PRELIMINARY OBSERVATIONS ON THE MITOTIC CHROMOSOMES OF *CORETHRELLA APPENDICULATA* (DIPTERA:CHAOBORIDAE)[1]

W. KEITH HARTBERG AND STURGIS McKEEVER

Institute of Arthropodology and Parasitology, Department of Biology, Georgia Southern College, Statesboro, GA 30460

ABSTRACT. The karyotype of *Corethrella appendiculata* consists of 3 submetacentric pairs (2n = 6). The average lengths of the late metaphase chromosomes are: I = 4.0 μm, II = 4.3 μm, III = 4.6 μm, with average arm ratios of: I = 1.26, II = 1.25, and III = 1.07. Somatic pairing is exhibited by the mitotic chromosomes.

INTRODUCTION

Prior to Stone (1956) the Chaoboridae were considered a subfamily of the Culicidae. Since that time they have been treated as a separate family.

Karyotype studies of mitotic and/or meiotic chromosomes have been made of many species in the Culicidae (Kitzmiller 1976), but to our knowledge only 3 members of the Chaoboridae have been karyotyped (Frowlowa 1929, Rai 1963). All of these were from the subfamily Chaoborinae. To the best of our knowledge the present study on *Corethrella appendiculata* Grabham is the first karyotyping for the Corethrellinae.

MATERIALS AND METHODS

The strain of *Corethrella appendiculata* used in this study was obtained from Dr. L. P. Lounibos, Florida Medical Entomology Laboratory, Vero Beach, Florida. This Florida strain was maintained for a time at Georgia Southern College. Rearing was at room temperature (25°–27°C) in specially designed cages that insured high humidity. The larvae were fed on *Aedes aegypti* (Linn.) and *Eretmapodites quinquevittatus* Theobald first and second instar larvae. Adults were fed 10% sucrose and furnished a bloodmeal from a *Hyla* sp. frog.

The larvae were selected at random from the colony. Brains of the larvae were dissected in their own tissue fluid with an added drop of *Ae. aegypti* saline (Hayes 1953), or were fixed and dissected in a solution of 6 parts methanol, 3 parts chloroform and 2 parts propionic acid (Pienaar 1955). The chromosomal slide preparation of the larval brains was essentially the same as that described by Breland (1961) except that a 1% lacto-aceto-orcein stain was used. After staining for 10–15 min, the preparation was gently squashed using coverslips and slides treated with Siliclad®.

The slides were sealed with fingernail polish. All measurements were made using a micrometer disc and slide micrometer. Each measurement represents an average of at least 3 measurements.

RESULTS

The diploid chromosome number of *C. appendiculata* is 6, 2n = 6. The karyotype consists of 3 pairs of submetacentric chromosomes, each pair homomorphic (Figs. 3–4). The chromosomes have arbitrarily been numbered according to the system used by Rai (1963) in which the shortest chromosome is designated as chromosome I and the longest as III. Somatic pairing (close association) of the homologous chromosomes is apparent in all preparations.

