

The distribution of the pelagic organic matter in North Adriatic

by

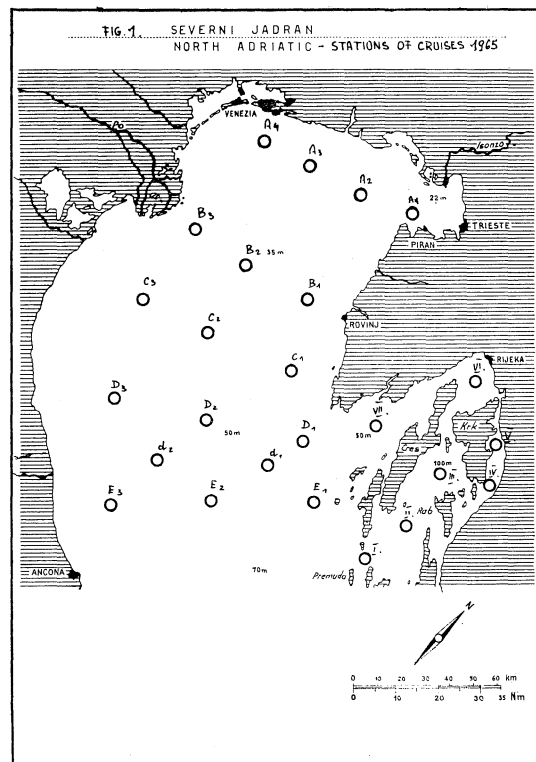
JOŽE ŠTIRN

Institut for Sea Research, Portorož (Yougoslavie)

Introduction

In the fram program of our Institute and with the help of Foundation for scientific work SR Slovenia B. KIDRIĆ we began in the year 1964 with the systematical research of physico-chemical oceanology and pelagic bioproduction of the North Adriatic.

As we want to get the first but continual insight into the oceanological happenings and those of the bioproduction we had accomplished with the ships *Argonaut I.*, *Zlatorog* and *Argonaut II.* during the year 1965 ten cruises and each cruise had visited all the stations marked on the map added. The cruise of our R.V. *Argonaut II.* in the summer 1966 along the Adriatic, Ionic sea and the part of the West Mediterranean we employed for the continuity of the measurements of the pelagic biomass in the different parts of the Mediterranean comparative to the North Adriatic and that first of all because it is very difficult to compare the data of the old authors as almost every one of them worked with another method and technics.



Rapp. Comm. int. Mer Médit., 19, 4, pp. 755-758, 3 fig. (1969).

On the each station we have researched the stratification of the waterbody, the chemical and light conditions, the general chemical qualities of the water and especially precise the conditions of the nutritive salts and the dissolved gasses. The organic matter we had determined partly with standard and partly with semi-micro Kjeldahl methods. Also we had worked on phytoplankton quantitative and qualitative with the help of the membran-filtration but on zooplankton with the standard Hensen net N° 3. The bacteria we had been determining as the colonies which were incubated on the membran filters. The methods and the results of all mentioned above will be published on the other place because of its extension.

Methods

We were taking the samples of 1000 ml and we fixed them with the adding 30 ml 40 per 100 of basic formalin to which we had determined the value of nitrogen. In the laboratory passed the sample through a membran filter MF 30 Göttingen with the adding of superfine suspension of $Mg CO_3$ to which we had also determined the value of nitrogen. This suspension makes possible the quantitative separation of particulate matter from the filter. From the water which was filtered on this way we have taken 250 ml to evaporate it to 10 ml. Originally we have destilated the water sample in the macro-type of Kjeldahl apparat while it shows very soon as unsuitable so we destilated the water and the particulate matter in the semi-micro Kjeldahl apparat. Afterwards we have made a semi-micro apparat which we fitted up into the laboratory on the research vessel and so we are determining all the samples immediately fresh on the sea. At so organised work the analyse lasts from the taking of the sample to the result ca 40 minutes.

This method as the indicator of the standing-crop of the organic matter seems to us very useful and exact and that first of all because it, in the contrary with the gravimetrical and volumetrical methods, eliminate disturbances which are appearing because of various voluminosities or because of different skeletal forms and it shows the most stable constituency, that are proteins. On the other side it makes possible to get into the analyses all the fractions of the organic matter at once or with the use of separate filtrations by various fractions.

Results

During the last years we made ca 800 above described analyses which detailed results we shall publish on another place. Here we shall describe only some most important results.

1. *The relation between the dissolved organic matter and particulate organic matter*

The absolute quantity of the dissolved organic matter varies a lot and it is no trace about more or less constant values as it is quoted by some older authors. In contrary the absolute value of the organic matter rises with the value of the particulate organic matter but the relation between one and another is relatively constant and the dissolved organic matter is taking place with 130-355 per 100 of the total organic nitrogen in sea water.

