

Perspective

Insect ecology: Behavior, populations and communities

Golden Rima*

Department of Entomology Studies, University of Kent, Kent, Canada.

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DESCRIPTION

Insect ecology is the scientific study of how insects interact with their surroundings or ecosystems, either individually or collectively. They have a range of highly essential ecological roles in the numerous functions of an ecosystem since they are the largest contributor to biodiversity in the majority of habitats, with the exception of the sea. In the case of nutrient recycling, insects aid in the process by decomposing or devouring leaf litter, wood, carrion, and dung, as well as dispersing fungus. Entomophagous creatures, which include a wide range of mammals, birds, amphibians, and reptiles, rely extensively on insects as a food source. Insects have an important role in maintaining the structure and composition of communities in both animals and plants, including disease transmission, predation, and parasitism in animals, and phytophagy and plant proliferation through pollination and seed dispersal in plants. Insects compete with humans on an anthropocentric level, consuming up to 10% of the food produced by humans and infecting one out of every six humans with a virus.

Community ecology

The mechanism through which a collection of species that reside in the same area interact is known as community ecology. Direct connection occurs in the form of symbiosis, competition, and predation, which are the most obvious. Reproduction, foraging behaviours, and dying are all examples of indirect interaction. In its most basic form, any creature may be a consumer in certain settings and a producer in others. What constitutes a community and distinguishes one from another is the sum of all these interactions. Insects frequently perform many functions in these communities, albeit their responsibilities differ greatly depending on the species present. Decomposer insects feed on the decayed or dead corpses of plants and animals. These insects are known as saprophages, and they are divided into three groups: those that eat dead or dying plant stuff, those that eat dead animals (carrion), and those that eat other animals' waste (faeces). More surface area is exposed when dead plants are eaten away, causing the plants to deteriorate more quickly due to an increase in microbes consuming the plant. These insects are significantly important for assisting in the formation

of a humus layer on the soil, which creates a perfect habitat for fungus, microbes, and bacteria. Many of the nitrogen, carbon, and minerals that plants require for development are produced by these creatures. Several beetles, ants, mites, wasps, fly larvae (maggots), and other insects feed on carrion. These insects inhabit the dead body for a brief time before quickly devouring and/or burying it. The first insects to devour the body are usually some species of fly, but the order of insects that follow is predictable and known as the faunal procession. The scent of animal excrement attracts a lot of dung beetles and manure flies. The adults frequently lay their eggs on fresh dung, and the larvae eat the organic materials. Many dung-feeding organisms have evolved to solely consume the excrement of a single species. A variety of dung beetle would wrap excrement into a ball, press it into a pre-dug hole, deposit an egg in the dung, and then cover it with new soil to produce an ideal nursery for their larvae. Carnivorous insects feed on other living creatures, whether by hunting, sucking blood, or as an internal parasite. Predators, parasites, and parasitoids are the three primary types of insects. Predatory insects are often bigger because their capacity to seek, kill/immobilize, and devour their prey is essential to their survival.

Herbivores

Approximately 500,000 herbivorous insects make for over a third of all identified eukaryotes.

Plant matter that is still living or plant products are eaten by them. These insects may devour plant elements that are important to the plant's survival, such as leaves or sap, or they may feed on pollen and nectar generated by the plant. Herbivorous insects use scent and sight to select a good host plant. A visual signal might be as simple as the contour of a specific type of leaf or the stark contrast between a flower's petals and the foliage around it. These are usually linked to the smell signal received by an insect from its intended prey. The aroma of honey generated by a flower, a chemical emitted to deter undesired predators, or the exposed sap of a cherry tree might all be olfactory cues. Herbivorous insects pose a greater threat to plants than those that eat them; they are among the most common disease-carriers in the insect world.

*Corresponding author. Golden Rima, E-mail: goldenrima@gmail.com.