

## Fishing technique from HVAR Expedition until today

Perica CETINIĆ

*Institute of Oceanography and Fisheries, P.O. Box 500, 21000 Split, Croatia*

*At the end of 40's and the beginning of 50's, the marine fishery in our country records its fast growth. The expand of our marine fisheries hasn't been manifested only in construction of technically speaking, more perfect fishing vessels, but also in establishing of new technical achievements and producing new fishing equipment. It is also manifested in change of relations in fisheries production. Therefore, today our marine fisheries became an occupation of a great interest and commercially very important field, while modern achievements are in use in our country, as well as worldwide.*

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At the end of 40's and beginning of 50's, the marine fishery in our country, as well as worldwide, records its fast growth. The expand of our marine fisheries hasn't been manifested only in construction of, technically speaking, more perfect fishing vessels, but also in establishing of new technical achievements and producing new fishing equipment. It is also manifested in change of relations in fisheries production. It is well known that a marine fisheries in our country had a seasonal character for a long time. Therefore, it was an additional rather than a main occupation. With establishing of new technical achievements, as well as new technical equipment of the fishing fleet, greater mechanisation of fishing processes, better working and financial conditions on the fishing vessels helped our marine fisheries to assume stronger economical foundations and to become an occupation of a great interest.

Taking into consideration above mentioned, it is possible to stress out that development of Croatian fishing fleet progressed in two phases until 1962. The first phase lasted until 1955. The types of fishing boats that were built until than are next:

- Vessels from 14 to 15m, engine power of 37-44 kW (50-60 HP), designed for combined purse seining and trawl fishing in the coastal sea area,

- Vessels from 16 to 18m, engine power of 44-74 kW (60-100 HP), designed also for combined purse seining and trawl fishing in the inner coastal waters,

- Vessels from 18 to 20m, engine power of 74-110 kW (100-150 HP), designed for combined purse seine trawling at the open sea,

- Vessels over 20m, engine power of 176-220 kW (240-300 HP), also designed for combined purse seining and trawl fishing, and tuna fishing at the open sea,

- Vessels under 12m of length with the engines up to 22 kW (30 HP) for the fishing with purse seines and coastal trawls for pickerel (*Spicara smaris*) and the demersal fish species in the coastal area in the winter period.

In that period, which lasted until 1955, about 120 smaller and bigger fishing vessels were built. Therefore, that was the year with 193 fishing vessels 12m length and engine power greater than 18,4 kW (25HP) (SRDAR, 1960). Although, the number of vessels was related to

whole former Yugoslavian state, the greatest number of vessels was in Croatia.

That is also connected to a fishing gear, where between 478 of purse seines for the catch of small pelagic fish at the end of 1954, Croatia owned 437 in total, while 31 of tuna purse seines, all were based in Croatia. Although there is no data available of how many of 381 bottom trawls was owned by Croatia, it is assumed that it was the same as with other types of fishing gear and that the most of bottom trawls used at that time were owned by Croatian marine fisheries, as what happened later on.

Based on its main technical and constructional characteristics of heterogeneous character, the above mentioned fishing fleet, particularly its new boats, represent basis of our fishing fleet. It is made of less flexible and not adequate vessels, which differed between each other by their maritime characteristics and main technical parameters. It wasn't a rare occurrence that vessels of various sizes, power as well as history of dealing with work of machine and catching equipment can be found in the same company, and for many of these vessels, a year of their construction was unknown. Therefore, it was difficult to maintain that, especially supply with spare parts of main engines of different origin. All vessels had a common characteristic, which is the fact that all of them were designed for purse seining and trawl fishing. They were built on the model of North American vessels emphasising characteristic for purse seining fishing (CETINIĆ, 1973, 1988), for catch of small and big pelagic fish, which is the basis of our fishing industry.

The next construction phase of our fishing fleet in 1963, until when around 100 fishing vessels were built, characterises a fleet of heterogeneous composition. Also, the fleet is not mainly standardised and varied between each other by their maritime and technical characteristics. Until the end of 70's and beginning of 80's, for the needs of our marine fisheries, neither one new fishing vessel wasn't built; therefore, our fishing fleet went through the period of stagnation and decline. However, according to an Italian fishing fleet, which used the open waters

of the Adriatic, predominantly at that time, including rich trawling areas of our outside fishing sea, there is a great interest between our fishermen for a development of fishing fleet, mainly designed for bottom-trawl fishing.

Beside a development of fishing fleet and other significant changes occurred in our marine fisheries. Thus, an electric light, introduced in 1952, is an exchange for gaslights used in catch of small pelagic fish in purse seining fishing.

That wasn't the battery lighting, but it was from diesel power units, which had a light power of 4000 candela. It improved a catch of small pelagic fish and since then didn't have to be performed only on classical coastal fishing-grounds.

