

**THE EFFECT OF COLD AND WARM CORE EDDIES ON THE
DISTRIBUTION AND STOICHIOMETRY OF DISSOLVED NUTRIENTS
AND ENHANCEMENT OF PRIMARY
PRODUCTION AND CHANGES IN ELEMENTAL COMPOSITION OF
PHYTOPLANKTON IN A COLD CORE EDDY IN THE EASTERN
MEDITERRANEAN**

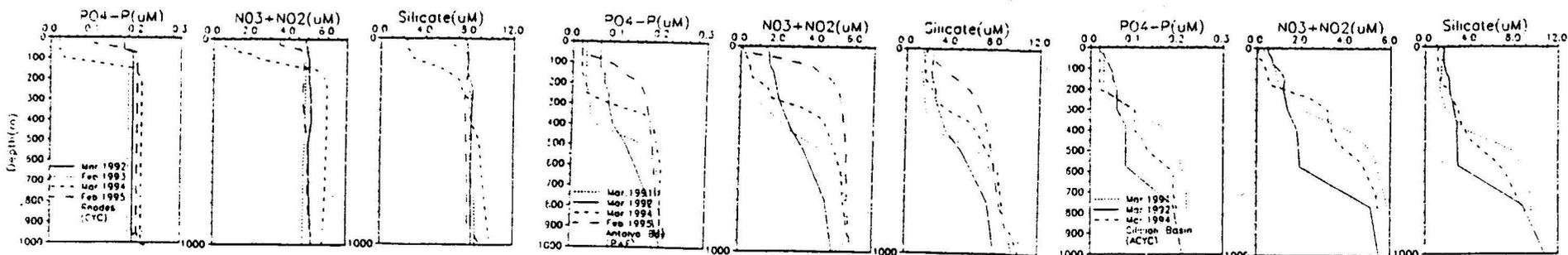
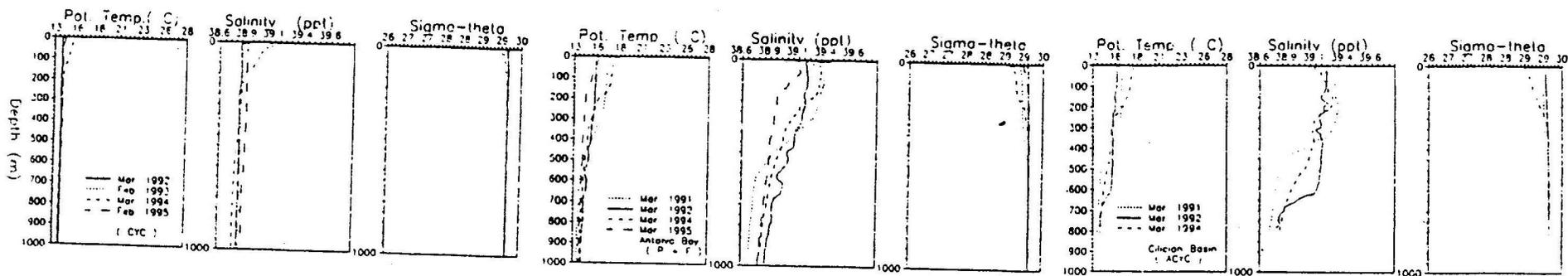
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ABSTRACT:

