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Authors: LOCKE, L. N., WIRTZ, W. O., and BROWN, E. E.

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## Pox Infection and a Secondary Cutaneous Mycosis in a Red-tailed Tropicbird (*Phaethon rubricauda*)

L. N. LOCKE

*Patuxent Wildlife Research Center, Laurel, Maryland*

W. O. WIRTZ II

*Pacific Project, U. S. National Museum  
Smithsonian Institution, Washington, D. C.*

E. E. BROWN

*Patuxent Wildlife Research Center, Laurel, Maryland*

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Although pox virus infection has been reported from a wide range of terrestrial birds, there are few records of its occurrence among marine species. This paper reports the occurrences of pox among Red-tailed tropicbirds (*Phaethon rubricauda*: Pelecaniformes) on Sand Island, Midway Islands, Hawaii.

During the period September 10-15, 1963, one of us (W.O.W.) was engaged in banding birds on Midway Islands. Infected tropicbirds were first noted on September 10 when the banding party arrived on Sand Island. One group of infected birds was found about 100 yards north of a hangar and a second group near a new brig. Bulbous masses were present at the base of the bill, on the eyelids, and occasionally on the feet of the infected birds.

At this time, only the chicks appeared to be infected. On September 11, 75 young were banded and three dead chicks were found. Twelve other chicks had tumors (swellings) around their eyes. On September 14, seven chicks and two adults were found with tumors at the base of the bill. One chick also had a tumor on the manus of the wing. Six dead chicks were found. During this period, 115 tropicbird chicks and 15 adults were banded. Nineteen chicks

and two adults had nodules or tumors at the base of the bill; nine chicks were found dead, four of them with the nodules. One adult was found dead but it did not have nodules on the bill.

Tumors were not found on any individuals of the four other species (*Diomedea immutabilis* and *D. nigripes*, *Puffinus pacificus* and *Pterodroma hypoleuca*) handled during this period.

A head was removed from one affected bird, preserved in 10% formalin, and sent to the Patuxent Wildlife Research Center for diagnostic studies. Upon arrival at the laboratory, measurements were taken of the gross lesions and sections (for microscopic examination) were removed from the large growth and from three smaller nodules found on the eyelids. Sections were stained with either hematoxylin and eosin, the Periodic acid-Schiff technique, or with Gomori's methenamine-silver nitrate technique.

### RESULTS

Grossly there was a large eschar-covered proliferative lesion at the base of the bill, involving the entire cere and extending into the turbinates. This granuloma measured 17 mm long along the ventral base, 12 mm long on the

dorsal surface, 13 mm high and 19 mm wide. It had a caseous center, but the sides were fibrous. Several smaller nodules were found on both of the dorsal eyelids, the lateral canthus of the left eye, and at the angle of the right mandible. These swollen nodules were raised, circular to oblong, proliferative lesions measuring from 1 x 2 mm to 6 x 3 mm. Microscopically the smaller lesion proved to be typical avian pox nodules (Biester and Schwarte, 1952. Diseases of poultry, Iowa State College Press). The majority of the cytoplasmic inclusion bodies measured 6 to 12 microns in diameter with an occasional inclusion body measuring up to 20 microns in diameter.

Sections from the nasal granuloma consisted of a proliferating fibrous nodule. The nodule was covered with normal epithelium in some areas and pox infected epithelium in others. Scattered throughout the connective tissue element of the nodule were many small, weakly encapsulated microabscesses filled with necrotic cells, cell debris and fungal hyphae. In some sections large numbers of multinucleate giant cells of both Langhan's type and the foreign body type were scattered in the connective tissue. When stained by the Periodic acid-Schiff technique or by the Gomori methenamine-silver nitrate technique, these giant cells were observed to be engulfing small strands of fungus. The fungal hyphae were of branching, septate type (typical of *Aspergillus sp.*) but no fruiting bodies were found.

#### DISCUSSION

Unfortunately only the head of the tropicbird was available for study; thus it was impossible to determine if there was any mycotic pulmonary or air sac involvement elsewhere in the body. The structure of the large nasal granuloma leads the authors to the conclusion that the mycotic infection occurred as a secondary invasion of a pox nodule. To the authors' knowledge pox infection has not been reported previously from tropicbirds.

Murphy (1963, Oceanic Birds of South America. Volume II, pp. 642-1246. The American Museum of Natural History, New York) makes no mention of any pox-like disease among the tropicbirds (*Phaethon aethereus* and *P. lepturus*) of the South American coast. Although Murphy discusses the epidemics among the "guano birds" of Peru, he fails to mention the occurrence of a pox-like lesion among these birds.

As the entire island of Midway was not surveyed, it is impossible to estimate the percent of the population of tropicbirds involved. It is of interest to note that pox has not been seen among the tropicbirds on Kure Island (56 nautical miles from Midway), although almost 1800 birds of this species have been banded on that island.

During a return trip to Midway in December 1964, several people mentioned again seeing tropicbirds with "growths" upon their heads. Unfortunately no additional specimens were collected during 1964.