

2024

**A PROJECT REPORT ON  
FIELD STUDY TOUR AT TINGRI,  
MANIPUR  
FOR THE STUDY OF THE LIFE CYCLE OF  
HONEY BEE, (*APIS CERANA INDICA*)**

**SUBMITTED BY –**

**Name -** \_\_\_\_\_

**ROLL NO -** \_\_\_\_\_

**REGD. NO -** \_\_\_\_\_

**B.Sc. 2<sup>nd</sup> SEMESTER**

**CORE COURSE – III: PRACTICAL: ZOO201-CP**

**UNDER THE GUIDANCE OF  
THONGAM BINAPATI DEVI (ASSOC. PROFESSOR)**



**LILONG HAOREIBI COLLEGE, LILONG  
DEPARTMENT OF ZOOLOGY**

## CONTENT –

- Certificate
- Acknowledgement
- Aim and Objective of the project work.
- Introduction
- Honey Bee (*Apis cerana indica*)
- Caste system
- Life cycle
- Photograph column
- Conclusion

# CERTIFICATE

TO WHOM IT MAY CONCERN



This is to certify that Shri/Md/Miss.....Mahiya Bogi.....  
..... B.Sc. 2<sup>nd</sup> semester bearing roll no - ....22102373.....

And Registration no - .....  
Of under Manipur University worked a project report "The study of the life cycle of Honey bee, Apis Cerana Indica" as a partial fulfillment of practical syllabus of B.Sc. 2<sup>nd</sup> semester core course - iii: practical: ZOO 201-CP for zoology department of Lilong Haoreibi College, Lilong.

He/She is not related to me.

TH. Binapati Devi  
04/03/24  
TH. Binapati Devi

Associate professor in zoology

Teacher in charge of project report

B.Sc. 2<sup>nd</sup> semester 2023 - 24

CORE COURSE - III Practical: ZOO 201-CP

Lilong Haoreibi college, Lilong

TH. BINAPATI DEVI  
Associate Professor (Zoology)  
Lilong Haoreibi College  
P.E. Dept. Govt. of Manipur

Dr. L. Sanahanbi Devi

Dr. L. Sanahanbi Devi

Associate professor and

HOD Zoology department

Lilong Haoreibi College

Lilong

Dr. L. Sanahanbi Devi  
Head, Department of Zoology  
Lilong Haoreibi College  
Government of Manipur



# ACKNOWLEDGEMENT

The Project work gives information of the magnificent of the study of different types of animals and their life cycle stages. The study of honey bee is one of the interesting field studies that their social behavior life cycle, caste system and production of honey. The production of honey by the honey bees is one of the important economic values to human beings.

I am greatly indebted to our faculty members of Zoology department, Lilong Haoriebi college, Lilong for their supervision and guidance of TH. Binapati Devi Associated Prof. in zoology department so as far her hard work and advices in the guidance and to Dr. L. Sanahanbi Devi, Associate Prof. and HOD of the zoology department for her supervision during the project work.

I am also thankful to all my fellow students who shared with me during the project work.

Yours faithfully,

Date: 4<sup>th</sup> - March - 2024

Place: Lilong

Name: Mahiya Bogi

Roll No. 22102373

B.Sc. 2<sup>nd</sup> Semester (Zoology)

Lilong Haoreibi College, Lilong

# INTRODUCTION

Project work being a part of the prescribed syllabus is compulsory for all students who are in B.Sc. 2<sup>nd</sup> semester (Zoology) practical core course - iii ,practical ZOO 201- CP. It is true that knowledge, we acquired hereby from the books is incomplete.

The study of animal kingdom in their own habitation in nature is one of the most interesting and useful study and gave us a very interesting knowledge than we learn from our classroom discussion. The study of honey bee, that bee keeping farm, social behaviour, life cycle and production of honey is also one of the most interesting for studying. The project work interdependence to me for the full knowledge of study. So, we cannot ignore either of the two i.e. natural habitation of animals and classroom discussions.



