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Biopesticides an Eco-Friendly Alternative Pest Control

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Abstract

Biopesticides characterize intensifies that are utilized to oversee agrarian nuisances through explicit natural impacts as opposed to as more extensive compound pesticides. It alludes to items containing bio control specialists i.e., regular microbes or substances obtained from microbes, plants, or certain minerals including their qualities or metabolites, for controlling insect pests.

Keywords: Chrysanthemum; Insecticides; Crown Gall; Submerged Fermentation

Abbreviations: BT: Bacillus Thuringiensis; IPM: Integrated Pest Management

Introduction

Biopesticides are synthetics that are extracted from biological entities like plants, microbes, fungi etc and these synthetic substances can be utilized for controlling harmful pests [1]. For instance, canola oil or baking with pesticidal applications is considered as biopesticides [2]. Biopesticide incorporates naturally occurring substances that helps in controlling pests in an eco-friendly, non-toxic manner [3]. Bio pesticides may be derived from numerous biological organisms such as from nematodes, Chrysanthemum, Azadirachta and Bacillus thuringiensis, Trichoderma, nucleopolyhedrosis virus etc [4,5]. Microbial bio controls may incorporate microorganism or natural parasites that attack their specific prey [6]. Biochemical bio controls on the other hand, function by employing various mechanisms such as by repressing pest population by inhibiting its reproduction or multiplication etc [7]. Plant extracts were seemingly the earliest reported agricultural bio control methods, for example was used to control plum beetles in the early seventeenth century [8]. Another example includes the use of Beauveria bassiana fungus to control silkworm [9]. Later on Bacillus thuringiensis (BT) became the most widely used bio pesticide for bio control [10]. In 1956, the Pacific Yeast Product Company developed BT containing bio pesticides on massive scale using the applications of submerged fermentation [11]. In 1979, U.S. EPA registered the first pheromone employed in mass trapping of Japanese beetles [12]. Another reported example is the use of kaolin clay as a repellent in organic fruit farms [13].

Types of Biopesticides

Following are some various types of bio pesticides:

- **Microbial Pesticides:** Microbial pesticides contains microorganism such as bacteria, fungi organism or protozoan as their active core [14]. Microbial pesticides can control various types of pests but are target specific [15]. For example, there are specific fungal species that can handle explicit weeds and insects [16]. Microbial pesticides include insecticides, fungicides, herbicides and growth regulators having microbial origin [17].
- **Bacillus Thuringiensis:** It controls American bollworm

in cotton and stem drills in rice, when ingested by pest larvae, it releases toxins which harm the mid gut of the pest, in the long run killing it [18].

- **Agrobacterium Radiobacter:** it is utilized in the treatment root crown gall in peaches, grapevine and mostly roses [19]. In addition, they are capable of producing agrocin, an antibiotic that is poisonous to Agrobacterium tumefaciens [20].
- **Pseudomonas Fluorescens:** These microorganisms are utilized to control damping off caused by Pythium sp., Rhizoctonia solani, Gaeumannomyces graminis etc [21,22].
- **Trichoderma:** An active fungicide for controlling microbes that causes root rots [23]
- **Metarizium Anisopliae:** It controls spittle bugs, rhinoceros' bugs etc [24].
- **Beauveria Bassiana**: It controls Colorado potato bug [25].
- **Plant-Incorporated-Biopesticides:** Plant-incorporated-pesticides are pesticidal substances which are produced from genetically modified plants such as gene for Bt pesticidal proteins introduced into plants which later on releases the toxin that annihilates the microbe [26].
- **Biochemical Pesticides:** Biochemical pesticides incorporate substances such as pheromones that interfere with insect mating [27].
- **Botanical Pesticides:** Such as employing plants natural properties to control pests such as insect repellent property of Azadirachtin [28]

1.1. Advantages of Biopesticides

- It is inherently not very harmful and there is less environmental load [29].
- Intended to influence a single specific pest or, a couple of targets living beings simultaneously [30].
- When utilized as a segment of Integrated Pest Management (IPM) programs, biopesticides can contribute extraordinarily [31].

Conclusion

Biopesticides are effective microbial biological pest control that are applied in a way like chemical pesticides and is used to control soil borne and seed borne fungal parasitic microbes.

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