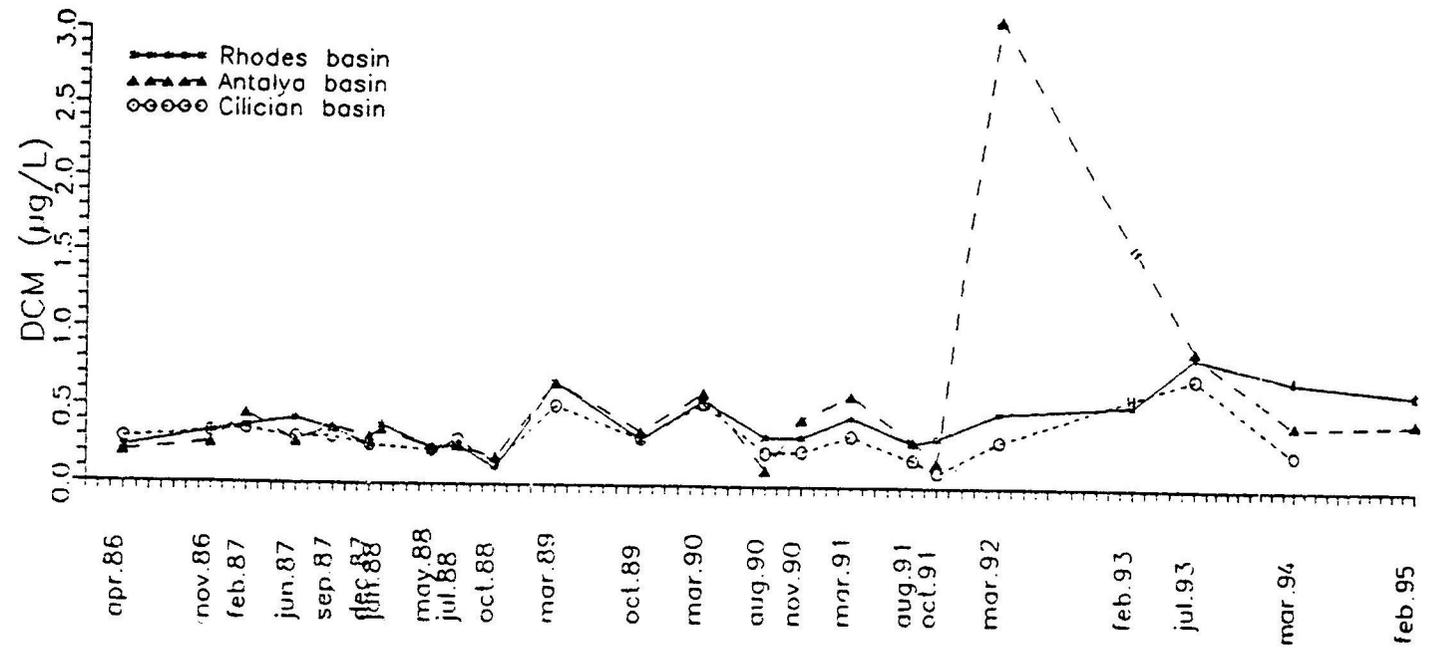
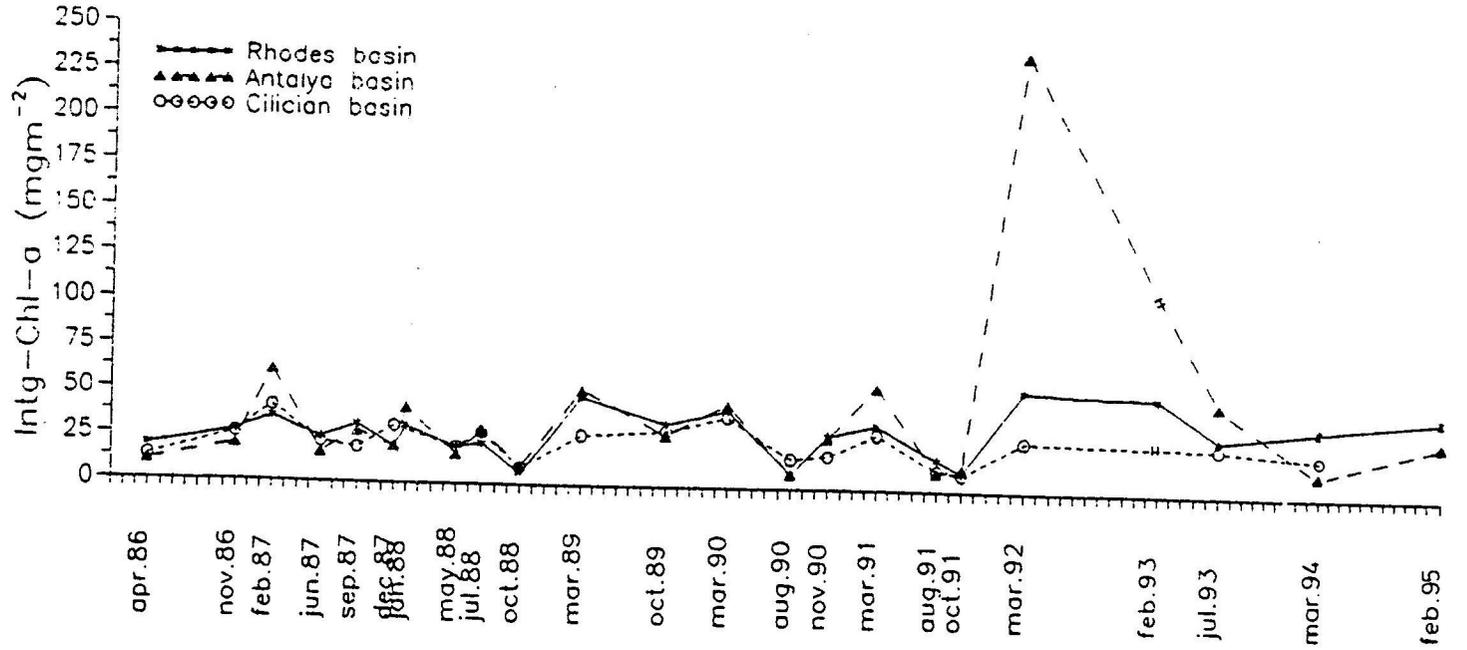
Quasi-permanent cyclonic Rhodes Gyre located in the NE Mediterranean is the major source of nutrients for the oligotrophic surface waters. In the core of eddy and its peripheries, elemental compositions of biogenic particulate matter in the productive layer (~100m) have been studied with simultaneous measurements of primary production (PPT), Chl-a, light penetration and inorganic nutrients. When the surface water cooling prolonged (e.g. in 1992, 1993 and 1995 winters), the nutrient concentrations displayed vertically uniform profiles down to >1000m. During bloom of these years, PPT and biomass were as high as 0.5gC/m²/d and 3 mg/m³ (0.2 g/m²) in terms of Chl-a respectively; which are similar to those reported for the Western Mediterranean and the Black Sea where the majority of land-based inputs reach. The prominent DCM nearly disappeared and vertically uniform Chl-a profiles were formed in such winters. However, in mild winters (1991, 1994), the deep water ascended up to only the base of the euphotic zone, resulting in a limited Pp and thus biomass in the nutrient depleted euphotic zone. The chemical composition (C:N:P ratios) of POM in the euphotic zone, which were very similar to the classical Redfield values under the P-limited conditions, were nearly 100:10:1 under the nutrient unlimited winter production; the anomalous C:N and N:P ratios in nutrient enriched waters might be the result of either less inorganic nitrogen assimilation during photosynthesis with respect to phosphate or selective excretion of org-nitrogen from POM.



