

LONG-TERM MONITORING OF ENDOPARASITES IN CAPTIVE BIRDS OF PARADISE AT AL WABRA WILDLIFE PRESERVATION

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Extended abstract

Birds of Paradise (BoP) have long attracted interest because of their display habits and exaggerated display plumes of adult males (Diamond, 1986). They are found in regions of Eastern Indonesia, New Guinea and North-eastern Australia. Their main food consists of fruit, seeds, and small insects. Differences in the diets between the species have been documented by Beehler & Pruett-Jones (1983); in particular, *Seleucidis melanoleuca* ingest a higher proportion of insects than most other BoP species.

Literature reports on the veterinary management of BoP are rare. In this study, we evaluate the results of the coproscopic examinations performed between November 2000 and March 2007 in the AWWP BoP collection, thus expanding a previous evaluation of a shorter time period (Schulz et al., 2004). Although, in captivity, low mortality rates are observed even with very high parasite infestation (Varghese, 1987), parasites represent an important mortality factor (of 40 BoP casualties observed at AWWP over the years, a maximum of 12 [30%] could possibly be attributed to intestinal parasites; C. Schwarz and S. Hammer, pers. obs.), and parasite infestation could have a negative influence on disease susceptibility or breeding success. We wanted to find specific patterns for the different species, bird houses (the epidemiological units) and seasons, and to demonstrate the relevance of a strict antiparasitic-treatment in relation to health and breeding.

We evaluated results of over 4400 documented faecal parasitological examinations between 2000 and 2007 in more than 90 individuals of six species of Birds of Paradise (BoP). Between 2000 and 2007, 83.2% of investigated samples were negative for parasites, and the number of negative samples increased consistently over the years; in positive samples, the proportion of *Capillaria* sp. decreased (from 100% to 4.8%) and that of *Coccidia* sp. increased (from 0% to 67.5%). Differences in prevalence of endoparasites between species, epidemiological units (houses) and sexes were found. The BoP species with the highest reported proportion of insects in its natural diet (*Seleucidis melanoleuca*) had the highest prevalence of tapeworms, indicating a high propensity to ingest intermediate hosts. *Coccidia* sp. were particularly prevalent in an epidemiological unit with high exposure to free-ranging birds. A difference between the parasite prevalence of males and females was evident in the Flame Bowerbird (*Sericulus aureus*, higher prevalence in females), the King BoP (*Cicinnurus regius*, higher prevalence in males) and the Greater BoP (*Paradisaea apoda*, higher prevalence in males). The number of offspring per female and year correlated with the percentage of negative samples taken in the according year and species.

The results indicate that consistent antiparasitic management leads to a reduction of parasite species. Due to hygienic standards and isolation of individuals, a decrease in the prevalence of endoparasites with time in wild-caught animals kept in captivity can logically be expected, especially if antiparasitic treatment is regularly applied. However, to our knowledge, no such

pattern has been described in literature so far. Our findings indicate that parasites with intermediate hosts are more difficult to control. Exposure to free-ranging birds should be minimized; in a similar study, at the Basel Zoo in 1978, only 25% of the birds with contact to free-living birds in one bird-house and 77% of all faecal samples (indoor and outdoor) were negative for parasites (Wagner and Rüedi, 1981), indicating that contact with droppings from free-ranging animals is an epidemiologic risk factor. Coccidia are of particular concern in this respect.

Differences in parasite load between sexes of the same species have been described in the literature and been explained by the additional seasonal stress of breeding in females (Mond et al., 2001); in this study, however, the observed differences did not show a seasonal trend. The reasons for the difference between the sexes remain uncertain; in the case of the Flame Bowerbirds, breeding stress could as well be suspected. In the case of the other two species, the management of the birds – males are exchanged between aviaries if new breeding pairs are set up; male competition for females is encouraged to increase breeding activity by placing two males in individual aviaries next to that of a female – could be hypothesized to lead to greater stress, and greater susceptibility of males to parasites.

Finally, a tight antiparasitic management potentially contributes to the improved breeding success in bird species. Hudson (1986) performed an experiment in free-living red grouse (*Lagopus lagopus scoticus*), including a control group treated with an anthelmintic drug; the ratio of young to old birds seen in a year was used as an estimate of breeding success. He found a significant, negative correlation between breeding success and helminth numbers. A similar correlation could also be shown in our data. Although in our case, the evidence is correlational rather than causal – controlled, experimental studies would have to be performed for that -, it provides an additional incentive to reduce parasite loads in birds that are part of a breeding program.

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