

Exploring the displayed insects at the Coimbatore Museum

As a part of our RHATC Course the ten fellows of the 4th batch had the opportunity to visit the 'Insect Museum' which is a part of the Department of Agricultural Entomology at Tamil Nadu Agricultural University, Coimbatore. The Insect Museum is a fascinating educational space dedicated to showcasing the incredible diversity, biology, and ecological importance of insects. The museum is a treasure trove for nature enthusiast, researchers, and anyone curious about the often overlooked world of insects. Before directly diving into the mind-blowing things which received us in the museum, we will try to understand something more about insects so that we could set a platform to discuss about the museum, its importance, and its implications in conservation.

About Insects

Class Insecta, is the most diverse group of invertebrate organisms which show cosmopolitan distribution all around the world and include organisms characterized by six legs, a three-part body (head, thorax, and abdomen), and an external skeleton made of chitin mostly.

The Insecta is classified based on different basis, the most common being based on their social structures. We have insects such as weaver ants, honeybees, paper wasps, and termites who live in organized colonies and cannot survive alone while others, like the coconut skipper, bagworm, gall insect, carpenter bee, antlion, and caddisfly lead solitary lives.

Insect Life Cycles

The life cycle of insects makes them very special among other invertebrates as they have a larval stage in most cases and undergo a special type of development which increases their complexity from egg to an adult individual. There are different types of metamorphosis based on the steps they undergo during development, they are:

1. Holometabolous (Complete metamorphosis)
2. Hemimetabolous (Incomplete metamorphosis)
3. Paurometabolous (Gradual metamorphosis)
4. Anamorphosis (No metamorphosis)

DIFFERENT ROLES OF INSECTS

Role as predators

Root feeders include predators like Arecanut root grub, root aphid, wireworm, sugar root scrub, and termites, which feed on plant roots. Stem borers such as the rice yellow stem borer, potato tuber moth, brinjal shoot borer, banana pseudo stem borer, sorghum stem borer, and cardamom shoot borer prefer plant stems. Leaf folders and rollers, including the rice leaf folder, mango leaf twisting weevil, banana skipper, rice case skipper, coconut leaf roller, and coconut skipper, feed on leaves by folding or rolling them. Leaf miners and gall makers, like the cashew leaf miner, groundnut leaf miner, serpentine leaf miner, citrus leaf miner, mango shoot gall, and eucalyptus leaf gall, feed on leaf tissues or induce galls. Defoliators such as the mango leaf weevil, mustard sawfly, brinjal

hadda beetle, grapevine flea beetle, coconut rhinoceros beetle, and leaf cutter bees strip plants of their foliage.

Flower feeders, including the blister beetle, jasmine bud worm, bean pod borer, gram pod borer, chafer beetle, and diamondback moth, prefer flowers and buds. Fruit borers like the mango nut weevil, tomato pinworm, pigeon pod borer, brinjal fruit borer, lablab pod borer, and guava fruit borer feed on developing fruits. Lastly, tree borers, including the cashew stem borer, bark borer, shot hole borer, Asian long-horned beetle, emerald ash borer, and sandalwood borer, bore into tree trunks and branches, which at times may cause structural damage to the plant. Apart from the variety of ecological services insects provide, in reality, their positive contribution to the agricultural sector overshadows the negative perception of their harm to agriculture. The predator-prey relationship between insects is important for maintaining balance in insect species and the ecosystem.

The insects play a very crucial role in the ecosystem as we will read now.

Role as Pollinator

Insects visit flowers to feed on nectar and pollen, and in the process, they may accidentally brush against the flower's reproductive parts. This transfers pollen from one flower to another, allowing the plant to fertilize and produce fruit, seeds, and new plants. Bees are the most important group of pollinators.

Role as decomposer

Insects physically break down large pieces of organic material into smaller fragments,

which are then further decomposed by microorganisms. Insects like blowflies and flesh flies lay their eggs on dead animals, and the larvae feed on the soft tissues, speeding up the breakdown process and insects also improve soil structure by enhancing aeration and promoting nutrient availability.

