

<table>
<thead>
<tr>
<th>Chromosome No.</th>
<th>Total length (μ)</th>
<th>Length of short arm (μ)</th>
<th>Length of long arm (μ)</th>
<th>Arm length ratio</th>
<th>Length of chromatic segment (μ)</th>
<th>Length of achromatic segment (μ)</th>
<th>Achromatic to chromatic ratio</th>
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<td>1.</td>
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<td>2.</td>
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<td>3.70</td>
<td>18.86</td>
<td>5.10</td>
<td>9.64</td>
<td>14.19</td>
<td>1.07</td>
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<td>3</td>
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<td>..</td>
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<td>..</td>
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<td>4.</td>
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<td>1.08</td>
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<td>7.12</td>
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<td>7.</td>
<td>16.17</td>
<td>5.34</td>
<td>10.83</td>
<td>2.03</td>
<td>5.47</td>
<td>10.70</td>
<td>1.96</td>
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</tbody>
</table>

*C. capsularis*. An increase in the length of the achromatic segments is also observed in this species. These differences, however, appear to be genotypic and do not seem to account for the strong cross incompatibility between the two species.

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**ON THE FORMATION OF THE MICROPYLE IN NEMACHILUS TRIANGULARIS DAY**

During a detailed investigation on the anatomy and histology of the reproductive system of the common loach *Nemachilus triangularis* Day it was possible to observe the origin and formation of the micropyle. At the migratory nucleus stage the oocyte is spherical and measures 500 μ in diameter. The germinal vesicle which is very near the animal pole appears as a very prominent oval body with a distinct wall which is thrown into feeble folds (Fig. 1). A distinct zona radiata covers the oocyte all around. This egg membrane has a large number of closely packed striations giving it a tough consistency. Over this, the follicular epithelium forms a single layered membrane, the cells being cuboidal. Each cell has a very distinct central nucleus with dense cytoplasm. Immediately dorsal to the germinal vesicle, the micropyle is visible as a funnel-shaped depression of the zona radiata, with the wide end directed outwards. Three cells of the follicular epithelium lying dorsal to the germinal vesicle get enlarged and appear differently (Fig. 2). The nucleus in each of these three cells is eccentric in position. The portion of the cell dorsal to the nucleus gets vacuolated and the cell walls between them disappear. The cytoplasm of

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**FIG. 1. T.S. of migratory nucleus stage of oocyte of *Nemachilus triangularis* showing strands of protoplasm in the micropylar cell. (Reconstructed from 10 consecutive serial sections) × 250.**

**FIG. 2. T.S. of oocyte passing through the micropylar region showing follicular layer, micropylar funnel, and zona radiate, × 400.**
all the three cells are thrown into fibrillar strands which run parallel to one another from the base of the nucleus to the posterior end of the coalesced cells. In section, the whole structure appears as a rectangular stringed plug, the posterior part of which firmly pressing the zona radiata downwards. This impinging results in the formation of a deep depression, the micropyle.

The formation of the micropyle in teleosts has been studied by a few earlier workers who have come to the conclusion that the micropyle owes its origin to the follicular cells. In *Pygosteus punctatus* and in *Macropodus cupanus* a single follicular cell gets modified and the posterior part of this cell is drawn into a wedge-shaped process which presses down the zona radiata to form the micropyle. In *Leuciscus* three follicular cells crowd together and press the zona radiata into a funnel-shaped structure forming the micropyle. In *Stigmogobius javanicus* a cluster of cells of the follicular layer exerts pressure in the zona radiata to form the micropyle. In the present study however it can be observed that the micropyle is formed by the coalescence of three enlarged follicular cells, the cytoplasm of which is thrown into firm strands, that coalesce posteriorly.

Authors are grateful to Dr. N. Balakrishnan Nair, Professor and Head, for reading through the manuscript.

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CHARACTERIZATION OF NUCLEAR HISTONES IN SPERMATOZOA OF A CENTIPEDE (*MECISTOCEPHALUS* SP.)

Introduction

There are conflicting reports in literature regarding dual nature of the testis and spermatogenesis in Chilopods, leading to the formation of two types of Spermatozoa. Bouin (1925) reported two types of spermatogenic processes in the same testis of *Scolopendra sinuata*. Dual nature of testis having two types of spermatozoa have also been reported by Ansley (1954) in *Scutigera forcheps*. However Nath (1925), Ram (1937) and Gulati (1937) in their contribution on the spermatogenesis of *Lithobius forciatus*, *Rhyida longipes* and *Scolopendra sp.*, respectively, do not reveal such duality of spermatogenesis in anyone of the three forms.

In *Mecistocephalus* sp., under light microscopic work, no morphological differences are seen in sperm-cells, but there may be differences at the chemical level and also in their viability and fertilizing ability.

In the present investigation, cytochemical analysis of the nuclear histones has been carried out with the idea to ascertain if two types of spermatozoa are formed. It may then be possible to distinguish them according to the type of basic nuclear proteins present in their head-part. It is now well established that during spermatogenesis, a typical somatic or lysine rich histone is replaced by arginine rich histone type, at spermatid stage and in some species there is further alteration to protamine in mature spermatozoa (Dupraw, 1970). The role of basic nuclear protein in the sperm-head still remains unknown (Bloch, 1969).

Materials and Methods

Specimens of *Mecistocephalus* sp. were collected from damp soils of the Western Himalayan region. The testes and seminal vesicles from the male centipedes and oviducts from the female were dissected out in physiological saline solution.

Spermatozoa were taken out from these organs by teasing apart the tissues in physiological saline and were spread out in the centre of a few properly cleaned slides. The smears thus prepared were air-dried and slides were processed in the procedure stated below.

The reagents used to stain the basic nuclear protein of sperm-cells consisted mainly of trichloro-acetic acid (TCA)- alkaline fast green method as prescribed by Alfret and Geschwind (1953), and picric acid-bromphenol blue method of Bloch and Hew (1960). Such procedures can be used to differentiate among somatic histones, arginine rich and protamines.

The Alfret and Geschwind method is used specifically for the detection of nuclear histones at a pH 8.0-8.02, because any protamines present in the cell would be extracted by hot TCA. However, protamines are stained by bromphenol blue (at pH 2.3) after treatment with picric acid. Lysine rich and arginine rich histones stain with alkaline fast green or bromphenol blue. The lysine rich histones lose most or all their stainability after deamination (Van Slyke, 1971) or acetylation