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A NEW ASPECT OF MARINE CHEMISTRY IN RELATION TO DYNAMICS OF THE ADRIATIC SEA

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SUMMARY

Distribution of chemical parameters (salinity, pH, alkalinity, oxygen, nutrients) in relation to dynamics of the Adriatic Sea were investigated. 35 oceanographic stations in the Adriatic and Otranto Strait were occupied during the first cruise of R/V "Andrija Mohorovičić" August-September 1974. An unexpected current system for this period of season were found. Good interdependence between distribution of chemical parameters and Adriatic basin dynamics were established.

RESUME

On a recherché la distribution des paramètres chimiques (la salinité, l'alcalinité, l'oxygène, les sels nutritifs) par rapport à la dynamique du bassin Adriatique. Les recherches ont été effectuées dans les 35 stations océanographiques de la Mer Adriatique et du canal d'Otrante au cours de la première croisière du B/R "Andrija Mohorovičić" en août-septembre 1974. Pendant ces recherches on a constaté la présence de quelques systèmes des courants particuliers de la direction cyclonique séparés par la circulation transversale. Dans le canal d'Otrante, à travers toute la colonne d'eau on a enregistré les courants orientés vers l'Adriatique.

Rapp. Comm. int. Mer Médit., 24, 8 (1977).

Il n'était pas possible d'expliquer ces connaissances avec la notion de la dynamique de la Mer Adriatique obtenue jusqu'à présent. On a bien établi le rapport entre les systèmes dynamiques et la distribution des paramètres chimiques dans le bassin adriatique.

INTRODUCTION

Oceanographic work performed in the Adriatic Sea during past decades, contributed considerable to a basic knowledge of several environmental factors which govern its chemical characteristics. But more exact seasonal distribution and fluctuation of some microconstituents inside the Adriatic basin, their circulation between Adriatic and Ionian Sea as dynamical mechanisms of these exchange processes - remain unknown.

"Andrija Mohorovičić" expeditions (1974-76) try to solve these problems by realisation of complex transadriatic investigations. We would like to make your attention only on the first cruise ("Andrija Mohorovičić" September-October 1974).

MATERIAL AND METHODS

35 permanent hydrographic stations uniformly displaced thorough all the Adriatic area were occupied in order to obtain basic chemico-oceanographic data: Salinity, pH, alkalinity and oxygen were studied on standard oceanographic levels, while the determination of nutrients (P, N and Si) was carried out on four or more levels in relation to the depth and structure of sea water column. Investigated parameters comprises application of modern field instrumentation and laboratory methods, now in use in prevalent world's oceanographic institutions. All measurements and chemical analysis were carried out on board immediately after sampling. In the same time were performed also direct dynamical measuring by modern instrumentation (Vučak-Nožina: Results of direct measurements of currents in Adriatic and Otranto Strait).

RESULTS AND DISCUSSION

We shall discuss results for longitudinal adriatic profile. From distribution of chemical parameters an inflow aspect of Ionian waters into Adriatic is evident. It is very important to emphasize the results of direct measurements of currents confirm results of chemical distributions. Rather, they complet them with the following - till now unknown conception:

1. Unexpectedly in this season was registred strong currents with direction of entrance in Adriatic across whole the water column, particularly on Otranto Strait.

2. Inside of the Adriatic basin very expressed cyclonic flow of transversal currents divide the Adriatic water masses on more dynamicaly separated parts.

The knowledge of both points are of great importance for the chemistry of Adriatic basin and we hope that they give a key for solution some of fundamental problems of Adriatic chemistry.

DISCUSSION

Questions and comments:

1. What is, after You, modern instrumentation?

(A. BALLESTER, Spain).

- In our research, up-to-date instrumentation includes different field and laboratory oceanographic instruments used on board of "Andrija Mohorovičić" for simultaneous and "in situ" measurements of physical, chemical, biological and geological parameters. Those are: currentmeters, spectrofotometers, underwater fotometers, salinometers, oxysonda, microscops, grabs etc.

2. What is the vertical and horizontal distribution of components? (A. BALLESTER, Spain).

- Seasonal distribution of components, as it was possible to sea from graphs, shows an unexpected ingoing trend of Mediterranean water into the Adriatic. It was reflected especially in decreasing of values from Ionian to Adriatic Sea for sigma-t (29.0 - 26.0) and nutrients (reactive phosphate 0.2 - 0.07 $\mu\text{g-at/l}$, nitrate 2.0 - 0.5 $\mu\text{g-at/l}$, silicate 7.0 - 1.0 $\mu\text{g-at/l}$ while an increasing of specific alkalinity (0.120 - 0.130). This is in a very good corelation with strong currents dynamic registered directly across the whole water column especially on Otranto Strait.

3. It is necessary to study and to know chemical composition of seawater, dynamics of water masses, nutrient content and biomass. (M. BRANICA, Yugoslavia).