

# *The Insect Apocalypse: Why Losing Insects Means Losing Biodiversity*

**Chinmayi S<sup>1</sup>, Sandeep V<sup>1</sup> and Chiranth M P<sup>2</sup>**

<sup>1</sup>Department of Entomology, Keladi Shivappa Nayaka University of Agricultural and Horticultural Sciences, Shivamogga, Karnataka, India

<sup>2</sup>Department of Entomology, University of Agricultural Sciences, Dharwad, Karnataka, India

**Corresponding Author**

Chinmayi S

Email: chinmayisrinivas03@gmail.com



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## **ABSTRACT**

The "insect apocalypse" refers to the alarming global decline in insect populations, with over 40% of species at risk of extinction. This decline, driven by habitat loss, pesticide use, climate change, and pollution, poses significant threats to biodiversity and human well-being. Insects play vital roles as pollinators, decomposers, and prey for other species, and their loss disrupts ecosystems, affecting plants, animals, and essential processes like nutrient cycling. Addressing this crisis requires reducing pesticide use, restoring habitats, and adopting sustainable farming practices. Protecting insects is crucial for maintaining the health of ecosystems and ensuring food security and biodiversity for future generations.

## **INTRODUCTION**

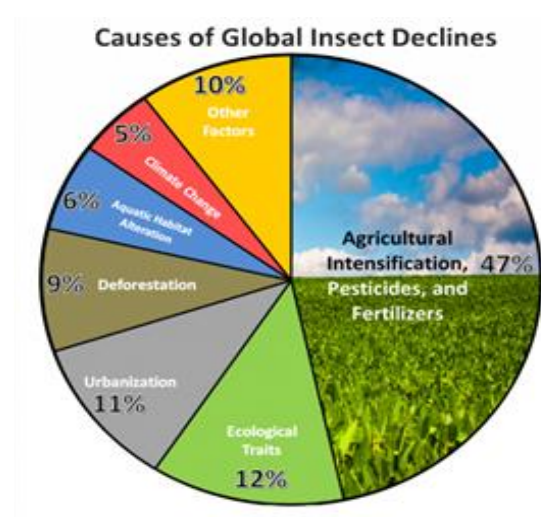
Insects are often overlooked in discussions about biodiversity, yet they play essential roles in maintaining the balance of ecosystems. Alarming, recent studies suggest that insect populations are in rapid decline worldwide, leading scientists to dub the phenomenon the "insect apocalypse." This

dramatic loss is not just a concern for entomologists—it poses serious threats to global biodiversity and human well-being.

### **The Decline in Numbers**

Reports from countries across Europe, North America, and parts of Asia reveal sharp drops

in insect populations. A 2019 global review estimated that over 40% of insect species are at risk of extinction. Some areas have recorded up to 75% fewer flying insects over just a few decades. The reasons behind this decline are numerous: habitat destruction, pesticide use, climate change, pollution, and the spread of invasive species (Jactel *et al.* 2020).



### Why Insects Matter

Insects are the foundation of many ecosystems. They serve as pollinators, decomposers, and a crucial part of the food web. Without pollinators such as bees and butterflies, many crops and wild plants would struggle to reproduce, impacting food security and agricultural productivity. Insects like beetles and ants break down organic matter, recycling nutrients back into the soil, while others serve as prey for birds, amphibians, and small mammals.



### Consequences for Biodiversity

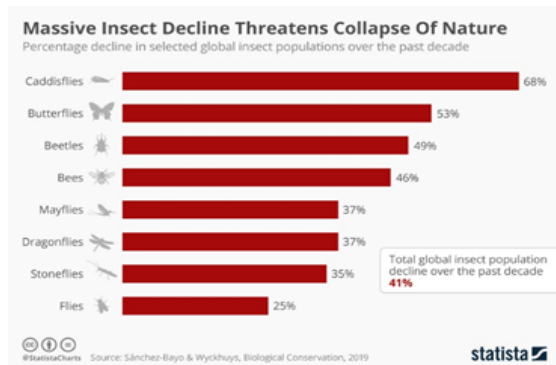
The loss of insect populations has cascading effects throughout ecosystems. Insects support biodiversity by maintaining the health of the soil, pollinating plants, and providing food for other species. As insect populations decline, so too do the species that depend on them. This can lead to ecosystem collapse, with plants, animals, and even entire ecosystems suffering from a breakdown in essential processes such as nutrient cycling and seed dispersal.

For example, fewer insects mean pollinators like honey bees, butterflies, which affects flowering plants and the animals that rely on those plants. Birds, reptiles, and amphibians that feed on insects are also at risk as their food sources dwindle. This chain reaction could lead to the loss of not just insect species, but many other forms of life that are interconnected with them.

### The Drivers of Decline

One of the primary drivers of insect decline is habitat loss. Urbanization and intensive agriculture have replaced natural habitats with monocultures and developed areas, depriving insects of the diverse environments they need to thrive. Pesticides, particularly neonicotinoids, are another major culprit (Wagner *et al.* 2021). These chemicals are harmful to non-target insects like bees and butterflies, leading to population declines.

Climate change is also altering ecosystems, shifting temperature and weather patterns, which in turn disrupt the life cycles of many insects. For example, rising temperatures may cause insects to emerge earlier in the year, disrupting their synchronization with the plants they pollinate or the predators that feed on them.



### What Can Be Done?

Addressing the insect apocalypse requires immediate action. Reducing pesticide use, restoring natural habitats, and promoting sustainable farming practices are critical steps in preserving insect populations. Encouraging the growth of wildflowers, trees, and native plants can create habitats for pollinators and other beneficial insects. Additionally, raising public awareness about the importance of insects and the threats they face is crucial for driving change.

Policies that regulate pesticide use, promote habitat conservation, and address climate change are essential to preventing further declines. Scientists and conservationists are calling for a more insect-friendly approach to agriculture, including the adoption of organic farming methods and reduced reliance on harmful chemicals.

### CONCLUSION

The insect apocalypse is a wake-up call that highlights the fragile nature of our ecosystems. Insects are not just pests or background creatures—they are the lifeblood of biodiversity. Their decline signals a broader collapse of the natural systems that sustain life on Earth. Protecting insects means protecting the intricate web of life they support, ensuring that ecosystems remain resilient and capable of sustaining future generations. By recognizing the vital role insects play in our world and taking action to protect them, we can help preserve the delicate balance of biodiversity that all life depends on.

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