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"Control Of Insect Crop Pest Of Brinjal (*Solanum melongela* L.) By LED Light Trap"

Kamble V. S. and Bhosale A. M.
Department of Zoology, Sangola College Sangola. Dist. Solapur.
P. A. H. Solapur University, Soalpur
Email: vidhinkamble16@gmail.com bhosaleashank22@gmail.com

ABSTRACT:

The present study was conducted in Brinjal (Solanum melongela L.) vegetable crop field. A total of 1229 species belonging to five orders including Hemptera, Orthoptera, Coleoptera, Lepidoptera, and Thysanoptera throughout the kahriff season recorded. The population of aphids was maximum throughout khariff season followed by, white fly, thrips, fruit and shoot borers, grasshopper, and hadda beetle respectively. A total of 6 species of insect pests, namely Aphid Aphis gossypii (Glover) Grasshopper Melanoplus differentialis (Thomas), Hadda beetle Henosepilachna vigintioctopuntata (Fabricius), Shoot and fruit borer Euzophera perticella (Ragonot), Whitefly Bemisia tabaci (Gennadius) Brinjal crop has mainly damaged the varieties of insect pest such as fruit borer, stem borer, defoliater, sap sucker, and stem girdlers, etc for control of the insect pest. the light trap was used. This method is beneficial and has no adverse effect on the environment and is cost-effective, being part of IPM.

***Index Terms*: Insect pest, Light Trap, cost effective, crop damage, IPM**

I. INTRODUCTION

Insects are responsible for direct damage to agricultural crops by feeding or infestation of leaves, roots, fruits, inflorescence, etc. Insects are also responsible for the transmission of various kinds of pathogens such as bacteria, viruses, fungi, plant of plants. It is very necessary to control insect crop pests and there are several approaches to insect pest management including physical control, mechanical control, chemical control, cultural control, and host-resistant varieties of crops. The physical control methods of insect crop pests prevent insects reaching from their hosts. Among these light traps are the most applicable physical control method for insect crop pests and monitoring, capturing, killing, and studying of biodiversity of insect crop pests of nocturnal habits. In nature, there are thousands of nocturnal insect species not able to collect oh capture by the conventional methods for the control of insect crop pests. In such situations, light traps are the best tool for trapping and capturing them (Szentkiralyi, (2002). The present study was conducted in Nazarae region Tal. Sangola dist. Solapur of Maharashtra for the application and effectiveness of LED light traps.

II. RESEARCH METHODOLOGY

Insects were trapped during dusk and down from Nazare region Tal. Sangola. Dist. Solapur (MS). The insects were trapped during the month of June every week on Sunday, with the help of light traps (from 6:00 pm to 9:00 pm) for the tapping of insect species/plants. Identification of insect pest individuals with the help of appropriate literature (AESA Based IPM. Department of Agriculture and Cooperation Ministry of Agriculture of India 2014.).

Table: -1: Diversity of inset crop pest from brinjal vegetable crop Trapped during month of June -2019-20

Name of insect	Order	Average number of individual trapped
Aphid	Hemiptera	250
Grasshopper	Orthoptera	33
Hadda beetle	Orthoptera	10
Shoot and fruit borer	Coleoptera	133
Whitefly	Lepidoptera	415
Thrips	Thysanoptera	388
Total		**1229**

In the present study, 1229 species belong five orders includes, including Hemptera, Orthoptera, Coleoptera, Lepidoptera, and Thysanoptera throughout the kahriff season (2019-20) (Table No. 1))were recorded. Abbas et al., (2019) studied the diversity of insect pests and trapped 32415 insects by using LED light trap of 24 watts from Thal, Pakistan along with other insets species, 26 species of biological crop agents,s and insect pest f order Lepidoptera, Hemiptra and Coleoptera respectively were also trapped and concluded that increase in diversity and density of insect crop pest is with increasing temperature but humidity have no major

impact. The rate of attraction towards the light also increases with increasing temperature. June, July and August were the most active periods of insects attracted through light traps (Muirhead-Tomson (1991); Holyoak et al. (1997). In the present study, 1229 species were trapped and belong to 05 orders. The maximum number of species recorded from the order Lepidoptera (415) followed by Thysanoptera (380), Coleopteran (133), Hemiptera (250), and Orthoptera (43), respectively. The population of aphids was maximum throughout the khariff season followed by, white fly, thrips, fruit and shoot borers, grasshopper, and hadda beetle respectively.

H. armigera is a major economic pest of many agricultural and horticultural crops (Torres-Villa et al., 1996). Tomato spotted wilt virus is transmitted by various species of thrips, including the western flower thrips F. occidentalis, and the onion thrips Thrips. The virus has wide host range, including many weeds and ornamentals as well as crop host (Nault, 1997).

Most of the moths and butterflies are included in the order Lepidoptera are the major pests in forests, stored grains, and fiber and food crops widespread and widely recognizable insect orders in the world. Sharma (2016) 13 species of Lepidoptera have been observed attacking young seedlings and plants of T.undulata. of them, 10 species are causing mild to severe defoliation. Hemipteran insects comprise some of the most economically important plant pests, due to their ability to achieve high population growth and their potential to transmit plant viruses (Kyle et al., 2016). Order Orthoptera includes grasshoppers are the dominant herbivores and polyphagous insect crop pests in grassland ecosystems worldwide (Branson, 2010). For the control of the order lepiodptera (Grasshopper), the primary control tools are chemical insecticides, such as carbaryl, malathion, and diflubenzuron are required (Dakhe et al., 2019). These chemical insecticides have a potentially serious effect on non-target insects, mainly pollinators, environmentally sensitive areas, and endangered ones (Latchininsky et al., 2011). So, light traps are the most effective tool in controlling the various insect crop pest that damages crops severely without harm to the environment.

