

NUTRIENT ENRICHMENT AND BIOLOGICAL RESPONSE IN THE ADRIATIC COASTAL SEA

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The Institute of Oceanography and Fisheries have, for the past ten year, been involved in the research of the coastal waters of the middle Adriatic (from Zadar to Dubrovnik). This research has been undertaken to establish the impact of land factors (river and waste water runoffs), on the one hand, and of the open sea-water, on the other, on chemical and biological properties of the adjacent sea.

The studies of chemical hydrography, nutrients, chlorophyll *a* and primary production (*in situ*) point to the fact that, for the past decade, an increase in the eutrophication level has persisted in all the areas, except in the area of Dubrovnik which is still affected by the open sea. A marked trend of increase of some nutrients (nitrate and nitrite) along with temporary occurrences of higher quantities of other nutrients has been recorded from the areas of Sibenik and Ploce. These areas are also characterized by markedly high productivity and phytoplankton biomass, presumably due to the effects of fresh water inputs by the rivers Krka and Neretva respectively as well as to urban sewage effluent disposal. Considerable changes have been recorded in the Split area ecosystem, particularly in Kastela Bay. Here, the eutrophication intensification is presumably closely related to urban waste water runoffs which have been constantly increasing. Red tide has frequently been recorded from these areas, devastating them seriously. Therefore these problems call for intensive future investigations which would help to establish the causes and effects of these phenomena.

Stat.	Parameters									
	T°C	Sx10 ³	O ₂ cm ³ m ⁻³	NO ₃ -N	NO ₂ -N	NH ₄ -N	PO ₄ -P	SiO ₄ -Si	N/P	
Z-1	18.99	37.78	5.63	0.98	0.089	0.76	0.046	3.33	35	
Š-1	19.12	34.09	5.58	1.25	0.134	1.22	0.105	7.14	33	
S-1	18.82	37.38	5.62	0.87	0.087	0.78	0.064	4.19	45	
P-1	19.52	35.51	6.11	0.90	0.121	0.82	0.062	4.20	35	
D-1	18.99	38.06	5.79	0.82	0.094	0.61	0.062	4.09	30	
I.Via	17.70	38.51	5.47	1.09	0.093	0.73	0.062	3.09	31	

Table 1. Mean summer values of hydrographic parameters, and nutrients (m mol m⁻³) on investigated areas.

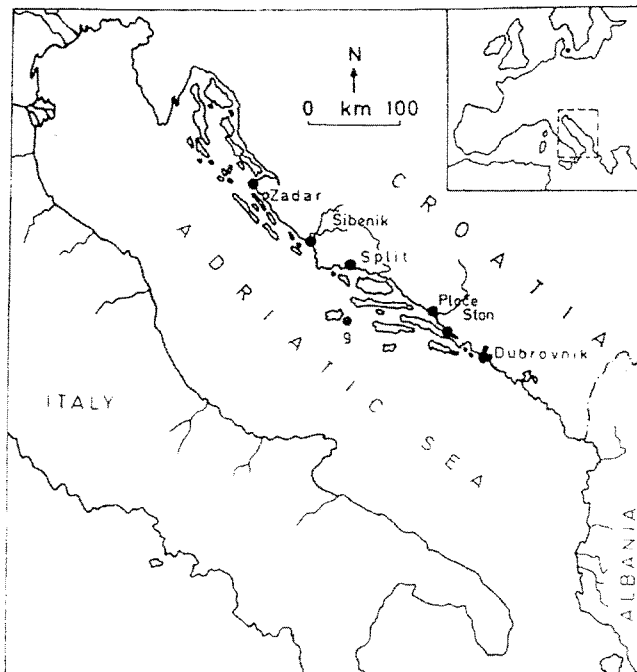


Fig. 1. Study area

REFERENCES:

- Analiza rezultata istraživanja projekta "Vir-Konavle" u razdoblju 1984-1991 god. Elaborat-IOF-Split, 1992.
- VUKADIN, I. 1991. Hydrographic and Biological Aspects of Algal Bloom in Adriatic Sea in 1988. Toxicological and Environmental Chemistry. Vols 31-32: 265-274.
- ZORE-ARMANDA, M. M. BONE, V. DADIĆ, M. MOROVIC, D. RATKOVIC, L. STOJANOSKI and I. VUKADIN., Hydrographic properties of the Adriatic Sea in period from 1971 through 1983. *Acta Adriat.* Vol. 32: 1-547.