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FIRST RECORDED OBSERVANCE OF THE DINOFLAGELLATE *PROROCENTRUM MINIMUM* (PAVILLARD) SCHILLER 1933 IN MISSISSIPPI SOUND AND ADJACENT WATERS[1]

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ABSTRACT The present paper documents the occurrence of the dinoflagellate *Prorocentrum minimum* in Mississippi Sound and adjacent coastal waters. Outbreaks of discolored water are attributed to blooms of *P. minimum* in February 1977 and in January and February 1981. Data are presented on the seasonality of the organism in St. Louis Bay. Observations on water appearance and a descriptive analysis of the cells are presented for the 1981 blooms.

INTRODUCTION

Major outbreaks of discolored water caused by phytoplankton blooms periodically occur in Mississippi coastal waters (Perry et al. 1979, Eleuterius et al. 1981). In addition, the occurrence of localized plankton blooms appears to be commonplace and is suggested as the cause of fish kills and jubilees along the Mississippi coast (Gunter and Lyles 1979).

OBSERVATIONS

The most recent outbreaks of discolored water occurred in Mississippi Sound and adjacent coastal waters in January and February 1981. Areas of "reddish" water were observed in the Sound south of the Intracoastal Waterway between the mainland and the east end of Horn Island and in St. Martin Bayou, an inlet off the Back Bay of Biloxi (Figure 1). Samples of the discolored water were taken by personnel of the Gulf Coast Research Laboratory parasitology section and given to the authors for analysis. Examination of these samples revealed the presence of large numbers of the dinoflagellate *Prorocentrum minimum.* Though the samples were not quantitative, cell numbers were estimated to be in the millions per liter. Water at the St. Martin Bayou site was reported to be viscous and "orange-brown" in color. Numerous spot (*Leiostomus xanthurus*) were observed swimming erratically or floating belly-up. No fish kills were

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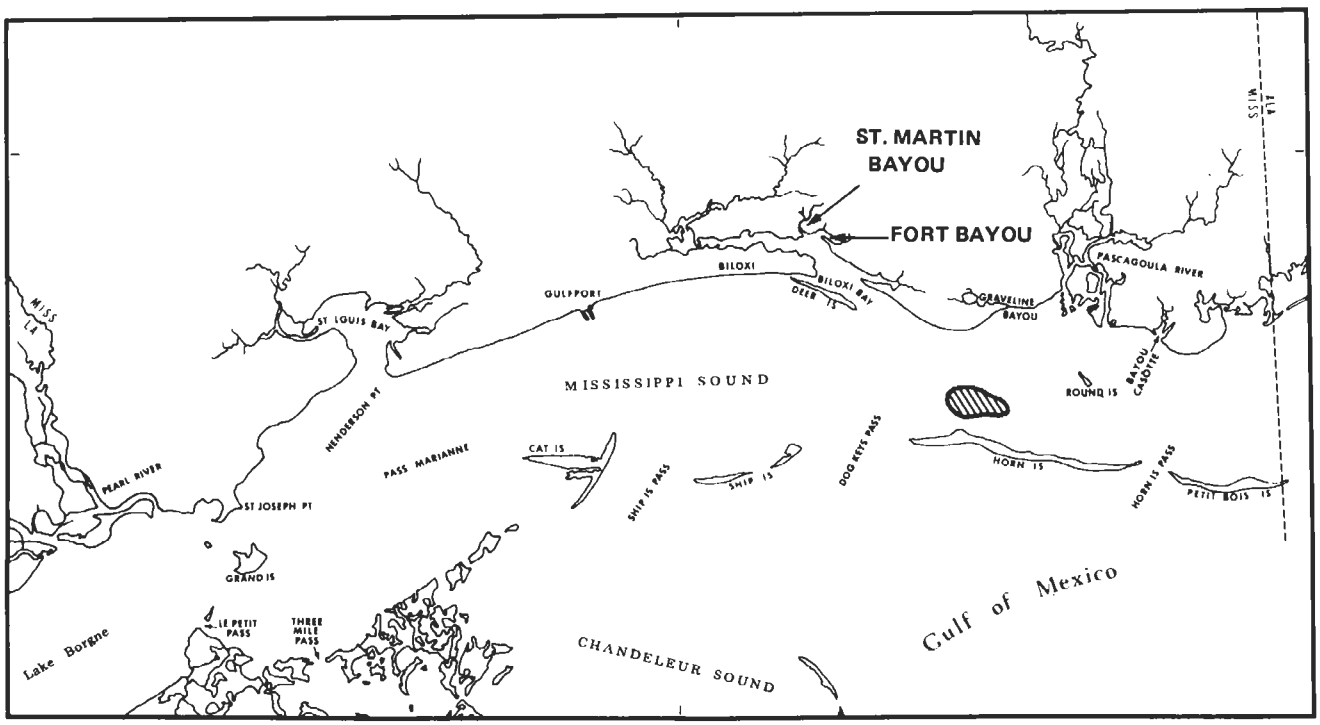

Figure 1. Bloom sites, Mississippi coastal waters.

reported in association with the bloom in the Sound. Hydrographic data were not available from either site.

