

SURFACE MACROPHYTOPLANKTON OF THE PACIFIC OCEAN
ALONG THE EQUATOR

Information about the composition and abundance of the phytoplankton of the equatorial Pacific Ocean is limited. The most important contribution is the study by Hasle (1959, 1960*a, b*) of 23 bottle samples collected at three equatorial stations in the central Pacific Ocean. Semina (1960) and Kozlova and Mukhina (1967) have published counts from some stations near the Equator. Taxonomic observations may be found in Pavillard's (1935) and Rampi's (1952) papers. Sediment analysis as performed by Kolbe (1954) and Mukhina (1966), if handled with caution, also gives pertinent indications about the overlying plankton.

During the trans-Pacific cruise ALIZE (November 1964 to March 1965) of the RV *Coriolis* of the Centre O.R.S.T.O.M. de Nouméa, along the Equator from the Galapagos Islands to the New Guinea

of the vessel and the propeller eddy make the water homogenous over a greater depth; therefore the catches are representative of the superficial first meters as a whole, even in smooth seas. Organisms thus collected are called surface macrophytoplankton.

The hauls took place daily at 1830 hours (local time) and lasted 10 min. The samples were preserved in a 4% neutralized formalin solution. Diatoms and dinoflagellates were identified (to genus or species) and counted under a microscope in a shallow cell engraved with a cross-ruling which permits either a sample count of abundant taxa or a total count of less common taxa.

According to Barnes (1951), Glover (1953), and Glover and Pope (1956), the filtered volume of water is a function of the haul length and of the area of the front aperture (i.e., 0.36 m³ in this case).

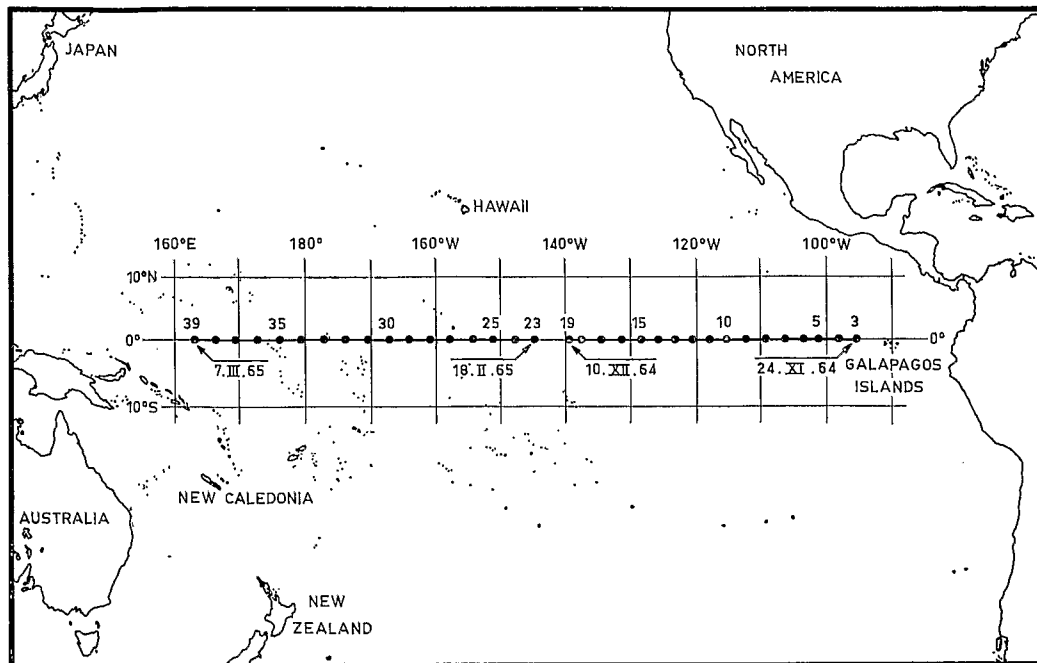


FIG. 1. Location of surface phytoplankton hauls during the cruise ALIZE of the RV *Coriolis* (November 1964–March 1965).

chemical properties: an increase in temperature from east to west and a decrease in phosphate and nitrate content, as shown in Fig. 2 (drawn from the data of Rotschi et al. 1967). Following a less regular

sta. 6 arises from an overwhelming dominance of *R. bergonii*. The secondary peak which appears in the peridinians at 130° W long is caused by *C. furca* and accessarily by *Ceratium candelebrum*.