# AIM AND OBJECTIVES OF THE PROJECT WORK

The purpose of the project work to partial fulfilment for the prescribed syllabus of practical paper of B.Sc. 2<sup>nd</sup> Semester, Zoology, core course – iii practical: ZOO 201- CP by the Manipur University.

The aim and objective of the project work is "The study of the life cycle of honey bee, *Apis cerana indica* .

It is the study of the life cycle stages of the honey bee, social behaviour, caste system and production of honey.

So, we decided a field study tour programme at a beekeeping farm, Tingri(Manipur) for study of the Honey bee.

## TOUR DIARY

The field study tour programme of B.Sc. 2<sup>nd</sup> semester zoology department, Lilong Haoreibi college, Lilong, was arranged on 22<sup>nd</sup> January 2024 as one day tour programme at the Tingri Bee farm, Sub-division Iamsang, Imphal West, Manipur for the study of honey bee and its environment.

The tour was conducted under the guidance of Dr. A. Hei, Asst prof, MD Shahid Khan, Asst Professor, Th. Binapati Devi, Associate professor as officers in charge with the help of respective Principal Dr. Md. A. Sattar Shah and Dr. L. Sanahanbi Devi, HOD Zoology department, Lilong Haoreibi College.

The tour programme was launched with a nice group photosession with the principal, teachers, and students on the college ground and tour was started by bus from 10:00 am on 22<sup>nd</sup> January 2024 from the college ground towards Tingri bee farm, Imphal West, Manipur for one day tour programme.

An envisaged into new pattern of new education policy (NEP) to gain knowledge of zoology, field study tour becomes a part of the syllabus for B.Sc. 2<sup>nd</sup> Semester Zoology



## TINGRI VILLAGE OVERVIEW

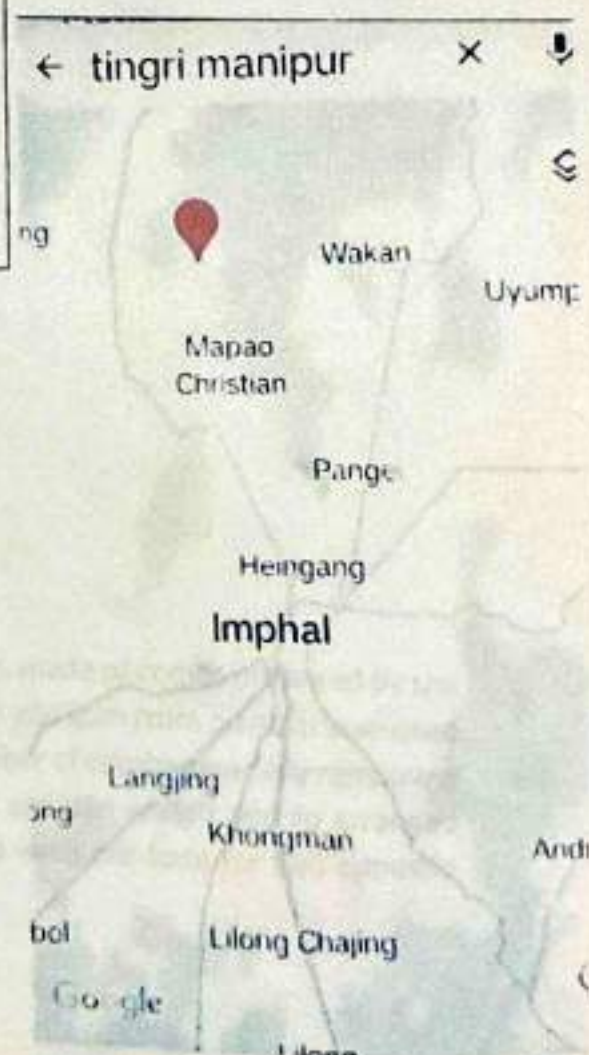
Tingri village is located in Lamsang sub-division of Imphal West District in Manipur, India. It is situated 19 km away from district headquarter Lamsang. Tingri is located in Imphal to Mapao Tangkhul Lambi road. The total geographical area of the village is 401.34 hectares, pin code 795136. Imphal is the nearest city to Tingri for all major activities, which is approximately 15 km away.

