

Beneficial Insects: Predators, Parasitoids and Pollinators

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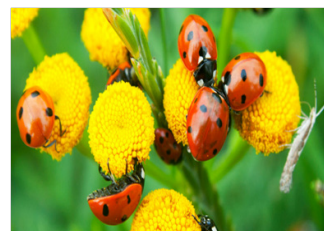
Introduction:

Beneficial insects and mites play crucial roles in maintaining ecological balance and supporting agriculture by performing three essential functions: predation, parasitism, and pollination. Understanding these roles helps in harnessing their benefits for natural pest control and plant reproduction. These insects and mites actively hunt and consume other organisms, such as pests and mites, contributing to the control of harmful insect populations. They include diverse species such as ladybird beetles, lacewings, syrphid flies, praying mantids, minute pirate bugs, aphid midges, bigeyed bugs and predatory mites. These insects lay their eggs on or inside other insects, with their larvae eventually consuming and killing the host. By targeting various life stages of their hosts, parasitoids provide a natural means of pest control. Notable examples include parasitic wasps that target pests like aphids and caterpillars. Essential for the reproduction of many plants, pollinators transfer pollen between flowers, facilitating seed and fruit production. Key pollinators such as honeybees, leafcutter bees, butterflies, and moths are indispensable for thriving ecosystems and successful crop production. Each group of beneficial insects contributes uniquely to ecosystem health and agricultural productivity, making their conservation and promotion important for sustainable practices. Beneficial insects and mites can be categorized into three groups: predators, parasitoids, and pollinators.

1. Predators

Predators hunt and consume other organisms such as insects or mites. Common predators include:

Ladybird Beetles: These beetles come in various colours including black, red, and orange, often with spots. They measure between 1.0 and 5.0 mm in length. Both adults and larvae feed on pests like aphids, whiteflies, and mites. They overwinter as adults, laying eggs in clusters on the undersides of leaves.



Lacewings: With a body length of 10.0 to 20.0 mm for adults and 6.0 to 10.0 mm for larvae, lacewings are known for their predatory larvae. They attack aphids, whiteflies, and small caterpillars. They typically overwinter as adults or pupae, depending on the species.



Syrphid (Hover) Fly Larvae: These maggot-like larvae, 10.0 to 15.0 mm long, are yellow to brown and prey on aphids, scales, and thrips. Adults mimic bees and feed on nectar. They lay eggs on aphid-infested plant parts.



Praying Mantids: Ranging from 5 to 10 cm in length, these green, brown, or yellow insects use their grasping forelegs to capture prey. They feed on a variety of insects including aphids and beetles. They overwinter as eggs.

Minute Pirate Bugs: Measuring 2.0 to 4.0 mm, these bugs have a pointed head and clear markings. They attack aphids, spider mites, and thrips. They overwinter as adults and are active early in the season.



Aphid Midges: Tiny, delicate flies about 3.0 mm long, they are effective against aphids. They lay eggs in aphid colonies, and their larvae, often mistaken for tiny orange maggots, feed on aphids.

Bigeyed Bugs: These bugs are around 4 mm long with large, bulging eyes. They feed on flea beetles, mites, and small caterpillars. They lay eggs singly on leaves.

Predatory Mites: Species like *Typhlodromus occidentalis* and *Zetzelliamali* are effective against spider mites and thrips.



Measuring 0.25 to 0.4 mm, they are fast-moving and active throughout the summer.

2. Parasitoids

Parasitoids lay their eggs on or inside other insects. Their larvae consume and eventually kill their hosts. They can attack various life stages of their hosts, including eggs, larvae, and adults. Common parasitoids include:

Parasitic Wasps: Ranging from 1.0 to 24.0 mm in size, these wasps target pests like aphids and caterpillars. They often leave behind "mummies" (inflated, hardened remains of the host) and may also create small cocoons beside the host for pupation.



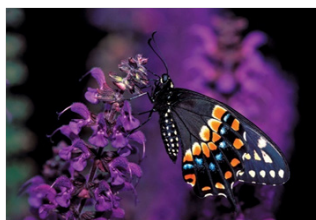
3. Pollinators:

Pollinators are insects that transfer pollen between flowers, aiding in plant reproduction. Key pollinators include:

Honeybees, Leafcutter Bees, and Other Wild Bees: These bees are crucial for pollinating a wide range of plants.



Butterflies and Moths: They visit flowers to feed on nectar and pollen, contributing to the pollination process. Each type of beneficial insect plays a vital role in maintaining ecological balance, controlling pests, and supporting plant reproduction.



Conclusion:

Beneficial insects and mites are indispensable to both ecological balance and agricultural productivity. By fulfilling roles as predators, parasitoids, and pollinators, they provide natural pest control, reduce crop damage, and ensure effective plant reproduction. Predators like ladybird beetles and lacewings manage harmful insect populations, while parasitoids such as parasitic wasps target pests through a lifecycle of parasitism. Pollinators, including honeybees and butterflies, are essential for the fertilization of plants, driving successful seed and fruit production. Protecting and encouraging these beneficial organisms through sustainable practices is crucial for maintaining healthy ecosystems and enhancing agricultural outcomes. Their conservation supports biodiversity and contributes to the resilience of both natural and managed environments, making them key players in the sustainability of our agricultural systems.

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