

The Saronikos and the S. Evvoikos gulfs, Aegean Sea. Zooplankton standing stock and environmental factors

by

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The zooplankton standing stock in the Saronikos and the S. Evvoikos gulfs has been studied in relation to environmental factors, on the basis of samples collected during August 1969 and March 1970.

The particular physical conditions, which have been reported, are mainly due to currents. These water movements are the result of the general circulation at the surface layers in the Aegean Sea, combined with the tidal currents which are observed in the Evvoikos gulf. These two factors act simultaneously twice every 24 hours, either in an antagonistic or a synergistic way, including all intermediate stages; consequently the pattern of the currents is complicated and almost undetectable in its details but the influence on the zooplankton standing stock is obvious.

The eutrophication in these gulfs is a result of the disturbances that are observed at several places. Turbulent movements scatter nutrients and detritus raised from the bottom into the whole water mass, thus enriching the water significantly. As a consequence, there appear local phytoplankton blooms. The importance of the presence of detritus for the nutrition of zooplankton is obvious when phytoplankton concentration drops to very low levels during unproductive periods. In short, these two gulfs constitute a twin, highly reproductive system because of their particular circulation patterns.

An additional source of enrichment in the Northern part of the Saronikos gulf is due to the discarded material from the Athens basin and city, that is rain water, sewage etc. This last statement has been verified by recently obtained data during the 1970 cruise but the exact contribution of this source on the eutrofication problem has not yet been estimated, though it seems much less important even in the Northern regions of the Saronikos gulf compared to the previous factor.

The zooplankton wet weight varied from 40 to 200 mgr/m³ according to the analysis of samples collected during a highly productive period (March). Measurements obtained from samples during unproductive periods (August) were about half as much.

Finally, an abiotic factor, that is the almost complete absence of oxygen at the west district of the Saronikos gulf has been detected. From our observations we know that oxygen concentration drops to very low values; 1.40 ml O₂/lt H₂O has been recorded especially at layers close to the bottom. This is a result of the absence of circulation due to the peculiar formation of the sea bed and the surrounding land, which prevent the entrance of the currents; circulation occurs only at the surface while the deeper layers, up to 300 meters remain unrenewable so that oxygen concentration depends directly on its diffusion from well oxygenated waters at the surface, but the process never reaches depths greater than 100 meters. The oxygen concentration changes when the deeper water masses are disturbed, at times, by local subsurface weak currents due to either severe action of surface currents or to sea water vertical displacement because of physical conditions.

