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Bangalore: Imagine there are no beetles

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As of now, the findings do not sound an alarm bell. The abundance of insects and trees only indicate an abundance. **Photo:** A Veeramani / DNA

If insects are to be taken as a vital sign indicating a city's environmental health, there's not much to worry for Bangalore. That is, not yet.

A recent study conducted by researchers from the Ashoka Ashoka Trust for Research in Ecology and the Environment (ATREE) has recorded a large number of insects — 2,185 insects from 10 orders, of which ants, bugs, beetles and flies were the most common. They also found 25 species of trees and 117 species of herbs and shrubs in the 50 sampled domestic gardens in the city. "The number of insect orders encountered was significantly related to the number of tree and herb/shrub species. Garden management practices also influenced the abundance and richness of insect orders," the researchers said.

"Insects constitute key indicators that enable the monitoring of the impact of urbanisation on biodiversity, responding sensitively to changes in habitat extent and quality and to altered management practices associated with urbanisation. Insects play key roles in nutrient cycling, organic matter decomposition, pollination and soil aeration in urban ecosystems. Yet, although arthropod taxa (such as ants and butterflies), are abundant in urban environments, little is known about how these are distributed within a city environment," said lead researcher Harini Nagendra.

According to the ATREE team, previous research has indicated that home owners and residents had perceived declines in a variety of urban wildlife visiting domestic gardens, ranging from monkeys to sparrows. Yet, a majority of house owners indicated that they could not support further increases in their garden area, citing reasons of lack of space and difficulties in maintenance, indicating the challenges of the protection of domestic gardens in a continuously expanding city with the constraints of land availability.

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There were interesting findings. The researchers found that many older residents of the city tend to prefer gardens with a less manicured look and a greater diversity of plant species, while residents of apartments prefer trees and plants that fit with the aesthetic of a manicured garden, with a greater preference for ornamental plants. Most residents avoid the practices of applying pesticides and herbicides, largely because of health concerns. The researchers found insect abundance to be significantly reduced in gardens with pesticide application.

"Coupled with our findings that increased plant diversity and lawn area lead to an increase in ground insect numbers, this indicates that cultural preferences concomitant with older domestic gardens in Bangalore may support a greater associated insect population. The increased conversion of single homes to shared apartment gardens in Bangalore, and the shrinking of available garden space over time, also poses challenges for insect conservation in the city," they said.

As of now, the findings do not sound an alarm bell. The abundance of insects and trees only indicate an abundance. Since no similar studies have been conducted in the past, there is nothing to signal a drastic decline in biodiversity levels.

Said Nagendra, "We need much more in-depth studies of this sort on insects, and the factors that impact insect numbers and diversity in India's growing cities. This is because insects are a) sensitive indicators that will enable the monitoring of urbanisation's impacts on biodiversity through its effects on management practices, pollution, and b) insects play key roles in a number of important processes such as nutrient cycling, organic matter decomposition, pollination and soil aeration in urban ecosystems."

The findings of the ATREE team of Nagendra, Madhumitha Jaganmohan and Lionel Sujay Vailshery — Patterns of Insect Abundance and Distribution in Urban Domestic Gardens in Bangalore, India — have been published in the latest issue of *Diversity*.

THE BACKDROP

The backdrop in which the researchers worked was a rapid increase in population density over the past decade that has resulted in substantial expansion of built area and a corresponding decrease in green space. Bangalore has witnessed a slow conversion of many large- and moderate-sized single domestic gardens in the city into small-sized, shared apartment gardens with lower tree density and diversity, which may also indicate a decrease in the levels of biodiversity of other species, such as birds and insects.

HIGHLIGHTS

- The most common trees, found in more than 30 percent of the home gardens, are *Mangifera indica* (mango), *Polyalthia longifolia* and *Cocos nucifera* (coconut).
- The most common shrubs found in more than 30 percent of the home gardens are *Rosa* spp., *Bergera koenigii*, *Codiaeum variegatum*, *Jasminum* spp., *Chrysalidocarpus lutescens*, *Hibiscus rosa-sinensis* and *Ocimum tenuiflorum*.
- The garden with the most number of insects was located at the periphery of the city, with 120 insects belonging to five orders, while the garden with the least insect order richness had a recorded 12 individuals of five orders, closer to the city centre.
- The age of the home gardens ranged from two years to 50 years, with an average age of 18 years. The size of the garden area ranged from 100 sq ft to 5,000 sq ft, with an average area of 1,490 sq ft.
- Gardens had an average of 25% grass cover, 42% bare soil and 30% concreted area.
- Of the 50 gardens sampled, only four gardens had a pond, while six had a composting area, and seven had a bird feeder—all practices known to be associated with insects.
- Many residents indicated that they did not use chemicals in their garden, because of concerns about health and, in particular, the impacts on their children and pets.



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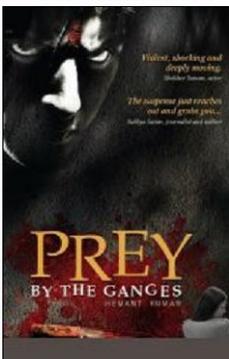
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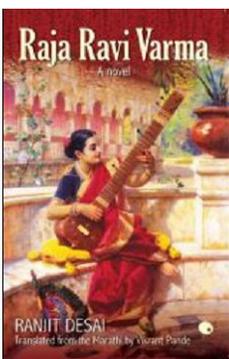
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