XXIV. A PRELIMINARY NOTE ON THE CHROMOSOME NUMBER OF THE FIRST SPERMATOCYTE OF BRUCHUS

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Bruchus quadrimaculatus Fabr., commonly known as the four-spotted cowpea weevil has come to the notice of the geneticists as being an insect which readily adapts itself to breeding experiments. Since considerable work has already been done, chiefly by Breitenbecker, on the inheritance of *Bruchus* and since more work is likely to follow, a knowledge of its chromosome number and of the general facts concerning its spermatogenesis is desirable.

The difficulties attendant upon the study of coleopteran spermatogenesis are well known. Due to the smallness of the cells, the difficulty of fixation and the necessity of dissecting out the genital organs, good slides are procured only by painstaking and irksome proceedure. After the slides are prepared there are irregularities in the spermatogenesis which further complicate the problem.

The literature along the line of this study is meager. Although some phase of gametogenesis has been studied in about seventy species of beetles, complete work has been done in only three or four cases. Most investigators considered their tasks completed after they had demonstrated an unequal pair of heterochromosomes. Miss Stevens has worked on about forty-five species but since she is concerned chiefly with the sex chromosome, her work is limited to this phase of the study. Ethel Browne Harvey, Shelford and Bordas have done extensive work upon different phases of the problem. Goldsmith's work on tiger beetles, however, constitutes what is probably the most comprehensive investigation that has been made.

Since, therefore, the literature on the subject is meager and the irregularities many, a study of the spermatogenesis of *Bruchus* has cytological as well as genetic value.

In this paper the observations are limited to the first spermatocyte stage. Of course the thing of outstanding importance is the chromosome number. The writer is able to demonstrate clearly that the haploid number of chromosomes for the species is ten. A very common occurrence in my material is a cell showing a polar view of the equatorial plate. In such a cell, eight chromosomes may be seen to form an imperfect oval in which are located two other chromosomes as seen in figure 1 of Plate IV. One chromosome is always seen out of focus. This is the X-chromosome which

has precociously started toward the pole. It is a very frequent occurrence to find but nine chromosomes in the plate as illustrated by figure 2. In these cases the section has been so cut that the X-chromosome, which has previously started its migration, has not been included in the section. Figure 3 shows a lateral view of the mitotic figure. Figure 4 show an arrangement of the chromosomes in the equatorial plate which is other than the usual arrangement as shown in figure 1. Distorted arrangements of the chromosomes on the equatorial plate sometimes occur, but the chromosome number is unaltered. Figures 5 and 6 show other views of the change from the tetrads of the first spermatocyte to the diads of the second spermatocyte.

A tentative count of the chromosomes of the spermatogonial cells shows nineteen to be the diploid number. This points to the absence of a Y-chromosome.

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