

First Documentation of Fibropapillomas Verified by Histopathology in *Eretmochelys imbricata*

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Fibropapillomatosis (FP) is a cutaneous disease globally affecting sea turtles (George 1997). It is characterised by the appearance of benign tumors, both internal and external. FP can become life threatening when the size and location of the tumors interfere with locomotion, vision, breathing of the turtle, or internal physiology of afflicted organs. First described in green sea turtles (*Chelonia mydas*) over 60 years ago (Lucke 1938; Smith & Coates 1938), FP has been encountered with increasing frequency not only in green turtle populations throughout the world, but also in loggerhead (*Caretta caretta*), olive ridley (*Lepidochelys olivacea*), and flatback (*Natator depressus*) sea turtles (Herbst 1994). With respect to hawksbill (*Eretmochelys imbricata*) sea turtles, we are not aware of any reports with verification based on histopathology of the disease occurring in this species. A nasal wart from a captive individual in an aquarium in Germany was reported (Harshbarger 1991), but it probably is not comparable to FP. Here we report two cases of FP tumors in hawksbill sea turtles from Brazil, both of which were confirmed by histopathology.

The first case was observed in September, 1996, of a female with a curved carapace length of 84 cm. This individual turtle had been maintained in captivity by Projeto TAMAR (the national marine turtle conservation program of Brazil) since hatching from a nest laid on the beach in Praia do Forte, Bahia, and had been kept in communal tanks with other species, including green turtles. It is possible that this hawksbill could have been exposed to FP via contact with infected turtles or contaminated water. When 7 to 8 years old, this individual developed a large mass (46cm by 43 cm by 38 cm) on its right front flipper and several small ones (approximately 5 cm in diameter) on its rear flippers and close to its cloaca, and was isolated from other turtles. The masses were pedunculated with a firm and elastic consistency. Normal swimming behavior in this turtle was constrained, therefore the masses were removed surgically. During the surgery, a large internal mass that was smooth and nonpedunculated (i.e. macroscopically different from fibropapillomas) was discovered in the coelomic cavity and had begun to

invade the lungs. It was decided not to remove the mass because of its large size and the extent of infiltration into various tissues. The individual died soon afterwards. No histopathology was performed on this internal mass.

The second record also comes from a female turtle, currently with 69 cm curved carapace length, which was raised in captivity by Projeto TAMAR in the state of Sergipe, Brazil, since hatching from its nest. This turtle was also maintained in communal tanks with different species of marine turtles, and may have been exposed to FP from infected turtles or contaminated water. This individual had 3 masses: two on the head and one on the anterior portion of the right front flipper (see front cover). The masses on the head were in the region of the frontal bone, and measured 9cm and 1 cm in diameter. The presence of the larger mass had raised several of the prefrontal scutes on the head, exposing a portion of the skull. The third mass was located at the base of the flipper, close to the first marginal scute of the carapace. All external tumors were surgically removed, and currently the animal remains under veterinary care.

Histological analysis of the tumors of both individuals revealed several features that met the criteria of FP previously published (e.g. Santos & Mello 1983): a layer of connective tissue with small mononuclear cells, areas of newly formed and congested vascularization covered with typical keratinized scaly epithelial tissue. There was an absence of dysplastic or malignant cells, and few instances of fibroblasts depositing collagen in an inflamed area. The margins of the areas treated with surgery were free of the lesion.

There are at least two pertinent factors relative to these cases. The first is that the individuals were raised in captivity from an early age. Captivity may engender FP in this species, for example by compromising their immune systems, by exposing them to pathogens they normally would not encounter, or by placing them in densities that make them more susceptible to infection. In normal wild conditions, these animals may not have developed the tumors. The second factor is that hawksbill turtles in Brazil exhibit a relatively high level of hybridisation with loggerhead turtles (Bass *et al.* 1996).

Although we do not know if these individuals are hybrids, it may be the case that hybrids are more susceptible to FP than non-hybrid hawksbill turtles. Fibropapillomatosis is known to affect green sea turtles in Brazil (Matushima *et al.* in press). We now confirm that FP has crossed another interspecific barrier, widening the sea turtle populations which may be affected. Further study of FP in hawksbills is needed in the general effort to better understand this disease, which is crucial in developing successful treatments.

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