Nearby villages of Tingri –

Kanto, Khurkhul, Maharabi, Awang Leikanthabi, potshangbam khunou, Thouriphai, Konsakhul, Senjam Khunou and Loitong khunou.

Tingri village area is one of the suitable place for bee farm because the village is located nearby the hilly range are and rich in vegetation of flowering plants and trees in its environment. So, the place is most availability of foods of bees and more productivity of honey.





Tinori - Manao Tanokhul

### **HONEY BEE (Apis)**

Apis (Honey bee) is a social insect living in colonies of 50,000 or more individuals. Honey bees are mostly vegetable feeders preferably living on pollen and nectars of flowers. The Larvae which have no legs are helpless and are fed by the nursing workers of the colony upto their pupation time. The adults chiefly live upon honey, while the young ones are given pure pollen or pollen mixed with honey and water to form a paste called bees-bread.

Although these insects thrive best in gardens and forests, yet they have noticed lapping the honey dew of some plants bugs and also seeking sugar from places other than flowers. Honey bee lives in a highly organized colony wherein a perfect corporate life under discipline is exhibited. Excellent division of the society in view, make the life very harmonious and extremely busy.

### **APIS SYSTEMATIC POSITION**

Domain – Eukaryota

Kingdom – Animalia

Phylum – Arthropoda

Class – Insecta

Sub class – Pterygota

Order – Hymenoptera

Family – Apidae

Genus – Apis

Species – cerana

Sub species – indica

### **BEES – HIVE**

The Indian honey bees are already stated live in hives, made of combs prepared by the workers with the help of wax secreted by them. Resin and gum from plants is also used for repairs on the hive. Each hive is made up of a number of combs generally remaining parallel to each other on a common base. The cells are thin-walled and so arranged that each side-wall serves for two adjacent cells and each cell-base for two opposite cells.



The worker-cells, where workers are reared and honey is stored, are about 5mm across, and the drone cells 6mm across, serve to rear drones and for storage. Large vertical peanut – like queen cells, open below, are built along the lower comb margins for queen rearing. The combs keep a vertical plane, while the cells are horizontal position. There are no special cells for lodging the adults which generally keep clustering or moving about on the surface of the comb. The cells are mainly intended for storage of honey and pollen specially in the upper portion of the comb, while those in the lower part for brood rearing.

### **BEES-WAX**

The worker bees secrete wax from glands situated in the abdomen. The secretions is exceeded between the segments of the underside of the abdomen and scales of wax can be noticed as a result of hardening of this secretion. These scales are detached from the body by the setae of tarsi and passed onwards to the mouth, wherein they are chewed and made plastic to be used in building the comb walls. This wax is isolated and forms an important base for an important industry concerned with the manufacture of toilet goods and cosmetics. A large quantity is utilized in pressing comb foundations and returned to the bee-hive wherever artificial methods of rearing is carried out several thousand mounds bees-wax is used in preparing candles, shaving creams, cold creams, cosmetics, polishes, casting of models, carbon paper, crayons, electrical and other products.

### **HONEY**

Honey bees require forty to eighty thousands trips to visit several times the number of flowers for collecting one Kg of honey. Honey is a very nutritious. It contains 40% sugar.

#### **Composition of Honey –**

- i) Levulose – 38.10 %
- ii) Dextrose – 2.28 %
- iii) Maltose – 8.81 %
- iv) Enzyme – 2.21 %
- v) Ash – 1.00 %
- vi) Water – 17.20 %

Honey is used as a rich food and medicine.

i) **As food** –

About 200 g of honey is said to be equivalent to 9.15 liters of milk or 1.6 Kg butter or 330 g meat.

Its sugar, minerals, vitamins can easily assimilated in the body. It can be used in all seasons and

by all persons of different ages. It can be used in the preparation of cakes, bread, candy, etc. It is very good for patients.

ii) **As medicine** –

Honey is used in Unani and Ayurvedic treatments. It acts as a laxative, sedative and antiseptic. It

can be used in cough, cold, fever. It purifies blood and helps in the synthesis of haemoglobin.