Insects also serve various purposes across multiple industries due to their versatility and nutrient richness and are often exploited. As a sustainable protein source, they offer an alternative to traditional livestock and are used in feed ingredients for many species. In the textile industry, silkworms are cultivated for silk production. Cosmetics benefit from insect-derived pigments, essential oils, and fatty acids found in products like moisturizers, shampoos, and lipsticks. Agriculture relies on insects as natural pest controllers, pollinators, and contributors to soil quality through their waste, such as exuviae & frass, which enhance plant



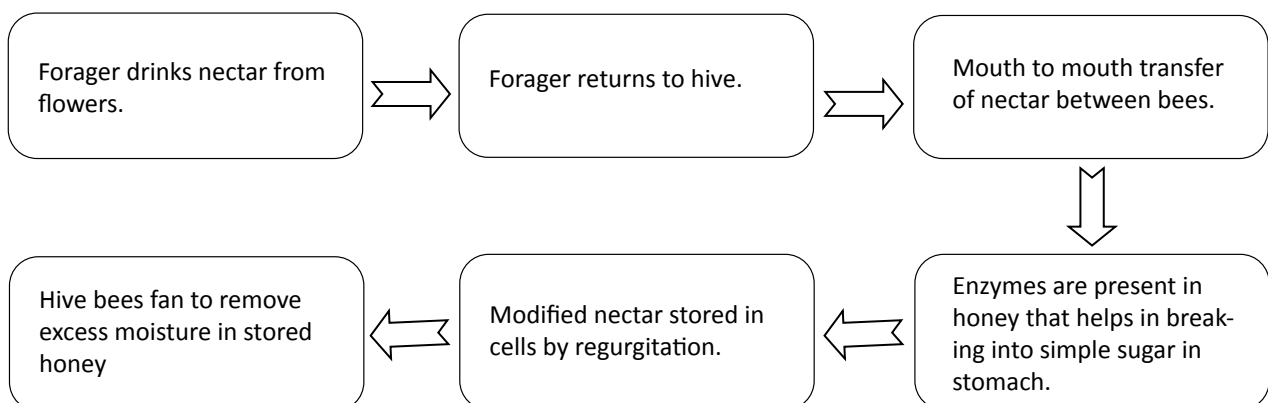
Role of insects In pollination. © Diya Banerjee



Role of Insects in Agriculture. © Diya Banerjee

growth. Additionally, insects are widely used as fishing bait, while substances like antimicrobial peptides, apitoxins, and enzymes derived from insects play a role in medicine by combating infections, inflammation, and diseases like cancer. Historically, cochineal, a pigment from scale insects, was used by the Aztecs as a dye for textiles and body paint.

How bees make honey



Insects in Stamps

Another important fact about insects where they have been a part of philately for decades. The first stamp featuring an insect was issued by Nicaragua in 1891, depicting a honeybee hive. Since then, over 5,000 stamps featuring insects have been issued globally, celebrating their diversity and importance. This shows that human kind has recognized the services provided by the insects both to the ecosystem and to the humans and were ready to acknowledge all these in the very beginning of the human race.

The display of migration of insects was quite remarkable and extraordinary and served as a feast to our eyes. Moreover, this information was very new to most of us as it was a bit difficult to believe that such tiny creatures could travel such long distances. Some interesting stories of insect migration below.

Monarch Butterfly Migration

The monarch butterfly *Danaus plexippus* undertakes an extraordinary migration to escape the cold winters of the USA. Millions of butterflies travel 2,800 miles to central Mexico, completing the journey over four generations.

Desert Locust Migration

The desert locust is one of the biggest predator invading 20% of the world's landmass. Its invasion area spans 32 million square kilometers, while its recession area covers 16 million sq. km. A single swarm, consisting of 40–80 million winged adults or wingless nymphs per square kilometer, can migrate up to 100 km per day. During migration, a swarm consumes as much food as 10 elephants, 25 camels, or 2,500 people daily, causing devastating damage to vegetation.

As honey bee is one of the first and foremost thing which comes to our mind when we think about insects, let us try to understand a bit more about honey bees. To begin with, we will try to have an idea about their life cycle.

Life Cycle of a Bee:

A queen bee lays up to 2,000 eggs per day, and these eggs mature in about 21 days. The bee colony consists of a single queen, around 5% drones (males), and approximately 95% worker bees.

Honey, being an integral part of Indian diet in general, cannot be left back when discussing about bees. So, let us try to figure out how the bees produce honey.

Benefits of honey

Honey provide several health benefits, including:

- Regulation of blood sugar.
- Antibacterial properties.
- Relief from asthma.
- Enhanced athletic performance.
- Probiotic benefits.
- Antifungal properties.

- Reduction in ulcers and gastrointestinal disorders.
- Control of blood pressure.
- Anti-cancer properties.

Conclusion

Insect Museum was a place that holds vast knowledge, serving as a valuable resource for researchers while also offering entertainment to the public. However, as far as I am concerned, the museum is in pursuit of creating visually appealing displays to attract visitors, has collected some dead insects and preserved.

I also observed the perception of my fellow beings as they came from diverse science backgrounds, each bringing a unique perspective. Those with expertise in entomology were particularly precise, sharing detailed information about insects with the group. Some of them, curious about insects, were amazed by the incredible diversity they observed.

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