IMPACT OF PHYTOPESTICIDE, NIMBECIDINE ON HISTOLOGICAL CHANGES IN THE SEMINAL VESICLE OF ADULT MALE *Odontopus varicornis* (DIST.) (HEMIPTERA: PYRRHOCORIDAE)

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SUMMARY

The male reproductive system of Odontopus *vericornis* consists of a pair of testis, seminal vesicle, vasadeferentia, a common ejaculatory duct, an erection fluid reservoir (ambulla), a pair of short oval shaped accessory glands opening into the reservoir and an adeagus. The seminal vesicle showed remarkable changes in the insects treated with phytopesticide, nimbecidine (25 ppm median lethal concentration). In treated insects shows a highly disintegrated epithelial cells with weakly stained cytoplasm and nuclei with many cytoplasmic vacuoles.

Key words : *Odontopus varicornis*, Phytopesticide, Cytoplasmic vacuoles, Basement membrane.

The reproductive system of insects is found to be a complicated one. Reproduction in insects is an essential physiological process from the view point of propagation of the insect species. General views of insect reproduction are given by Engelmann (1970) and Wigglesworth (1972). The structure of reproductive organ is described by Miall and Denny (1886) and Musgrave (1937).

Reproduction always does not imply the bi-sexual methods, but other reproductive processes like parthenogenesis. The parthenogenesis occurring in insects may be arrhenotoky, in which only males are produced. Thelytoky, in which only females are produced (or) amphitoky producing the individuals of either sex. Besides such diversity occurs in the mode of reproduction. Almost all insects possess a well defined set of internal organs of reproduction, primarily consisting of paired gonads, genital ducts leading to the gonopore, and some accessory structures. The seminal vesicle of *Odontopus varicornis* appears to be white oval shaped body (Osanai *et al*.,1986). The seminal vesicle was richly supplied with tracheoles. It lies in the posterior region of the abdomen in between the vas deferens and testes. The seminal vesicle has dual function that is secretary and storage of sperms.

The seminal vesicle has an outer connective tissue sheath and an inner circular muscle fibre (Joseph, 1965, Jayakumar, 1988 and Premavathi 1993). Seminal vesicle is found to be a single layer of columnar epithelial layer surrounding the narrow lumen (Numata and Hidaka, 1980). The secretion of these cells are found to be in the form of fine eosinophilic foamy secretary substances which are released into the lumen by the rupture of the apical region of the cell membrane and thus , it represents the apocrine mode of secretion Mernitt and Cummins (1978). Similar studies have been carried out in insects such as Grylotalpa grylotalpa (Ito,1924), pleiognyllus guttiventris (Ranganathan,1984) and Gryllotalpa aficana (Sumathi *et al.* 2001). These consideration lead to investigate the effect of phytopesticide nimbecidine on the seminal vesicle of the adult male *Odontopus varicornis*.

MATERIALS AND METHODS

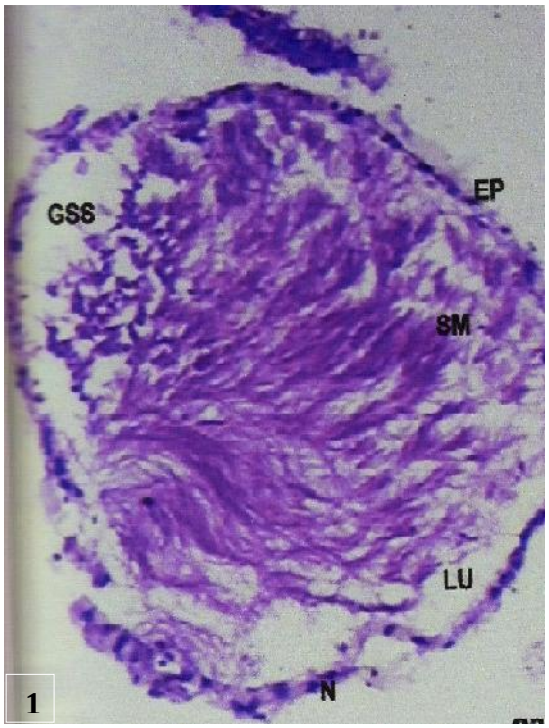
The adult control treated *Odontpus varicornis* were kept separately after 48 hours; they were dissected under binocular microscope by using Ringer solution (Emphrussi and Beadle, 1936). The Ringer and subsequently removed and the tissue was fixed in Boun's fluid for 24 hours. Later the tissue was processed by adopting standard histological techniques (Gurr, 1958).

RESULTS AND DISCUSSION

The seminal vesicle of the control insect consists of an outer thin delicate membrane and it has folded epithelium which encloses a central lumen. The lumen is surrounded by a layer of folded columnar epithelium and contains rich secretary substances and sperm masses. These substances have given activation and nourishment to the stored sperm masses. The cytoplasm contains a prominent spherical nucleus with out any vacuoles. The nucleus is deeply stained with haematoxylin (Fig.1, 2, 3 and 4). The histopathology of the seminal vesicle exhibits marked histological changes in its architecture such as

highly disintegrated folded epithelium with feebly stained cytoplasm and nuclei. The cytoplasm contains many vacuoles and appears to be fewer secretaries in nature.

