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# Center for Smart Agriculture

## Course: Organic Farming



*Rhizobium*



*Azotobacter*



*Azospirillum*



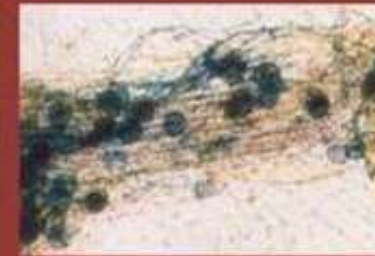
PSM



*Azolla*



*Cyanobacteria*



**Topic:** Types of biopesticides



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# INTRODUCTION

- Biopesticide is a formulation made from naturally occurring substances that controls pests by non toxic mechanisms and in ecofriendly manner.
- Biopesticides may be derived from animals (e.g. nematodes), plants (Chrysanthemum, Azadirachta) and micro-organisms (e.g. Bacillus thuringiensis, Trichoderma, nucleopolyhedrosis virus), and include living organisms (natural enemies) etc.



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## Advantages of biopesticides

- Inherently less harmful and less environmental load,
- Designed to affect only one specific pest or, in some cases, a few target organisms,
- Often effective in very small quantities and often decompose quickly, thereby resulting in lower exposures and largely avoiding the pollution problems .
- When used as a component of Integrated Pest Management (IPM) programs, biopesticides can contribute greatly



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## Types of biopesticides

- Microbial pesticides
- Plant-incorporated-protectants (PIPs)
- Biochemical pesticides • Botanical pesticides
- Biotic agents (parasitoids and predators)



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## Microbial Pesticides

- Microbial pesticides are composed of microscopic living organisms (viruses, bacteria, fungi, protozoa, or nematodes) or toxin produced by these organisms.
- Applied as conventional insecticidal sprays, dusts, or granules.



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- Their greatest strength is their specificity as most are essentially nontoxic and non pathogenic to animals and humans.
- Microbial pesticides includes insecticides, fungicides, herbicides and growth regulators of microbial origin.



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Some of the important microbial pesticides a.

*Bacillus thuringiensis*

- Discovered in Japan in early 20th century and first become a commercial product in France in 1938.
- Control lepidopterous pests like American bollworm in cotton and stem borers in rice.



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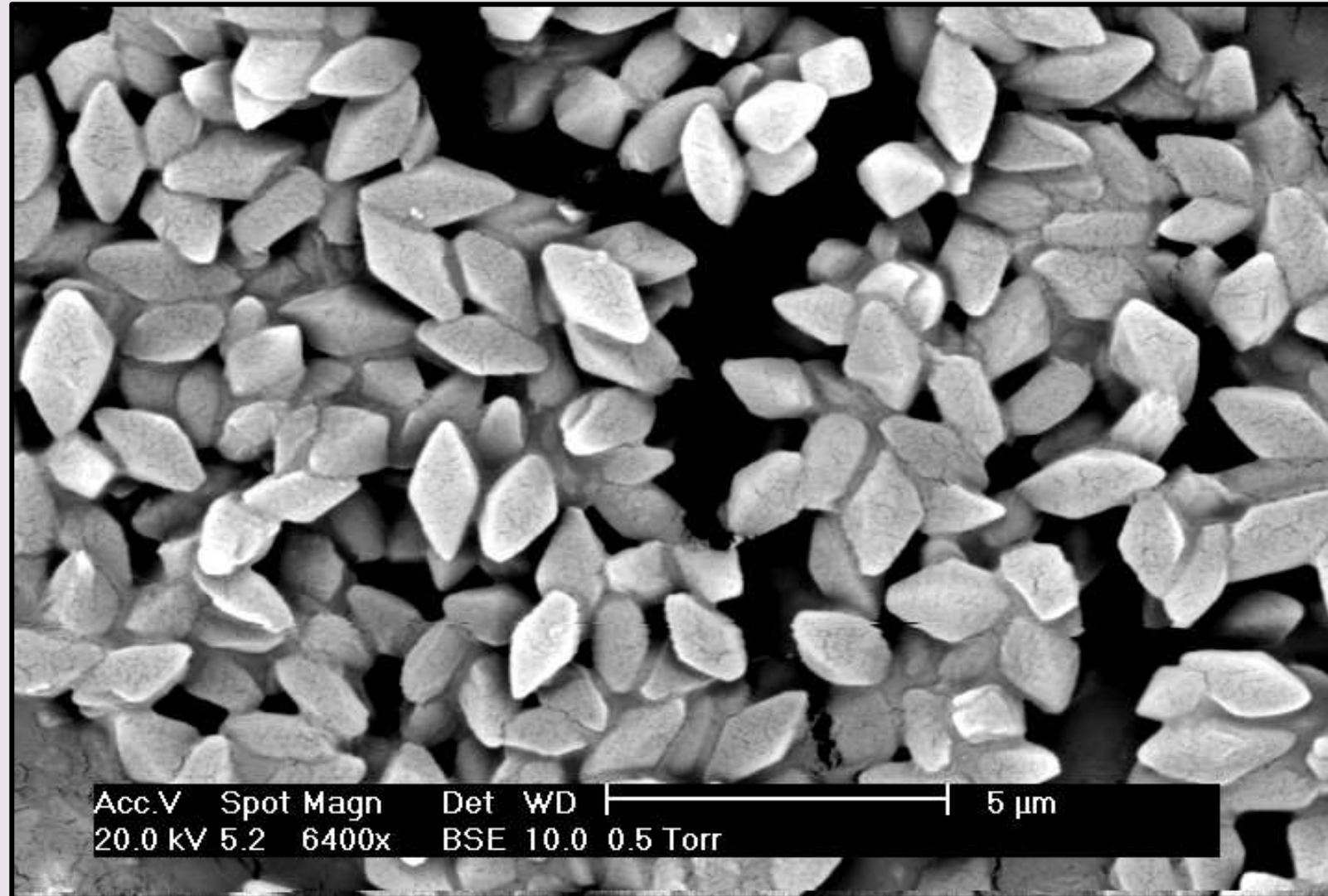


Fig 1: *Bacillus thuringiensis*





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THANK YOU