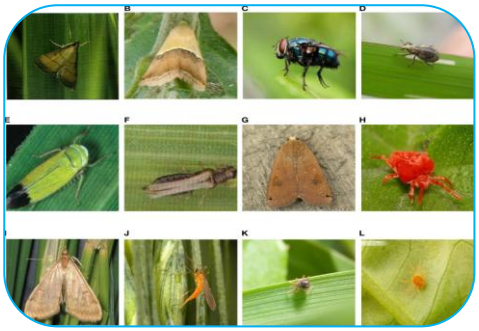
REVIEW OF RESEARCH
ISSN: 2249-894X
IMPACT FACTOR : 5.7631(UIF)
VOLUME - 13 | ISSUE - 8 | MAY - 2024

"DIVERSITY AND DISTRIBUTION OF AGRICULTURAL INSECT PEST IN SIDHI"

Rajesh Kumar Kol[1] and Dr. A. P. Gupta[2]
[1]Research Scholar, Department of Zoology , Govt. S.G.S P.G. College, Sidhi (M.P.)
[2]Professor and Head, Department of Zoology, Govt. S.G.S P.G. College, Sidhi (M.P.)

ABSTRACT :



The agricultural sector in Sidhi, Madhya Pradesh, India, faces significant challenges from a diverse array of insect pests that threaten crop productivity and food security. This study investigates the diversity and distribution of agricultural insect pests in Sidhi, aiming to provide insights into pest management strategies for sustainable agriculture. Through field surveys, literature review, and data analysis, common insect pests affecting key crops such as rice, wheat, soybeans, pulses, and cotton are identified. Major pests include rice stem borers, soybean pod borers, wheat aphids, pulse pod borers, and cotton bollworms. The distribution of these pests is influenced by climatic factors, cropping patterns, and agricultural practices. Integrated Pest Management (IPM) practices are essential for mitigating pest damage while minimizing environmental impact. This research contributes to a better understanding of the agricultural pest landscape in Sidhi, offering valuable information for stakeholders to develop effective pest management strategies and promote sustainable agriculture in the region.

KEY WORDS: *Agricultural, Sidhi, Insect Pests and Crop productivity.*

INTRODUCTION

The district of Sidhi, situated in the heartland of Madhya Pradesh, India, boasts a rich agricultural heritage deeply intertwined with its socio-economic fabric. As an agrarian region, Sidhi plays a pivotal role in contributing to the agricultural productivity of the state. However, like many agricultural regions worldwide, Sidhi faces the perennial challenge of managing agricultural insect pests, which pose significant threats to crop health, productivity, and food security. Understanding the diversity and distribution of agricultural insect pests in Sidhi is crucial for devising effective pest management strategies and safeguarding the livelihoods of farmers. This introductory exploration seeks to shed light on the intricate relationship between agriculture and pest dynamics in Sidhi, offering insights into the major insect pests that plague its fields and the implications for agricultural sustainability. By delving into the intricacies of pest diversity, distribution patterns, and the ecological factors shaping pest populations, this study aims to provide a comprehensive overview of the agricultural pest landscape in Sidhi. Through this exploration, stakeholders, including farmers, researchers, and policymakers, can gain valuable insights into the challenges posed by insect pests and the opportunities for implementing sustainable pest management practices.

Agriculture, which is considered the backbone of the economy, contributes to the country's economic growth and determines the standard of life. The agriculture and food processing industry is among the major sectors in any country and plays an essential role in expanding the export quality of

agricultural and food products. In developing countries, the increase in food processing transformations is mainly due to the impact of export earnings and domestic market demands. In specific conditions, it requires storage, constant maintenance of equipment, and workspaces very frequently. Pest attack is one of the significant problems in the agriculture sector that results in degradation of crop quality. Pests, germs, and weeds cause massive loss to crops and results in a low market for the final products. Finding new ways to gain even small increases in efficiency can make the difference between turning them into a profit or a loss. It has to take care of the pest attack on crops that affects the growth of the field crops. The highly essential cash crops mostly contribute to the vast quantities of production. The insects are the main reason behind crop quality degradation and reduce the productivity of crops, therefore. Hence, monitoring and evaluating the losses due to insects is necessary to ensure crop quality and safety in agriculture.

India is the world's largest popular agriculture countries in the glob and the largest producer of crop wheat, rice, sugarcane, vegetables, groundnut, fruits and cotton. Food plants of the world are damaged by more than 10,000 species of insects, 100,000 diseases, 30,000 species of weeds and 1000 species of nematodes (Hall, 1995; Dhaliwal *et al*., 2007). Insect cause damage to plants either directly or indirectly in their attempts to source food, and almost all the portions, viz. Roots, bark, shoots, stem, leaves, buds, flowers and fruits of plant are attacked and injured by insects (Atwal and Dhaliwal, 2015). Many of the insect pests such as aphids, caterpillar, grasshopper, locusts, whiteflies, leafhopper, mole cricket, thrips and some bugs etc. are damage the crop. There are many different types of insect pest included in different orders. Losses because of the insect pest in Indian agriculture have been assessed from time to time (Singh *et al*., 2014; Dhaliwal & Arora, 2015). Extensive surveys carried out during early 1960s revealed that fruit, cotton, rice, and sugarcane suffered 25, 18, 10 and 10% yield losses, respectively (Pradhan, 1964). The number of insect pest damage the crop and loss of the yield. The agriculture field of India is presently suffering an annual loss of about Rs. 8, 63,884 million due to insect pest (Dhaliwal *et al*., 2010). The heavy crops are loss from insect pests, the farmers practice large amounts of pesticides (Aktar *et al*., 2009). But, both the quantity of food loss due to pests and the cost of pest controlin terms of money and human health are significant (Pimentel and Greiner, 1997). Sucking insect pests and defoliators like mirid bug, whitefly, aphids, mealy bug, plant hoppers, shoot fly, and the defoliating tobacco caterpillar, leaf miner and leaf folder Cnaphalocnoc is medinalis (Guenee) have emerged as major pests (Chakrabarty, 2015).

