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Influence of trap height on the diversity and abundance of insects captured by yellow sticky traps in eggplant (*Solanum melongena)*

M Anjana*, Pradhan A
Regional Institute of Education (RIE), Sachivalaya Marg, Bhubaneswar, Odisha, India
Corresponding Author: M Anjana
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Abstract
The study was conducted at Regional Institute of Education (NCERT), Bhubaneswar to evaluate the effect of yellow sticky traps at varying heights on insects capture in eggplant (*Solanum melongena)* field. The study aimed to understand how the vertical positioning of yellow sticky traps influences the number of insects captured. Traps were placed at three different heights i.e., 20 cm (Near the ground level), 70 cm (At canopy level), 120 cm (Above canopy level) and aligned along the crop rows in a west-east direction. The major insect orders such as Hymenoptera, Diptera, Homoptera, Hemiptera, Neuroptera and Coleoptera were captured in yellow sticky traps. The result showed that the maximum number of insects was trapped at 70 cm (canopy level), indicating that flowering plays a significant role in attracting insects. The Lowest trap height (20 cm) also captured a considerable number of insects, but less than medium height, likely due to favourable conditions such as higher humidity and lower temperature. The least number of insects were captured at highest trap height (120 cm), where fewer attractants and less favourable conditions existed. This study highlights the importance of trap placement in insect monitoring and suggests that the canopy level is the most effective in capturing a wide variety of insect species in eggplant cultivation. The findings may help improve pest management strategies by optimizing trap placement based on plant structure and insect behaviour.

Keywords: *Nezara viridula*, stink bug, polyphagous, pest, leguminous crops, crop yield

Introduction
Eggplant/brinjal (*Solanum melongena* L.), also known as aubergine, is one of the essential vegetables cultivated throughout the world. Eggplant/Brinjal is an important solanaceous vegetable crop of tropical and sub-tropical regions. It is a versatile crop adapted to different agro-climatic regions and can be cultivated all the year-round. It is a perennial plant but cultivated commercially as an annual crop (Ghosh 2022) [5]. In tropical and sub-tropical areas, brinjal cultivation is severely constrained by the infestation of insect and mite pests and different diseases. In northeast India, brinjal is cultivated at a commercial scale, but insect and mite pest damage constitute a limiting factor for its successful production (Ghosh *et al*. 1999; Ghosh *et al*. 2000; Ghosh and Senapati 2001a; Chaudhury *et al*. 2001) [1, 2, 3, 4].
Effective monitoring and controlling of insect-pests is vital for safeguarding agricultural yields and ensuring food security. Yellow sticky traps (YSTs) serve as essential instruments in integrated pest management (IPM) strategies, effectively aiding in the monitoring and control of flying insect pests within agricultural and greenhouse environments. These traps take advantage of the powerful visual appeal that numerous insects possess for the color yellow, which mimics floral cues and reflects light at wavelengths that are particularly noticeable to insect photo-receptors (Nagaraj *et al*. 2025) [6].
In this investigation, the relative trapping efficiency of yellow sticky traps at various heights for eggplant (*Solanum melongena)* were evaluated.

Methods and Methodology
Study Area
Regional Institute of Education (RIE), Bhubaneswar (20°17′20″N & 85°49′57″E) has a total geographic area of approx. 40.7 hectares (407000 sq.mt.) and is located in the mid-urban area. The study area experiences tropical weather conditions having average annual rainfall of 1,492 mm (58.73 in) with average temperature ranging between 20 0C and 36 0C which provides a favourable environment for the occurrence of a wide variety of insects. The summer season extends from March to May having maximum temperatures often exceeding 40ºC, followed by monsoon season from June to October with temperature range; 25ºC-32ºC. Winter lasts for about ten weeks from November to February with temperature range; 15ºC- 18ºC. May is the hottest month with daily temperatures ranging from 32ºC- 42ºC. December is the coldest month, with temperatures varying from 15ºC- 28ºC. Experiment was carried out at the agricultural garden in the eggplant (*Solanum melongena*) field of RIE, BBSR Campus.

