

SOME NEW INFORMATION ON THE OCEANOLOGY OF THE ADRIATIC SEA

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SUMMARY: The transadriatic oceanographical cruises performed during the period 1974-1980 by the R/V "Andrija Mohorovičić" of the Hydrographic Institute of the Yugoslav Navy, Split, have provided a more profound insight into dynamical and hydrodynamical relations of the Adriatic basin. Oceanological properties of the Adriatic waters could be better understood through extremely dynamical intra (inter) basin relations between:

- the Ionian and the Adriatic (longitudinal binding),
- the west and east Adriatic coast (transversal (binding),
- the surface and the bottom of the Adriatic water body (deep vertical binding).

The above processes are prevalently induced by some out-sea factors based on the interaction with the atmosphere, surrounding land, as well as reactivation of bottom sediments. In strong connection with permanent and periodical mechanisms of water circulation, these factors favourise a differentiation of Adriatic water bodies, dispersion of nutrients, and also a specific distribution of some zooplanktologic species.

RESUME: Les croisières océanographiques transadriatiques effectuées pendant la période 1974-1980 avec B/R "Andrija Mohorovičić" de la Marine Yugoslave, Split, ont contribué à une connaissance plus profonde des relations dynamiques et hydrochimiques du bassin adriatique. Les propriétés océanographiques de l'Adriatique sont rendues plus compréhensibles par la recherche des relations entre:

- le bassin de la mer Ionienne et celui de l'Adriatique (liaison longitudinale),
- la côte occidentale et la côte orientale de l'Adriatique (liaison transversale),
- la surface et le fond du corps d'eau de l'Adriatique (liaison verticale de la profondeur).

Les processus indiqués ci-dessus sont causés surtout par les facteurs extramarins fondés sur l'interaction de l'atmosphère, de la terre environnante et de la reactivation des sédiments du fond. Ces facteurs favorisent une différenciation du corps d'eau de l'Adriatique. Cela se déroule dans une connexion étroite des mécanismes permanents et périodiques de la circulation marine, de la dispersion des sels nutritifs et de la distribution des certaines espèces zooplanktologiques.

Introduction

More recent multidisciplinary oceanological investigations of the Adriatic have pointed out at some new important elements of its oceanological dynamics and chemistry. They are based on a strong interrelation and confrontation of the atmosphere the sea and continental factors on one side, and the biosphere on another.

Material and methods

The investigated area included the whole Adriatic basin with the exception of Yugoslav and Italian territorial waters. Investigations had an expeditionary character and were performed from 1974 to 1980 in various seasons with the R/V "Andrija Mohorovičić" of the Hydrographic Institute of the Navy, Split. The field research included about 50 permanent oceanographical stations at which the following measurements were carried out:

- classical hydrometeorological investigations,
- standard hydrographical measurements (T, Sal, density),
- direct measurements of currents,
- chemical investigations (pH, alkalinity, oxygen, saturation, nutrients),
- some biological (zooplanktological) investigations.

Results and discussion

Combined investigations give more possibilities for estimating complex relations of the Adriatic:

The interbasin exchange between the Ionian and the Adriatic comprises the whole water body column in the Otranto Strait. It includes a permanent cyclonic current system with the in-going branch along the eastern (Yugoslav) coast and the out-going branch along the western (Italian) coast. The velocity of current changes markedly during different seasons and also for different levels of the water column (0.04 - 0.80 knots). The outgoing current velocity along the both Adriatic coasts

increases during the summer season.

The interbasin exchange within the Adriatic basin divides the Adriatic aquatory in three dynamical entities, separated by a strong transversal current system, denoted as: "Zones of hydrological discontinuity" (ZHD). The ZHD appear as zones with maximum expressed convection processes, especially during winter (Adriatic upwelling zones). The most frequent regional winds (NE and SE) often appear as important activators of drift currents as well as convective and advective dynamical processes.

The main source of the Adriatic nutritional (also polluted) budget substances are Italian and Albanian rivers, Ionian (Mediterranean) waters, and recycled bottom sediments. Under the influence of complex dynamic relations including activity of physico-chemical equilibrium mechanisms, chemical substances are dispersed and appear prevalently in micro concentrations.

Conclusion

Oceanological properties of the Adriatic are complex. Therefore, they should be correctly interpreted using a multidisciplinary approach and emphasizing dynamics.

References

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