

SUMMARY OF THE STUDY ON THE HETEROGENEITY OF THE STOCK OF
ALBACORE (I. ALALUNGA) IN THE NORTHEAST ATLANTIC

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SUMMARY

Although albacore are seriously exploited in the northeast Atlantic, their stock structure is not yet well understood. In order to resolve, at least in part, the problem posed by the structure of the stock or to try to bring in new elements which can facilitate the advance of research, all available biological samples collected on the ISTPM oceanographic vessel are analyzed.

RESUME

Bien que sérieusement exploité, le germon dans l'Atlantique nord-est est encore imparfaitement connu au niveau de la structure des stocks. Afin de tenter de résoudre, au moins en partie, le problème posé par la structure du stock ou essayer

d'apporter des éléments nouveaux pouvant faciliter l'avance des recherches, tous les échantillons disponibles collectés sur les navires océanographiques de l'ISTPM sont analysés.

RESUMEN

Aunque el atún blanco es explotado fuertemente en el Norte y Este del Atlántico, no se conoce muy bien todavía la estructura de sus stocks. A fin de resolver al menos en parte, el problema planteado por dicha estructura, o tratar de aportar nuevos elementos que facilitarían el avance de la investigación, se analizan todas las muestras biológicas disponibles, recogidas en el barco oceanográfico del ISTPM.

There are two stocks of Atlantic albacore: a southern stock which is exploited by the longline ships of Asia and a northern stock which is exploited both by the longlines Asiatics and by French and Spanish fisherman, and to a lesser degree by the Portuguese. The European fishermen exploit the immature fish found in the surface waters of the north eastern Atlantic in the summer months. While seriously exploited, this fish is not as yet well understood, in particular with regard to the structure of its stock. As one begins the study of the management of resources this lack of information introduces an element of doubt as to the validity of the results obtained. In order to obtain or resolve, at least in part, the problem posed by the structure of the stock of the north east Atlantic or to try to bring new elements which can facilitate the advance of research, we have worked out a serie of biological samples : eye lens, length distribution, scales, vertebrae, gills, head, recaptured fish from tagging, etc, collected on oceanographic ships of the I.S.T.P.M. in 1976 and 1978 between the coasts of Europe and the Azores. In the course of our studies at the I.S.T.P.M. we have participated in the majority of the expeditions, and the material necessary for our works was extraited from the captured fish.

We commence the first part of our research by the analysis of proteins from the eye lenses. We examine the proteins extracted on cellulose acetate which show two types of electrophogram. The examination permits us to separate the groups of albacores as function of the different zones and periods of capture. The analysis on the gel does not permit the establishment of a differentiation. The result of this study shows that there are at least two groups of albacore in the study zone.

Moreover, as for the majority of pelagic fish the mesurements give only a small amount of susceptible information useful in specifying the ultimate heterogeneity of the stock. We have however obtained an interesting result concerning the ratio of head length to body length in which a difference appears between the Azores fish and that of the European coast.

With the same reasoning the study of a number of gill raker and of differents species of parasites collected on the gills showed no difference between the samples collected from various other provenances.

In the study of the structure of stock, the age, the growth and the length of the individual species studied and the examination of certain hard parts of the fish can demonstrate to some interesting comparisions. The analysis of histograms of frequency of size shows us above all that for young individual fish there is a heterogeneity of composition, which is very clear between the captured fish in the archipelago region of the Azores and those taken on the coast of Europe. The captured fish taken in June and July in the Azores are compared with those of sectors of coastal Europe captured in June and July and the frequency of size of the specimens captured from August to October on the coast of Europe are examined monthly.

The analysis of the structure of the hard part-scales vertebrae, otolithes-appeared more delicate because of the weak percentage of the legibility and irregularity of the ring. We have confronted the obtained results with those obtained earlier in order to verify that there are actually logical agreements. From the lecture concerning the scales it appears that the albacore of the zone of Azores "azorian" come from a spring breeding ground, however the fish which migrate in front of the coast of Europe "classic" reproduce in autumn.

Concerning the ring formed on the vertebra, one can observe a slight difference between the two groups. The otolithes are in insufficient numbers to forme a solid conclusion but nevertheless we have discovered identical results to those obtained by the study of the vertebrae.

We have finally retaken all the data of tagging at the I.S.T.P.M. even though many of them were incomplete because of little interest shown by the fisherman at the recapture. The data of the recovered were analysed in order to know the summer and winter migration as functions of the different stocks and

confirm the separation into two groups of north east Atlantic stock. These taggings permit us to calculate the rate of mortality, survival and exploitation and to estimate the instantaneous rate of rejection of the tag. In particular, what we have obtained for the yearly mortality total (0,98) is interesting if one compares the estimations of this rate with that made by means of the composition of the aged classe of one homogenous population by other authers. These estimated rates vary from 0,7 to 1,2. They also permit us to tender an estimation of the speed and direction of the mouvements of the schools at the beginning and at the end of the season.

In spite of the inevitable lack of samples for this work caused by the shortness of time at our disposal and of the difficulty of collecting the biological samples of the seasonal fish, we estimate that it is no longer possible to consider the stock of the albacore exploited in the north east Atlantic as a homogenous whole. A hypothesis among the others seems decisive, this hypothesis concerns the highly probable existance of two different areas in which breeding takes place. These areas are separated both by time and space. Because of the pressure exerted by the long line on each species of stock and because of the unequal capture perpetrated on the immature fish of the two groups by the Franco-spanish surface fisheries, it will be hazardous to undertake a study of the dynamic population without taking into account the heterogeneity of all the element composing this fishery operation.

Serene (1969) and Hallaire and Dao (1971) have already found the different phenotypes by the method of serum esterase. Aloncle and Delaporte (1973) have separated the stocks by the

different moires on the ventral. Well then, in order to clarify the heterogeneity more precisely on each stock, It had better utilise three genetical methods : serum esterase, moire on the ventral and protein of eyelens in our research. If the 3 results obtained from each method on the same individual are well corresponded, there are no longer confusions on the heterogeneity of the stocks of albacores in the north east Atlantic.

Leterature cited

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