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Biological Peculiarities of the South African Horse Mackerel (Trachurus trachurus)

By

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Since 1957 the Baltic Research Institute of Marine Fisheries and Oceanography has carried out investigations on ichthyofauna and the stocks of commercial species inhabiting the tropical and South Atlantic areas. At the end of 1960 a commercial expedition on board the trawler "Muksun" discovered high concentrations of horse mackerel in the South-west African coastal waters.

The above mentioned horse mackerel refer to the common Trachurus trachurus, in South Africa called Maasbanker.

This species differs from others by some 75 lateral scutes 40 of which have spines. The common horse mackerel occur widely in the Atlantic; near the South-west African coast they occur everywhere from Angola to the Cape of Good Hope on the shelf at a depth of 300 m. They were also found on the Angulyas Ground. Commercial concentrations of horse mackerel near the south-west coast of Africa are formed at depths of 60 m to 270 m, mostly between the 120 m and 180 m isobaths.

The main concentrations are located in the mixing zone of the cold Benguela Current and the southward opposite current where the most favourable conditions for spawning and feeding of horse mackerel are found.

Horse mackerel of different ages constantly inhabit the shelf between 17°20' and 22°00'S.

The South African horse mackerel reaches a length of 75 cm. They become mature at the age of 3-4 years. At that time their body length is about 21-23 cm. According to our data the commercial concentrations of horse mackerel on the shelf between 17°00' and 25°00'S consist of specimens of different age-groups, their length varying from 17 to 45 cm. Young age-groups inhabit comparatively warm waters. Thus, they are often found at the northern edge of the area off the coastline. Mean age-groups (linear sizes 23-30 cm) are found near the southern edge of the area. Older age-groups prefer relatively cold waters during the feeding period. It was noted that the mean body length of horse mackerel increases with the increasing depth in the area of distribution.

While maturing horse mackerel migrate to relatively warm waters, the bulk of them migrate for spawning to the northern area between the Kunene River mouth and the Frio Cape. A small number spawn on the Angulyas Ground. In January large spawning horse mackerel were observed at depths of 140 m. Spawning of varying intensity is going on nearly throughout the year. The spring and summer seasons in the southern hemisphere (November-April) are periods of the most extensive spawning of horse mackerel.

The spawning prolongation may be explained by the maturation of different groups at different times and by intermittent spawning.

The coefficient of the female maturation (the ratio of the weight of the gonad to the body weight without intestines) increases up to 5% in the last stage, while it increases up to 15-17% before the extrusion of the main portion of the eggs. The coefficient of the male maturation is very seldom higher. Males keep ripe testes (running sex products) for a long time, these products being extruded in small portions. In connection with it the coefficient of the male maturation firstly increases with the ripening of the gonads and then when the running stage begins, gradually decreases reaching its minimum by the end of the spawning.

During the spawning period the horse mackerel continue feeding. After spawning some of them continue feeding not far from the spawning zone between the mouth of the Kunene River and the Frio Cape, but the bulk of the fish migrate southwards. While moving to the south they concentrate in areas rich in food. The main feeding area is on the huge shell from the mouth of the Orange River to the St. Helena Bay. Here the horse mackerel find rich food.

The horse mackerel feed on various organisms. Young specimens feed on small zooplankton organisms, while adult specimens feed on large ones, for example, on Euphausiidae and small fish, mainly on lantern anchovy. Fat of the feeding horse mackerel is deposited mainly in the intestines. According to our data obtained in January 1962 in the Orange River area more than 80% of the horse mackerel had 2-3 degrees of fatness on the intestines.

Horse mackerel are considered a pelagic species but they ought to be referred to as an intermediate species as they inhabit both the near-bottom layers and the water strata. The diurnal vertical migrations are very complicated and so far we know very little about them. Vertical migrations depend on the physiological state of the fish, on hydrological and weather conditions as well as on the distribution of the food organisms. Horse mackerel may stay in the bottom layer both in the daytime and at night. It was noticed that they avoid those waters where the oxygen saturation is below 6%. Neither in the day nor at night do they descend to the bottom layers with poor oxygen contents.

The density of the concentrations depends on the body length; the smaller the fish the greater the density. The shoals of large horse mackerel are scattered, especially during the feeding period and are therefore hard to determine by hydro-devices.

At present the stocks of horse mackerel are poorly exploited. In the shallow waters of South-western Africa there are immense concentrations of horse mackerel but they are not fished there. In the St. Helena Bay area the fishermen of the South African Republic fish for horse mackerel and pilchard by purse seines.

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