

RESEARCH NOTES

THE LOWEST CHROMOSOME NUMBER IN COLEOPTERA¹

Of the ca. 200,000 known species of Coleoptera, about 5 pro mille have been studied cytologically. The chromosome numbers range from $n = 5$ to $n = 15$ (see Smith^{2,3}). The most typical Coleopteran karyotype consists of nine autosome pairs and a sex-chromosome pair, the X chromosome being bigger than the Y . The meiotic association of the big X and the tiny Y resembles a parachute in side views, and is marked Xy_p . The formula

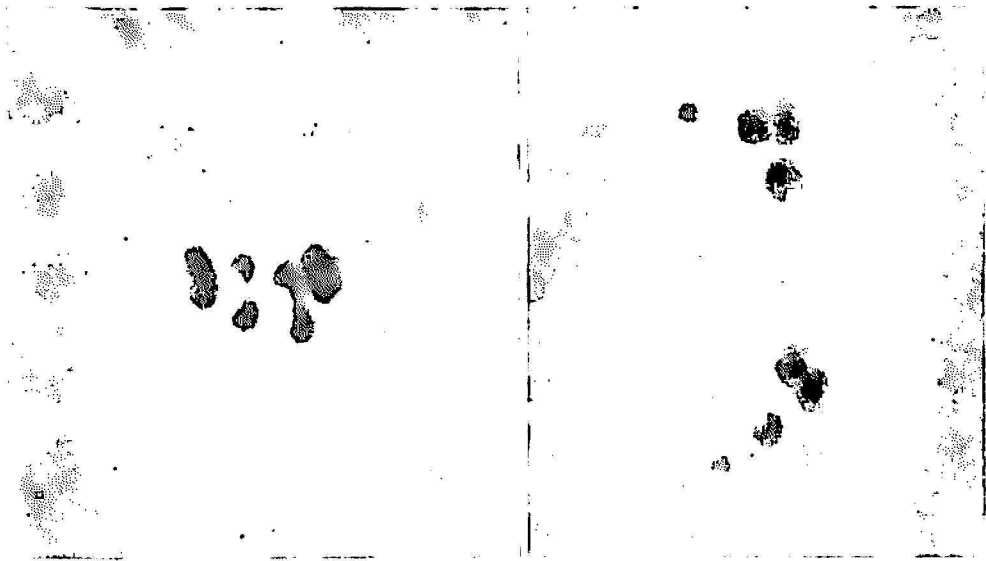


FIG. 1.—First meiotic division of male *Homoschema nigriventre*. Metaphase (left) with 4 bivalents; anaphase (right) with 2 groups of 4 chromosomes. Squash preparations stained with propionocarmine. Magnification 2725 \times in both photographs.

$9 + Xy_p$ ($n = 10$), encountered in about 20 percent of beetles, is considered as the basic formula for the beetles, or, at least, for Polyphaga.

The lowest numbers, five pairs, have been found by Piza⁴ and Virkki⁵ in two Neotropical Elaterids of the subfamily Pyrophorinae. Translocation of sex chromosomes on an autosome has been the last step in reducing the chromosome number in these species. Their karyotype is thus $4 + neo - XY$.

¹ Contribution to the National Science Foundation, Grant GB-1917.

² Smith, S. G., Chromosome numbers of Coleoptera, *Heredity* 7: 31-48, 1953.

³ ———, Chromosome numbers of Coleoptera, II, *Canad. J. Genet. Cytol.* 2: 66-68, 1960.

⁴ Piza, S. de T., A note on the chromosomes of an elaterid beetle, *Proc. 10th Intern. Cong. Genet.*, Montreal, Canada, 2: 219, 1958.

⁵ Virkki, N., On the cytology of some Neotropical Elaterids (Coleoptera), with special reference to the neo-XY of Pyrophorini, *Ann. Acad. Sci. Fennicae A IV* 61: 1-21, 1962.

This record was recently broken when we, pursuing our studies of Alticide cytology, came across a tiny Puerto Rican species, found on a Malpighian vine, *Stigmaphyllon tomentosum* (Desf.) Ndz. This species, *Homoschema nigriventre* Blake, has only four pairs of chromosomes (Fig. 1). Although there was some slight evidence of a *neo-XY* formation having occurred earlier in the evolution of this species, we were not able to identify the sex chromosomes with certainty. We therefore suggest the formula $3+XY$ for this species.

It is of special interest that a considerably small systematic group like the family Alticidae (or subfamily Alticinae of Chrysomelidae) has nearly the same range of chromosome numbers as the rest of Coleoptera (from $3+XY$ to $2y+neo-XY$ in Alticidae, see Virkki⁶; from $4+neo-XY$ to $28+XXy$ in other beetles). This together with some other oddities of chromosome relationships suggests speed and success of evolution within Alticidae.

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⁶ —, On the cytology of some Neotropical Chrysomelids (Coleoptera), *Ann. Acad. Sci. Fennicae A IV* 75: 1-25, 1964.