HEAVY METALS AND SELENIUM IN FEATHERS OF THREE SHOREBIRD SPECIES FROM DELAWARE BAY

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Abstract. Concentrations of lead, cadmium, mercury, selenium, chromium and manganese were examined in breast feathers of shorebirds migrating north through Cape May, New Jersey in 1991 and 1992. Although we predicted that metal levels would be positively correlated with weight, this was only true for mercury in red knots (*Calidris canutus*). Selenium was negatively correlated with weight in red knots. No other significant correlation of metal concentrations with weight were found. Lead and mercury were highest in sanderlings (*C. alba*). Selenium and manganese were highest in red knots, while chromium and cadmium levels were highest in semipalmated sandpipers (*C. pusilus*). For 1991, interspecific metals differences were significant for all metals except lead. For semipalmated sandpipers, cadmium and chromium concentrations were significantly higher in 1991 while manganese concentrations were significantly higher in 1992.

1. Introduction

Heavy metals can enter the food chain through a variety of anthropogenic sources as well as natural processes (Reid and Hacker, 1982; Stoewsand *et al.*, 1986; Grue *et al.*, 1986). Once a metal enters the body, it may be eliminated or accumulated. Birds can eliminate heavy metals and selenium in their feathers, making feathers useful for biomonitoring exposure because they reflect the body burden of metals at the time of formation (Goede and de Bruin, 1984). Numerous studies have evaluated levels of heavy metals in bird feathers (Goede and de Voogt, 1985; Gochfeld *et al.*, 1991; Burger and Gochfeld, 1991). Yet some highly migratory species, such as shorebirds, have been largely ignored. Migratory species that overwinter in South America may be expected to be exposed to high levels of contaminants on their wintering grounds.

This paper examines levels of mercury, cadmium, lead, selenium, manganese and chromium in the breast feathers of Red Knots (*Calidris canutus*), Sanderlings (*C. alba*) and Semipalmated Sandpipers (*C. pusilus*) from the Delaware Bay collected during their norther migration in May 1991. Semipalmated Sandpiper feathers were also collected from the same area in May 1992. The three species examined in this study are in the sandpiper family, allowing examination of interspecific differences in heavy metal levels in closely related species. Weights were taken for the Sanderlings and Red Knots from 1991 and from the Semipalmated Sandpipers from 1992, allowing comparison of feather metal levels with body size.

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