It is useful in ulcers of alimentary canal, indigestion and under nourishment. It use destroys

typhoid bacteria in 48 hours. By using honey dysentery can also be cured within 48 hours.





# LIFE CYCLE OF THE HONEY BEE

## Three Castes of Bees in a Colony

The colony has a queen, the queen lays the eggs, and the colony works to raise the queen.

## Three Castes of Bees in a Colony

- A honey bee colony is an organized society of three adult castes of bees.

- Queen,
- Workers, and
- Drones.

- Each caste has its own certain special responsibilities for the ongoing operation, maintenance and preservation of the colony.



**Queen**



**Worker**

Female



**Drone**

Male

### **Three Castes of Bees in a Colony**

Two castes are female, the queen and the worker, and only one caste is male, the drone.

## **Three Castes of Bees in a Colony**

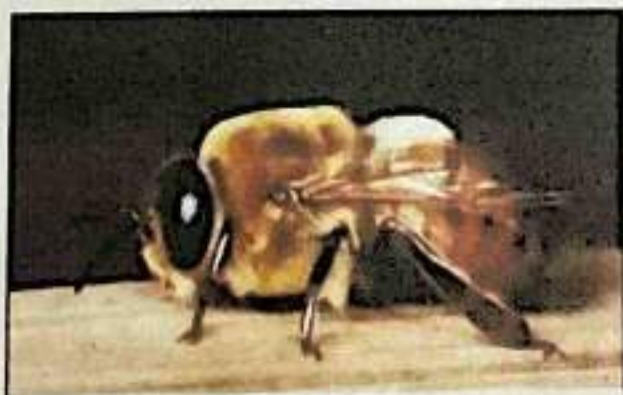
- A honey bee colony is an organized society of three adult castes of bees:
  - Queen,
  - Workers, and
  - Drones.
- Each caste has its own certain specialized responsibilities for the ongoing operation, maintenance and preservation of the colony.



## Queens



- Queens, responsible for producing and laying eggs, live an average of 2-3 years, but some can live up to 5 years.
- Domesticated queens may die earlier, as beekeepers "re-queen" the hives frequently.
- A single queen can potentially lay millions of eggs throughout her life.



## Drones

- Queens also produce unfertilized eggs that hatch into drones, or male honey bees.
- The sole purpose of drones is to mate with a queen, and their life span relates directly to this task.
- Should a drone succeed in mating, he soon dies because his penis and the associated abdominal tissues are ripped from the drone's body after sexual intercourse.
- If he is unsuccessful in the mating flight, the drone will be ejected from his hive at the end of the active summer season and will eventually die of cold or starvation.



## Workers



- Worker bees are the smallest members of the colony, but they comprise the largest number:
  - A hive can contain from 20,000 up to 80,000 workers.
- The life span of worker honey bees ranges from **five to seven weeks**, during their active spring and summer months.
- The first few weeks of a worker's life are spent working inside the hive as house bees, while the last few weeks are spent outside the hive as field bees, foraging for nectar and pollen.

### THE LIFE CYCLE OF A BEE



### The Four Stages of Metamorphosis

Honey bees go through four stages, from egg to adult.



## Egg Stage



- The first stage of physical development in the life cycle is the egg stage.
- The queen determines, each time, whether she will lay a fertilized or an unfertilized egg, based on the cell size.
- Eggs are very minute and have the appearance of grains of rice in size, shape and color.
- Hatching of the egg normally occurs after **three days** from the egg being laid.

- Generally lasts up to ten days.

## Larval Stage



- Larvae are fed on a diet known as royal jelly for the initial 2 days.
- Royal jelly is produced by the hypopharyngeal gland in the head of the workers.
- As the 3rd day progresses, larvae destined to develop into queen bees continue to be fed on royal jelly, while worker larvae feed on honey, pollen and water.
- Larval stage duration:
  - Queen: **5.5 days**,
  - Worker: **6 days**
  - Drone: **6.5 days**.