These finding appears to suggest that the secretary nature of the seminal vesicle and its secretary substance may be used for the nourishment of stored sperms.



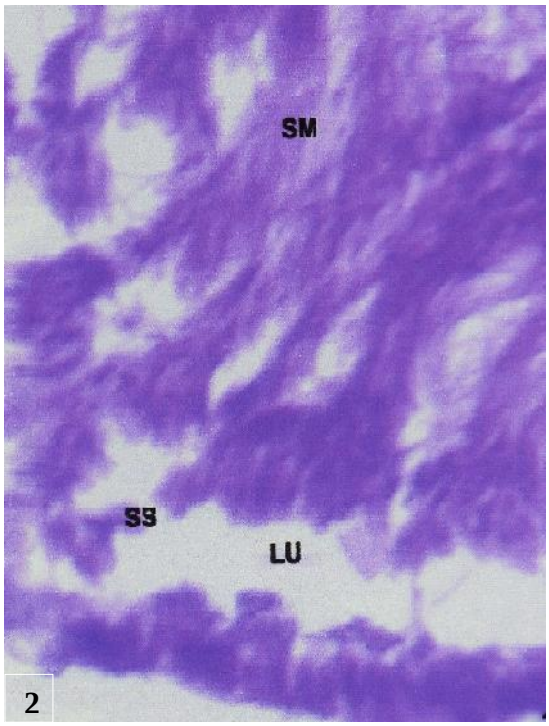
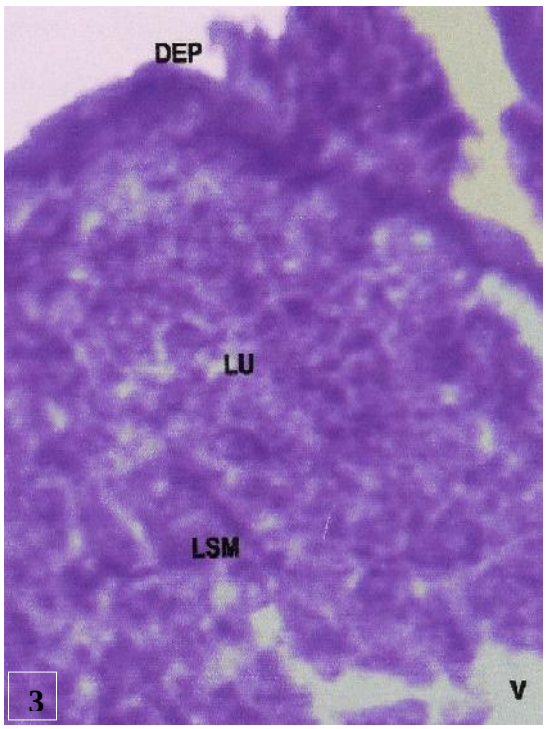


Fig. 1 and 2 : Transverse section of seminal vesicle of control insect.



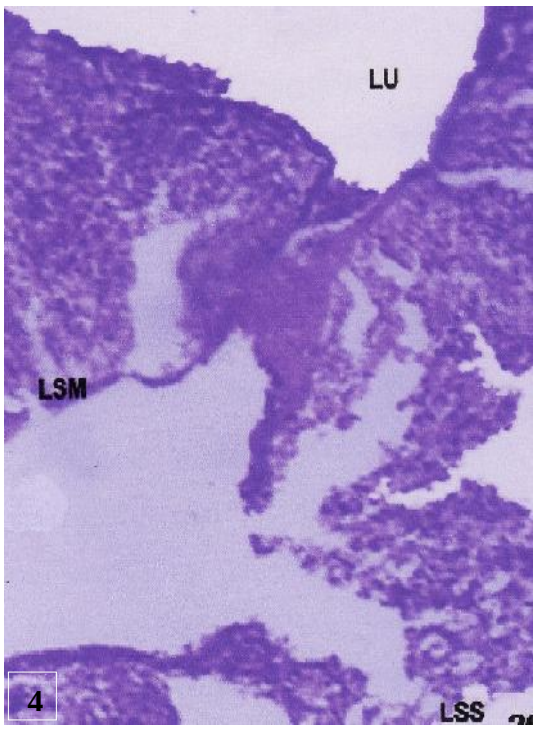


Fig. 3 and 4 : Transverse section of seminal vesicle of treated insect.

LU – Lumen, LSM – Less Sperm Mass, LSS – Less Secretary Substance, V – Vacuole, SS – Secretary Substance, SM - Sperm Mass, DEP – Disintegrated Epithelium, N – Nucleus.

Thus a similar changes have been reported in *Odontopus varicornis* when exposed to dimethoate that cause vacuolization in cytoplasm, enlargement of epithelial cells, disintegration of epithelisl cell wall and nuclear pycnosis in the seminal vesicle (Jayakumar,1988) and in *Laccotrephes ruber* when exposed to mercuric chloride (Pazhanichamy,1997). From these findings, it may be inferred that the phytopesticide, nimbecidine produces severe histopathological changes in the seminal vesicle so that the seminal vesicle has lost its secretary nature, there fore, no nourishment to the developing sperms in *Odontopus varicornis*.

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