Disease and Pathology

Survey of Fibropapillomatosis and other Potential Diseases in Marine Turtles from Moreton Bay, Queensland, Australia

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During June of 1998 an initial survey was undertaken to evaluate the health status of green turtles (*Chelonia mydas*) and loggerheads (*Caretta caretta*) at Moreton Bay (27°S, 153°E) near Brisbane in Queensland, Australia. The turtles were captured unharmed by hand and brought aboard a Sea World Australia research vessel where an array of biomedical specimens were collected prior to flipper tagging and release. Biopsies were taken of tumors and of adjacent normal skin followed by fixation in 10% neutral-buffered formalin. Counterpart biopsies were frozen in liquid nitrogen for DNA sequencing (Quackenbush , this volume).

A total of 147 green turtles and 51 loggerhead turtles were captured and examined. Unfavorable weather conditions prevented sampling at locations within Moreton Bay where tumor prevalence is known to be high (40-70%). Approximately 16% of the captured green turtles and 6% of the loggerheads had tumors. These tumors were characterized by small (1-2mm) to large (10-15cm) smooth to papillary masses located in the eyes and mouth and on the neck, flippers and inguinal, axillary and peritoneal areas.

A total of 101 skin biopsies were examined histologically. Fifty-six of these biopsies were from non-tumored areas and 45 were tumors. Sections of normal skin were characterized by epidermis that was 5-7 cells in thickness. There was a thin layer of relatively dense collagen between the epidermis and the relatively loose collagen of the deeper dermis. Within 52 of the normal skin samples there was mild to moderate acanthosis. Eighty percent of the normal skin samples were covered with bacteria and 63 percent of these samples also had fungus. Two percent of the normal skin sections had small blisters between the epidermis and dermis. Five percent of the normal skin samples had a mild infiltration of lymphocytes at the dermal/epidermal junction. Sixty-eight percent of the normal skin sections had mild to moderate dermatitis characterized by lymphocytic cuffing of vessels. Thirteen percent of the normal skin biopsies contained granulomas with parasitic ova within the dermis.

Two primary patterns were found in the 45 tumor biopsies. One was a smooth or nodular type, and comprised 52% of the tumors, while 41% were of the papillary type. Seven percent were of the linear form. The primary characteristics within all of these tumors were similar and included mild to moderate acanthosis and pseudoepitheliomatous hyperplasia. Eighty-four percent of the tumors had acanthosis, 75% had orthokeratotic hyperkeratosis and 77% had pseudoepitheliomatous hyperplasia. Intranuclear or intracytoplasmic inclusion bodies were not found in any of the sections of normal skin or tumors. The dermal portion of tumors was characterized by relatively compact collagen with a low to moderate degree of cellularity. Mitotic figures were not found. Vessels surrounded by lymphocytes were found in 60% of the tumors. Granulomas containing parasitic ova were found in 47% of the tumors. Margins of tumors showed evidence of spread by expansion and not by infiltration. Histologically, these tumors were similar to the tumors that have been observed in green turtles from the Hawaiian Islands (21°N, 157°W). However, the Australian tumors showed a slight difference between the tumors examined from olive ridley turtles (*Lepidochelys olivacea*). Tumors examined from the adult female olive ridley's from nesting grounds at Nancite, Costa Rica and Oaxaca, Mexico showed evidence of a mild to severe cell-mediated response within approximately half of the tumors. This extensive cell-mediated immune response may, in some cases, lead to regression of the tumor.

This study histologically confirms the presence of fibropapillomas in green and loggerhead turtles in Queensland, Australia, the presence of which has been previously reported through visual observations by Limpus and Miller (1994) and Limpus *et al.* (1994a, 1994b).

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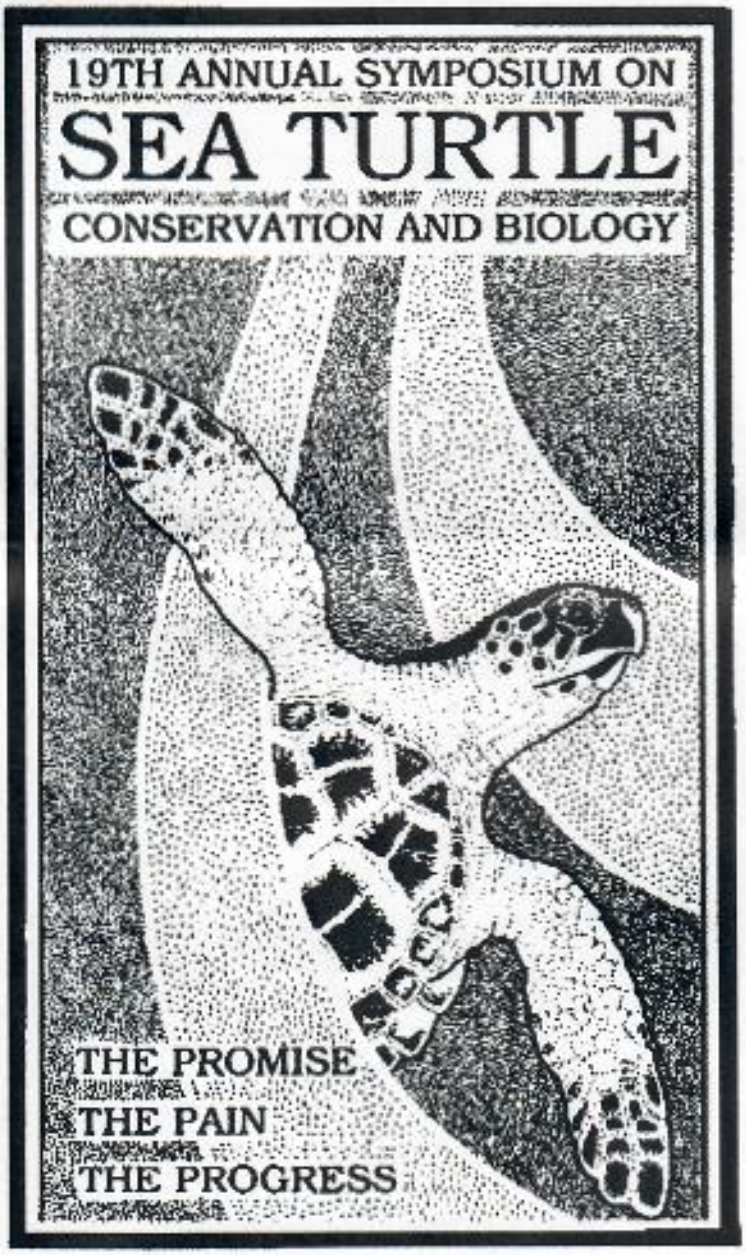
NOAA Technical Memorandum NMFS-SEFSC-443

PROCEEDINGS OF THE NINETEENTH ANNUAL SYMPOSIUM ON SEA TURTLE CONSERVATION AND BIOLOGY



2-6 March 1999
South Padre Island,
Texas, U.S.A.

Compilers:
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September 2000

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