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Diversity of Honey Bees (Order- Hymenoptera) in and around G.S. College, Khamgaon Campus.

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ABSTRACT

The survey of Hymenopteran insects was carried out during April 2024 to June 2024 in an around the campus area of G.S. College, Khamgaon Dist. Buldana. The college established during 1947 and one of the biggest and oldest higher education institution in Western Vidarbha.The college is spread over 97 acres, the campus has rich diversity of flora and fauna .We employed five collection methods for the study (viz. pitfall trap, including bee traps with sugar water or pheromones, smoke to calm the bees, photographic techniques for species identification, yellow pan trap, manual collection, light trap and yellow sticky trap etc). About five distinct species were identified *Apis mellifera* (commercially significant). *Apis indica*, *Apis dorsata* (known for large, aggressive colonies). *Apis florea* (adapted to arid climates) and Apis indica. Species are documented and identified up to species eve using literature, research articles and online resources. Our findings may help to enhance the understanding of these bee distribution and behaviors, supporting local pollinator conservation efforts in the study area.

Keywords: Hymenoptera, G.S. College Campus, pollinators, ecological roles, Khamgaon flora-fauna, Honey bees.

Introduction: Hymenoptera is one of the largest orders of insects and includes many species of bees, wasps, hornets, sawflies, and ants. The word Hymenoptera is derived from the ancient Greek words for hymen, meaning membrane, and pteron, translated to wing. Over 150000 species are described (Mayhew,2007).

Honeybees belong to the Apoidea group and are consistent flower visitors and major plant pollinators both in natural as well as agricultural ecosystems. Honeybees in India are traditionally used for honey production for the last two centuries and they have also contributed significantly in increasing crops productivity fruit bearing and weed set in forest plants. All honey bees are classified into the genus Apis and the family Apidae. Honey bee is a eusocial flying insects that have evolved complex social hierarchies communication system and cooperative behaviours (Seelay, 1995). Honey bees pollinate over 75% of global crops species, including fruits, vegetables s and seeds. (Klein *et.al.,* 2007). By enabling the transport of pollen from the anther (male portion) to the stigma (female part) of flowers, pollination plays a critical role in promoting agricultural yield. Fertilization, which produces seeds and fruits, depends on this mechanism. Even so, while some plants are capable of self-pollination, pollination by insects typically produces larger yields and better-quality crops. *Apis mellifera, Apis dorsata*, *Apis cerena indica*, and *Apis florea* are among the insect pollinators that are very crucial for

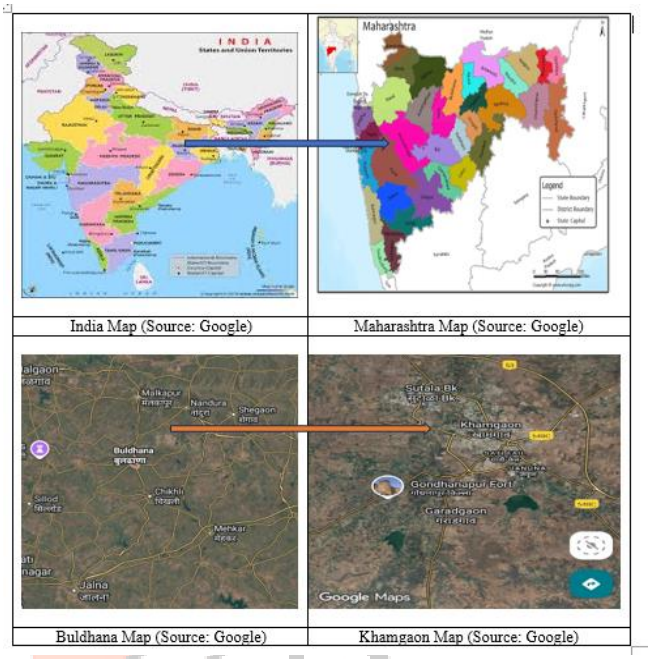
pollinating a variety of crops, including fenugreek, (Singh *et.al.,*2024)

There are about 2,000 species documented from fossil records (Aguiar *et al*.,2013). In India till date five species of honey bees have been identified and recognized as distinct species these are ***Apis mellifera***, which is used as a commercial honey bee, ***Apis indica*** commonly found in Himalayas and surrounding regions. ***Apis dorsata*** found in forest and rural areas known for their large colonies and aggressive behaviour, ***Apis florea*** found in hot and dry areas and they are adapted to local climate and vegetation play an important role in pollination. Honey bee produces honey, royal jelly, pollen, beeswax, and venom and all the products have been used for various nutritional as well as medicinal purposes since long before. Honey is the most well-known economically important and nutritive hive product. So they have economical as well as commercial values. However, honey bee population faces various threats like habitat loss, use of pesticides, climate change, deforestation. Conservation efforts should be taken for enhancing the honey bee colonies to maintain an healthy ecosystem.

Characteristics: They are native to Europe, Western Asia, and are introduced to other continents by humans and now found worldwide. Honey bees are typically brown with black bands and a hairy body with two compound eye and three simple on head they perform a unique waggle dance to communicate for the location of food sources to other bees in the bee hive. They live in a colonies that include a queen, drones and worker bees. The queen bee is the only female with fully developed ovaries and her primary role is to lay eggs and produce pheromones to maintain colony unity. Drone bees are mate with queen. And worker bees performs various tasks like foraging, caring of young bees and defending the colony from the enemies. They build the nests or hives in trees, shrubs or manmade structures. They collect nectar from flowers and converts it into honey which they stored as a food source for the colony. The study was conducted over a period of April 2024 to June 2024. The main objective of the study is to find out the common and available varieties of honey bees in and around the study area and to know the diversity of honey bee in the surrounding campus area.