Rhodes Basin

Antalya Bay

Cilician Basin



Linear regression analysis for organic carbon, nitrogen and phosphorus in particles from the surface layers of the northern Levantine basin. Concentrations are in μM , n is the number of samples and r is the related correlation coefficient

Location	Regression	r	n	Remark	Source
Western Mediterranean (Ligurian Sea, March, 1980)	C=5.89N+0.29 C=119P+0.42 N=20.9P+0.002	0.975 0.942 0.963	296 62 60	0-100m	C.Montegut C.Montegut 1983
SE Mediterranean (Nile delta June-July, 1986)	C:N=5.68±1.43 C:P=111.8±24.4 N:P=19.7±4.4	- - -	- - -	0-50m	AbdelMoati 1990
Northern Levantine (October 1991)	C=6.70N+0.89	0.500	23	0-150m	Present Study
Northern Levantine (March 1992)	C=9.92N+0.64 C=108P+0.00 N=10.8P-0.06	0.959 0.877 0.905	17 17 17	0-100m	Present Study
Northern Levantine (July 1993)	C=8.00N+0.81 C=116P+0.85 N=15.4P-0.02	0.916 0.871 0.728	44 21 43	0-150m	Present Study
Northern Levantine (Dec. 1993)	C=6.50N+0.68	0.880	10	0-150m	Present Study
Northern Levantine (March 1994)	C=6.20N+1.64 C=118P-0.68 N=18P-0.05	0.920 0.850 0.810	21 9 10	0-150m	Present Study
Eastern Mediterranean (Feb. 1995)	C=11.3N+0.74 C=116P+0.87 N=9.25P+0.27	0.910 0.850 0.800	41 41 41	0-100m	Present Study

**The Level of Total Primary Production(PP_T), New
Production(NP)($gC/m^2/y$) and f-ratios estimated
for the Northern Levantine Basin**

Date	NP	PP_T	f-ratio
1991 Rhodes(CYC)	7.6	17.8	0.42
1992			
Rhodes(CYC)	50	44	1
Antalya(P+F)	17.7	64.6	0.27
Cilic.(ACYC)	16.4	39.7	0.41
1995			
Rhodes(CYC)	19.8	25.1	0.79
Antalya(P+F)	7.1	28.4	0.25

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P65
1996

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**BIOLOGICAL PROCESSES IN THE EASTERN
MEDITERRANEAN INTERACTION WITH
HYDROLOGICAL STRUCTURES**

Molitg les Bains (France) 1-2 July 1996

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