has a large number of cellular elements. During the transitional period (August to December) the testicular histology exhibits the presence of the spermatogonial divisions and their subsequent transformations into the primary and the secondary spermatocytes. The spermatids appear in September and continue to exist during later months metamorphosing by December and January onwards into spermatozoa.

During the hiberanating months, the testes of *Uromastix* exhibit slow and progressive spermatogenesis. The interstitial cells are large with distinct nuclei. By March when the lizards emerge from hibernation, the animals are sexually active and remain so till June as is indicated by the active spermatogenesis in the testes and the availability of spermatozoa in the epididymidal smears. The sudden and steep decline in the testicular activity starts in the last week of June and continues till the end of July. During this period of sexual inactivity, the interstitial cells are relatively few in number. The testis contains only spermatogonia and no other spermatogenetic elements. In specimens examined in the month of September, there is statistically significant increase in the testicular weight which also coincides with an increase in the diameter of the epididymical tubules.

In the present study a correlation between weight of testes, the diameter of the epididymal tubules and the availability of spermatozoa in the epididymis is noted during the annual reproductive cycle of both *Hemidactylus* and *Uromastix*. However, during June in *Hemidactylus* and September in *Uromastix* (Fig. 1) the mg testicular weight/100 g body weight appears anomalous since in these months the testes are dormant whereas the body weight is comparatively higher than that of March–April in *Hemidactylus* and of June in *Uromastix*. These observations coincide with the finding of Nice[5–6] and Saxena and Mathur[9] in the house sparrow.

The present observations on the male reproductive cycle of *Hemidactylus* and *Uromastix* agree in general with previous finding of Herlant[3], Mahendra[4] and Sanyal and Prasad[8] in *Hemidactylus*, Courrier[1] and Ramaswami and Jacob[7] in *Uromastix*. Between testicular activity and epididymidal tubules diameter, a similar relationship has also been reported in *Anolis carolinensis* (Fox[2]). Further he has noted that annual fluctuations in the diameter of ductus epididymis can be considered as a time indicator of the breeding season in *Anolis*. This is also found to be the case in *Hemidactylus* and *Uromastix* although the two lizards reveal markedly different patterns of male reproductive cycles. The variations in their reproductive patterns are probably due to the difference in their general behaviour and natural habits and habitant. Further work on these factors is in progress.

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MINERAL CONTENTS AND CHEMICAL DISSOLUTION OF THE POLYHEDRAL INCLUSION BODIES OF THE NUCLEOPOLYHEDROSIS VIRUS OF *AMSACTA ALBISTRIGA* WLK.

THE importance of chemical properties of inclusion bodied insect viruses has been reviewed by Smith[1]. The chemical analysis of polyhedral inclusion bodies (PIB) of nuclear polyhedrosis virus (NPV) of *Heliothis zea*, revealed the presence of several metals and nob-metals[2]. Though the occurrence of NPV in the groundnut red hairy caterpillar *Amsacta albistriga* has been reported and its cross infectivity tested in India[3,4], no information is available on the chemical properties of the PIB. In order to characterize the NPV of *A. albistriga*, studies were made on the mineral content of PIBs as well as the effect of certain alkalies and organic solvents on their dissolution which are vital in understanding the mode of action of the virus in the insect.

The inclusion bodies were concentrated and purified from diseased final instar caterpillars of *A. albistriga* by differential cetrifugation. The PIBs (50 mg) were analysed for potassium and phosphorus contents by photometry, and calcium and magnesium by titrimetry[5]. Varian Tectran Atomic absorption spectrophotometer-120 was used to determine iron, copper, zinc and manganese in the triple acid extract. In the study on the effect of various alkalies and organic solvents on the PIB a drop of purified polyhedral suspension was placed on a clean slide, air dried, and dipped in various concentrations of alkalies and organic solvents. The dissolution of PIB was observed under a Meopta Phase contrast microscope for different periods after treatment, *viz.*, 5, 10, 15, 30 and 60 seconds, and 5, 10, 15, 30, 45 and 60 minutes.

