Suspended matter in the Gulf of Venice (Northern Adriatic Sea): years 1990-1991

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The mechanisms of production of suspended matter are widely recognized to be related mainly to the riverine supply and to the biological activity, especially in a basin like the Adriatic.

In the northern part of the Adriatic Sea, the predominant suppliers of suspended matter are the rivers, and, among these, the Po River is undoubtely the main.

In some periods of the year, when the environmental conditions are favourable, the particulate matter supplied by the rivers is accompanied by the products of the biological activity that in some conditions can be very relevant.

The present paper refers about a study on particulate matter carried out from March 1990 to November 1991 in the Gulf of Venice.

An example of the distribution of particulate matter at a basin scale is the result of a survey done in May 1990, that showed the typical features of the suspended matter distribution at the beginning of the stratification period, in which the Po River plume is well developed and north-eastward deflected, with concentration values at the plume front of the order of 10 mg dm^{-3} at the surface, 15 nautical miles off of the river mouth.

The observations on suspended matter were carried out on three stations in the Gulf of Venice, with monthly frequence, and deal with the Total Suspended Matter (TSM) concentration, the content in Particulate Organic Carbon (POC) and Particulate Nitrogen (PN), together with the measurements of standard hydrological properties.

In Tab. I the average values, at different depths, for TSM (expressed as dry weight, DW), organic and inorganic fractioning, POC and PN are reported, taking into consideration the same periods of the two years of observations, to allow a better comparison.

In the summer 1991 appeared in the Northern Adriatic Sea a noticeable amount of gel-like aggregates; on the contrary, in the previous year, these were not observed.

In our data this is evidenced by the increase of the total amount of suspended matter and particularly of the organic carbon. Looking at the data in detail, we can observe that this increase was particularly striking in the layer from surface to 20 m (about 2 times), whereas at the bottom the POC concentration remained substantially unchanged. These differences could also be due to the different meteo-hydrological regimes that took place in 1990 and 1991.

During the 1991 we realized some preliminary measurements of sedimentation fluxes, utilizing two fixed sediment traps located in the Gulf of Venice. We choosed one station in the transition area between the coastal zone and the open waters, 17 m deep (Station 1), and a second one in open waters, 28 m deep (Station 2).

The preliminary results on sedimentation rates for suspended matter (DW), Organic Carbon (OC) and Total Nitrogen (TN) are reported in Tab. II.

These data, in the period from April to September 1991, suggest that the sedimentation conditions are homogeneous in the two stations, with the same variations of sedimentation rates in time. The unique constant difference is related to the content of organic carbon, that always appeared to be higher in the station closer to the coast.

	DEPTH m	DW mg/dm3	INORG mg/dm3	ORG %	POC ug/dm3	PN ug/dm3	C/N	SAMPLES n
June-October 1990								
	0.5	2.34	1.49	43.24	158.9	21.0	9.0	16
	5	2.04	1.30	43.28	160.3	20.7	9.2	16
	10	1.92	1.25	46.46	143.9	20.2	8.6	16
	20	2.28	1.44	46.07	176.4	26.1	8.4	8
	>20	2.10	1.40	40.24	161.0	26.1	7.7	12
June-October 1991								
	0.5	2.73	1.50	49.14	315.1	40.9	9.0	15
	5	2.40	1.10	51.34	316.4	40.4	8.9	14
	10	2.52	1.40	49.35	315.7	40.8	9.0	15
	20	3.26	1.86	46.83	210.0	31.7	7.8	9
	>20	3.65	2.52	33.23	168.0	26.5	7.6	9

TAB. I

STATION	PERIOD	DAYS	DW g/m2/day	OC g/m2/day	OC %	TN g/m2/day	TN %
1	Apr-Jul 91	84	23	0.56	2.39	0.06	0.28
2	Apr-Jul 91	91	25	0.48	1.92	0.06	0.23
1	Jul-Sep 91	59	4	0.17	4.24	0.02	0.55
2	Jul-Sep 91	56	3	0.13	3.68	0.01	0.43

TAB. II

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