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FIRST CONFIRMATION OF MULTIPLE FIBROPAPILLOMAS IN A WESTERN AUSTRALIAN GREEN TURTLE (CHELONIA MYDAS)

Multiple small (1-3 cm diameter) and several relatively large (5-10 cm diameter) round, pedunculated tumours were attached to the skin of the axillary and inguinal regions of a juvenile green turtle (Chelonia mydas) of approximately 10 kg weight and 46 cm curved carapace length found stranded at Baba Head, Shark Bay, Western Australia, on 2 June 1995. The tumours were relatively soft, and were covered with small papillary projections. One large tumour protruding from the inguinal region on the left side had an ulcerated surface and a necrotic central core. There was a 1-2 cm diameter lobulated tumour attached to the conjunctiva on the ventral eyelid of the right eye.

Other juvenile Western Australian sea turtles with very few small external tumours had previously been reported to the junior author (RITP), but the regional occurrence of fibropapilloma disease had not been confirmed. The Baba Head stranding, however, suggested a well developed case of fibropapilloma disease. Transport of the turtle to Perth for further investigation was arranged.

The animal was euthanased by intravenous injection of sodium pentobarbitone into the vertebral venous sinus by a midline approach along the ventral surface of the cranial edge of the carapace. Necropsy examination revealed several, well demarcated, spherical, smooth, white tumours measuring 0.5-1 cm in diameter in each kidney. Some tumours were raised from the surface of the kidney. Their cut surface was white. Other visceral organs appeared grossly normal. Several skin and kidney tumours, and randomly selected 1 cm^3 segments of the visceral organs were removed, fixed in buffered formalin, and processed routinely for histological examination.

The skin tumours were non-encapsulated and composed predominantly of well differentiated, fibroblastic tissue covered by a diffusely, slightly thickened epidermis. The superficial tissue was basophilic, highly cellular and occasional mitotic figures were present in this layer. Deeper fibroblastic tissue was less cellular, disorganised and vascularised. Throughout some

neoplasms were moderate accumulations of free melanin granules and perivascular aggregations of lymphocytes and occasional plasma cells. The tumours in the kidneys were composed of non-encapsulated, dense, well differentiated but disorganised fibroblasts within a dense collagenous ground substance. There was infiltration around renal tubules and collecting ducts at the margins of the neoplasms. Other organs appeared histologically normal.

Fibropapillomas such as those described have been recorded in wild green turtles throughout the Pacific and western Atlantic oceans (Herbst, 1994). In Florida and in the Hawaiian Islands there is a high prevalence and high public awareness of the condition (Balazs, 1991a,b; Herbst, 1994). In Australia there have been several recordings of similar disease in green turtles in the waters off the Queensland coast (Glazebrook and Campbell, 1990; Limpus and Miller, 1994). There have been two recordings of the disease from the Indian Ocean, in the Seychelles and at Aldabra Island, respectively (Herbst, 1994). We believe this is the first confirmation of the disease occurring in Western Australian waters.

Similar fibropapillomas have been reported less frequently in other sea turtles, including wild loggerhead turtles (Caretta caretta) in Florida (Herbst, 1994) and Australia (Limpus and Miller 1994); olive ridley turtles (Lepidochelys olivacea) in Costa Rica (Herbst, 1994); and flatback turtles (Natator depressus) in Australia (Limpus and Miller, 1994). We have no reports so far of the disease occurring in species other than green turtles in Western Australia.

In the present case, the neoplasms described were morphologically benign. The turtle appeared relatively strong, and was in good condition when captured. However, if left to progress naturally, the neoplasms can grow to much larger sizes (>30 cm) and, depending on their location, can interfere with swimming, vision, respiration, and feeding (Herbst, 1994). Affected turtles often have internal fibromas, such as we have described, in the lungs, kidneys, heart, gastrointestinal tract and liver (Herbst, 1994). Growth of visceral neoplasms may compress adjacent normal tissue and organs. Consequently, affected turtles have a reduced ability to survive in the wild.

We have not seen any such tumours on the more than 15,000 mainly adult female turtles tagged in the wild over the past nine years. Dedicated survey of occurrence in Western Australian juvenile turtles has not been attempted, but low frequency occurrence of probable fibropapil-lomas has been reported from observations of approximately 700 turtles in Exmouth Gulf over the past 4-5 years (R. Wann and J. Wann, pers. comm.).

The gross and histological lesions described are similar to neoplasms in other species caused by papillomaviruses. Numerous research groups using various immunological and molecular techniques have generally been unable to demonstrate or extract papillomavirus, group-specific antigens or DNA from the sea turtle neoplasms (Herbst, 1994; Jacobson et al., 1989). A recent transmission study provides evidence that the sea turtle disease may be caused by a herpesvirus (Herbst et al., 1995). The disease was experimentally reproduced in young green sea turtles raised from eggs 15-43 weeks following inoculation with cell-free, filtered homogenates of fibropapillomas obtained from naturally affected turtles. Tumour development was associated with a rise in ambient water temperature. Scattered foci of epidermal degeneration were found in tissue sections of experimentally-induced fibropapillomas and within some sections taken from donor turtles. Electron microscopic examination of these lesions demonstrated intranuclear herpesvirus-like particles.

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CAUTION URGED IN THE INTERPRETATION OF TRENDS AT NESTING BEACHES

In a recent issue of the Marine Turtle Newsletter, two papers report apparent increases in populations of ridley sea turtles in México (Márquez et al., 1996a,b). Both articles begin with statements to the effect that increasing trends in the annual number of nesting females or the number of nests laid can be interpreted as a reflection of an increasing population. Regrettably, this is not so, and while I join the authors' optimistic hopes for these endangered populations, I would caution against premature declarations of success. There are at least three reasons why the apparent increase in nesting may or may not indicate increasing populations.

First, nesting population counts can only reflect the numbers of reproductively active females. Non-reproducing females and males may or may not be following the same trends. The best that can be deduced from the two data sets presented is that at some time in the fairly recent past, there has been a steady increase in the number of females who reproduced. This may reflect increased recruitment, decreased mortality within these cohorts, or merely a change