Determining the Sex of Adult White-winged Doves by Cloacal Characteristics

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INTRODUCTION

During a study of the White-winged Dove's *(Zenaida asiatica)* breeding biology (Swanson 1989), we found that determining the sex of adults by plumage characteristics alone was difficult, if not impossible. This paper compares two methods of sexing adult White-winged Doves: plumage differences and cloacal examination.

Cottam and Trefethen (1968:29) stated that male and female White-winged Doves could be distinguished by plumage characteristics: males having brighter purple coloration on the crown, nape, and hindneck, and more iridescence on the sides of the neck. However, Brown (1977:248) found cloacal examination necessary to determine the sex of adult white-wings accurately. Arizona Game and Fish Department personnel sexed white-wings by cloacal examination during a 1950's banding program (Cottam and Trefethen 1968:98). The sex of white-wings also has been determined by differences in body weight: males averaged 151 gm; females, 139 gm (Russell 1969:107). The major drawback of using weight as a sexing criterion is that crop content may add as much as 56 gms to a bird's weight (Cottam and Trefethen 1968:29).

Miller and Wagner (1955) sexed 31 species of columbids by cloacal characteristics. Cloacae of males typically possessed two conical papillae, one on each side, 1-3 mm in size that represented the termination of the vasa deferentia. Cloacae of females had no papillae and were identified by the oviductal opening on the left side, which was often whitish in color (see Plate 14 in Miller and Wagner 1955).

METHODS

Twenty-six males and 26 females were captured at the nest with hoop-net traps (Nolan 1961, Swanson 1989). We assumed that incubating adults captured on the nest between 1130-1300h were male and those captured between 1900-2030h, female (see Cottam and Trefethen 1968:135). The plumage of the crown and sides of neck of those 52 incubating adults was scored (Table 1) and their cloacae examined for the characteristics described by Miller and Wagner (1955). After banding and color marking, the birds were released.

Twenty-three males and two females were collected by shooting. The plumage of the crown and sides of the neck was scored and the birds' cloacae examined as described above. Sex of the collected birds was determined by dissection.

Because there was no significant difference in the plumage scores of the crown or sides of neck between male and female white-wings captured on the nest versus those collected, scores of these characteristics were averaged over all males (n = 49) and females (n = 28). The t-test was used to test the null hypotheses of no difference in plumage scores of the crown and sides of neck between male and female White-winged Doves. All tests were conducted at the 0.05 level of significance.

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RESULTS

Plumage scores were significantly higher for male crowns (t = -3.47, 75 df, p = 0.0009) and sides of neck (t = -3.41, .75 df, p = 0.0010). However, plumage scores of crowns and sides of neck ranged from 0-3 for both sexes.

All 26 white-wings captured on the nest between 1130 & 1300h (presumed males) possessed cloacal papillae, as did the 23 collected males. The oviductal opening was found in 22 of the 26 white-wings captured on the nest between 1900 & 2030h (presumed females) and the two collected females.

DISCUSSION

Although some columbids, like the Mourning Dove *(Z. macroura)*, may be sexed accurately by plumage characteristics (Petrides 1950, Menasco and Perry 1978), in the white-wings, there was considerable overlap between sexes within the two characteristics tested. Although males tended to have more purple coloration in their crowns and more color and iridescence on the sides of the neck than females, we could not confidently define "male" and "female" plumage categories during our study.

Miller and Wagner (1955) reported that neither papillae nor oviductal openings could be found in immature columbids. The four white-wings in our study assumed to be females, which had no oviductal opening, were breeding adults. Petrides (1950) expressed difficulty in finding the oviductal opening in some adult female Mourning Doves he attempted to sex by cloacal characteristics.

Papillae were conspicuous in the cloacae of all male white-wings examined. Not finding an oviductal opening should not prevent the determination of an adult white-wing's sex. Presence or absence of cloacal papillae should provide a technique for sexing adult white-wings with a level of accuracy at least as high as that reported by Miller and Wagner (1955) (i.e., 90%) for 31 species of columbids.

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LITERATURE CITED

Brown, D.E. 1977. White-winged Dove *(Zenaida asiatica)*. Pp. 247-272 in Sanderson, G.C., ed. Management of migratory shore and upland game birds in North America. International Association Fish and Wildlife Agencies, Washington, D.C.

Cottam, C. and J. B. Trefethen, eds. 1968. Whitewings: the life history, status and management of the White-winged Dove. D. VanNostrand Co., Inc., Princeton, NJ. 348 pp.

Menasco, K.A. and H.R. Perry. 1978. Errors from determining sex of Mourning Doves by plumage characteristics. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 32:224-227.

Miller, W.J. and F.H. Wagner. 1955. Sexing mature Columbiformes by cloacal characteristics. *Auk* 72:279-285.

Nolan, V., Jr. 1961. A method of netting birds at open nests in trees. *Auk* 78:643-645.

Petrides, G.A. 1950. Notes on determination of sex and age in the Woodcock and Mourning Dove. *Auk* 67:357-360.

Russell, S.M. 1969. Regulation of egg temperatures by incubating White-winged Doves. Pp. 107-112 in C.C. Hoff and M.L. Riedesel, eds. Physiological systems in semiarid environments. Univ. New Mexico Press, Albuquerque, NM.

Swanson, D.A. 1989. Breeding biology of the White-winged Dove *(Zenaida asiatica)* in south Texas. M.S. Thesis, Texas A&I Univ., Kingsville, TX. 122 pp.

Table 1. Description and assigned scores for characteristics of crowns and sides of neck used for determining sex of adult White-winged Doves in south Texas.

Character and Score	Description
Crown	
0	Brownish-gray
1	Pink wash to brownish-gray base
2	Pink/light purple
3	Deep purple extending onto nape
Sides of Neck	
0	Brownish-gray
1	Scattered flecks of iridescence
2	Pinkish wash with flecks of iridescence
3	Extensive pink with much iridescence