



In the PINK

by Robert Tindle, Professor at University of Queensland, Australia

Paddling a makeshift balsa-wood raft across Isabela's isolated Cementerio lagoon on a still, moonlit night is an eerie experience.

For three years in the late 1970s, Elizabeth Tindle and I spent as much time in the company of Galapagos flamingos as we did in human society. The Cementerio flamingos, which live in the middle of the lagoon, were one of several breeding colonies we studied. Camped among the thick mangroves that fringed the lagoon, we conducted 20 hours of observations every day, alternating shifts every four hours, each involving a paddle to and from the colony. To really learn what goes on in a flamingo colony, you have to 'live' with the flamingos as they go about their daily rituals of feeding, building nests, incubating eggs and raising young, and we soon found most of the activity at the colony occurred during the night.

Flamingos frequent about 40 lagoons in Galapagos, and have bred at nine of these on five islands. We worked out that the flamingos move freely between these sites, their distribution strongly associated with the abundance of two important food items, the brine shrimp (*Artemia salina*) and the water boatman (*Trichocorixa reticulata*). In other parts of the world, flamingos will not breed until there are hundreds of birds displaying to each other. In Galapagos, things are different, with breeding seemingly triggered by much smaller group displays involving fewer than 20 individuals.

Galapagos flamingos breed when the conditions are right, with laying mainly occurring during the coastal dry season from August to January when the water levels in the lagoons

are at their lowest and suitable nest sites become exposed. We found that around one in three adults incubates clutches every year, contributing enough chicks to maintain the population. These and other observations, made almost 40 years ago, seemed to suggest that the flamingos in Galapagos might be different from their ancestral stock, the American flamingo (*Phoenicopterus ruber*) from the Caribbean. But in the 1970s, DNA fingerprinting and gene sequencing had yet to be invented and, after several years in Galapagos, Elizabeth and I boxed up our notebooks on flamingos and I resumed my career in medical research and Elizabeth turned to clinical psychology.

Then, around 2010, two scientists — Roberto Frias-Soler from the University of Havana in Cuba and Michael Wink at the University of Heidelberg in Germany — got in touch to propose a possible collaboration. They were collecting DNA from flamingos in the Caribbean and Galapagos to look for genetic differences and help answer some long-standing questions: what is the relationship between the two populations, when did flamingos first reach Galapagos, and have there been repeated colonizations?

This study, which Elizabeth and I contributed to, suggests that in spite of the fact that the Caribbean and Galapagos are some 1,500 km apart, most of which is open ocean, flamingos from the Caribbean must have reached Galapagos just once, at least 70,000 years ago. The isolation that Galapagos provided for flamingos helps explain how they could have come to be significantly smaller birds with significantly smaller eggs than those in the Caribbean.



It remains to be seen whether the genetic, morphological, and behavioral peculiarities of the Galapagos flamingos means that they qualify as a distinct subspecies. In the meantime, these findings contribute to our understanding of the process of divergence and the origin of new species and underscore the need for continued management of this unique population. Although there are no major threats to the persistence of flamingos in Galapagos, their habitat — the lagoons — do need protection to accommodate local fluctuations in food availability and nesting conditions.

I think back to the time Elizabeth and I spent with flamingos all those years ago. It is exciting to know that our work has played a part in enriching our understanding of this remarkable Archipelago. ■

Left page: Lagoon on Floreana
© Henri Leduc

Above, top: Flamingo in flight.
© Christopher Gegenheimer

Above, left: A flamingo family on Bainbridge Lake. © GNPD

Above, right: © Kevin McCarthy

Circle: Elizabeth Tindle paddles her way to the flamingo colony aboard the balsa wood raft, *Beagle III*. © Robert Tindle

Below, left: Chicks remain in the nest until they are at least 7 days old.
© Robert Tindle

Below, right: Locations of lagoons in Galapagos where flamingoes breed.

