

NATURE'S INGENIOUS ARCHITECT: MARVELS OF INSECTS

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ABSTRACT

The world around us thrives with the most remarkable creatures and life on earth relies on this glorious scale of biodiversity. It is the smallest creature that plays the most significant role in our ecosystem. We live on a planet of insects. They make up around 70% of all known species on earth. Insects are extraordinarily diverse, existing in a bewildering array of colors, shapes, and sizes. Within these pages, discover the vital significance of insects and their instrumental role in enriching life on Earth.

Introduction:

Nature is extraordinary! Insects are tiny titans that carry the weight of the ecosystem. Insects are incredibly diverse, so they play a crucial role in ecosystems such as pollination, soil enrichment, decomposition, nutrient recycling, and pest management. Insects are also being used for various industrial purposes such as silk production, as a source of food for all animals including humans. The intriguing thing about insects is that they are used for medicinal purposes and can be engineered to act as drones (1).

1. Insects: The Agricultural Marvels

Pollination: Pollination is how plants reproduce. The relationship between plants and their pollinators (insects) is an ancient one. About 99 million years ago. Seven known insect pollinators are bumblebees, hoverflies, solitary bees, wasps, moths, butterflies, and beetles (2). They carry pollens from flowers male part to the female part.

Farmer's friends: Predatory insects such as ground beetles, ladybird beetles, assassin bugs, braconid wasps, soldier beetles, and green lacewings increase crop yields by keeping weeds and pest species in check (4).

Insectary engineers: Some species of insects like earthworms, damselfly, and dung beetles aerate the soil, disperse seeds, and promote plant growth (3).

2. Insects: The Industrial Marvels

The textile industry: For example, Chitosan is a derivative of a part of insect skin called chitin. It can be used to protect textiles from breaking in the weaving process. Secondly, chitin gives textiles with specific properties such as water resistance. Silk obtained from the cocoon of mulberry silkworm larvae is important to the economy of certain countries. The textile made from this silk is called the queen of textiles as it has certain features such as elasticity, absorbency, thermal regulation, shine, and lightweight.

The food industry: From early ages, insects like crickets and grasshoppers have been used as food sources for both humans and animals. Such as soldier flies, and mealworms. Insects are grown in vertical farms to feed animals and humans. Insects are a reliable source of organic and inorganic feed for birds and fish.

Industrial Waste Management: Fly larvae such as soldier fly larvae are used for commercial waste management. These larvae can eat up to 4 times their weight. As mentioned above, these larvae convert food waste into nutrients, and their waste product is used as fertilizer for agricultural purposes.

3. Insects: The Medicinal Marvels

Honeybee Venom: For treatment of cancer cells, including renal, prostate, mammary gland, lung, and liver. To treat HIV, rheumatism, pain, and arthritis (5).

Tree Ant Venom: It has pharmacological effects such as reducing inflammation, relieving pain, inhibiting of tumor growth, hepatitis treatment, and liver protection.

Termites: *Microkeratomes exiguous* used for asthma, bronchitis, influenza, whooping cough, and flu. *Nasturtium macrocephalous* is used to treat, sinusitis, and tonsillitis (7).

Maggots of flies: This is used to treat non-healing surgical wounds. Maggots eat the debris around the wound so that it can heal more quickly. They release active enzymes that help effective wound healing (6).

Cone snail venom: These toxins reduce pain about 1000 times more potent than morphine without causing addiction.

Conclusion

Insects are tiny, marvelous creatures that play a crucial role in maintaining terrestrial ecosystems. Insects are tiny builders of our ecosystem. These are intricate, diverse, and even acrobatic. Insects and great economic and scientific importance. Without insects, sustaining life on Earth will be nearly impossible.

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