

## **Monitoring exposure of birds to heavy metals and arsenic in Bundala National Park, Sri Lanka: a preliminary study**

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Feathers are used as a non-invasive method of monitoring exposure to toxic elements. Bundala National Park (BNP), in the Southern Province of Sri Lanka, a Ramsar site, is a wetland complex used by almost 200 species of resident and migrant wading birds as well as by other birds. Heavy metals and other contaminants accumulate in wetlands through agricultural runoff and atmospheric deposition. Our objectives were to monitor the exposure to heavy metals and arsenic in resident and migratory birds at BNP using feather samples and to determine the patterns of exposure among birds with different dietary habits. Feather samples (n=44) from 12 species (six migrants) were collected from birds captured during the National Bird Ringing Programme during migratory seasons in 2011 – 2013. Feathers were analysed by inductively coupled plasma mass-spectrometry (ICP-MS) for Hg, Cd, Pb and As. The range (mean ± S.E.) of Hg, Cd, Pb and As in tested samples were 0-8.20 (2.02 ± 0.27), 0-1.88 (0.10 ± 0.05), 0-12.63 (2.18 ± 0.45) and 0.01-10.20 (0.94 ± 0.25) mg/kg respectively. The highest mean concentrations of Hg, Pb and As were recorded in three species of migrant waders which were 3.05 mg/kg (± 0.84) of Hg in *Tringa totanus* (n=10), 4.30 mg/kg (± 1.92) of Pb in *Tringa stagnatilis* (n=3) and 1.14 mg/kg (± 0.64) of As in *Calidris ferruginea* (n=4). Both resident passerines tested, *Pycnonotus luteolus* and *Turdoides affinis* (n=2 each), showed levels of contaminants that were higher than expected. Hg levels in *P. luteolus* and *T. affinis* were 1.20 (± 0.69) and 1.86 (± 1.21) mg/kg respectively. These two omnivorous species are at lower trophic levels than waders and less likely to bioaccumulate metals. This study shows that both migrant and resident birds of varying dietary habits at BNP are exposed to Hg, Cd, Pb and As. The results of this preliminary study indicate that levels of heavy metals and arsenic in the environment are high enough to cause adverse effects in birds. This study also highlights the importance of monitoring the exposure of wildlife to contaminants especially in protected areas as these areas are vital for their conservation.

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