## Pupal Stage



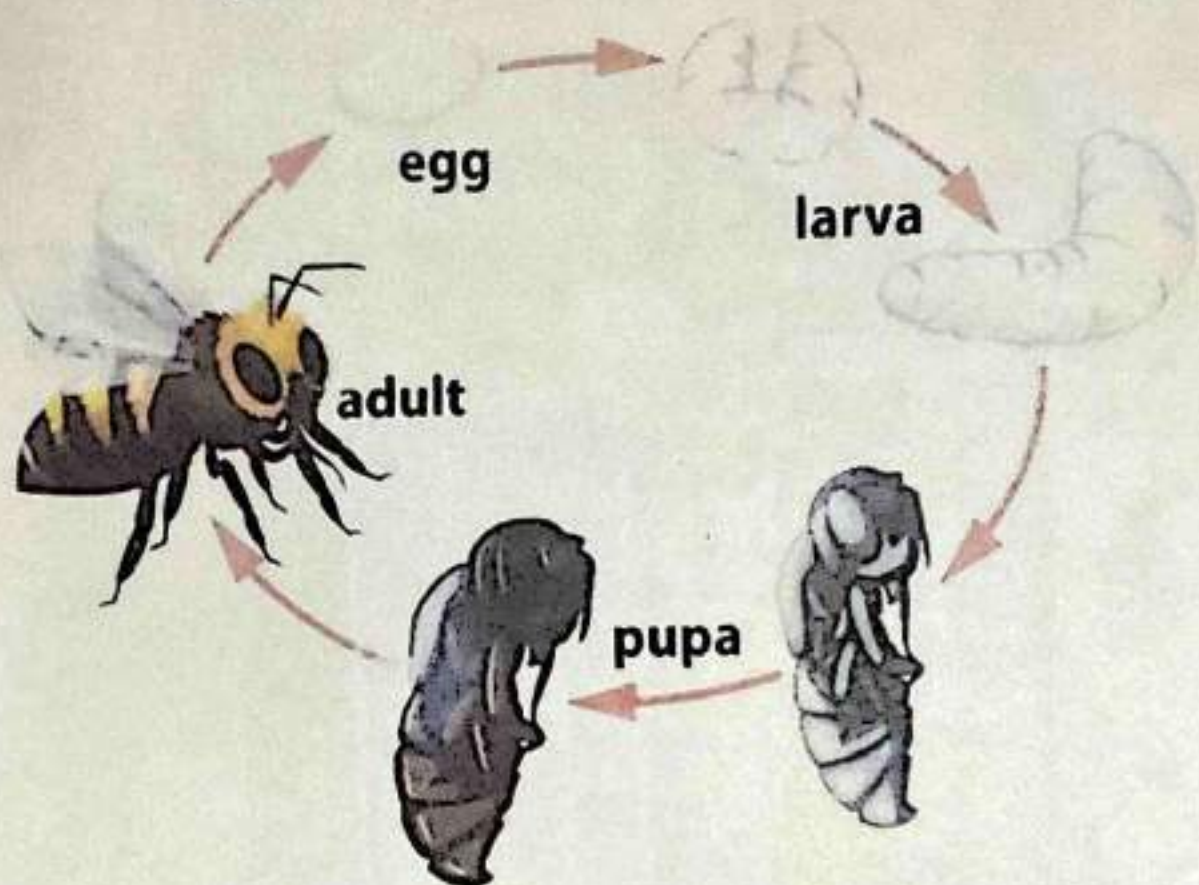
- Massive reorganization of bodily tissues takes place during the pupal stage.
- The worm-like body has now three distinct parts:
  - Head,
  - Thorax, and
  - Abdomen
- This stage usually lasts for:
  - 7.5 days for the queen,
  - 10 days for the worker, and
  - 14.5 days for the drone.


## Adult Stage

- All three castes of bees are now fully mature and they are ready to accomplish their biologically pre-determined tasks.
- A typical colony of honey bee consists of:
  - 50,000 to 60,000 worker bees,
  - 600 to 1,000 drone bees, and
  - Only 1 queen bee (ordinarily).



