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The present work includes the studies on the behaviour of chromosomes during spermatogenesis in five species of coleoptera viz, Aulacophora foveicollis, Aspidomorpha santicrucea, Monolypta Laccoptera quadriraculata, and Cocassida bundicata.

(1) The number, position and colour of the testes vary in different species of the adult male beetles. Remarkably, Aulacophora foveicollis and Monolypta possess a single testis which is reddish in colour and is situated in the 5th abdominal segment of the insect. However, Aspidomorpha santicrucea, Laccoptera quadriraculata and Cocassida bundicata, are having a pair of testes in the last abdominal segment and are orange in colour.

(2) The testes have been found surrounded by the fibrous sheath with a few nuclei in it. This sheath is very thick in the case of Aulacophora foveicollis and thinnest in Laccoptera quadriraculata and Aspidomorpha santicrucea.
(3) The testicular lumen contains spermatogonial cells, primary and secondary spermatocyte cells and spermatids in groups. All the cells in a group have been found showing synchronous nuclear division. The stages of spermiohistogenesis also form groups.

The age of all the elongating nuclei in one group is similar, therefore all the sperms contained in a group mature at one time.

It has been found that in the case of Lacocoptera quadrimaculata and Monolypta a few incomplete partitions extend from the testicular fibrous sheath i.e. from periphery to the central region. The presence of such partitions have not been recorded by the previous investigators. It is rather difficult to give any satisfactory explanation regarding the presence of such partitions. However, it appears that crowding and mixing of the cell groups is avoided by their formation.

(4) During the present study of the spermatogenesis the cells in a group remain separate from one another. However in Cocassida bundicata only a few spermatogonial cells have been found connected with cytophasmic bridges showing rosette pattern.
This condition is different from the reports of Hoelle Richard Mercier (1979) where he detected the presence of cytoplasmic bridges connecting the cells.

(5) Remarkably the presence of nucleolar vacuole and perinucleolar ring could not be detected by previous investigators. During the present study an unstained nucleolar vacuole has been found within the nucleolus in the leptotene stage of primary spermatocyte cells in -

Apodomorpha santicrucis, Aulacophora foveicolis and Laccoptera quadrimaculata.

In the case of Aulacophora foveicolis in addition to such nucleolar vacuoles an unstained perinucleolar ring is also present surrounding the nucleolus of the primary spermatocyte cells. It may be mentioned here that such a nucleolar vacuole or a perinucleolar ring is absent in the cells of Cocassida and Monolypta. Here the nucleolus appears as a deeply stained body within the nucleus.

The presence of nucleolus in the primary spermatocyte cells could be traced up to the
leptotene stage in *Occassida bundicata* and *Monolypta*

up to zygotene stage in *Aulacophora foveicolis*, and

up to the pachytene stage in *Aspidomorpha santicruce* and *Lacoptera quadrimalculata*.

(6) The chromosomal activity in a group of secondary spermatocyte cells makes it clear that all the cells are of the same age because all of them exhibit only one stage of nuclear division.

(7) The spermatids of all the species in their early stage behave in similar manner. The condensation of the chromatin material at the inner surface of the spermatid nuclear membrane is a common feature. It appears as a horse shoe shaped structure and stains deeply with haematoxyline. A clear unstained nuclear vesicle appears within the nucleus in all the species under study.

(8) In *Aulacophora foveicolis* and *Occassida bundicata* acrosomal granule is deposited as a deeply stained body within the acroblast which in turn is found closely associated with the nuclear membrane. In the case of *Aspidomorpha santicruce*, *Monolypta* and *Lacoptera quadrimalculata* the acroblests could not be seen. During the course of nuclear elongation,
the acrosomal granule shifts at the apex of the sperm nucleus without showing remarkable changes.

(9) The centriole could be traced as a deeply stained granule on the nuclear membrane of spermatids in Cocasside bundicata, Aspidomorphic santicrucele and Monolypta. However, in Aulacophora foveicolis it could not be detected till the formation of axial filament. It appears as a small dark granule at the anterior end of the flagella after it has been formed. In Lacoptera quadrimaculata the centriole could not be detected.

(10) After a short duration the spermatid nucleus undergoes spermiohistogenesis. Its elongation and condensation of the chromatin material occurs simultaneously. In some cases few vacuoles appear within it but due to further condensation of the chromatin material the vacuoles are lost. Its shape changes from oval to fusiform, and finally becomes filamentous. It is remarkable to note here that during condensation in some species a few vacuoles appear within the nucleus. For the first time an attempt has been made to study these vacuoles in details. Their number, size and shapes
exhibit variations in different species during the course of spermiohistogenesis in these insects. In a newly formed spermatid of *Lacconyx quadrimaculata* only one large vacuole, in *Aspidomorpha santi cruz* and *Oocassida bundicata* one to two vacuoles and in *Monolycta* two to three vacuoles appear. However, after a little more elongation of the nucleus in *Aspidomorphas santi cruz* three to four vacuoles appear in it. It will not be out of place to mention here that in *Lacophora foveicola* such vacuoles are absent. In *Monolypta* and *Lacconyx quadrimaculata* as the spermatid nucleus elongates, the vacuoles present in it increase in number but their size becomes very small. In *Monolypta* it has been found that the condensation of the chromatin material starts from the posterior end of the nucleus, and gradually advances towards anterior side. As the condensation continues the vacuoles are lost completely and the sperm nucleus becomes filamentous with its anterior pointed acrosomal end and posterior broad flagellum end. In *Lacconyx quadrimaculata* the small vacuoles present in the spermatid nucleus fuse together
with the result a tube like hollow space appears within the nucleus. Due to further condensation of the nucleus. This elongated space gradually disappears in a mature sperm. In a mature sperm the acrosomal end is pointed while the posterior flagellar end is broader.

It is interesting to note that in *Aulacophora foveicola* and *Aspidomorpha anticracce* the elongating spermatid nucleus becomes flattened and appears like a trypanosome. Later on the lateral margins of the flattened nucleus roll up and fuse as a result of which a tube like hollow space is seen within the nucleus. Due to further condensation of the nucleus this tubular space is lost and the sperm nucleus stains deeply.

In the case of *Oocassida bundicata* the middle portion of the nucleus becomes broad but the rolling of the lateral margins do not occur. During the course of elongation the flattened nucleus finally changes into filamentous form as in the sperm.