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**Dr. Bed Prakash Roy**  
UMS, Chethru Tol,  
Ghogardiha, Madhubani,  
Bihar, India

## Viability effect on gonads of *C. stollii* (Wolff.) by chemosterilant treatment

**Dr. Bed Prakash Roy**

### Abstract

Phylum Arthropoda is the largest group of animals in the kingdom, belonging to the group Hexapoda. *Chrysocoris stollii* (Wolff.) or litchi bug is an insect pest belonging to family Pentatomidae under Heteroptera. This particular hexapod are quiet versatile in their feeding behavior, majorly known to destroy agricultural croplands and are also capable to infect livestock by feeding on their blood. Scientists have entered a new era in research focused on pest control method. The use of chemosterilant is done in connection with new approaches to insect control. The conducted study show promising results with Thiourea as a chemosterilant in litchi bug and it's mode of action.

**Keywords:** Chemosterilant, thiourea, litchi bug, mortality, spermatogenesis

### Introduction

Insects are of great importance to the mankind due to the vital role played by them in human welfare and economy. Some of them are beneficial whereas others can be harmful in several ways, one of the prime negative impact would be their impact on crop fields.

Insect control program in its broadest sense includes everything, which makes their survival difficult and at the same time checks their multiplication. For their efficient programming of insect control, a thorough knowledge of their distribution, pest status, life cycle, host complex, periodicity, mode of feeding, breeding pattern, host and predators should be available. The introduction of insecticides has revolutionized the protection technology. One of them includes Integrated Pest Management (IPM) which includes the use of mechanical, physical, biological, legal, and chemicals. The chemical agent includes the use of pheromones, hormones, antifeedants and chemosterilants.

Most of the works on chemosterilant treatment of insect pests are restricted only to fecundity and fertility and to some extent their histopathological level. Limited number of literatures were available on the effects of chemosterilant at histochemical level. However, few reports were available on the effects of thiourea on the gonads of *Musca domestica* (LeBras, 1973) at histochemical level. Therefore, this work has been undertaken to observe the integrated effects of thiourea at histochemical level on the gonads of *C. stollii* (Wolff.).

### Material and Method

A laboratory stock *C. stollii* (Wolff.) was developed from the nymphs and adults collected from different region of Laheriasarai and Samastipur, near water tank located at K.S College campus area and garden, green patches near Samastipur college. *C. stollii* (Wolff.) was collected from its natural habitat, which was later observed that they were commonly present throughout the year. Both the nymphal and adult stages were collected from the host plant, *Croton sparsiflorous* (Family: Euphorbeaceae). The test samples were collected and bought in a plastic netted bag to the laboratory and stored in wooden cages for further study.

### Observation

Abnormal production of male and female gametes of *C. stollii* (Wolff.) was observed after the treatment with thiourea with different concentrations. It was observed in the experiment that viability of the sperm and the ova was reduced from 0 % to 20 % with increase in the thiourea concentration, 0.125 % to 1.5 % using topical mode of application.

**Corresponding Author:**  
**Dr. Bed Prakash Roy**  
UMS, Chethru Tol,  
Ghogardiha, Madhubani,  
Bihar, India

It was also observed that the rate of gametal mortality was on its peak in the first 48 hours of the treatment and there was gradual fall in the mortality after six days. On further study it was observed that the nymphs were more susceptible than the adults to the same concentration.

### Result and Discussion

In the testis of male *C. stollii* (Wolff.), spermatogenesis was found negatively affected by the treatment of thiourea as it was responsible for fluctuating cholesterol level. Primary stage of spermatogenesis was found more sensitive to chemosterilant than the later stages. Testicular capsule was found thickened after application of higher dose of thiourea. Moreover, existed cysts did not burst as a result of which further development of sperms was totally blocked. The number of cysts were reduced in comparison to control bugs. Conducted biochemical tests of protein and cholesterol of gonad in litchi bug show significant rise in protein level in gonads, it could be presumed that the malfunctions of endocrine organs due to the treatment of thiourea. Based on the conducted study, the infertility in testis of adult males in *C. stollii* (Wolff.) may be cumulative results of the under mentioned reasons: cytoplasmic disintegration, loss of compactness in testicular tissue mass, partial aspermia due to interruption of spermatogenesis at spermatogonial level, reduction in the number of cysts as well as the suppression of cyst bursting activity.

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