Tne mineral analysis of PIBs of *A. albistriga* NPV revealed the presence of a higher content of calcium (1·6%), iron (0·6%), potassium (0·28%) and zinc (0·2%), and lower content of magnesium (0·05%), phosphorus (0·04%), copper (0·02%) and manganese (0·025%). The presence of magnesium and iron in the PIBs either by adsorption or as loosely bound salt linkage and possibility of major parts of phosphorus being associated with the crystallization of the polyhdral protein have been reported by Holoway and Bergold[6,7]. Estes and Faust[8] have reported the presence of silicon in the PIBs which along with magnesium and iron may be responsible for the stability of the polyhdral. Tne fundamental unit of orthosilicate ion, SiO_4^{4-} in which the silicon atom is surrounded tetrahedrally by four oxygen atoms and balanced by the positive charges of cations, *viz.*, Fe^{++} and Mg^{++}, packed in the lattice in the interslices of the silicate ions. Thus the magneisum and ferric ions together with silicate ions corstitute the silicaceous framework structure of the polyhedral matrix as postulated previously[8].

At a higher concentration of 0·2% of KOH and NaOH, the PIBs lost their refractile nature within 60 seconds and became black dense, dot-like granules, when viewed through the phase contrast microscope. No such effect was noticed in the lower concentration of 0·01, 0·05 and 0·1% of the alskalis. No dissolution of PIBs was found in 0·04, 0·4, 0·1 and 1 M concentrations of sodium carbonate, in 0·05, 0·1, 0·5 and 1 M concentration of sodium chloride, in 0·5, 1·0, 1·5 and 2% concentrations of sodium hypochlorite and in 5, 10, 15 and 20% formalin even an hour after treatment. The PIBs were also found insoluble in organic solvents like ether, chloroform, ethanol, methanol, propanol and butanol. The insoluble nature of PIBs in lower concentrations of alkalis but solubility in high concentrations of NaOH and KOH is in conformity with the earlier reports[9,10]. Since there was no dissolution of PIBs even in 20% concentration of formalin, its use as an antiviral agent may be due to its penetrative effect suppressing the progressive infection[11], or denature of the viral DNA and/or modifying the inclusion body, thereby making occluded virions less accessible to susceptible larvae as suggested by Ignoflo and Garcia[12].

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ENHANCEMENT OF CHROMOSOMAL ABERRATIONS AND GROWTH INHIBITION BY MALEIC HYDRAZIDE WHEN DISSOLVED IN DIMETHYL SULPHOXIDE

Introduction

Maleic hydrazide (MH) is known to induce localized chromosome breakages and mitotic suppression in *Vicia faba* root meristem[1,3,6,7]. It also resulted in inhibition of spirdle formation and chromosome breakages during mitosis in the root tips of onion and barley[6].

MH is a pyrimidine component of RNA and a structural isomer of uracil. It is highly soluble in dimethyl-sulphoxide (DMSO). Therefore, the present experiment was undertaken to see the effects of MH alone (dissolved in water) and effect of MH and DMSO (when MH dissolved in DMSO) on barley root tips. Experiments were designed to find out the potentiating effect of DMSO on MH induced growth inhibition and chromosomal aberrations in barley root tips.

Materials and Methods

Seedlings with intact 2·5 ± 0·5 cm root tips were treated with 20 ppm of MH solution and 1 ppm of DMSO saparately for 4 hr (1 ppm of DMSO did not show any lethal or toxic effect on root tips). In another set of experiments root tips were treated with a mixture of equal volume of 20 ppm of MH and 1 ppm of DMSO for 4 hr. Each treatment was followed by recovery periods of 24, 48 and 72 hours. Handling of material, fixation, staining and detailed cytological techniques were the same as in earlier experiments with MH[6].

Observations and Comments

Chromosomes of barley do not possess well differentiated heterochromatin regions; therefore most of the breakages were concentrated at the centromeric region.