



## SOLITARY BEES AND BEE HOTEL INSTALLATION IN PALAR AGRICULTURAL COLLEGE

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### Introduction

More than 20,000 species of bees are present in the world. Apidae, Halictidae, Megachilidae, Andrenidae, Colletidae, Melittidae, and Stenotritidae are the 7 families in Bees. In this Solitary Bees belongs to the Family Megachilidae, Andrenidae.

**Table: -1** Honey Bee species

Common Name	Scientific Name	Remark
Giant or Rock Bee	<i>Apis dorsata</i>	Not Domesticated
Indian Bee	<i>Apis cerana indica</i>	Domesticated
Italian Bee	<i>Apis mellifera</i>	Domesticated
Little Bee/ Dwarf Bee	<i>Apis florea</i>	Not Domesticated
Dammer Bee/ Mosquito Bee	Tetragonula ( <i>Melipona</i> ) iridipennis	Domesticated

Honey bees are eusocial insects with three distinct castes; **Queen, Worker** and **Drone**. There are 5 Species of Bees which are social in Nature.

### Introduction:

Solitary bees are stingless, non-social bees that don't form colonies or have a queen or worker caste system like honey bees. Unlike honey bees, they don't swarm and produce honey but collect nectar and pollen for their own survival. These small, anti-social insects are

more important for pollination than honey bees, as they forage in small areas and are highly efficient at **buzz-pollination** (Anthers in such flowers require a certain frequency of vibration in order to release the pollen) crucial for crops like tomatoes, chilies, and bell peppers. Solitary bees are **polylectic**, meaning they gather pollen from a wide variety of plants.

Their presence can boost crop yields, like pigeon pea yield can increase by up to 60% when solitary bees are present for pollination, compared to just 20% under self-pollinating conditions. Only females collect pollen and raise their brood, either in ground or aerial nests, using materials like mud, leaves, or floral oils. They nest in natural cavities such as plant stems or walls. Solitary bees undergo complete metamorphosis, with four life stages: egg, larva, pupa, and adult.

### Life-Cycle:

Solitary bees have a lifespan of about a year, with most of their time spent in the larval and pupal stages. Adult bees live for just 3 to 8 weeks. After hibernating, both males and females emerge in spring. While Males only there for reproduce.

Females build nests with small chamber and in each chamber it keeps a ball of food made by mixture of pollen and nectar. Using her sperm store, lays fertilized eggs for future females at the back and un-fertilized eggs for males at the front. Males emerge first, waiting for females. After mating, both males and females die, while the larvae, fed with pollen and nectar, survive the

winter in their chambers. The cycle repeats the next spring when the larvae emerge as adults.

Solitary bees are resourceful; they use a range of natural materials to protect their nests from intruders such as parasites and fungi. Plant materials are used in different ways for their Defence mechanism.

Leaf sections may be cut or chewed up by leaf cutter use it in brood security, while the Wool Carder Bee collects hairs from woolly plants. The Yellow Loosestrife Bee even uses floral oil and mixes this into the nectar-pollen mixture for her larvae. Some species use abdominal secretions, which are like gum and waterproof.

#### **Management for Solitary Bee: -**

Leaving small patches of grass and flowering plants along the edges of farmland will provide bees with a continuous supply of food throughout the year, while also offering safe spaces for nesting, mating, and shelter, as well as protection from predators.

#### **Bee Hotel Importance: -**

An artificial structure for solitary bees, such as a bee hotel, is designed to replicate the natural nesting sites these bees typically use. Unlike honeybees, which live in colonies, solitary bees nest in small tunnels, hollow tubes, or cavities. Bee hotels create these types of spaces, giving bees a secure place to lay eggs and raise their offspring. Bee hotels are important because they provide a safe place for solitary bees to nest, helping support pollinator populations that are declining due to habitat loss and other threats. They promote better pollination, enhance biodiversity. Many bees lose their habitats due to urbanization and farming practices. Bee hotels help address this issue by providing valuable nesting sites in urban and agricultural areas, where natural habitats are often scarce.

#### **Construction of Bee Hotel: -**









Wooden blocks with neat circular holes, ranging from 1.5-3.5 mm in diameter and 6 cm deep, attract these bees for nesting. Similarly, bundles of thin bamboo stalks or sticks, cut into 15-20 cm pieces, also serve as nesting sites, with

bamboo and Johnson's species being preferred. Besides bees, various species of wasps also use these nests, as they are predators of pest insects. Creating these artificial "bee hotels" can help conserve these bees, supporting plant pollination. For Sterilizing the Bee Hotel like Sun Expsoure, Vinegar, non-toxic wood treatments like **linseed oil** or **beeswax**. These are good alternatives that protect the wood without harming the bees.

#### **References:-**

- <https://india.mongabay.com/2021/03/no-honey-no-hives-but-solitary-bees-have-important-lives/>
- <https://blog.nwf.org/2022/06/the-life-of-a-solitary-bee/>
- <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/solitary-bees>
- <https://www.nhsn.org.uk/a-short-guide-to-solitary-bees/>
- <https://biodiversityireland.ie/the-secret-life-of-solitary-bees/>
- <https://growwild.kew.org/championing-nature/pollinators/solitary-bees>

## Types of Solitary Bees: -

 <p>carpenter bee <i>Xylocopa virginica</i> கட்டிட தேன்</p>	 <p>Leaf Cutter bee <i>Megachile spp</i> இலைகட்டு தேன்</p>	 <p>Mason bee <i>Osmia spp</i> பறைநிரை தேன்</p>	 <p>Mining bee <i>Andrena spp.</i> கிழியோட்ட தேன்</p>
 <p>wool carder bee <i>Anthidium manicatum</i> நெய்யர் தேன்</p>	 <p>Sweat bee <i>Halictidae spp.</i> குளிர்கூடு தேன்</p>	 <p>Small carpenter bee <i>Ceratina (Pithitis) binghami</i> (Cockerell) சிறிய காடுபோக்கு தேன்</p>	 <p>Cuckoo bee <i>Thyreus nitidulus</i> குய்யு தேசிப்பி</p>

## We have Made the Bee Hotel in PAC

Students chopping the bamboo for Bee Hotel



Fixing the Bamboo to make a complete Structure



Completion of Bee Hotel



Installation of Bee Hotel in the near-by Mango Tree