Fig 1: Study area

During the experiment, yellow sticky traps (10 cm × 20 cm × 0.2 cm) were placed in the two-opposite edge of egg plant (*Solanum melongena*) field with the help of iron rods or wooden sticks and thread. These traps placed vertically of heights 120 cm, 70 cm, 20 cm (three traps were placed in

one edge in increasing order of heights). The crop rows and traps were aligned in west-East direction. The separation distance between the traps were 60 cm from each other. No insecticides were used throughout the sampling period.

Fig 2: Placement of yellow sticky traps at different heights

Sampling

The traps were placed in the morning during 8:00AM-8:30AM. Traps were left in the eggplant field for one week and the traps were removed and collected for sampling. They were brought to the laboratory and examined using a magnifying glass. The numbers of different groups of trapped insects were records.

Results and Discussion

Homoptera and Hemiptera constituted the dominant insect order captured at the lower (20 cm) and medium (70 cm) trap heights, with 228 and 227 individuals, respectively.

Hemipteran insects were recorded in large numbers at the lower and medium heights, indicating their preference for the crop canopy zone. Diptera showed the highest abundance at the medium height (109 insects), followed by the lowest height (43 insects), while very few (2 insects) were captured at 120 cm. Hymenoptera and Lepidoptera were most abundant at the medium height (80 insects), followed by the lowest height (55 insects). Coleoptera were captured at all trap heights, with the maximum number at 20 cm (16 insects). Neuroptera were absent at the lowest height, scarce at the medium height (3 insects), and highest at 120 cm (8 insects). Overall, 20 cm and 70 cm trap heights were considerably more effective than 120 cm for capturing insect populations in the eggplant ecosystem.

Among the three trap heights evaluated, yellow sticky traps installed at canopy level (70 cm) captured the highest diversity and abundance of insects. Homopterans were the predominant group, followed by Hemipterans, Dipterans, and Hymenopterans. Trap catches declined markedly at 120 cm above ground level, indicating that the majority of insect movement occurred within the crop canopy region.

A **B** **C**

Conclusion

The study revealed that trap height significantly influenced the abundance and diversity of insects captured by yellow sticky traps in an eggplant field. Among the three heights evaluated, traps placed at canopy level (70 cm) recorded the highest insect catches, followed by traps positioned at 20 cm above ground level, whereas traps installed at 120 cm captured the fewest insects. The greater effectiveness of canopy-level traps indicates that most insect activity occurs within and around the crop canopy. Therefore, placement of yellow sticky traps at canopy level is recommended for effective monitoring of insect populations in eggplant ecosystems and may enhance the efficiency of integrated pest management programmes.

References

1. Chaudhury N, Ghosh SK, Ghosh J, Senapati SK. Incidence of insect pests of cabbage in relation to prevailing climatic conditions of Terai region. Indian Journal of Entomology,2001:63(4):421-428.
2. Ghosh J, Ghosh SK, Chatterjee H, Senapati SK. Pest constraints of okra under Terai region of West Bengal. Indian Journal of Entomology,1999:61:362-71.
3. Ghosh J, Ghosh SK, Chaudhuri N, Senapati SK. Preliminary studies on the insect pest complex of cauliflower in Terai region of West Bengal. Haryana Journal of Horticultural Sciences,2000:29(1 & 2):118-119.
4. Ghosh SK, Senapati SK. Seasonal incidence and biology of brinjal shoot and fruit borer (*Leucinodes orbonalis* Guen.) under Terai region of West Bengal, India. Annals of Entomology,2001:19(1):13-18.
5. Ghosh KS. Eggplant (*Solanum melongena* L.) and Climate Resilient Agricultural Practices. In: Climate Change Dimensions and Mitigation Strategies for Agricultural Sustainability,2022:2:01-24.
6. Nagaraj S, Namachivayam V, Nagarajan M. Yellow Sticky Traps in Integrated Pest Management: Progress and Challenges. In: Research Perspective on Biological Science,2025:7:51-65. DOI: 10.9734/bpi/rpbs/v7/6264.