The Condor 95:1051–1053

THE KARYOTYPE OF THE WHITE-WINGED DOVE[1]

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Key words: *Karyotype; White-winged Dove;* Zenaida asiatica.

Chiarelli and Capanna (1973) point out the significance of karyotypes as a species-specific aspect of the phenotype. They also discuss the potential of a species' karyotype to evolve largely independent of the genotype thereby providing an additional suite of characters for karyological analysis. This paper presents the first description of the karyotype of the White-winged Dove (*Zenaida asiatica*).

Karyotypes were prepared and examined from three populations of White-winged Doves in southwestern Texas. These included locations in Apline (Brewster County), Pharr (Hidalgo County), and the Sierra Vieja Mountains (Presidio County).

Standard mitotic karyotypes were prepared from bone marrow cells following the techniques of Patton (1967), Hsu and Patton (1969), and Lee (1969). Additional material was prepared from spleen tissue. Chromosomes were subsequently stained in 2% Giemsa solution. Elevation of the mitotic index was accomplished following the yeast technique described by Lee and Elder (1980). Differential staining of nucleolus organizer regions (NORs) of mitotic chromosomes was accomplished following the technique of Howell and Black (1980).

Meiotic chromosome spreads, from testicular tissue of reproductively active males, were prepared in much the same manner as the mitotic except that a 1% sodium citrate solution was used for the hypotonic incubation phase following homogenization in several drops of 2.2% sodium citrate solution.

Karyotypes of members of the genus *Zenaida* have a diploid chromosome number range of 2n = 76 (for *Z. auriculata*) (De Lucca and De Aguiar 1976) to 2n = 78 (for *Z. macroura*) (Benirschke and Hsu 1971). Analysis of well-spread metaphase chromosome sets from White-winged Doves establishes a diploid chromosome number that ranges from 2n = 76 to 2n = 80 (Fig. 1). This variation was noted within individuals as well as between individuals.

The karyotype of the White-winged Dove contains five macrochromosomal autosome pairs that are biarmed with the remainder being acrocentric. These macrochromosome pairs (#1, #2, #4, #5, and the Z sex chromosome) are all classified as submetacentric (more metacentric). The #3 chromosome pair is classified as acrocentric. The remainder of the chromosome pairs and the W sex chromosome were small acrocentric microchromosomes. These designations were made on the basis of centromere indices and follow the terminology of Levan et al. (1964). The fundamental number for the White-winged Dove ranged from 84 (when 2n = 76) to 88 (when 2n = 80). Haploid chromosome numbers ranged from n = 38 to n = 40. No occurrences of abnormal synapsis were observed.

The mitotic chromosomes ranged in mean length from 7.7 μm to <1.0 μm and can be divided into three general groupings based on length. Group 1 consists of chromosome pairs #1–#3 and have a mean length of >4 μm. Group 2 consists of chromosome pairs #4, #5, and the Z sex chromosome, all of which have a mean length of <4 μm and >2 μm. Group 3 consists of chromosome pairs #6–#37 and the W sex chromosome. Members of this latter group all have a mean length of <2 μm. Mitotic karyotypes that were differentially stained with a silver solution showed the presence of NORs on the telomeric ends of a single pair of the microchromosomes.

Although the macrochromosomes of the White-winged Dove were consistently identifiable, well-spread, unoverlapped chromosome sets were rare making conclusive counts of the microchromosomes difficult. Subsequently, we feel it is important to emphasize the entire 2n chromosome range without stating a specific modal number until a more definitive sample can be taken. It is also unclear at this time whether the chromosome number variation present among the cells is a naturally occurring phenomenon (i.e., a form of mosaicism) or one of the numerous inherent problems associated with karyological techniques when working with microchromosomes.

By identifying the important features of this species' karyotype a species-specific base-line is established that augments the data previously gathered within this order and genus, and should facilitate future studies within the group.

We thank Richard A. Hilsenbeck for assisting with the data analysis and for reviewing the manuscript.

