

## THE SPECIES COMPOSITION OF GENUS *TRACHURUS* IN THE BLACK SEA

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During the last years since the appearance in the Black sea of a large number of so-called large mediterranean stavrid *Trachurus trachurus lacerta* PALLAS: a discussion in some journals of the U.S.S.R. concerning its appearance and species composition took place.

The taxonomy of the European species till recently was not elaborated and only owing to the monographical investigations of TORTONESE 1951, and LETACONNOUX 1951, the typical characteristics of species have been established. GÜNTHER 1860, distinguished only one species of stavrid - *Trachurus trachurus* L. The other authors recognized two species. *T. trachurus* L. and *T. picturatus* BOWDICH, 1825. PALLAS 1811, described for the Black sea the 3<sup>d</sup> species *T. lacerta* which has been recognized the following authors as species or subspecies (such as EICHWALD 1831: *Coranx lacerta*; KESSLER 1877: *T. lacerta*; OSTROUMOV 1896: *T. mediterraneus*; GRACIANOV 1907 and KNIPOVICH 1923: *T. lacerta*; SLASTENENKO 1939, DRENSKI 1951, CARASU 1952, BANARESCU 1952: *T. trachurus lacerta*).

STEINDACHNER 1868, distinguished a special subspecies for the Mediterranean sea — *T. trachurus mediterraneus* which recognized by some authors as subspecies (DE BUEN, 1935; LETACONNOUX, 1951) or as species (LÜTKEN, 1880; SOLJAN, 1948; TORTONESE, 1951; NÜMANN, 1955). Thus, the presence of the separated subspecies or species *T. mediterraneus* in the Mediterranean sea was recognized by all authors, but the question concerning the relationship of *T. mediterraneus* and *T. lacerta* remained undecided.

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Black sea ichthyologists have been considering *T. mediterraneus* as a synonym of the *T. lacerta*. Recently to such conclusion also come TORTONESE 1951, by special study of this question. However ALEEV 1956, and SVETOVIDOV 1959, believed that *T. lacerta* is a synonym of *T. trachurus* L. In spite of the monographical investigations of the European stavrid of g. *Trachurus* the question of the number of species remain not quite decided. TORTONESE considers three independent species *T. trachurus*, *T. picturatus* and *T. mediterraneus*, while LETACONNOUX recognizes only two species *T. trachurus*, in which the additional lateral line reaches almost to the end of the second dorsal fin and there are from 67 to about 100 shields in the lateral line, and *T. picturatus* in which additional lateral line reaches to the beginning of the second dorsal fin only (acc. to ALEEV to 3-10 ray) and there are 90-108 smaller lateral line shields; besides, the last two rays of the second dorsal and anal fin are longer and separated one from the other by more distance than the previous rays.

However LETACONNOUX recognizes a few subspecies of *T. trachurus*: 1) *Trachurus trachurus trachurus* the additional lateral line reaches almost to the end of the 2nd dorsal fin (acc. to ALEEV to 30-32 ray), 2) *T. trachurus declivis* lateral line reaches to behind of beginning the 2nd dorsal fin, 3) *T. trachurus mediterraneus* it reaches to the beginning of the second dorsal fin (acc. to ALEEV to 1-6 ray), 4) *T. trachurus trecae* it reaches to the middle of the first dorsal fin only (CADE-NAT, 1949: Bull. Mus. nat. Hist. nat., 2<sup>e</sup> ser., 21 (6): 668, fig. 3, considers it as independant species). ALEEV discovered in the Black sea a specimen of the stavrid in which the additional lateral line is unden-developed and ends on the head. Following the classification indicated

above we can separate the 5 th subspecies *T. trachurus alineata*. Some subspecies as a *T. trachurus mediterraneus*, *T. trachurus trecae* have characteristics more similar to *T. picturatus* and others as *T. trachurus trachurus* and *T. trachurus declivis* similar to *T. trachurus*.

The beginning from PALLAS in the Black sea have been known two species, one is a small sized *T. trachurus trachurus*, permanently living here (see the figure n° 36 in КНИПОВИЧ, 1923) and the other *T. trachurus lacerta* a large sized sporadically migrated into the Black sea from the Mediterranean sea, which presently penetrated in a great number, distributed everywhere and displaced the local naturalized small sized *T. trachurus trachurus*. A great interest by investigators was provoked by such exceptional phenomenon. АЛЕЕВ 1956, investigated stavrids of the Black sea and concluded from this, that in the Black sea exist only one a new subspecies *T. mediterraneus ponticus* and that all data of previous investigators here refer to this form. However on the p. 180, table 2, cites a data about the rate of growth and the age-limit of the stavrid flocks from which we can see that in the Black sea there are two groups (species) of the stavrid the southern with the fast rate of growth and with a 12 years age-limit, and the northern with the slow rate of growth and a 5 years age-limit. Between these are two intermediate groups, apparently as a result of merging of southern and northern forms.