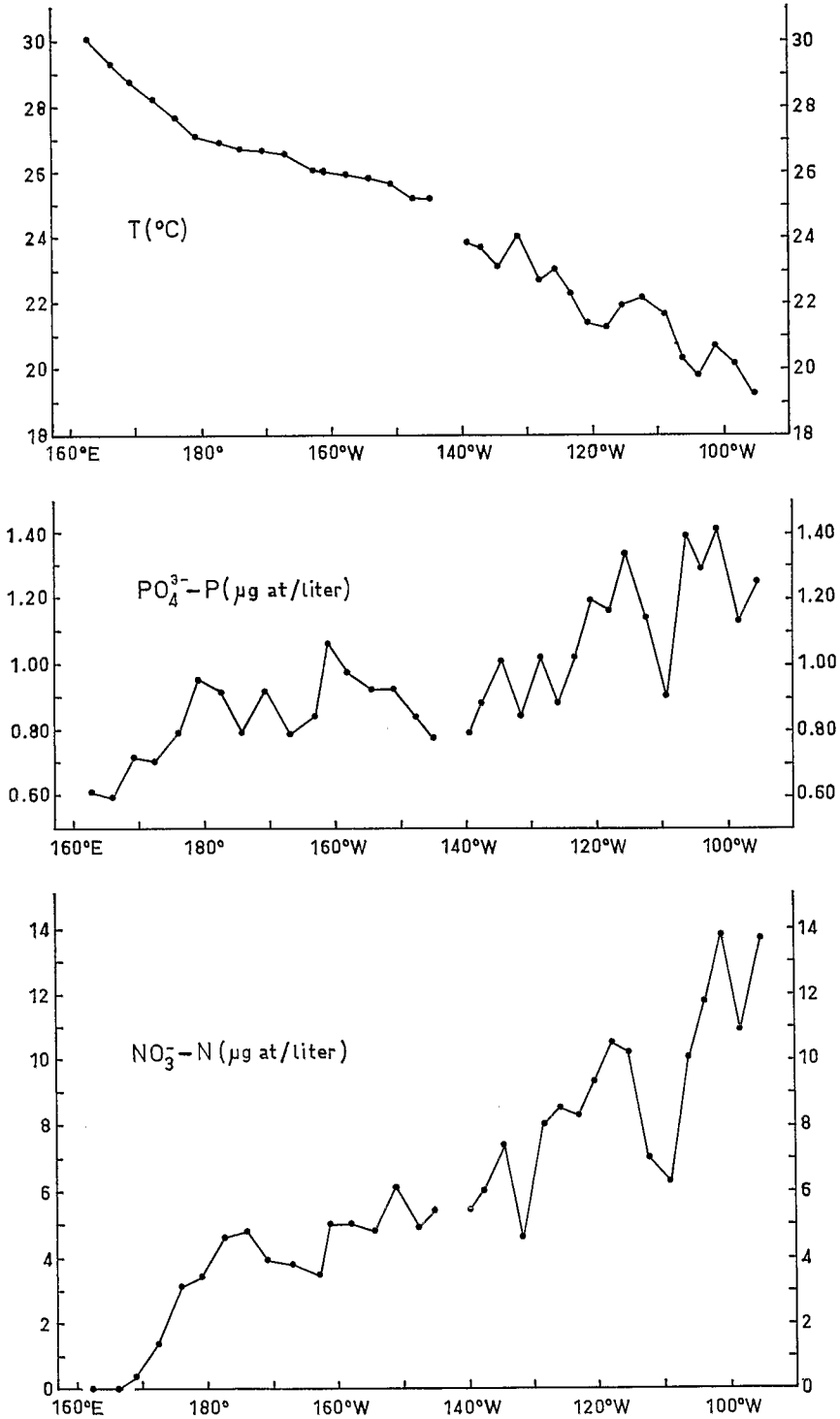


FIG. 2. Temperature, inorganic phosphate-phosphorus concentration, and nitrate-nitrogen concentration along the Equator surface.

