

Viewpoint On: Prospects of Botanical Biopesticides in Insect Pest Management

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Opinion

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We all are aware of raising the use of chemical insecticides but these chemical insecticides are harmful to human health and also affect the nutritional value of crop. According to World Health Organization about 200,000 people killed worldwide due to use of chemical Insecticides. Insecticides plays very important role to control the population of pest which damage the crops. An alternative way is finding to control the population of pest that is usage of botanical biopesticides instead of chemical insecticides. The botanical biopesticides having certain bioactive compounds that act against pest and control the population of pest. The usage of botanical biopesticides regarded as one of the best methods of Integrated Pest Management. There are some traditionally used biopesticides such as Pyrethrum, Rotenone and Nicotinoids. These all three are bioactive compounds which is present in different plants and act against the pest. Pyrethrum was obtained from the flowers of *Tanacetum cinerariaefolium*. Pyrethrum effect the central nervous system of pest. It effects the electrical impulse transmission along axons. Pyrethrum affects the nerve cells and causes paralysis. Rotenone is a bioactive compound obtained from Lonchocarpus. Rotenone is stomach and contact poison. It causes the failure of respiratory functions by inhibiting the electron transport chain in mitochondria. Nicotinoids is a bioactive compound obtained from *Nicotiana tabacum*. Nicotinoids effects on the nervous system of pest causes blockage of acetylcholine receptors. Other than these there are some new botanical pesticides which causes death of pests. The botanical extracts of *Azadirachtin indica* (neem), essential oils are also very effective against the pest. Azadirachtin is a bioactive compound that present in neem and it is regarded as active compound of neem. Azadirachtin acts as Insect Growth Regulators (IGR) and causes malformation, inhibits growth and disrupts the moulting of insect at their larval stages and increase the mortality rate of pests. Neem is very effective against the pests like lice, mite, tick, bugs and cockroaches. Essential oils are called as secondary metabolites in plants. Plants itself releases certain compound to act against pests such as terpenes, alcohols and aromatic compounds. These compounds have toxic effect against pests and act on digestive system of pests. Pests are unable to feed which may contribute to mortality. Some essential oils which are obtained from aromatic plants having insect repellents properties. They alter insect growth and moulting and also effect on the behaviour of insects during their mating and oviposition. As insects are not unable to mate then their population ultimately declined.

As we all know very well the use of chemical insecticides increases but insects got resistance from these chemical insecticides and they have no effect on them and that's why management of insects becoming a major problem. Biopesticides act as an alternative approach to synthetic insecticides. Basically, there are so many different kinds of pests and to control their population pesticides are also grouped into several categories. Microbial pesticides are used to variety of pests. Microorganism such as bacteria, fungi and algae act against pests. *Bacillus thuringiensis* (BT) produces protein crystals which causes death of pests. Plant incorporated protectants which is obtained from genetically modified plants also kill a huge number of insects. A biochemical pesticide which includes plants extracts and insect pheromones act against pests and which may contribute to its mortality [1].

Insect causes varieties of destructive activities which may leads to extreme decrease in crop yields and also affect the nutritional status of crops. Synthetic insecticides having a drastic effect on human health, nutritional value and also kill the non-target pests. Due to over usage of chemical insecticides insects get resistance from them and they are unable to control their population. To overcome these problems an alternative way is finding the use of biopesticides to control the population of pests. Biopesticides prepared from plant extracts having certain bioactive compounds which may leads to mortality of pests [2]. Microorganism like bacteria, fungi, algae and protozoa act as a mobile component for controlling the population of pests. These are ecofriendly pesticide and kill target organisms only and having no harmful impact on non-target species. BT is known as one the best microbial pesticides and produce crystals protein to kill pests. So, the formulations of microbial pesticides are one of effective method to control the pest's population [3].

Natural pesticides are those which obtained from certain plants having bioactive compound in them called as phytochemicals which act against the pest and may contributes to its mortality. Sabadilla is a biopesticide obtained from *Schoenocaulon officinale*. Sabadilla affect on nerve cell membrane of insect's results in loss of nerve function which causes paralysis and death. Ryania is a biopesticide obtained from the stem of *Ryania speciosa*. It is stomach poison and insects are unable to feed which causes death. Fluoroacetate is a biopesticide which affect on the nervous system of pests, damage nerve cell causes paralysis and death. So, all these natural pesticides are very effective against major insects of wheat, rice and cruciferous vegetables [4]. Biopesticides act as an effective tool for insect management. It maintains the natural diversity without using artificial residues. There are number of biopesticides like microbial, biochemical and plant incorporated protectants which kill the target organism. But in India as farmers are less educated only 3% of Indian using biopesticides rest of them using synthetic insecticides but Indian government starts awareness among farmers to use biopesticides rather than chemical insecticides [5].

In conclusion I hold my opinion that uses of biopesticides are very much effective as compared to chemical insecticides. Farmers adopted number of methods to protect their crops from pests, they use chemical insecticides which are much costly and kill non target insects and put drastic effect on crop yield. Biopesticides have potential to be used in integrated pest management in future and also it controls the population of pests.

REFERENCES

1. Riat A.K., and kaur A . An alternative approach to synthetic insecticides: biopesticides. TIJ. 2019;22: 89-98.
2. Tijjani A, et al. Biopesticides for pests control: A Review. J Biopest Agric. 2016;3:6-13.
3. Marzban R., and Naeimi S. A review on the formulation of microbial- based biopesticides. J Biocont Plant Protect. 2019;7:39-55.
4. Oguh C.E, et al. Natural pesticides (biopesticides) and uses in pest management-a critical review. AJBGE. 2019;2:1-18.
5. Sharma K.R., et al. Biopesticides: An effective tool for insect pest management and current scenario in India. Indian J Agric Sci. 2018;4:1-5.