Table 1 gives the measurements for the chromosomes examined at mitotic stages

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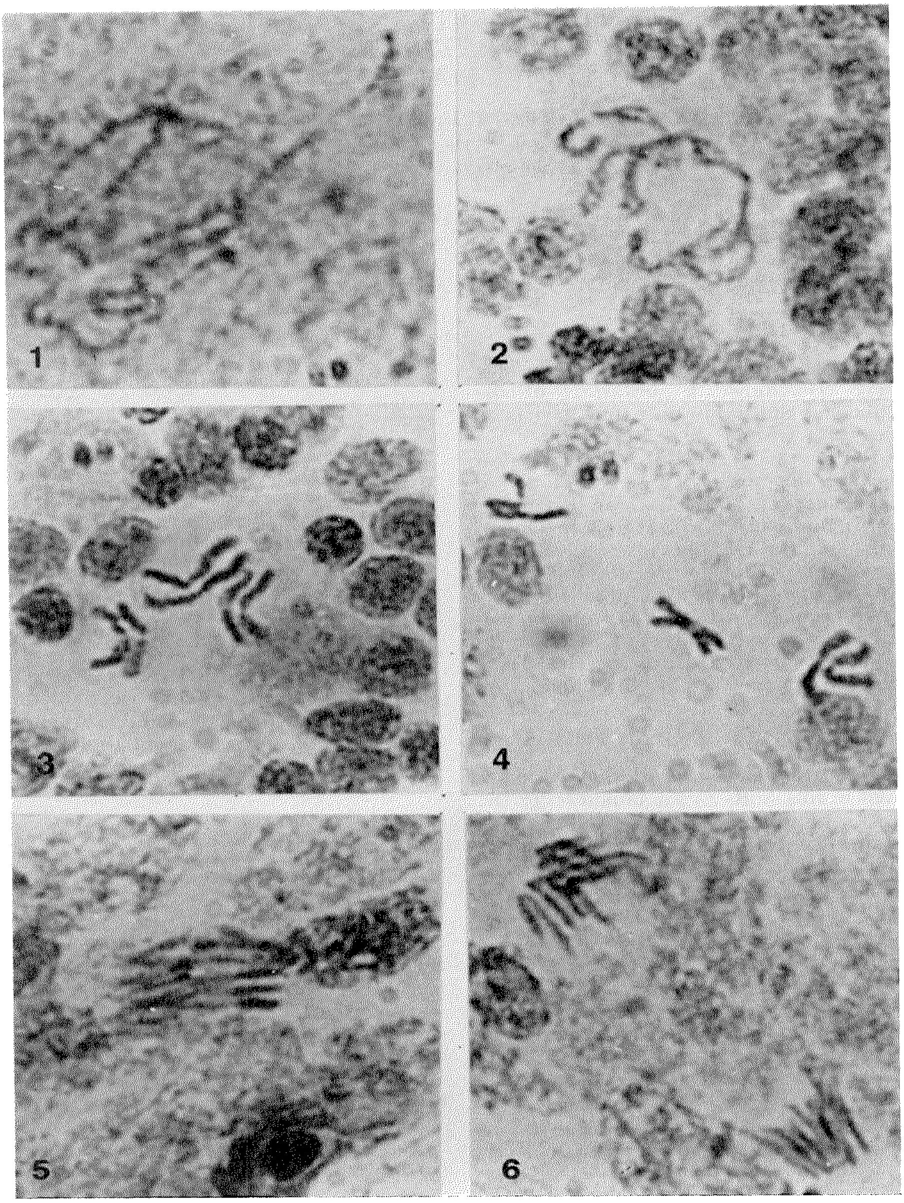
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Table 1. Measurements of mitotic chromosomes of *Corethrella appendiculata**

Mitotic stage	Chromosome no.	Length in μm		Arm ratio**	
		Range	Mean	Range	Mean
Late mitotic prophase	I	5.5– 9.5	7.4	1.03–1.33	1.15
	II	7.4–13.0	9.0	1.03–1.46	1.20
	III	8.0–17.0	10.4	1.13–1.29	1.21
Early mitotic metaphase	I	5.2– 5.7	5.5	1.03–1.28	1.15
	II	5.5– 7.0	6.0	1.00–1.33	1.13
	III	6.5– 8.5	7.5	1.00–1.24	1.13
Late mitotic metaphase	I	3.9– 4.0	4.0	1.22–1.30	1.26
	II	4.1– 4.5	4.3	1.25	1.25
	III	4.3– 4.8	4.6	1.04–1.09	1.07

* Centromere location is submetacentric.
** Arm ratio = length of longer arm/length of shorter arm.

adjudged to be late prophase, early metaphase and late metaphase, respectively. The measurements for late metaphase are probably representative of near maximum contraction of the chromosomes and will be used as the measurements for the karyotype of this species. Figures 1–6 show various stages in mitosis in the brain cells of larvae of *C. appendiculata.*

DISCUSSION

Frowlowa (1929) reported the diploid chromosome number to be 8 (2n = 8) in 2 species of the genus *Corethra*—(*Chaoborus*) *plumicornis* Fabricius and an unidentified species. Rai (1963) also reported the same for another unidentified species of *Corethra.* All 3 of these species are from the subfamily Chaoborinae. The diploid chromosome number of *Corethrella appendiculata* reported on in this study is 2n = 6, and it is a member of the subfamily Corethellinae. Additional karyotype studies of other members of the Chaoboridae need to be undertaken to determine if 8 or 6 is the more prevalent chromosome number.