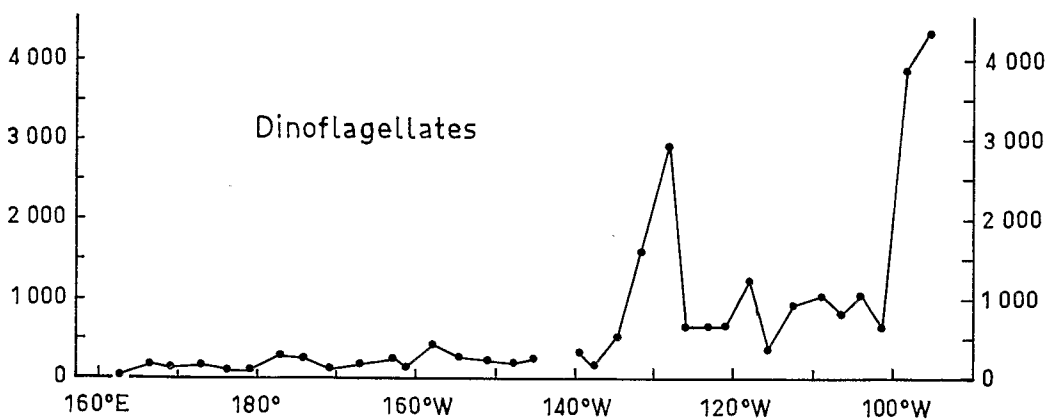
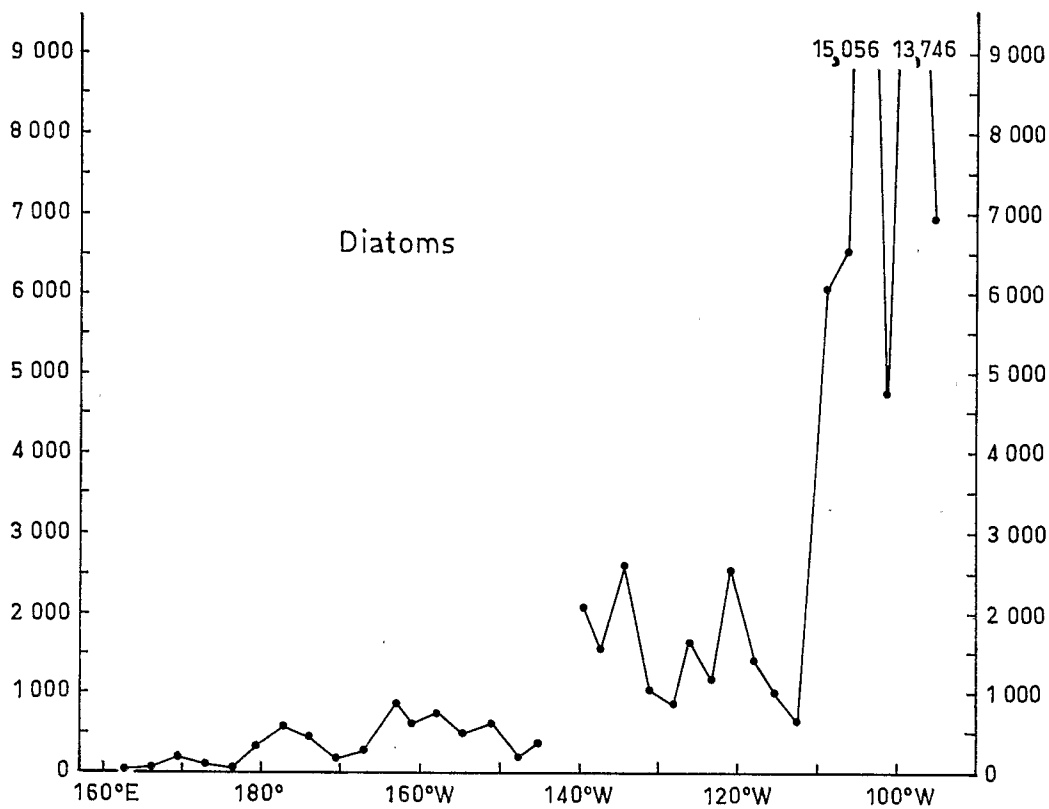


FIG. 3. Number of diatoms and dinoflagellates per 0.5-m³ haul.

TABLE 1. Number (or occurrence, noted p) of individuals of dominant taxa caught in a 0.5-m² haul

Sta. No.	Diatoms						Dinoflagellates (<i>Ceratium</i> sp.)								
	<i>Coscinodiscus</i>	<i>R. herveyi</i>	<i>P. dohrnii</i>	<i>P. sol</i>	<i>H. cuneiformis</i>	<i>Asteromphalus toceros</i>	<i>Chae-</i> <i>azoricum</i>	<i>C. furca</i>	<i>C. teres</i>	<i>C. kofoidii</i>	<i>C. buceros</i>	<i>C. taenium</i>	<i>C. pen-</i> <i>breve</i>	<i>C. tricho-</i> <i>ceros</i>	<i>C. can-</i> <i>delabrum</i>

Although the biomass falls off from east to west, the number of species collected at each station increases eastward. This tendency to tropicalization which characterizes both the hydrological features and the planktonic flora is confirmed by the fact that typical tropical species like *Ceratium reflexum* and *Climacodium frauenfeldianum* have only been recorded at the last two stations, which are also the poorest.

