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## Heterochromatic Patterns in *Drosophila virilis* Interphase Nuclei

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## General Notes

HETEROCHROMATIC PATTERNS IN *DROSOPHILA VIRILIS* INTERPHASE NUCLEI

In interphase nuclei of *Drosophila* there is a distinct chromocenter. This is clearly seen in salivary gland preparations where one large chromocenter is present with all of the chromosomes attached to it. In the large nuclei of the larval brain a distinct chromocenter can be demonstrated when these cells are treated to show chromosomal heterochromatin.

Hsu (1971) and Beck (1977) demonstrated that the regions near the centromere in *Drosophila melanogaster* and *D. virilis* were heterochromatic and comparable to the constitutive heterochromatin composed of satellite DNA of mammalian chromosomes. Gall et al. (1973) found three satellite DNAs in *D. virilis* that were rich in adenine and thymine. Ellison and Barr (1972) and Mayfield and Ellison (1975) showed that there were two to three A-T rich satellites localized in interphase nuclei as heterochromatic masses when studied with fluorescence staining. This study was made to see if the chromocenters observed in interphase nuclei correspond to the heterochromatic masses demonstrated with fluorescence stains.

Slides of larval ganglia of *D. virilis* were prepared according to Guest (1975) and the giant interphase nuclei were treated to demonstrate heterochromatin following Hsu (1971). These giant cells were counted in a mixture of cells from male and female larvae. Of 100 nuclei counted, 86 showed a single heterochromatic mass, 11 had two chromocenters, and three showed three chromocenters. Since the Y chromosome is completely heterochromatic, 25 cells from male larvae were studied to determine if the appearance of two or more chromocenters was related to the sex chromosomes. Of the 25 nuclei counted, 23 had one chromocenter (92%), and two had two heterochromatin masses (8%). This is comparable to the 86% of the mixed population that showed a single chromocenter. Thus, it appears that the presence of two chromocenters is not related to the sex chromosomes.

In examining cells with a single chromocenter, 12 showed an irregular mass with one or two extensions from the mass. This also was apparent in four of the 11 nuclei studied that had two chromocenters.

Mayfield and Ellison (1975) suggested a one to one correspondence between the number of heterochromatic masses and satellite DNA and showed with fluorescence techniques that the single heterochromatic mass could be distinguished as three A-T rich satellites. The Giemsa technique will not discriminate between DNA satellites. However, the fact that 14% of the nuclei showed two or more chromocenters indicates that in some cases the constitutive heterochromatin composed of satellite DNA does separate and can be distinguished by Giemsa staining. The irregular shape of many of the chromocenters may also be an expression of the partial separation of the satellite DNAs. Ellison and Barr (1972) suggested that the number of chromocenters present could result from chromosome orientation in anaphase. Heterochromatin in close proximity would form the chromocenter, and this association would persist throughout the following interphase. Each of the six pairs of chromosomes in *D. virilis* contains the same satellite DNAs and if, in anaphase, these fuse, the resulting chromocenter would be observed in interphase until the S phase when the satellite DNA begins replication.

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## AQUATIC MACROINVERTEBRATES OF WAPANOCCA NATIONAL WILDLIFE REFUGE

Wapanocca Lake and its contiguous swamps may have been formed by the New Madrid earthquakes of 1811-12, but probably predate this event. The area had flourishing willow and cypress stands prior to 1827 (Madden, M. R. 1978. Wapanocca: A History - Hunting Club to Wildlife Refuge. Appendix II. In: Jackson, H. E. 1979. A Cultural Resources Reconnaissance of Wapanocca National Wildlife Refuge. Vol. II. Report prepared by the Research Institute, NE Louisiana Univ. 120 p.). However, infrequent and moderate habitat alteration has occurred since that time. Wapanocca Lake was drained in 1968, and a levee system was constructed to inhibit inflow of silty and potentially contaminated waters from surrounding intensively cultivated farmland and from the Mississippi River. General repair work and undergrowth removal were also undertaken at this time. The lake was again drained in 1979 and repairs were made. On both occasions the lake was refilled with relatively silt-free deepwell water.

The refuge, located approximately 6.5 km W of the Mississippi River and 0.4 km S of Turrell, Crittenden County, Arkansas, consists of 2,220 ha, fairly equally proportioned among three major habitat types. These are the freshwater impoundment, which includes the 240 ha Wapanocca Lake and cypress-willow swamp; bottomland timber, which is seasonally flooded; and agricultural land, which is cooperatively farmed, with the refuge receiving supplemental waterfowl foods (Fig. 1). Primary functions of this refuge are to provide a wintering area for migratory waterfowl, to provide a nesting and brooding area for resident wood ducks, and to serve as a link in the chain of refuges along the Mississippi River to encourage the southward migration of Canada Geese. Secondary functions are to maintain representative populations of indigenous species associated with bottomland hardwood forests, and to provide for the public enjoyment of all migratory bird resources (Wapanocca National Wildlife Refuge records).

The purpose of this study was to ascertain the success of this refuge in attaining one of its goals, specifically the maintenance of indigenous species populations. Further, this study contributes to our knowledge of the native fauna of Arkansas.