

Effects of Starvation on NSCs of *Dysdercuskoenigii*, in Relation to its Natural Control

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Abstract

Starvation significantly affected to neurosecretory cells(NSCs) of adults *Dysdercuskoenigii*. Starvation in day 1 old adults shows accumulation of neurosecretory materials (NSM) in NSCs that continues day 3 and shows clumping of NSM. Its further continuation on day 4 causes formation of blobs in NSCs but on day 5 disappearance of NSM, pycnosis and disintegration of NSCs, the same results are also observed in day 30 old adults.

Keywords: *Dysdercuskoenigii*, Brain, NSCs, NSM, Starvation.

Introduction

Dysdercuskoenigiis is an important cotton pest severely affected to cotton and other growing crops. In insects brain some cells involved in secretory activity called NSCs, its product is neurosecretory material (NSM) which controls all most all the physiology of insects (1,2,3). From several years entomologists and other biologists are carrying research to search a novel and natural ways to control the harmful insects population because use of insecticides causes many harmful effects to human population and also damages to natural ecological chains (4,5), which is not good for future ecology and biospheres. In this concern more studies are required about Insect physiology, the present investigation carried in this regard to know more about Insect physiology and helps in search of natural ways to control Insect population.

Aim of the Study

To search the biological method to control harmful insect and enrich the academic knowledge regarding effects of starvation on NSCs of *Dysdercuskoenigi*.

Materials and Methods

To build up the culture, the *Dysdercuskoenigii* were raised in glass jar in BOD incubator set at 28°C±1, 16 hr photoperiod and 75 % RH. They were fed on water soaked cotton seeds and water provided in homeopathic vials plugged with cotton. A strip of blotting paper folded into fan like fashion was slipped around the inner wall of the culture jars to enable the insect to climb and descend in the folds and to get a semblance of natural environment. The jars were covered with muslin cloth and rubber -band. The food and water were changed everyday. Newly emerged (0 hrs) adults were sorted out and kept starved in separate jars up to seven day because after this they dies, in BOD incubator set as described earlier. The stored insects were sacrificed, their brain were dissected out and processed for the study of NSM content within the NSCs. For staining of NSCs stain aldehyde fuschin (AF) uses by applying technique of Dogra and Tandon (6).

Results

Though the initial starvation for varying length of time inhibits the release of NSM in the NSCs of adults. An initial starvation of day 1 adult shows accumulation of NSM in NSCs Fig.1. The starvation of day 3 shows clumping of NSM in the NSCs Fig.2 and the starvation of day 4 causes accumulation of NSM to form large blobs which are clearly seen at the periphery of the NSCs and the nuclear area starts to disappear Fig.3. The starvation of day 5 results into disappearance of NSM, pycnosis and disintegration of cells before death of experimental insect Fig.4. In comparison to normal adults the NSM content accumulation and release observed in the NSCs of adult Fig.5. The blob formation, vacuolization,

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NSM disappearance and disintegration of cells as day 5 old starved also observed in day 30 old adult Fig.6.

Figures

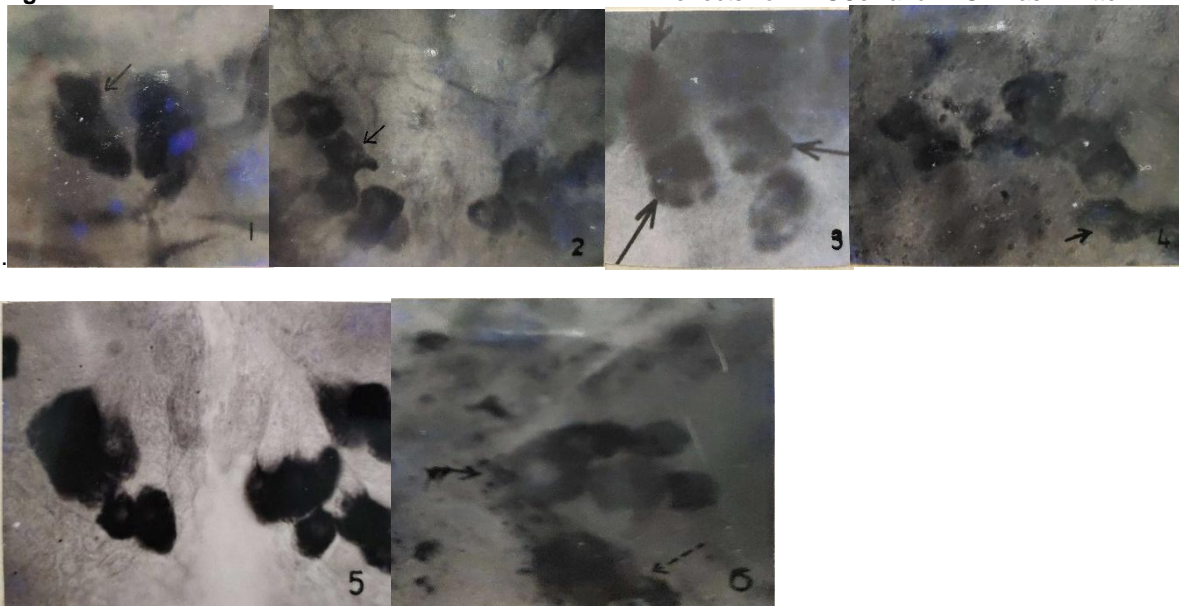


Figure no.1, 2, 3, 4, 5, and 6 are in accordance with the results of this article. The arrows indicated the effects on NSCs and NSM as written in article

Discussion

The decreased activity of NSCs as evidenced by an increase in the amount of NSM resulting from starvation was demonstrated in several insects (^{7,8,9,10}). Awasthi (⁷) reported that starvation inhibits the release of NSM from NSCs as a result of deformation of cells and clumping of granule in the NSCs in starved bug, *D. Koenigii*. The findings of present study also show the same observation as reported by Awasthi. The accumulation of NSM in NSCs for throughout starved days may also be due to absence of appropriate stretch receptor send by gut region to brain as discussed by Tiwari et al (¹¹). This assumption more evident with observation of accumulation and release of NSM in NSCs of normal adults, *Dysdercus koenigii*. Further the day 5 starved Insect NSCs similar in much respect to day 30 old adults also focuses some light that starvation lead very fast ageing in the Insect. This may in line of problems and issues discussed by Rosario et al (⁴) and Abdel tawab H mossa et al (⁵).

Conclusion

Starvation affects to NSCs and inhibits release of NSM as it accumulated cause blob formation, vacuolization and disintegration of cells.

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