2. *The absolute quantity of the particulate organic matter*

The absolute quantity of the particulate organic matter in North Adriatic is in the months of the plankton minimum from 3 — 20 mg N/m³, in the months of plankton maximum but from 20 — 220 mg N/m³. From that point of view comparatively to the data in cited literature North Adriatic is not very much different from most productive parts of North Atlantic. The quantity of the organic matter in the time of plankton bloom in the region of Po-water inflow even surpasses up to now known values for the northern seas.

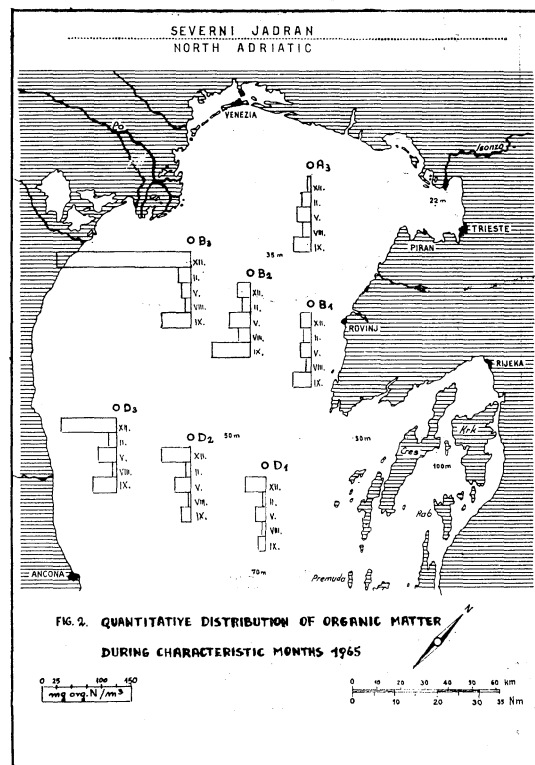
3. *The comparison of Mediterranean and North Adriatic*

In July 1966 we made a line of comparative measurements of the continuing series from the North Adriatic to the North African coast. The index shows organic nitrogen in mg/m³ in surface waters on named stations caught from 13th to 25th July every time at noon :

North Adriatic	23,1	Crotone	1,0
Middle Adriatic	5,1	Messina	5,3
Otranto	9,2	Maritimo	38,1
Taranto	10,9		

4. The distribution of the organic matter in North Adriatic during 1965

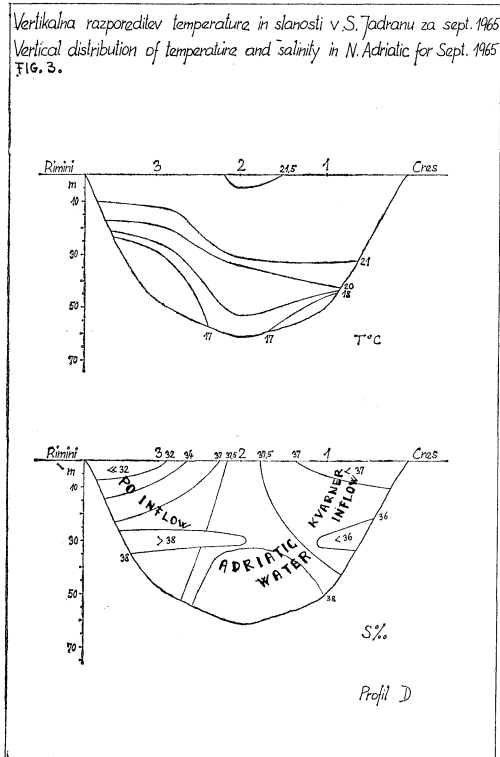
To show the whole material from all the stations and from all the depths it does not belong to the frame of this report. But on the Fig. 2 there are inscribed the values of organic nitrogen in the surface water layer/10 m in the characteristic months and on selected stations.



The distribution during the year cycle shows us three plankton maxima out of which the late autumn is the richest but most depending on the meteorologic factors, the spring and late summer ones are more stabile.

All the same the distribution shows a great heterogeneity of the bioproduction in North Adriatic. So is the belt along the Italian coast directly under the influence of the Po-river basin conditions and it is the most productive. The middle belt regards us on the conditions in the Middle Adriatic even it is more productive. The belt along the Istrian-shore and Kvarner has for the conditions in North Adriatic relatively small production but which is far more continuing as wherever else. We could attribute that also to a rather constant undersea inflow of the carstwaters which causes a minimal but permanent fertilisation but doubtless they came because of constant winds here to expression also the known upwelling processes.

The described heterogeneity of the North Adriatic is evident also from the data given by the physico-oceanological analyses of our cruises. As a characteristic example of the composition of the North Adriatic waterbody we are adding Fig. 3 which shows the section and the main characteristics of the « Po-inflow waters », « Middle Adriatic insert » and « Kvarner-Istrian inflow ».



References

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