EFFECT OF ETHYL-METHANE-SULPHONATE (EMS) ON HISTOLOGY OF TESTES AND OVARIES OF *HELIOTHIS ZEA*

Introduction

MUTAGENIC properties of EMS have long been known in crop plants as well as in micro-organisms but its use in the field of chemosterilization is not very much known. Chemosterilants have been found affecting fecundity and fertility[1,2], but their effects on the histology of testes and ovaries have not been extensively studied. EMS has been found affecting fecundity and fertility in *Cochliomyia hominivorx*[3] but the reports on the effect of this chemical on the histology of reproductive organs are not available so far.

Effect of various host plants on the growth and development of populations of *Heliothis virescens*[4], *Heliothis armigera*[5] and *Heliothis zea*[6] has been studied by various authors in order to estimate the damage done to various crops by this polyphagous pest. Not much work has been done to control this pest by chemosterilants or by other biological means. The present report shows that EMS can be used to sterilize male population of *Heliothis zea* by causing aspermic donditions.

Material and Methods

Adult males and females of *Heliothis zea* were kept at 25 ± 2° C. They were provided an alternate photoperiod of 12 h light and 12 h darkness. The eggs were collected daily and were placed in Petri-dishes for hatching. Newly hatched larvae were fed on fresh potato leaves. After the third larval instar the larvae were transferred to glass jars whose bottom was filled with 2–3 inches of soil.

Sexing of the pupae was done by close morphological examination. Two-µls of 10% aqueous solution was applied to each pupa topically, with the help of topical applicator (forty pupae were treated and out of them only thirtyfive emerged). Adults emerged from these pupae after 10·5 days.

One day old males and females were dissected in saline solution (Belar's saline solution). The testes and ovaries were fixed in Zenket's fluid for 24 h and processed. Paraffin sections were stained in Heidenhain's hematoxylin anl eosin.

Results and Discussion

Male and female pupae of *Heliothis zea* have several distinguishing morphological characters which aided in their sexing, *e.g.*, (*a*) Coloured patches in particular segments (*b*) Difference in the antennal length of maale and female pupae. (*c*) Difference in the number of free segments. These observations differ from those of Jennings[7] and Yates[8] for *Rhyacionia* pupae.

It was significant to note that the treatment with EMS in the case of *Heliothis zea* males, resultel in the degeneration of germ cells and absence of sperm bundles (aspermia. Fig. 1). Thus a sufficient number of males in a population of sexually reproducing *Heliothis zea* can be rendered sterile by inducing aspermic condition. Degeneration of germ cells of testes has also been recorded in *Anthonomus gradis*[9] and *Hypera postica*[10] after treatment with apholate.

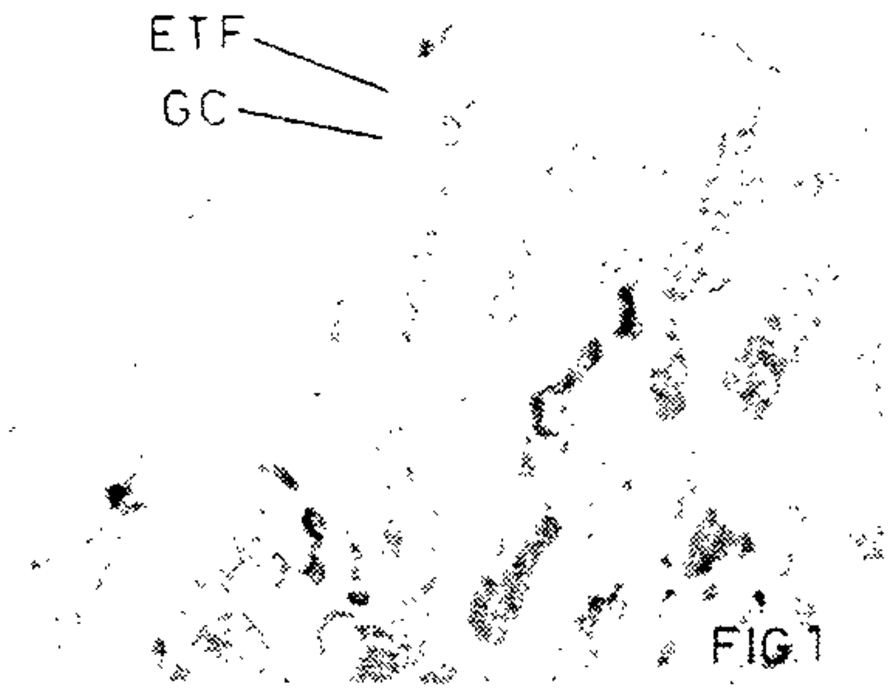

FIG. 1. Transverse section of a part of adult testis of *Heliothis zea* treated with 2µl of EMS. Showing empty tecticular follicles, degenerating germ cells and absence of sperm bundles.
ETF=Empty testicular follicles
GC=Germ Cells (× 145 µ).

The size of the testes was not affected after EMS treatment. The observations of Rai[11], Outram and Campion[12] and Saxena and Vikramaditya[13] on *Aedes aegypti* (treated with apholate), *Diparopsis castanea* (treated with tepa) and *Poecilocerus pictus* (treated with tepa and apholate) respectively, did not show any change in the size of the testes after the treatment.

There was no change in the size of the ovary. Microscopic examination of transverse and longitudinal sections of ovaries of treated females also did not reveal the effect of the chemical. No disintegration of germarium and follicular epithelium was recorded as has been reported by Jalaja and Prabhu[14] in case of *Dysdercus cingulatus* after the treatment with metepa and apholate.

