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John Ogle

*Gulf Coast Research Laboratory*

Katherine Flurry

*Gulf Coast Research Laboratory*

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## OCCURRENCE AND SEASONALITY OF *PERKINSUS MARINUS* (PROTOZOA: APICOMPLEXA) IN MISSISSIPPI OYSTERS

JOHN OGLE AND KATHERINE FLURRY

Oyster Biology Section, Gulf Coast Research Laboratory,  
Ocean Springs, Mississippi 39564

**ABSTRACT** Oysters from four reefs in Mississippi Sound, sampled over a period of 25 months, were found to have a low prevalence of the protozoan parasite *Perkinsus marinus*. The greatest values were 80% prevalence, and 0.88 weighted incidence recorded for oysters from Biloxi Bay, Mississippi.

### INTRODUCTION

*Perkinsus marinus*, an oyster parasite, has been suggested as a cause of massive mortalities in Mississippi oysters (Gunter and Demoran 1970, 1971; Gunter et al. 1974; Overstreet 1978). Although Owen (1950) did not find the parasite in Mississippi oysters, it is known to occur (Mackin 1962; Ray 1954; McGraw 1980; Demoran, personal communication). *Perkinsus marinus*, previously identified as *Dermocystidium marinum* and *Labyrinthomyxa marina*, respectively, was first described from Louisiana oysters by Mackin et al. (1950). In the Gulf of Mexico, it has been reported from Texas (Hofstetter 1977), Alabama (Beckert et al. 1972), and Florida (Dawson 1955, Quick and Mackin 1971). Since no data were available on the seasonality and occurrence of the infection in Mississippi oysters, the present study was conducted.

### MATERIALS AND METHODS

Twenty oysters from each of four stations (a lagoon on Horn Island, Graveline Bayou, a closed reef in Biloxi Bay, and a commercial reef at Henderson Point near Pass Christian) were collected monthly from March 1978 to March 1980. The presence of *P. marinus* was detected by culturing a piece of the anterior oyster mantle in fluid thioglycollate fortified with antibiotics for 14 days using the procedure of Ray (1952, 1966). Its prevalence and weighted incidence (as defined by Ray [1954]) were determined according to the procedures of Ray (1954) and Mackin (1962). Hydrographic data including temperature, determined to the nearest degree Celsius, and salinity, determined to the nearest part per thousand (ppt) with an American Optical total solids refractometer, were collected monthly for each station.

### RESULTS

The parasite never reached the epizootic level in oysters

from any station at any time during this study (Table 1). When *P. marinus* reaches a weighted incidence of 2.00 in the live oyster population, it is considered to be epizootic (Mackin 1962). Oysters from the Biloxi Bay station were found to be infected in 23 of the 25 sampling periods, and during October of 1979, had the greatest weighted incidence (0.88) and prevalence (80%) recorded for this study. Biloxi Bay also had the greatest average weighted incidence (0.23) and average prevalence (22.4%) for the 25-month period; Pass Christian had the smallest average weighted incidence (0.10) and average prevalence (9.7%) for the same period. The prevalence exceeded 50% in only four of the samples: two from Biloxi Bay (April 1978-60%, and October 1978-80%), and two from Horn Island (October 1978-60%, and April 1979-53%).

The highest recorded temperature (34°C) occurred at the Biloxi Bay station; the lowest temperature (6°C) occurred at the Horn Island station. The highest salinity (32.0 ppt) occurred at the Horn Island station; the lowest salinity (0.0 ppt) occurred at the Graveline Bayou station.

### DISCUSSION

The protozoan *P. marinus* was seldom prevalent for oysters from any station sampled. The similarity of hydrographic conditions for all stations might explain the similarity in infections. Sampling should be continued over several years to encompass varying hydrographic conditions. Lack of an epizootic during this study may be due to the absence of a major foci of infection. There is no evidence to suggest that the lack of epizootic levels was caused by disease resistance in Mississippi oysters. Recent interest has been expressed by an agency of the State of Mississippi in planting seed oysters and moving oysters for restocking and relaying; however, care should be taken to avoid importing heavily diseased oysters. Relayed oysters should be monitored and assayed for *P. marinus*.

