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A BACTERIAL DISEASE OF HATCHLING LOGGERHEAD SEA TURTLES

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ABSTRACT: *Necrotic, spreading, nonwalled skin lesions developed in 140 pen-reared hatchling loggerhead sea turtles and most died within a week of the first appearance of the disease. Treatment with mixed penicillin and streptomycin was begun after 131 had died, and before pathogenic determination had been completed. Bacteroides sp., Pseudomonas aeruginosa and Staphylococcus epidermis were found in lesion pus cultures. Bacteroides sp., common in the feces of warm-blooded animals, was considered the primary pathogen.*

THE Florida Department of Natural Resources has been involved in sea turtle research for a number of years (Ingle and Smith, 1949; Carr and Ingle, 1959; Schmidt and Witham, 1961; Routa, 1968). Efforts to breed green turtles, *Chelonia mydas*, appear promising, and this species can apparently adapt to its natural environment after being hatched and raised in captivity for as long as one year (Witham and Carr, 1968; Carr and Sweat, 1969; Witham, 1971).

Disease is an ever-present threat to any mariculture operation and sea turtles being raised in captivity have often died with no specific cause determined. Superficial skin lesions, probably fungal (Anon., 1971) occasionally developed on our turtles and these were effectively treated with 5-10 percent gentian violet.

During July and August 1970, Ralph Estabrooks hatched 140 loggerheads, *Caretta caretta*, at the House of Refuge Museum, Hutchinson Island, near Stuart, Florida. These were kept in a large partitioned tank with a number of older green and loggerhead turtles. The concrete block partition permitted water circulation but maintained separation of large and small animals. Seawater of 30.50 to 35.50‰ salinity was pumped from shallow wells into the section containing small turtles and discharged from the other section.

Necrotic, spreading skin lesions which did not respond to gentian violet treatment began appearing on some hatchlings in September, 1970, and death followed within three to seven days. All hatchlings were not infected simultaneously, but within three months each had developed the symptoms. None of the older turtles became diseased.

Swabs of the characteristic pus exudate from lesions on tongues, cloacas, heads, flippers, and ventral body areas near the plastron were collected with "Cultorettes." Leon W. Powell, Jr., M.D., Department of Pathology, Martin Memorial Hospital (personal communication), found *Bacteroides sp.*, *Pseu-*

domonas aeruginosa, and *Staphylococcus epidermis* in the samples. His findings were confirmed by the Bio-Assay Laboratory, Dallas, Texas, and by the Florida Department of Pollution Control, Tallahassee (personal communication, Noel F. White, Microbiologist). Lesions were necrotic, spreading, and not walled off (Rosebury and Sonnenwirth, 1958), and thus *Bacteroides* sp. was considered the primary pathogen.

Since the lesions did not respond to fungal treatments, a bacterial infection was indicated prior to actual verification and identification. Consequently, a broad spectrum antibiotic combination was injected subcutaneously in the nine surviving turtles (131 hatchlings had already died). Dosage per turtle (50-100 g ea) was 0.1 ml of a solution of 25,000 USP units/ml potassium penicillin and 250 mg/ml streptomycin sulfate. Five of those being treated were apparently weakened by disease and died during cold weather, while one died following treatment. The remaining three received six injections each during a 3-month period to treat recurring lesions and are still alive after 18 months. While high dosages of penicillin/streptomycin mixture appear to have been effective in treating these animals, chloramphenicol is considered the drug of choice against *Bacteroides* and should be tested in future outbreaks (Goodman, 1971).

Bacteroides was first reported as a disease-causing organism in man during 1878-1879 when it was isolated from brain abscesses, lung gangrene, and peritonitis (Morton, 1965). It has been reported that pure cultures of *Bacteroides* caused disease in test animals, and that the pathogenic activity was increased when mixed with other bacteria (Rosebury and Sonnenwirth, 1958; Burrows, 1963). These anaerobic, Gram-negative, nonmotile rods are found in feces of warm-blooded animals, and Goodman (1971) reports that they comprise 95 percent of human intestinal flora and about 20 percent of the feces weight.

Janssen (1968) reported evidence of fish (white perch, *Roccus americanus*) being infected by human pathogens, and Krantz and Heist (1970) made similar findings for brook and brown trout. However, these authors did not find evidence of *Bacteroides* infection. No literature references to such infections in reptiles were found.

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