

Investigations into avian malaria in the African penguin

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The African (Jackass) penguin is the only penguin species to breed on the African continent. At present, their population is about 10% of that at the start of the 20th century. This decline is due to threats from both human and natural sources with oil pollution being the most important immediate threat. The South African Foundation for the Conservation of Coastal Birds (SANCCOB) has played a vital role in the rehabilitation of oiled, sick and injured penguins. Despite the successful rehabilitation of penguins by SANCCOB, significant mortalities occur in summer due to avian malaria. As an alternative to blood smear testing, an anti-*Plasmodium* enzyme-linked immunosorbent assay (ELISA) was developed for diagnosing exposure of penguins to avian malaria. This ELISA was used to firstly, establish whether the ability of penguins to produce an anti-*Plasmodium* antibody response influences their survival rate and secondly, whether oiling reduces this immune response. An increase in the immune responses of penguins to avian malaria on entry into the SANCCOB facility and during rehabilitation was detected during summer months with a concomitant increase in malaria infection rates.

The cause of infections at SANCCOB may be due to: (a) the penguins arriving with an existing malaria infection, (b) penguins contracting the disease on entry to the facility, (c) parasite recrudescence (relapses due to previous infections). Thus, the infection status of penguins at SANCCOB was determined on entry and during rehabilitation by PCR using genus conserved 18S rRNA primers. The immunity and infection status of penguins on three island colonies and one mainland colony was also determined. The results of these determinations will be presented and the positioning of the SANCCOB facility and its possible role in exposing penguins to avian malaria discussed.