[1] Received 7 April 1993. Accepted 9 June 1993.
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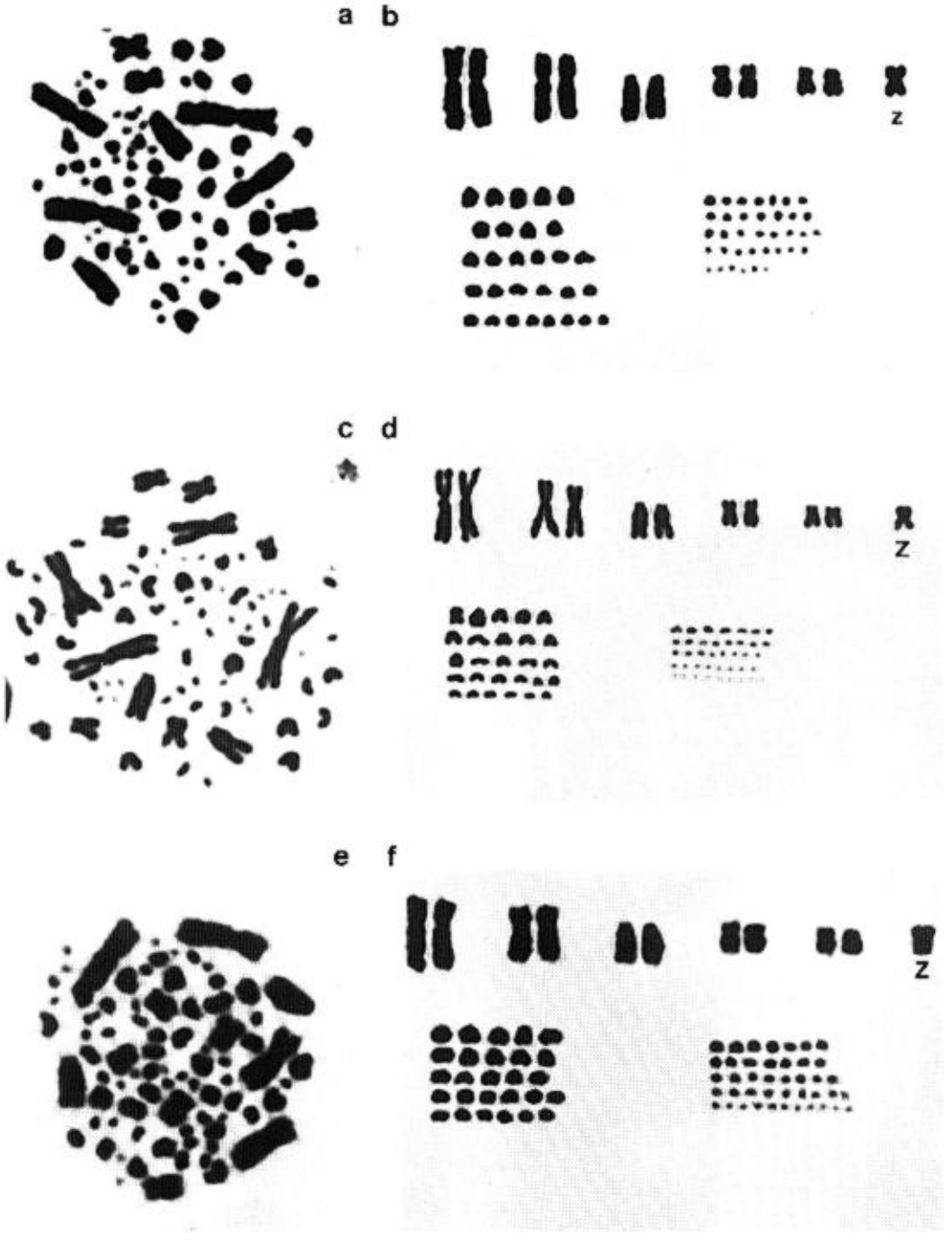

FIGURE 1. Mitotic chromosome spreads and subsequent karyotypes with varying diploid numbers from a single individual: 2n = 76 (a & b), 2n = 78 (c & d), and 2n = 80 (e & f).

This study was funded in part by a Research Enhancement Program grant awarded to J.F.S.

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The Condor 95:1053–1056

MATE AND NEST SITE FIDELITY IN A RESIDENT POPULATION OF BALD EAGLES[1]

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Key words: Bald Eagle; Haliaeetus leucocephalus; *mate fidelity; nest site fidelity; mate replacement; longevity.*

The faithfulness of birds to their mates and nesting places has long been of interest to ornithologists (Darley et al. 1971, Lenington and Mace 1975, Greenwood and Harvey 1976, Harvey et al. 1979, Ollason and Dunnet 1978). Rowley (1983) listed advantages for birds breeding in the same place with the same mate, including physiological and behavioral characteristics associated with the age of the partners, the best breeding sites, and efficiency of mating with a familiar partner. Improved reproductive success is often associated with age and experience, and remated pairs often produce more and superior young than first-time nesters (Greenwood 1980). Successfully nesting birds frequently have greater mate retention rates than birds that failed in a previous nesting attempt. Harvey et al. (1979) suggested that long-lived birds, and birds living in stable environments (e.g., Bald Eagles, *Haliaeetus leucocephalus*) may be more faithful to sites and mates than other birds.

Few data on mate and nest site fidelity of birds of prey are available, although Newton (1979) cites several examples of raptors that show a high degree of nest site fidelity. Newton and Marquiss (1982) reported strong site fidelity for a population of the Sparrowhawk (*Accipiter nisus*) in south Scotland; additional reports have been presented for the Flammulated Owl (*Otus flammeolus*) in Colorado (Reynolds and Linkhart 1987); the Ural (*Strix uralensis*) and Tawney (*Strix aluco*) Owl in Finland (Saurola 1987); urban-breeding Merlins (*Falco columbarius*) in Saskatchewan, Canada (Warkentin et al. 1991); and Ospreys (*Pandion haliaetus*) in the eastern U.S. (Poole 1989).

Stalmaster (1987) suggested that Bald Eagles are generally assumed to mate for life. Gerrard et al. (1992) reported high site fidelity for four adult Bald Eagles in Saskatchewan, with one female on her same territory for 13 years. Based upon nest defense behavior and egg size, Gerrard et al. (1992) also inferred mate fidelity at several sites. Other notes and comments on nest site and mate fidelity in Saskatchewan Bald Eagles appear in Gerrard et al. (1983) and Bortolotti and Honeyman (1985). In this paper, we report mate and nest site fidelity of 20 banded or color-banded resident Bald Eagles in California, monitored between May 1983 to May 1993. We also report seven instances of breeding adult replacement observed over this period.

All 20 banded Bald Eagles occurred as adults in one of 10 traditional nesting territories in the Pit River

[1] Received 12 April 1993. Accepted 16 June 1993.