Kreutzer (1978) reported 8 chromosomes (2n = 8) in the mosquito *Chagasia bathana* (Dyar). This was a surprising departure from all previous karyotype studies of many species in Culicidae where in each case the chromosome number is 6 (2n = 6). Kreutzer (1978) also discussed relationships between the Culicinae and Anophelinae and the synthesis of the known karyotypes.

Further cytogenetic studies on other species in the Chaoboridae may provide additional information on the chromosomal relationships among the Chaoboridae and between the Chaoboridae and Culicidae.

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Fig. 1. Early mitotic prophase; Fig. 2. Late mitotic prophase; Fig. 3. Early mitotic metaphase; Fig. 4. Late mitotic metaphase; Fig. 5. Early mitotic anaphase; Fig. 6. Late mitotic anaphase.

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WYEOMYIA MITCHELLII: OBSERVATIONS ON DISPERSAL, SURVIVAL, NUTRITION, INSEMINATION AND OVARIAN DEVELOPMENT IN A FLORIDA POPULATION[1]

J. K. NAYAR

Florida Medical Entomology Laboratory, Institute of Food and Agricultural Sciences, University of Florida, P.O. Box 520, Vero Beach, FL 32960

ABSTRACT. Seven mark-release-recapture experiments were conducted with a *Wyeomyia mitchellii* population in a wooded area near Vero Beach, Florida. Adult mosquitoes, marked with radiophosphorus during their fourth larval instar, were released once each month from March to October, 1977, either unfed or sugar-fed after emergence. Marked and unmarked adults were collected up to 100 meters distance from the release point in all 4 quadrants, with an average recovery rate of 5.2% in the 7 experiments. Dispersal was independent of the age of the mosquitoes at release time. Daily survival rates ranged from 0.76 to 0.87 for males and 0.74 to 0.91 for females, during different experiments.

Marked unfed adults first fed on nectar after release and soon thereafter started host-seeking, whereas sugar-fed females began host-seeking on the day of release. Almost all of the host-seeking females collected were inseminated. Host-seeking appeared to be continuous once started. Gravid females were collected from days 4 to 7 after emergence. Most females were parous from days 5 to 8. The average number of eggs in gravid females was 81 ± 6.

INTRODUCTION

In central and south Florida, *Wyeomyia mitchellii* (Theobald) occurs only in hard wood (oak and/or cypress) hammocks and forests where epiphytic bromeliads occur (King et al. 1960). Its immature stages are found with those of *Wyeomyia vanduzeei* Dyar and Knab in water held in the leaf axils of these epiphytic bromeliads, mainly *Tillandsia utriculata* L., throughout the year except when the leaf axils become dry, and the adults rest on trunks of trees (King et al. 1960). It has also been reported from Jamaica, the Atlantic slopes of Mexico, Cuba and Hispaniola, where it is found in the leaf axils of epiphytic and terrestrial bromeliads, "wild coco yam" and in the flower bracts of a large heliconia (Belkin et al. 1970, Knight and Stone 1977). *Wyeomyia mitchellii* females emerged from pupae collected along with *Wy. vanduzeei* from bromeliad plants in Vero Beach are anautogenous, while those of *Wy. vanduzeei* are autogenous (Nayar et al. 1979a). In Florida, this day-biting pest of man and animals is not known to be a vector of any mosquito-borne disease (Edman and Haeger 1977). A few innocuous viruses (Illheus and Wyeomyia) have been isolated from species of

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