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John Supan aided in field collection, and Juanita Ferguson reviewed the paper. This project was supported in part by the Mississippi Department of Wildlife Conservation, Bureau of Marine Resources, under Contract No. CO-ST-79-018.

TABLE 1.  
Occurrence of *Perkinsus marinus* in Mississippi oysters.

Month	1978											1979		
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	
<b>Biloxi Bay</b>														
Temperature °C	21	19	29	34	32	29	26	23	18	11	7	13	22	
Salinity ppt	22	12	6	6	8	16	18	22	26	20	16	4	4	
Prevalence %	0	60	—	40	20	15	35	80	40	5	5	10	10	
Weighted Incidence	0	0.35	—	0.29	0.38	0.25	0.30	0.88	0.38	0.05	0.05	0.08	0.05	
<b>Graveline</b>														
Temperature °C	19	24	22	30	32	28	25	23	17	11	8	10	14	
Salinity ppt	21	15	18	6	11	16	19	24	21	12	15	2	5	
Prevalence %	0	0	0	20	20	25	40	50	40	35	0	0	0	
Weighted Incidence	0	0	0	0.10	0.23	0.15	0.55	0.38	0.30	0.30	0	0	0	
<b>Pass Christian</b>														
Temperature °C	14	22	22	28	28	28	27	23	17	11	10	15	19	
Salinity ppt	18	14	17	12	18	14	18	18	18	15	16	5	5	
Prevalence %	0	0	10	0	5	15	30	40	10	30	5	0	5	
Weighted Incidence	0	0	0.10	0	0.05	0.30	0.25	0.53	0.08	0.12	0.05	0	0.03	
<b>Horn Island</b>														
Temperature °C	—	22	24	30	24	30	—	14	19	12	12	6	16	
Salinity ppt	—	22	16	12	22	25	22	28	32	24	26	11	14	
Prevalence %	—	0	5	5	37	0	—	60	25	6.6	0	0	10	
Weighted Incidence	—	0	0.05	0.03	0.39	0	—	0.55	0.25	0.12	0	0	0.05	
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Month	1979											1980		Avg
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar		
<b>Biloxi Bay</b>														
Temperature °C	20	23	29	32	31	25	21	12	12	13	13	17	21.3	
Salinity ppt	10	8	14	10	16	8	19	10	22	20	20	5	13.7	
Prevalence %	2.5	5	35	20	30	15	40	25	25	10	5	5	22.4	
Weighted Incidence	0.01	0.03	0.25	0.25	0.45	0.10	0.45	0.38	0.22	0.18	0.03	0.03	0.23	
<b>Graveline</b>														
Temperature °C	19	25	30	30	32	—	18	17	10	—	15	18	20.7	
Salinity ppt	0	2	10	0	10	8	—	12	10	3	8	22	11.3	
Prevalence %	5	2.5	0	5	5	15	5	15	30	20	5	5	13.7	
Weighted Incidence	0.30	0.03	0	0.03	0.05	0.25	0.10	0.13	0.23	0.10	0.03	0.03	0.13	
<b>Pass Christian</b>														
Temperature °C	20	26	29	29	29	23	20	18	9	—	13	18	20.8	
Salinity ppt	5	0	8	6	14	14	22	20	10	15	10	4	12.6	
Prevalence %	10	0	—	5	10	—	37.5	0	0	0	0	—	9.7	
Weighted Incidence	0.05	0	—	0.03	0.05	—	0.50	0	0	0	0	—	0.10	
<b>Horn Island</b>														
Temperature °C	25	26	24	28	—	—	23	17	20	15	15	19	20.0	
Salinity ppt	10	13	18	11	—	—	24	10	—	22	15	12	18.5	
Prevalence %	53	30	35	15	30	—	5	0	10	10	0	15	16.0	
Weighted Incidence	0.37	0.35	0.30	0.18	0.25	—	0.01	0	0.08	0.05	0	0.12	0.14	

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