GENERAL CHARACTERISTICS OF THE NERITIC ICHTHYOPLANKTON OF THE NORTHWESTERN SECTOR OF THE ALBORAN SEA IN AUGUST, 1982
II. ICHTHYOPLANKTON RELATIONS WITH MARINE ENVIRONMENTAL PARAMETERS

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ABSTRACT.- Relations between biological and hydrological parameters such as temperature, zooplankton organic matter and biovolumes, chlorophyll "a" values and ichthyoplankton abundance are studied.

Résumé.- Les relations entre les paramètres biologiques et hydrologiques tels que la température, la matière organique et le biovolume zooplanctonique , les valeurs de chlorophylle "a" et l'ichthyoplancton sont traitées dans ce travail.

The present paper based on the data gathered in the fish egg and larval survey, "Chanquete II-82", described in our previous paper, analizes some relations between hydrological and biological parameters taken, such as, sea water temperature and salinity, zooplankton organic matter and sedimented planktonic volumes, and the ichthyoplankton concentrations.

As Fig. 1 shows, zooplanktonic organic matter expressed in mg/m^3 and the volume of sedimented plankton (ml/m^3), both parameters giving an idea on the available nutritional resources, are in correspondance. To comparative effects, between total ichthyoplankton abundances station by station and separating egg and larval abundances with zooplanktonic biovolumes, show an intimate relation as can be observed in Fig. 2. In general, maximum and minimum zooplanktonic volumes coincide with the maximum and minimum ichthyoplankton abundances registered, alternating usually higher coastal values with lower values corresponding to offshore waters. A particular exception is remarked in the most western area corresponding to stations 2, 4 & 5, where lower larval abundances are not in correspondance with higher zooplankton volumes. This area is characterized by a high planktonic productivity and low superficial temperatures, due to the fact that it is an area of a marked "upwelling" process in the summer season, that was observed during the survey. The low temperatures registered act as a thermic barrier to the development of ichthyoplankton species. Another observation that supports this, is the fact that the mean mortality referred to the totality of eggs collected in this area is 73%, while the mean mortality in the rest of stations is 38%.

This phenomenom can also be observed in Fig. 3, where superficial temperatures are contrasted with egg and larval abundances. There is a temperature increase (to 20-22º C) in an eastern direction and an increase in spawning activity, situated between the bays of Marbella and Fuengirola (stations 6-10), that as commented in the previous paper, has proved to be the richest in spawning activity referred to total ichthyoplankton abundances. This zone is favoured by its coastal configuration in proximities with an intense upwelling area situated to the west, in front of the locality of Estepona.

As to sea water salinities, higher superficial values have been evenly distributed along the nearshore stations. No relevant effects on ichthyoplankton abundances have been observed.

With respect to chlorophyll "a" values encountered, the most occidental area shows high productivity, and inversely to zooplanktonic volumes, maximum chlorophyll "a" values have been registered in offshore stations (Fig. 4). Lower chlorophyll values in correspondance to higher zooplanktonic volumes and vice-versa can be explained to the "grazing" effect of zooplanktonic populations on phytoplankton.

In general, the main conclusions gathered is that ichthyoplankton populations are intimately related nutritional and hydrological factors that determine favourable spawning areas.

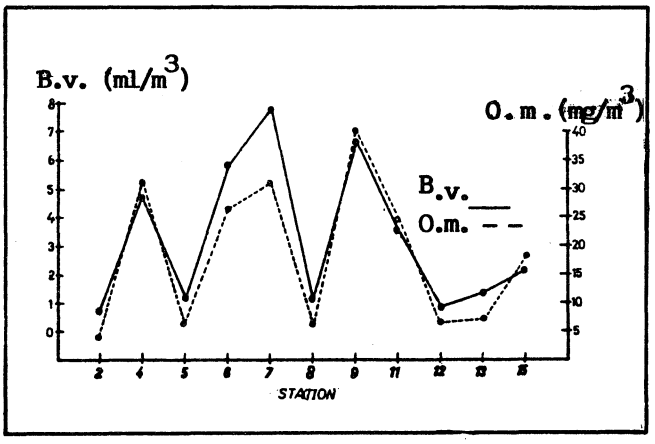

Fig. 1.- Relation of zooplanktonic org. matter-Biovolumes values.

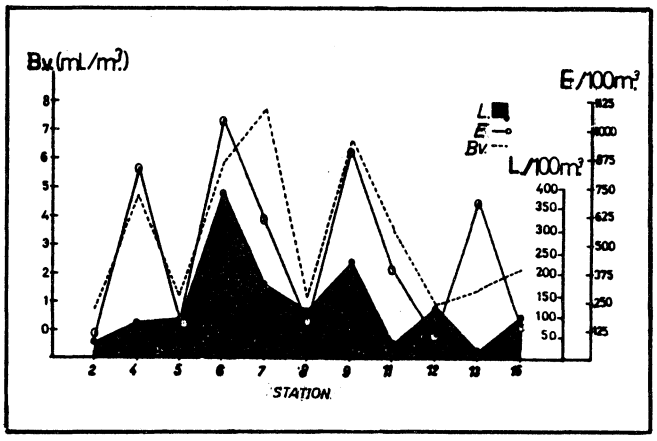

Fig. 2.- Relation of egg & larval abundance-zooplankton biovolumes.

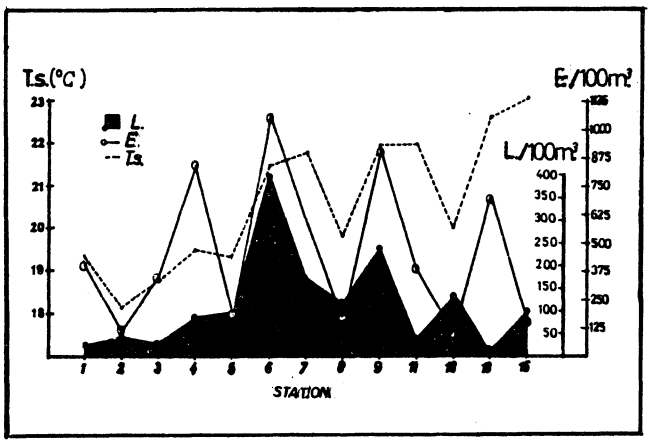

Fig. 3.- Relation of surface temperature-egg & larval abundance.

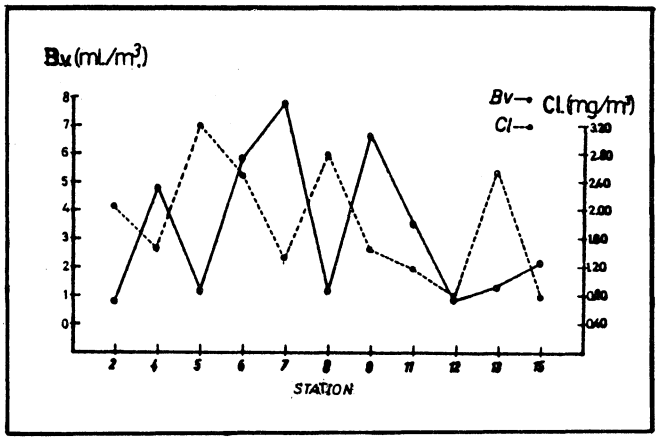

Fig. 4.- Relation of chlorophyll "a"-zooplankton biovolume values.