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PROLIFERATION IN THE REPRODUCTIVE STRUCTURES OF *ASPERGILLUS NIGER* VAN TIEGHEM

DURING the survey of micro-fungi associated with the leaf litter of a scrub jungle forest. Vikarabad, A.P., India the authors have isolated an interesting *Aspergillus niger* Van Tieghem showing proliferation. This isolate is characterized in possessing sterigmata in two series on primary vesicle and conidia. It is interesting to find that these secondary sterigmata gave rise to slender secondary conidiophores with small vesicles possessing biseriate sterigmata. This kind of proliferation is not common in *Aspergillus niger* though not uncommon in other *Aspergilli*. This is the first report of proliferation in *A. niger*.

A brief description of the present isolate is as follows :

Primary conidiophores are 700–1500 × 13·5–20·8 μm, vesicles 140–205 μm in diam, phialides in two series 36–40 × 7·2–12· μm, secondary conidiophores proliferating from secondary sterigmata, 72–150 × 3·6–5·2 μm, secondary vesicles small, 7·2–12·5 μm in diam, sterigmata in two series, 6·5–14·0 × 1·8–4·7 μm; conidia spherical, brown to black, 2·8–5·61 μm in diam. (Figs. A, B, C).

Isolated from leaf litter, scrub jungle forest, Vikarabad, Hyderabad Dist, A.P., India, 4 July 1977, OUF 228, The type slide has been deposited at I.T.C.C., I.A.R.I., New Delhi.

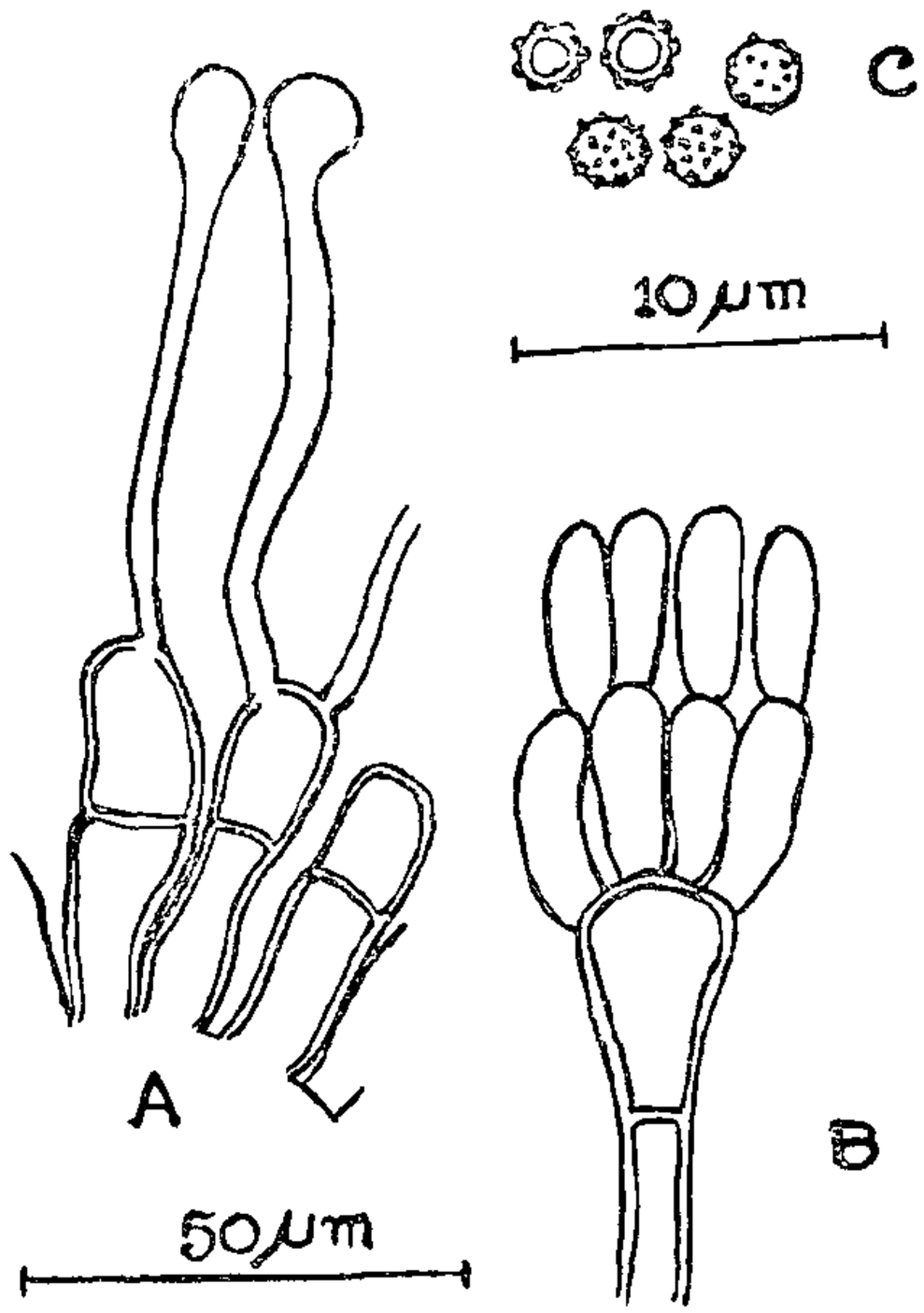

FIG. 1. A. *Aspergillus niger* secondary sterigmata showing proliferation. B. Secondary conidiophores with two series of sterigmata. C. Conidia.

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