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A MODIFIED TECHNIQUE FOR GRASSHOPPER CHROMOSOME PREPARATIONS

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Making use of colchicine-hypotonic-flame dry technique, hepatic caeca of acridids and tettigoniids have been used as the source of material for the preparation of somatic chromosomes.

INTRODUCTION

Mostly testes material is used to study chromosome number, structure and behaviour. Occasionally ovariole walls (JOHN & HEWITT, 1966) and neuroblasts (HEWITT & JOHN, 1971) have been used to study the somatic chromosome architecture. The authors of this paper have developed a technique using hepatic caeca of the acridid–*Acrida turrita* and a tettigoniid–*Euconcocephalus incertus*.

MATERIALS AND METHODS

The animals collected from Manasagangotri, Mysore, were injected 0.1 ml of 0.05% colchicine and sacrificed after 4 hours. The hepatic caeca were dissected out and treated with hypotonic 0.9% sodium citrate solution at room temperature for 1 hour. The material was fixed for 3 hours in 1:3 acetic/methanol with three changes of the fixative. The material was minced well on a clean slide and centrifuged at 750 RPM for 5 minutes. The supernatant was discarded and the cell button resuspended with fresh fixative. Cell suspension was dropped on alcohol-cleaned slides and were flame dried. The slides were stained with Giemsa, dried and mounted in DPX.

RESULTS AND DISCUSSION

The photographs (Figs. 1 and 2) show the clarity of the chromosome structure including the position of the centromere. The preparations obtained from the hepatic caeca are far better than those prepared from the testes (Figs. 3 and 4). Based on the cytology of the testicular cells of *Acrida turrita* it was believed that the chromosomes were acrocentric, but the somatic chromosome preparations from the hepatic caeca clearly show that they are telocentric. Further, the clarity of the chromosome size and position of the centromere are better expressed in the hepatic caeca preparations than in intestinal epithelium or Malpighian tubules. In addition, it was observed that the output of metaphase plates in the material under discussion outweighs those from other tissues. This is an added advantage. Further when one is studying metaphase chromosomes from neuroblasts, one has to get developing embryos which is ordinarily difficult. This high number is useful for comparative and mitotic index studies. Moreover, the usage of hepatic caeca from female grasshoppers overcomes the difficulties involved in getting chromosome preparations from ovarioles of orthopterans which are full of yolk. The authors opine that this technique would be easy and useful for all the orthopteran chromosomologists.

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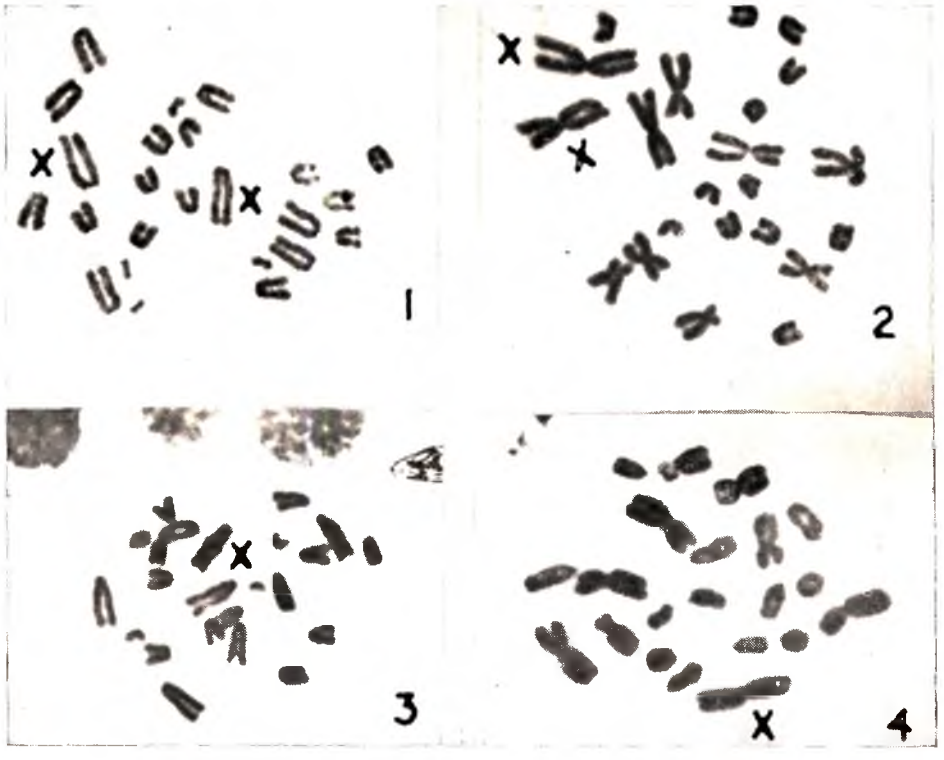

Fig. 1. Mitotic metaphase of *Acrida turrita* (2n $\overset{+}{O}$=24, hepatic caeca).

Fig. 2. Mitotic metaphase of *Euconcocephalus incertus* (2n $\overset{+}{O}$=22, hepatic caeca)

Fig. 3. Spermatogonial metaphase of *Acrida turrita* (2n $\overset{\uparrow}{0}$=23).

Fig. 4. Spermatogonial metaphase of *Euconcocephalus incertus* (2n $\overset{\uparrow}{0}$=21).