From 1-ml sample aliquots placed on microscope slides, randomly selected cells were measured using an eyepiece micrometer (Table 1). Photomicrographs displaying cell characteristics are shown in Figure 2. Cells from the Sound site were slightly larger than those from the Bayou site. The anterior spine, characteristic of the genus, was present on most but not all of the specimens examined. The specimens exhibited subtle variations in shape from ovoid-quadrangular to near circular. Such variations in shape and presence or absence of the spine are typical of the species as seen in Hulburt's (1965) study of dense growths of *P. minimum* in New England estuaries. All specimens displayed poroid valve surfaces with striate margins (intercalary band), a large vacuole near the anterior end, and two flagella, one circular and one trailing, protruding from a shallow depression adjacent to the anterior spine. Although the majority of cells were free-swimming, clumps of up to 100 or more cells were frequently observed in the samples, possibly accounting for the "rust-colored" suspended sediment noticed at the Bayou site.

TABLE 1.

Measurements (N = 15) of *Prorocentrum minimum* cells collected in Mississippi waters. Standard error in parenthesis.

Site	Length (μ)	Width (μ)
Mississippi Sound	19.5 (± 0.27)	19.3 (± 0.32)
St. Martin Bayou	17.3 (± 0.29)	17.3 (± 0.34)

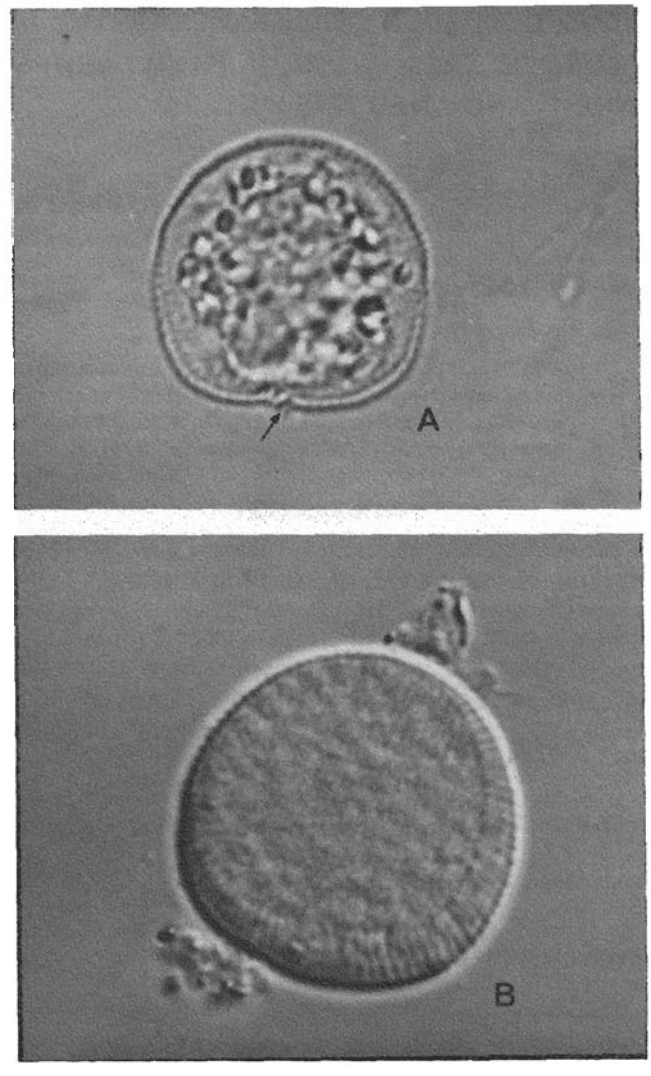

Figure 2. *Prorocentrum minimum*, Mississippi coastal waters. (A) Preserved specimen showing anterior spine (arrow). (B) Dried specimen showing poroid valve surface and striate margin (intercalary band). (Normarski optics, X 2300)

In addition to the 1981 blooms, the junior author observed a bloom of *P. minimum* in February 1977. Samples of discolored water were collected near the mouth of Fort Bayou (Figure 1) and brought to the Laboratory for analysis. All samples contained large numbers of *P. minimum*. The cells were estimated to be in the millions per liter, averaging between 18 and 20 microns in length and 14 to 16 microns in width. No hydrographic data were available.

Prorocentrum minimum appears to be an occasional component of the phytoplankton community in local waters. It was present periodically in phytoplankton samples collected from December 1977 through December 1978 at six stations in St. Louis Bay, Mississippi (Gulf Coast Research Laboratory, unpublished data). Peak abundance of 22,500 cells per liter occurred in March during a period of low salinity and high river discharge. The dinoflagellate was sporadic in occurrence from May through July, disappearing entirely from August through November. It reappeared in December 1978 and was more abundant at stations near the head of the Bay.

The St. Louis Bay observations are somewhat disparate from those of Campbell (1973) who found *P. minimum* present throughout the year in the Gales Creek estuary of North Carolina, with densities reaching 206 cells per ml in April. Campbell described the species as euryhaline, occurring in salinities from 1 to 33 ppt (but seemingly preferring salinities toward the higher ranges), and eurythermal in temperatures from 3 to 31°C.

The authors regret that very little quantitative data have been collected that would suggest the factors contributing to the development of phytoplankton blooms in Mississippi coastal waters. Most observations are made in the course of routine sampling trips for various projects. To the present, there has been no baseline monitoring of biological, hydrological, and meteorological parameters that specifically may be of importance in producing and sustaining bloom conditions.

ACKNOWLEDGMENTS

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