MAYOROVA 1961, notes that the large mediterranean stavrid is a sporadical phenomenon in the Black sea and presently its number is based on the productivity of 1949-1947 year generations which from year to year decrease owing to fishing and the natural mortality. So, in 1953-1955 the generations of 1949-1947 make up 70 p. 100 quantity of flock, in 1956 62, in 1957 46 and in 1958 27 p. 100 only. In 1957-1959 the basis of the commercial flock of large sized stavrid make up the generations of 1950, 1951 and 1952, less yield than generation of 1949, and number of which in 1959 make up only 5, 1 p. 100 of the yearly catching. The places of the spawning and its distribution is also much reduced and presently there are not a data to speak about the regular appearance and a number of the mediterranean stavrid in the Black sea. Apparently in the nearer future the large sized stavrid in the Black sea will be not the object of a great fishery and its distribution will be very limited. If a new outbreak of the mass migration will happen again, it is difficult to predict what form will appear again. Now in the Black sea there exists not only *T. trachurus trachurus* and *T. trachurus lacerta* but also there occurs a single specimens of the other forms.

The formation a special subspecies *T. mediterraneus ponticus* in the Black sea hardly possible taking into consideration that the large sized mediterranean sea stavrid is a sporadical phenomenon and both, large sized and small sized stavrid also are known in the Mediterranean sea and in the Atlantic ocean. Predominance of one or other form in the Mediterranean and in the Black sea undergo fluctuation, depending on hydrological, biological conditions and others factors. Recently *T. trachurus lacerta* in the Black sea in view of the mass migration are predominant and displace the *T. trachurus trachurus*, but as pointed out after 10-15 years owing to stopping a migration, fishing and natural mortality, its number sharply decrease and in the near futur perhaps the small sized form will again be predominate here. Such phenomenon of predominance as one form over others perhaps take place also in the Mediterranean sea.

In the Black sea owing to the mass appearance of *T. trachurus lacerta (mediterraneus)* hybrids were discovered between this and local species *T. trachurus trachurus* with the intermediate parental evidences which are distinguished here by the ichthyologists as « small » and « middle » stavrid and also by fishermen who gaven them a special names « kachanka » (see ТКАЧЕВА, 1957).

The serological investigations of Altuchov and АПЕКИН (1963) shown that the hybrids « small » stavrid in the Black sea have an intermediate position between the parental forms, although its more similar to the large sized mediterranean stavrid *T. trachurus lacerta* and the distinction between the last and hybrids carries an interspecific character. Moreover the hybrids (small stavrid) identical to the species (or subspecies *T. trecae* which is not known in the Black sea. Perhaps by the following investigations this will be identify by means of morphological analyzis and will increase here the number of stavrid forms. This will be according to our opinion that present European stavrid forms originated by hybridization between *T. trachurus*

and *T. picturatus* and the *T. trecae* CADENAT and « small » stavrid in the Black sea are clear examples of this, a remarkable phenomenon in Nature. The similar phenomenon of the mass hybridization in the natural conditions take place between many others marine species of fish. So, in the Black sea are existing 2-3 species gen. *Caspialosa* : *C. pontica*, *C. tanaica* and *C. maeotica*, the last some authors consider as a doubtful species. Owing to hybridization between this species there are many intermediate, unstable local forms the number of which increase with each new investigation. Some authors being not shure in its conclusion concerning the taxonomical position of the species of g. *Caspialosa* in the Black sea replace the names of specific on subspecific but this does not decide the question of species composition and its multiformity, but serves only to increase already numerous number of useless names.

Unfortunately little attention is given to this remarkable phenomenon on inter and intraspecific hybridization between the marine species of fishes in the natural conditions, whereas the multiformity and formation new forms among animals take place mainly owing to hybridization, especially in the densely populated and closely related species. Perhaps, this phenomenon in the marine migrated fishes, especially in time of its invasion has a great importance because the ecological conditions here do not play such a leading part that is attributed for the small local populations.

The continuous migration of some mediterranean species into the Black sea are to some extent make it difficult for the establishment of the taxonomic relation of separated populations, because besides the local populations here there occur the typical forms. Such mixing of mediterranean and Black sea forms clearly have been discovered between the stavrid species.

In conclusion, it is obviously the existing two subspecies in the Black sea : *T. trachurus trachurus* L. and *T. trachurus lacerta* PALLAS (*T. trachurus mediterraneus* STEINDACHNER, 1868) which in more or less numbered periodically penetrated into the Black sea in the purpose of fattening and reproduction and sometimes in a great number playing here a great role in the commercial fishery, and two kind of hybrids between them small and middle sized forms.

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