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HEMATOCRIT AND PROTEIN CONCENTRATION OF BLACK VULTURE AND TURKEY VULTURE BLOOD[1]

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Key words: Cathartes aura; Coragyps atratus; *Black Vulture; hematocrit; hematology; packed cell volume; protein concentration; Turkey Vulture.*

Blood protein concentration and hematocrit (packed cell volume) values are easily obtained and can be useful in determining the health of trapped or captive birds (Hunter and Powers 1980, Duke and Redig 1984). However, if these parameters are to be useful, there must be baseline data for comparison. Bond and Gilbert (1958), Hunter and Powers (1980), and Gessaman et al. (1986) have provided data for a variety of raptors, yet information on vultures is lacking. Our purpose is to provide baseline data on the blood characteristics of the Black Vulture (*Coragyps atratus*) and the Turkey Vulture (*Cathartes aura*).

METHODS

As part of a study of Black and Turkey vultures habitat use and feeding ecology in the mid-Atlantic states, we caught and took blood from 45 Black Vultures and eight Turkey Vultures. The study area, near Gettysburg, Pennsylvania, has been described previously (Coleman and Fraser 1987) and has an altitude of 100–450 m. The birds were trapped from March–November in 1983 and March–August in 1984. They were captured by hand in nest caves or with rocket nets. We processed and released the birds within 4 hr of capture except in the case of one sick individual which was held after processing until death 10 hr later. We tried to limit the capture of migrant birds by not trapping in the fall or late winter.

Blood was taken by pricking the large vessel at the humerus to radius-ulna articulation and pulling blood into heparinized capillary tubes. Within 1 hr, a portion of the blood was separated by spinning for 5 min at an RCF of 5,900 g on a Clay Adams Readacrit clinical blood centrifuge to determine hematocrit and plasma protein concentration values. Hematocrit was measured with calipers and plasma protein concentration measured with an American Optical refractometer. Samples of blood were provided to the USDA Avian Influenza Task Force for testing for the H5N2 Avian Influenza virus. All values were compared using *t*-tests.

RESULTS AND DISCUSSION

Mean packed cell volume for 44 healthy Black Vultures ($\bar{x}$ = 49.8%; Table 1) was higher than that reported by Schmitt (1972; n = 22, $\bar{x}$ = 47.0%; P = 0.005). We found no difference in Black Vulture blood characteristics by two seasons (March 15–September 14 and September 15–March 14) or by age (SY and ASY) ($P > 0.05$; Table 1). However, our samples were small (≤ three) in some seasons. We found no difference

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TABLE 1. Mean packed cell volume (% ± SE) and protein concentration (g/100 ml plasma ± SE) of Black and Turkey vultures trapped near Gettysburg, Pennsylvania, 1983–1984.

	Packed cell volume		Protein concentration	
	$\bar{x}$	n	$\bar{x}$	n
All Black Vultures	49.8 ± 0.53	44	4.2 ± 0.07	45
SY	49.8 ± 0.99	21	4.4 ± 0.10	22
ASY	49.8 ± 0.47	23	4.1 ± 0.08	23
Turkey Vultures				
Healthy	49.8 ± 2.03	4	4.1 ± 0.08	4
Sick or starving	30.6 ± 8.77	2	3.1 ± 0.84	2

between Black and Turkey vulture packed cell volume or protein concentration ($P > 0.05$; Table 1). One apparently starving, and another very sick Turkey Vulture had lower hematocrit values than the other Turkey Vultures ($P = 0.036$; Table 1). The starving Turkey Vulture was a nestling one third (650 g) below the weight of other nestlings of similar age. The sick adult Turkey Vulture was unable to stand or fly and died within 10 hr of capture. These results are consistent with Duke and Redig's (1984) suggestion that packed cell volumes of less than 40% indicate disease or poor condition. Hematocrit and blood protein varies with sex in some species (Sturkie 1976). Although we did not sex the vultures, it seems likely that both sexes are represented in the sample. If so, our small within-species variance suggests that sex differences in vultures are minimal. No sign of Avian Influenza antibodies were found in the 21 Black Vultures or the eight Turkey Vultures tested (L. Schorr, USDA Avian Influenza Task Force 1984, unpubl. report).

Although we did not survey the populations for disease, they appeared healthy. During 2 years of study of the 400–800 vultures in the area, we found only four sick or starving Turkey Vultures and no Black Vultures. The number of Black Vultures has increased in south-central Pennsylvania during this century (Grube 1953; Coleman and Fraser, in press). We feel that our data, particularly for Black Vultures, represent measurements from healthy populations and can be useful for comparison.

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