Materials and Methods:

There was no previous study available on Honey bees species in and around G.S College Campus Khamgaon, So The present study was conducted over a period of April 2024 to June 2024 the main objective is to gather data on Honeybees in the study area and also to gain knowledge about the diversity of Honey bees living in and around campus area.



India Map (Source: Google) | Maharashtra Map (Source: Google)

Buldhana Map (Source: Google) | Khamgaon Map (Source: Google)

Plate No. I. Geographical Location of the Study Area.

There are several methods which are used for beekeeping these are as follows:.

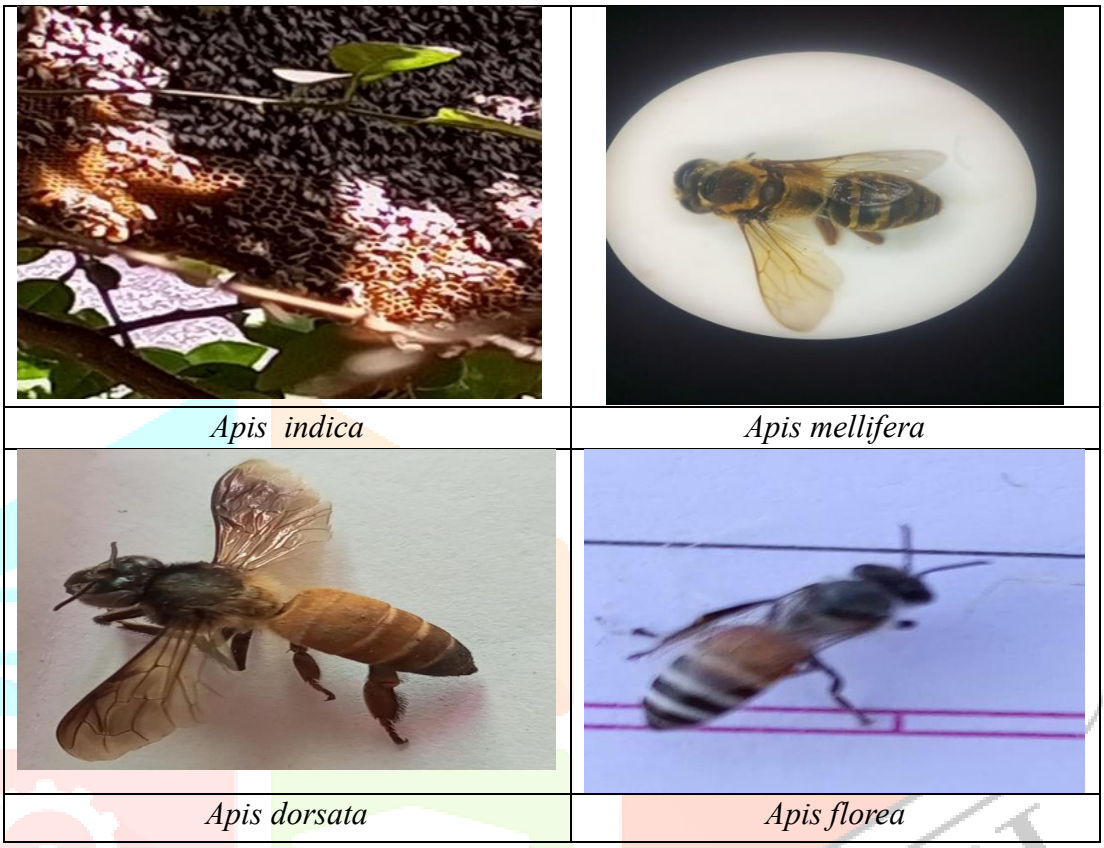
1. Bee Traps: these are used to attract bees into a container. They often use bait like sugar water or pheromones to lure the bees.

2. Smoking: use a smoker to calm the bees by producing a smoke that confuses them and prevent them from being aggressive.

3. Sugar traps: use a sugar bite to collect bees by attracting them to sugar solution and then collected them in a container.

4. Pitfall traps: a pitfall trap are systematically placed to cover all the area of college campus for capturing the species.

5. Photographic methods: We used photographic methods for the study purpose. Species were then identified and photographed with help of camera and species identification done at the genus level with help of various available literature, research articles, identification keys.



Apis indica | *Apis mellifera*

Apis dorsata | *Apis florea*

Plate No. II. Photographic collection of Honey bee Species.

Sr. No	Family	Genus	Species
1	Apidae	*Apis*	*A. indica*
2			*A. mellifera*
3			*A. dorsata*
4			*A. florea*

Table. No. I. Checklist of Honey Bees Recorded in the Study Area

Conclusion : The survey of Honey bees Order (Hymenoptera) was conducted from April 2024 to June 2024 in an around the campus area of G.S. College, Khamgaon. In the present study 4 species belonging 1 genus Apis and 1 family Apidae of Hymenoptera are recorded. Identification of species was done with the help of identification keys and existing literature.

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