

MORPHOLOGICAL AND BIOCHEMICAL STUDIES

ON BOVINE SPERMATOZOA

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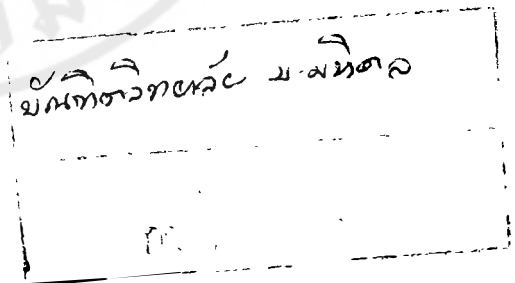
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## SUMMARY

To determine the sperm fertility, the basic morphological and biochemical studies are needed. We have investigated the semen of 11 fertile bulls (Holstein Fresian 75%) by light, scanning and transmission electron microscope as well as the acid urea and SDS polyacrylamide gel electrophoresis methods.

Fertile bovine semen analysed in volume, sperm concentration and normal cells were in normal ranges. The average dimensions measured from SEM were as followed :  $7.45 \pm 0.26$  u in head length,  $3.74 \pm 0.18$  u in maximum width and  $1.45 \pm 0.10$  u in base width. The lengths of the middle piece, principal piece with end piece were  $11.22 \pm 0.54$  u and  $42.61 \pm 1.30$  u respectively. TEM studies revealed that there was nearly homogeneous chromatin condensation of sperm head except the nuclear vacuoles at the posterior part of the nucleus. Few sperm heads demonstrated the different stages of chromatin package eventhough the cord like network of chromatin were similar in thickness of approximately  $500-700 \text{ \AA}$ . In the gel electrophoreses studies, the pattern contained mainly protamines with very small amount of histones and non-histones.

The equatorial segment of acrosomal cap and postacrosomal region which has been suggested to be the important structures in fusion with egg were clearly demonstrated. The locomotor apparatus, the axoneme and outer dense fibers, were arranged in the pattern of 9+9+2. The mitochondrial sheath which was shown in the middle piece provided the energy for sperm

movement. At the principal **piece**, the rib like appearance of the fibrous sheath provided more flagella flexibility and movement.

The results of this study demonstrated that the fertile bovine sperm required the intact of acrosome, equatorial segment, postacrosomal region and various tail components. The nuclear chromatin condensation mainly protamine in nature was also important for sperm being fertilized with egg.