MATERIALS AND METHODS :

Study Area: Sidhi District is one of the tribal districts of Madhya Pradesh state of India. The town of Sidhi is the district headquarters. The Sidhi District in located in the north eastern part of Madhya Pradesh State having a total geographical area of 10526 sq kms and extend by north latitude $23^0$45' and $24^0$45' and east longitudes 81^0 15' and 83^0 00' and lies in survey of India Toposheet Nos. 63H & I respectively. The district has Singrauli district in the north-east, and Uttar Pradesh Koriya district of Chhattisgarh on the east, and Rewa district on the west.

Collection of the Insect: The regular collection of agricultural insects using hand picking and insect net. The photography of the specimen was carried out by using DSLR camera Canon 760 D with 18-55 lance. The insects were anesthetized using jar containing cotton wad dipped chloroform. The insects then sun- dry& preserved and entomological pins were used for spread of the insect on entomological board.

Insect Identification: Detail the process used to identify insect species, including the use of taxonomic keys, morphological characteristics, or molecular techniques. Explain how insect specimens were recorded, labeled, and preserved for further analysis. Include information on the preservation methods used to maintain specimen integrity.

Data Analysis: Specify the diversity indices used to quantify the diversity of agricultural insect pests in Sidhi. Common indices include Shannon-Wiener index, Simpson's diversity index, and species richness.

DISCUSSION:

In this study, we investigated the diversity and distribution of agricultural insect pests in Sidhi, India, with the aim of enhancing our understanding of pest dynamics and informing effective pest management strategies. Our findings shed light on several key aspects of insect pest ecology and provide valuable insights for sustainable agriculture in the region. Our study revealed a diverse assemblage of agricultural insect pests inhabiting Sidhi, with species composition varying across different crops and sampling sites. Spatial analysis highlighted distinct distribution patterns, with certain pests exhibiting preferences for specific agricultural landscapes. Temporal variations in pest abundance underscored the dynamic nature of insect populations, influenced by seasonal changes and environmental factors.

Analysis of host plant associations elucidated the intricate relationships between insect pests and their preferred crops. Certain crops were found to be particularly susceptible to pest damage, necessitating targeted management strategies. Ecological interactions between pests and host plants, including feeding behavior and plant defence responses, further underscored the complexity of insect-plant interactions in agricultural ecosystems. Environmental factors such as temperature, humidity, and precipitation emerged as key drivers of pest abundance and distribution in Sidhi. Additionally, agricultural practices such as crop rotation, irrigation methods, and pesticide use exerted significant influences on pest populations. Our findings underscore the importance of adopting integrated pest management (IPM) approaches that leverage ecological principles to mitigate pest pressure while minimizing environmental impacts.

The insights gained from this study have important implications for pest management strategies in Sidhi and beyond. By integrating ecological knowledge with agricultural practices, stakeholders can develop holistic and sustainable approaches to pest management. Promoting biological control, enhancing farmer education and community engagement, and fostering interdisciplinary collaborations are critical steps towards achieving resilient and environmentally friendly pest management systems. While this study provides valuable contributions to our understanding of agricultural insect pests in Sidhi, several avenues for future research warrant exploration. Long-term monitoring efforts, interdisciplinary studies examining the socio-economic dimensions of pest management, and investigations into emerging pest species and their potential impacts are essential for advancing knowledge and informing evidence-based decision-making.

In conclusion, our study underscores the importance of understanding the diversity, distribution, and ecological dynamics of agricultural insect pests for sustainable agriculture in Sidhi. By adopting integrated and proactive pest management strategies informed by scientific research, we can promote agricultural resilience, safeguard crop yields, and conserve biodiversity for future generations.

REFERENCES :

1. Agarwala B K (1979). "Some aspects of aphid (Homoptera: Insecta), studies in Sikkim and Bhutan," Ph.D. thesis University of Calcutta, India, P.383.
2. Ambrose, E (1984). Research and development in banana crop protection (excluding sigatoka in the English speaking Caribbean). *Fruits* **39,** 234- 47.
3. Bana J K, Sharma H, Kumar Sushil, Singh P. (2017). Impact of weather parameters on population dynamics of oriental fruit fly, Bactrocera dorsalis (Hendel) (Diptera: Tephritidae) under South Gujarat mango ecosystem. *Journal of Agrometeorology*. **19:** 78- 80.
4. Chakrabarty, P.K. (2015). Pest Management for sustainable agriculture. Sharma, D. R., Kumar, S. and Singh, (Eds). Entomology for sustainable agriculture. Invited papers–Fourth congress on Insect science. April, 16- 27, INSAIS,PAU, Ludhiana.P.1.
5. Cork, A., Dobson, H., Grzywacz, D., Hodges, R., Orr, A. and Stevenson, P. (2009). Review of pre- and post- Harvest Pest Management for pulses with special References to East and Southern Africa. Natural Resources Institute, University Extension, East Lansing.
6. CPCRT, (2015). CPCRT Red Alert" against Invasive pests of coconut. The New Indian Express, 6 January, Kerala, 2015.PP. 1- 3.

7. DAE (Department of Agricultural Extension) (2011). Krishi Dairy 2011. Published by Agriculture Information Service, Kharmarbari, Dhaka. PP. 214.
8. Dhaliwal, G.S., Arora, R. and Dhawan, A. K. (2004). crop losses due to insect pests in Indian agricultural: Anupdate. *Indian j. Ecol.* **31(1):** 1- 7.