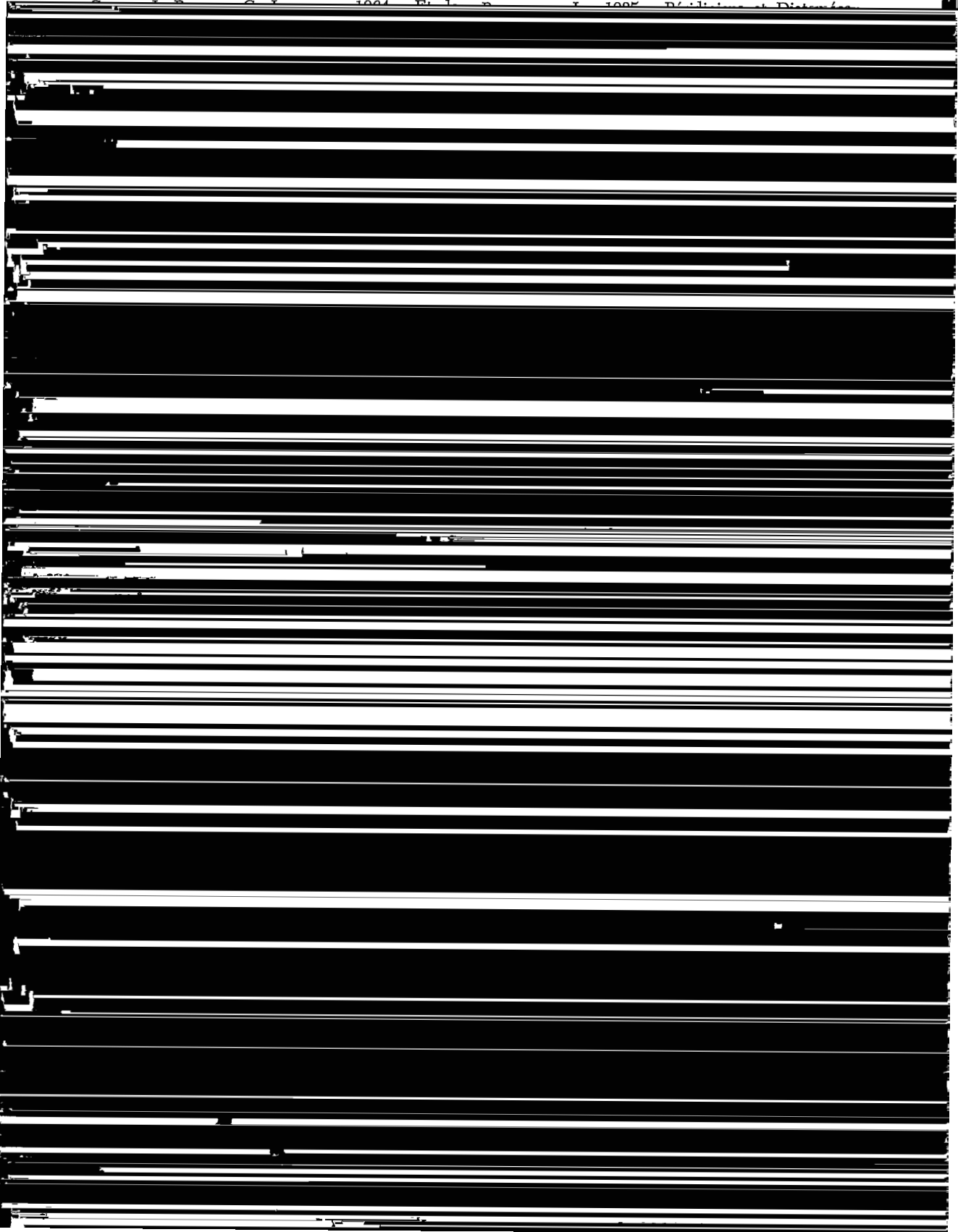
It is possible to some extent to compare these results with those of authors who used nets. Semina (1960), sampling with a No. 38 mesh net (Soviet standard) col-

species in the central Pacific near the Equator are *P. sol* and *R. bergonii*, and also on occasion, *Thalassiothrix longissima* and *Chaetoceros peruvianus*. The locality and abundance of *C. azoricum* in the extreme eastern area of the ocean substantiate the observations on this species by Steemann Nielsen (1934) and Graham and Bronikovsky (1944). The scarcity of the plankton in the New Guinea area confirms the absence of diatoms in sediments in this region (Kolbe 1954).

CONCLUSION

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