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***Trichomonas gallinae* in Columbiform Birds from the Galapagos Islands**

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ABSTRACT: Domestic pigeons were introduced into the Galapagos Islands in 1972 or 1973. There is a high prevalence of *Trichomonas gallinae* among them and some evidence of canker. *Trichomonas gallinae* can be found also in endemic Galapagos doves in the vicinity of Puerto Ayora on Santa Cruz Island. Doves examined on pigeon-free islands were not found infected.

Key words: *Trichomonas gallinae*, Galapagos Islands, domestic pigeon, *Columba livia*, Galapagos dove, *Zenaida galapagoensis*, trichomoniasis.

Domestic pigeons (*Columba livia*) apparently have introduced *Trichomonas gallinae* infections into populations of wild birds wherever they have been taken by man (Stabler, 1954; Honigberg, 1978). We found on our first of three trips (January 1983 and August 1984 and 1985) to the Galapagos Islands that domestic pigeons were present there. This observation was unexpected because their presence in the archipelago was not reported despite a wealth of literature on introduced vertebrates (Hoeck, 1984).

Once *T. gallinae* becomes established in birds within an area, and because of its mechanisms of transmission, columbid populations are likely to be those that sustain infections (Stabler, 1954). Consequently, flocks of native pigeons and doves may suffer losses if the introduced parasite strain is pathogenic for them (Greiner and Baxter, 1974).

This study was undertaken to determine if *T. gallinae* was present in introduced pigeons in Galapagos and to determine whether or not it occurred also in popu-

lations of the endemic Galapagos doves (*Zenaida galapagoensis*). Because the transfer of this infection across species depends largely on common access to drinking water, a further objective was to estimate the size and distribution of the domestic pigeon population throughout the islands.

Initial contacts with pigeon owners, for purposes of a census and to provide birds for examination, was through personnel of the Charles Darwin Research Station (CDRS) at Puerto Ayora on Santa Cruz Island and of the Galapagos National Park Service (GNPS). From these contacts, it was learned that all the pigeons now in the islands are descendants of four birds brought to Galapagos either in 1972 or 1973.

About 200 pigeons were found in 16 active lofts from the major towns of three of the four inhabited islands (Fig. 1). The single loft with a flock of about 20 birds on the fourth inhabited island, Floreana, was abandoned a few years ago when its owner returned to continental Ecuador. Feral or domestic pigeons from that loft were not found when we visited the island in 1984 and 1985. However, a feral flock, of 20 birds, was found in 1984 to be using a gorge a short distance west of Puerto Ayora. The cracked lava walls of the gorge provided natural roosting and nesting sites. Furthermore, its depth to the aquifer provided a reliable fresh water source. Pigeons were still occupying this site in 1985, but other free-flying pigeons were not seen

except near the towns. This suggested that truly feral pigeons must still be rare in Galapagos.

Following the technique of Stabler (1951) cells and mucus were gently scraped from the mucous membranes of the buccal cavities and crops of 10 pigeons (five from each of three lofts in Puerto Ayora and Puerto Villamil, respectively) with a pair of curved forceps, mounted in a drop of physiological saline on a microscope slide, and examined immediately for *T. gallinae*. Living, actively motile, organisms were observed from each pigeon examined by this method. Since all pigeons now in Galapagos are free-ranging descendants of the same small founding flock we surmise that every pigeon there may be infected. It is, further, most probable that each bird, actually under domestication, is perpetually infected. The conditions necessary for this (Stabler, 1954) are those that obtain in Galapagos lofts.

In addition to the 10 birds, examined by the microscopic method, 16 other birds (three from a loft in Puerto Ayora and 13 from six lofts in Puerto Baquerizo) were examined grossly for active or healed cankerous lesions of *T. gallinae*. Three adult birds (two from Puerto Baquerizo and one from Puerto Ayora) had scarred palatal flaps suggestive of healed canker. Three squabs, all from Puerto Baquerizo, had the yellow caseous lesions in the mouth and upper crop which are typical of active canker. It appears that the *T. gallinae* in Galapagos is, at least mildly, pathogenic for domestic pigeons.

Conditions regulating the abundance and distribution of Galapagos doves are poorly known. The GNPS/CDRS area, a short distance east of Puerto Ayora and where land iguanas and tortoise of the captive breeding programs are penned, was the only site near a town where doves were found. Doves may be attracted by the regular supply of fresh water provided for the captive reptiles. Doves were not seen or

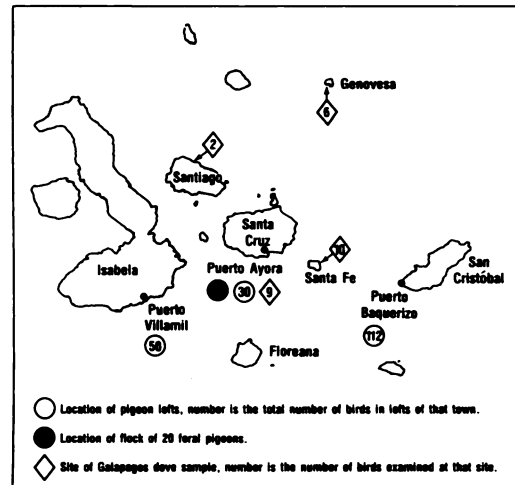


FIGURE 1. Sites in the Galapagos Islands where pigeons and doves were surveyed for trichomoniasis.

reported in or near Puerto Villamil or Puerto Baquerizo. They have not been reported from the vicinity of Puerto Baquerizo with records dating from the work of Gifford (1913). At present, it appears that the only place where Galapagos doves and domestic pigeons may encounter each other is Puerto Ayora.

Twenty-seven Galapagos doves from localities indicated in Figure 1 were captured by mist net or noose and examined for *T. gallinae*. After examination, by the method used for pigeons, they were marked by clipping a primary feather and released. Only three of nine doves at the GNPS/CDRS site were infected. Of 18 doves caught on three uninhabited, and presumed domestic pigeon-free, islands, none were infected or had lesions suggestive of canker. However, the pathogenicity of *T. gallinae* for Galapagos doves is not yet determined, but experimental studies would be desirable.

Our observations suggest that the *T. gallinae*, brought with domestic pigeons to the Galapagos Islands, was transferred to Galapagos doves near Puerto Ayora. Whether or not it will spread from this area to other parts of Santa Cruz Island,

or to adjacent islands, is difficult to predict. The movements of doves about the islands are unknown. Further, while the casual husbandry methods of Galapagos pigeon owners might encourage the establishment elsewhere of feral pigeon flocks that are carriers of the infection, the scarcity of permanent supplies of fresh water limits the potential for such flocks in Galapagos.

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