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Assessment of heavy metal pollution in selected locations in Sri Lanka by using feathers of Cattle egret (*Bubulcus ibis)*

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Toxic heavy metals in air, soil, and water are global problems that pose a growing threat to the environment. One of the largest problems associated with the persistence of heavy metals is the potential for bioaccumulation and biomagnification in the food chains. Birds are identified as potential, bio-indicators for environmental pollution and feathers have been used as a non-destructive method of assessing levels of environmental pollutants. Cattle egrets (*Bubulcus ibis*) were selected in this study, since they are widespread in all climatic zones and are susceptible to bioaccumulation of many heavy metals through the food chains.

Concentration of mercury (Hg), arsenic (As), lead (Pb) and cadmium (Cd) were examined in the flight feathers of cattle egrets from six roosting sites and three garbage dumping sites in Colombo, Kandy and Anuradhapura Districts. From March to June 2013, fallen feathers were collected from each sampling site and they were analysed for heavy metals by atomic absorption spectroscopy. Data were analysed by using R statistical package.There was no significant variation of heavy metal concentration in roosting sites between districts. However, multiple comparison analysis indicated that mercury was detected in higher levels than the other elements in all the sites. It was significantly high in the Thotalanga site in the Colombo District. Cadmium was high in the Nuwarawewa site in Anuradhapura and lead was high in the Polgolla site in Kandy. Arsenic was not detected in roosting sites.

There was no significant variation in heavy metal concentration of feathers collected from dumping sites. However, multiple comparison analysis indicated that mercury levels were higher in feathers from the Wattala dumping site and cadmium was higher in feathers from the Digana dumping site in the Kandy District. Lead was higher in feathers that were collected from the dumping site of the Anuradhapura municipal council. Arsenic was detected only in feathers from garbage dumping sites and not in feathers from roosting sites.The data shows a high level variability for roosting sites. This may have resulted due to the difference in feeding areas of the selected birds. This paper reports preliminary data for heavy metal accumulation in birds in Sri Lanka which highlights the potential of the use of feathers as a bio-monitoring tool.

Keywords: Cattle egret, heavy metals

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