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CONCLUSION:

The light trap is directly or indirectly important to reduce the adult population in the agricultural fields, ultimately reducing the larval/caterpillar population which is the harmful stage of many insect crop pests. It is a cost-effective and environmentally friendly physical method of integrated pest management (IPM). This light trap will be helpful to control insect crop pests from a variety of crop fields.

REFERENCES: -

AESA Based IPM. Department of Agriculture and cooperation Ministry of Agriculture of India (2014.).

Axmacher, J.C. and K. Fiedler (2004), Manual versus automatic moth sampling at equal light sources: A comparison of catches from Mt. Kilimanjaro. J. Lepidopt. Soc. 58: 196-202

Bhandari, G., S.K. Jha, Y.P. Giri, H.K. Manandhar, P.K. Jha, N. Devkota, P. Thapa and R.B. Thapa. 2017. Performance evaluation of locally developed black light trap for maize insects monitoring in Chitwan, Nepal. J. Maize Res. Dev. 3: 98-107. https://doi.org/10.3126/jmrd.v3i1.18926

Branson, D.H.; Sword, G.A. An experimental analysis of grasshopper community responses to fire and livestock grazing in a northern mixed-grass prairie. Environ. Entomol. 2010, 39, 1441–1446. [Google Scholar] [CrossRef] [PubMed]

Chatzivassilioua E. K. ,b, T. Nagatab, N. I. Katisa and D. Petersb (1999), Transmission of tomato spotted wilt tospovirus by Thrips tabaci populations originating from leek Plant Pathology (1999) 48, 700–706.

Dakhel, W.H.; Latchininsky, A.V.; Jaronski, S.T. Efficacy of two entomopathogenic fungi, *Metarhizium brunneum*, strain F52 alone and combined with *Paranosema locustae* against the migratory grasshopper, *Melanoplus sanguinipes*, under laboratory and greenhouse conditions. *Insects* 2019, *10*, 94. [Google Scholar] [CrossRef] [PubMed][Green Version]

Hagstrum D.W. and Flinn P.W., 1995. Integrated pest management. In: Subramanyam, B., Hagstrum, D.W. (Eds.), Integrated Management of Insects in Stored Products. Marcel Dekker, New York, pp. 399–408.

Kyle G. Koch1, Kaitlin Chapman1, Joe Louis, Tiffany Heng-Moss1 and Gautam Sarath, (2016). Review article . Plant Tolerance: A Unique Approach to Control Hemipteran Pests. Frontiers in Plant Science.

Latchininsky, A.; Sword, G.; Sergeev, M.; Cigliano, M.M.; Lecoq, M. Locusts and grasshoppers: Behavior, ecology and biogeography. *Open Access* 2011. [Google Scholar] [CrossRef][Green Version]

Mall N.P., Pandey R.S., Singh S.V. and Singh S.K., 1992. Seasonal incidence of insect pests and estimation of the losses caused by shoot and fruit borer on Brinjal. Indian J. Ent., 54(3):241-247.

Meeta Sharma (2016), INSECT PESTS OF FORESTRY PLANTS AND THEIR MANAGEMENT. Int. J. Adv. Res. 4(8), 2099-2116.

Muirhead-Thomson, R.C. (1991. Plant pest responses to visual and olfactory sticky traps. Trap responses of □ying insects. Acad. Press Ltd, London, UK. https://doi.org/10.1016/B978-0-12-509755-0.50010-4

Muneer Abbas, Muhammad Ramzan, Niaz Hussain, Abdul Gha□ar, Khalid Hussain, Sohail Abbas and Ali Raza (2019), Role of Light Traps in Attracting, Killing and Biodiversity Studies of Insect Pests in Thal. Link Research: Volume 32 | Issue 4 | Page 684

Patil S.S., Sutar M.V and Sathe T.V., 2016. Diversity, Biology and Control of Insect pests of teak Tectona grandis (Linnaeus) from western Maharashtra. Biolife, 4(1):141-146.

Pimentel (Ed.), Reducing Pesticides: Environmental and Economic Benefits, Chichester, UK: John Wiley & Sonspp.51-78

Simmons, A.M., Wakil, W., Qayyum, M.A., Ramasamy, S., Kuhar, T.P., Philips, C.R.,2018. Lepidopterous Pests: Biology, Ecology, and Management. In: Wakil, W., Brust, G.E.,Perring, T.M. (Eds.), Sustainable Management of Arthropod Pests of Tomato. AcademicPress, Elsevier, pp. 131–162.

Singh, S.K. and O. Bambawale. (2012), Light trap for managing insects. Indian Council of Agricultural Research, Unit Natinal Center for Integrated Pest Management. http://www.google.com/patents/WO2012098484A1?cl=en

Szentkiralyi, F.(2002), Fifty yearlong insect survey in Hungry: T. Jermys contribution to light trapping. Acta zool. Acad. Scientarum Huneraicae. 48: 85-105.

Torres-Villa, L.M., Rodrigues, M., Lacasa, A., 1996. An unusual behaviour in Helicoverpa armigera Hubner (Lepidoptera: Noctuidae): pupation insidetomato fruits. Journal of Insect Behaviour 9, 981–984 https://www.researchgate.net/publication/322184019_ Lepidopterous_Pests [accessed Oct 25 2022].