The following significant achievement that considerably improved marine fisheries is usage of echo sounders. First investigations for its use, in our marine fisheries had begun in 1952. Investigations that have been performed applying the echo sounders of German company, named "ELAK", gave positive results. Thus, in 1954 an echosounder is applied in our marine fisheries. Its wider practical usage commenced in 1957.

The following significant achievement that considerably advanced marine fisheries is usage of "power block", which is named "PURATIĆ power block" after the fisherman inventor, Mario PURATIĆ, who was born in Sumartin, at the island of Brač, which was patented by Mario PURATIĆ in USA, 1954, made a revolution in the world of purse seining fishing, especially tuna fishing, which enable usage of tuna purse seines of the greater proportions. That establishment is used for the first time in our marine fisheries in 1963, while today there is no purse seine, which doesn't use this equipment.

At that time starts industry of fishing nets made of synthetic materials, which usage begun a lot earlier and gradually exchanged heavy nets made of cotton, flax and rops. One of significant periods in developing and improving of our marine fishery is application of pelagic trawl, using two vessels for catch of small pelagic fish. Its usage dates from 1978, although the exami-

nation of that gear started in 1954, but it didn't give good results, not until 1969 and few years later when, at the western coast of Istra, the investigations gave sufficient results and enabled a pelagic trawl with two vessels at that area. Today, a pelagic trawl, has almost completely displaced purse seine at the catch of small pelagic fish at the western coast of Istra. The most current constructions of low resistance pelagic trawls, used today, in wings and in the first segments of belly have mesh bar up to 10 m or instead of netting material use ropes. Therefore, fishing by pelagic trawls not only improved catch of small pelagic fish in our country, but it also influenced modernisation of our fishing fleet and fishing techniques.

The four-sided pelagic trawl by using two vessels was made and patented in 1944 by Robert LARSEN from Denmark (CETINIĆ and SWINIARSKI, 1985) and it also enabled usage of not only wooden, but also plastic and iron vessels, simultaneous engines, deck-fishing equipment on hydraulic, equipment for fish uncovering and monitoring of fishing equipment, radar and other radio and navigational equipment. It considerably advanced fishing by a bottom trawls for which at the end of 80's is shown a great interest. Reasonable prizes on the Italian fish market were the reason for more intensive exploiting of our sea through increased number of vessels. The catches realised by bottom trawl had a dominant share.

In the middle of 1988, Croatian trawling and purse seining fleet was made of 233 fishing vessels of which 135 were state, while 98 were a private property and 312 fishing small boats, owned by private fishermen (CETINIĆ, 1989). Trawlers were 59% of that number, and the rest of it was made up of purse seine and combined purse seine trawlers, while with fishing boats

the number of trawlers came to 74%, and the rest of it was purse seine and combined purse seine-trawlers.

These data point to the fact that at the end of 80's and beginning of 90's there was a great interest for development of trawling fleet, which was increasing continuously, thus at the end of 1955 came to a number of 359 vessels of which 293 trawlers and 66 purse seine, and there were also 669 small boats of which 474 trawlers and 195 purse seine. It means that at the end of 1955 there were 1028 vessels in total, designed for trawling and purse seining, registered in category of vessels and small boats of which 767 were trawlers and 261 were purse seiners. That amount of vessels used only for commercial fishing, although big for potentiality of our sea, was not composed of all fishing vessels that were included in our fishing fleet. To the exact number of fishing fleet we need to add 14.758 fishing small boats for the fishing with an fishing gear that is used for a coastal fishing, which are gillnets, fishing pots, long lines, seines, fishing using ropes ("tramata" fishing), as well as fishing with other fishing gear used in commercial fisheries. The fleet above mentioned, especially its part assigned for fishing by bottom trawls, because of a bad fishing results for the last few years has been decreasing, thus today a part of vessels is in use occasionally, while the rest of the vessels are not in use at all.

Today, however, there is a great interest for tuna catch, but due to limited possibilities of its catch and annual catch quote, assigned by the International organisation for tuna protection, new approvals are not issued for its catch.

These would be certain general notes of development of fishing fleet and fishing technique of the HVAR Expedition up to nowadays.

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## Ribolovna tehnika od ekspedicije HVAR do danas

Perica CETINIĆ

*Institut za oceanografiju i ribarstvo, P.P. 500, 21000 Split, Hrvatska*

### SAŽETAK

Kao u svjetskom, tako i u našem morskom ribolovu, krajem 40-tih i početkom 50-tih godina ovog stoljeća započinje njegov brži razvoj. To se podjednako očituje u gradnji tehnički savršenijih plovila ribarske flote kao i u uvođenju novih tehničkih dostignuća pri obavljanju ribolova i izradi ribolovnih alata. Taj se napredak također uočava i u promjeni odnosa u ribolovnoj proizvodnji. Zahvaljujući svim tim promjenama ribolov kao zanimanje poprima sve čvršće gospodarske temelje i postaje sve zanimljivije.

Danas je hrvatski morski ribolov značajna gospodarska djelatnost u kojoj se koriste sva moderna dostignuća koja se koriste i u svjetskom ribolovu.