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HEAVY METAL CONCENTRATIONS IN KIDNEYS OF ESTUARINE RACCOONS FROM FLORIDA

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Abstract: Concentrations of lead, zinc and cadmium in the kidneys of 14 adult raccoons from an estuarine environment were determined. The mean concentrations in ppm wet weight and standard deviation for the metals were lead— 0.47 ± 0.22 , zinc— 75.88 ± 16.54 and cadmium— 2.48 ± 1.66 .

INTRODUCTION

The criteria used to define abnormal and pathologic conditions in biologic systems are established through comparisons with accepted values of normal. Regrettably, there is a dearth of information regarding baseline values of normality for various conditions in most wildlife species. In recent years, the Health Program Office, Florida Department of Health and Rehabilitative Services, has attempted to establish baseline values for physiology, disease and environmental pollutants in raccoon (*Procyon lotor*) populations throughout Florida.^{1,2,4,6} This report presents baseline values for concentrations of lead, zinc and cadmium in the kidneys of adult raccoons from Collier County in southwest peninsular Florida.

MATERIALS AND METHODS

Raccoons were trapped with wire box-type live traps in the estuarine mangrove habitat of Marco Island which is part of the Ten Thousand Island chain. Although the island has been partially dredged and filled for home development, the raccoons were trapped in a study area of unmanipulated mangrove (*Rhizophora mangle*). Raccoon density was 7.9 animals/km². Ketamine hydrochloride was used as the anesthetic for handling and sodium pentobarbital for euthanasia. The kidneys were removed, wrapped in alumi-

num foil and frozen on dry ice for transport to the laboratory.

Kidneys were thawed and digested in concentrated nitric acid for 24 h at 23 C. The whole kidney was used. The resultant digest was then boiled and filtered through nitric acid washed glass wool. The filtrate was adjusted to 10 ml with distilled water. Concentrations of the metals were determined by atomic absorption spectrophotometry using a Perkin-Elmer model 306 with flame analysis and background correction.⁵

RESULTS AND DISCUSSION

Results of the analysis on the kidneys from 14 adult raccoons are presented in Table 1. The authors are unaware of any published reports with comparable data on raccoons against which the results of this study can be assessed. Sanderson and Thomas⁷ reported concentrations of lead in the livers of raccoons from Illinois to be 6.8 ± 1.8 ppm. Values obtained in the present study are in general agreement with those for lead and cadmium reported for gray squirrels (*Sciurus carolinensis*) from Florida⁸ whereas the raccoon kidneys contained between two and four times the concentration of zinc found in the squirrel kidneys. Also, the concentrations of cadmium in the raccoon kidneys were slightly higher than values reported for the livers of brown pelicans (*Pelecanus occidentalis*) in Florida.³

TABLE 1. Kidney concentrations of lead, zinc and cadmium in adult raccoons from Collier County, Florida. (All values in ppm wet weight).

Raccoon	Sex	Lead	Zinc	Cadmium
1	M	0.73	80.50	7.30
2	F	0.23	94.17	5.03
3	F	0.63	105.00	1.10
4	F	0.73	62.80	2.66
5	M	0.60	83.75	2.66
6	M	0.19	83.10	3.25
7	F	0.33	71.00	1.08
8	M	0.88	83.60	2.56
9	M	0.63	52.50	1.69
10	F	0.29	89.40	1.24
11	F	0.31	63.80	0.85
12	F	0.31	65.10	0.96
13	F	0.43	45.12	2.88
14	F	0.31	82.50	1.50
Mean		0.47	75.88	2.48
S.D.		0.22	16.54	1.66

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