishery investigation in north area of the "Whales Ridge".

Fig. 10: DDR vessel "Junge Welt" for squid fishing in Falkland area (1985) (source: D. Zaharia).

Fig. 11: The vessel "Patriot (1982) (source: N.C. Papadopol).

After 1990, entering in the market economy, maintaining a non-profitable Romanian fishing fleet was out of the question and, in 1997, there were only 16 vessels left, most of them damaged, with 843 employees, whose wages, insufficient for a decent living, were always delayed.

Beginning with 1994, the Romanian vessels are involved in freezing operations in the region of Great Britain and Ireland. With this opportunity, our researchers have made observations and investigations on the environmental conditions of the North East Atlantic and on the biological characteristics ans structure of hering and mackerel populations in the above mentioned area.

In 1997, the fishing fleet company was reorganized with the view to saving the activity by reactivating certain vessels, reobtaining the right to fish in the north-western and south-western African area, obtaining the fishing license and the expenditure required for the first production cycle, clarification of the status or leased vessels, payment of the staff's wages etc. Unfortunately, it was too late and funding for the restructuring was lacking: the bankruptcy was final and, since then, ocean fish has been imported or it can be found in NIMRD's museum collection, from where exhibits were sent to other museums in the country.

At this moment, the research surveys of Romanian scientist in the World ocean came to an end.

Nevertheless, they left behind numerous research reports and scientific papers and books incorporating research findings conducted by the Romanian researchers in the World Ocean: Dumitrescu (1974, 1975), Dumitrescu, 1979, Jelescu and Papadopol (1976, 1978), Maxim (1976, 1978,1982), Maxim and Maxim (1982, 1983, 1988), Maxim and Lazu (1980), Maxim and Staicu (1976, 1980), Maxim and Dumitrescu (1979), Maxim Cornelia (1978, 1979, 1982 a, 1982 b, 1983, 1990), Maxim Cornelia *et al.*, 1984, Maxim Cornelia and Zaharia (1985), Maxim *et al.* (1988), Maximov (2001), Muller and Dumitrescu (1984), Nicolaev (1985), Nicolaev and Uzun (1980), Papadopol and Jelescu (1979), Parcalaboiu (1979), Pintilie (1978), Pintilie *et al.*, (1984), Skolka and Leonte (1982), Skolka *et al.*, (1986), Skolka and Vasiliu, (1988), Staicu and Maxim (1974, 1983), Staicu *et al.*, (1975, 1976, 1986).

CONCLUSIONS

In our brief presentation of the Romanian fishery investigations carried out beyond the Pontic area we avoided to give the names of the specialists in that field and mention their personal contributions. What we intended was to emphasize the effort of the Romanian oceanology scientists for the recognition of the Romanian contribution to the knowledge of the World Ocean, for their right to participte in knowing and exploiting it, the achivements of a passionate activity they carried out with the Romanian vessels and Romanian know-how during the decades of research activity.

ACKOWLEDGMENTS

We deeply thank dr. Cornelia Maxim, head of the Group of Ocean Fishery Resources of the Romanian Marine Research Institute / NIMRD in the period 1982-1996, who sinthetized the information concerning the presence of the Romanian researchers in the World Ocean with the occasion of the Jubilee Symposium "Study and exploration of the marine environment: achievements of the Romanian Marine Research Institute during 25 years of activity", wich took place on 15 September 1995 in Constanta, Romania (RMRI, 1995). We also thank all researchers who helped conduct the Romanian research in the World Ocean.

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