Research Note

BRIEF NOTES ON THE CYTOLOGY OF NEOTROPICAL COLEOPTERA

4. CHALCOLEPIDIUS SILBERMANNI CHEVROLAT (ELATERIDAE: PYROPHORINI)

Pyrophorini is noted for its low chromosome numbers, the record having been found in the Brazilian Chalcolepidius zonatus Esch.: 2n=4. For this reason we have been curious to check the chromosomes of the Puerto Rican Ch. silbermanni Chevr. This species, an apparent accidental introduction from the Dominican Republic, is beneficial because it predates on Cerambycid larvae.

Several females were found flying around fresh fuel wood piles (mango, cupey) in Carraizo Alto in March 1986. Larvae found in dead mango branches were kept in captivity and fed with Cerambycid larvae until pupation occurred. Three males were found in this sample: one pupa and two adults. All specimens were injected with 0.02% colchicine in tap water, and killed 30 to 60 min later. The testes, composed of numerous unfused follicles in the Elaterid fashion, are inconspicuous and hard to localize even in adults. Therefore, the dissection was made under a stereomicroscope, the abdomen covered with a fixative, acetic methanol (1:3). After about 30 min in this fixative, single testis follicles were briefly (up to 2 min) refixed in Kahle-Smith fixative (1 part glacial acetic acid to 3 parts formalin to 7.5 parts 99% ethanol), and squashed on albuminized slides. The main features of the spermatogenesis were immediately studied and photographed under phase contrast; then cover slips were removed in 50% ethanol, and the slides were silver stained according to Pathak and Elder.

In Ch. silbermanni, the diploid chromosome number is 2n=12, the male meiformal being 5+Xy (figs. 1 to 3). We suppose that the smallest chromosome is y; it is only very slightly smaller than X. Both sex chromosomes appear isopycnotic with the autosomes, or y may look slightly undercondensed probably because of its prophasic activity.

![Image of spermatogonial metaphase]

FIG. 1.—Spermatogonial metaphase; 2n=12 (X, y). Silver staining. 2136 x.

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In the Puerto Rican Ignilater (Pyrophorus) luminosus (III.) we recently found a mixed chiasmate/adhesive sex chromosome association, XpneoXneoYp, apparently derived from the primitive Polyphagan Xyp by one evolutionary step: an autosomal incorporation through a translocation. In Chalcolepidius, the sex bivalent seems to be arranged either by a chiasma or by terminal contacts. It could be a "worn" neoXY, or its autosomal component might have been originally small. In about 5% of diakinesis (fig. 2B) and M I (fig. 2D) cells, the sex chromosomes show failure of pairing. Such sex univalents are capable of congression and, apparently, of amphitelic orientation in the M I spindle. As in other Pyrophorini, the chromosomes are provided with distal collochores (see Smith and Virki et al., 1984).

FIG. 3.—A to D.—Second spermatocyte; n=6 (with X, or with y). Silver plus phase contrast in A and B, silver only in C and D.—A.—T I. Number 12 can be counted in the lower cell, because sister chromatids are maintained together only by their distal col·lochores. Chromatids of the two lowest chromosomes of the upper cell have not yet opened up completely.—B.—M II, one plate with X, another with y chromosome. Note the "bivalent look" of the chromosomes, characteristics for M II's where distal collochores are involved.—C.—A II, with X chromosome.—D.—A II, with y chromosome. — 2136 x.


are telo- or acrocentric and thus well qualified for centric fusions. Three centric fusions would produce a meioformula $2n=2$, in Diploscapter coronata, with the record $2n=2$, in Diploscapter coronata, some Acari, and some Coccoidea, remain, in addition to Chalcolepidius zonatus. Certainly, this small Pyrophorine genus, widely distributed in the Neotropics, is worth further cytogenetic studies.

Reduction of the chromosome number to $2n=4$ is very rare in Eukaryote animals. Not counting the compound chromosomes of Parascaris equorum, only some Nematoda, with the record, $2n=2$, in Diploscapter coronata, some Acari, and some Coccoidea, remain, in addition to Chalcolepidius zonatus. Certainly, this small Pyrophorine genus, widely distributed in the Neotropics, is worth further cytogenetic studies.