# Life Cycle of a Honeybee

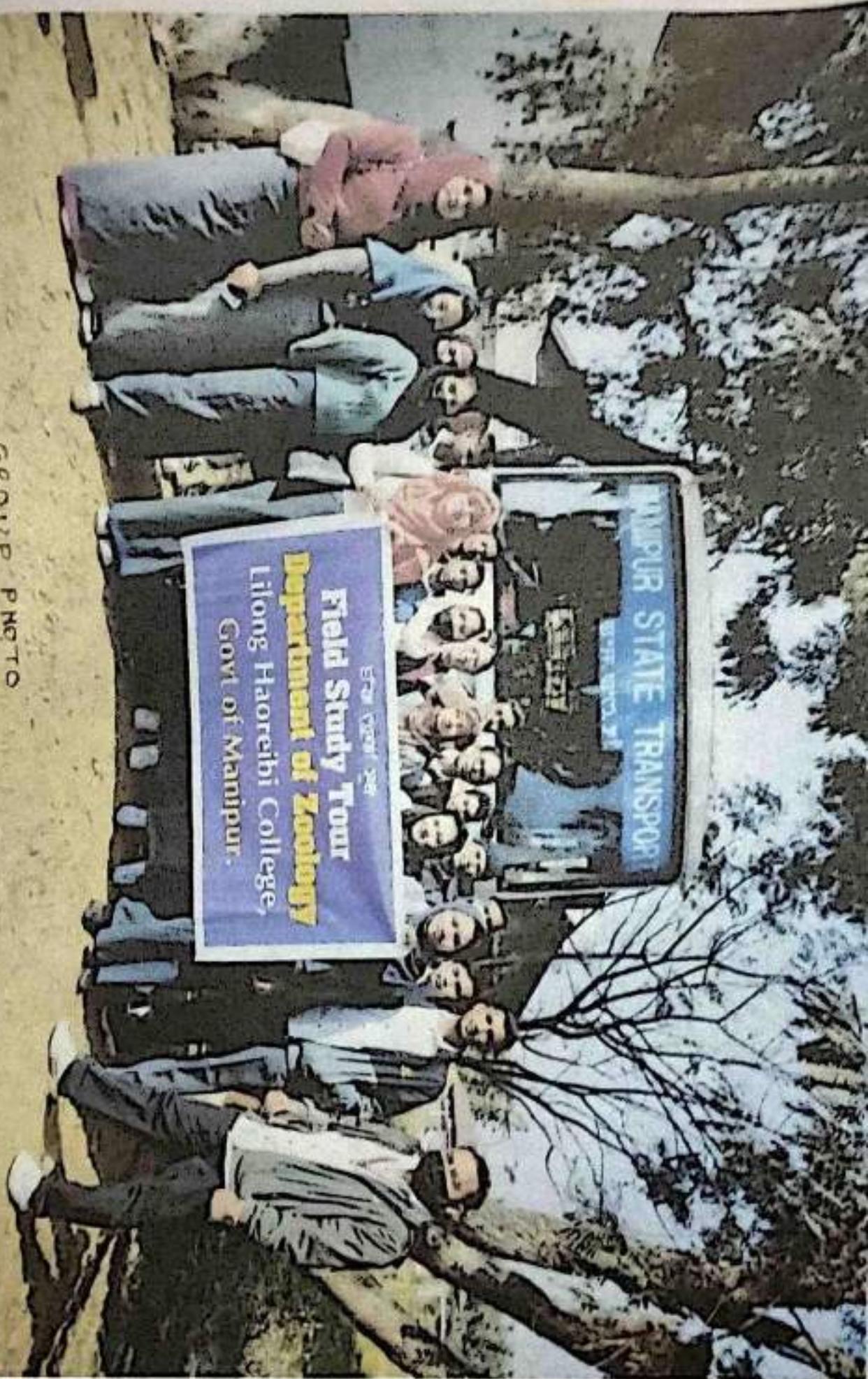


 Dreamstime.com

INDIAN HONEY BEE.  
S.N. — APIS CERANA INDICA.



GROUP PHOTO

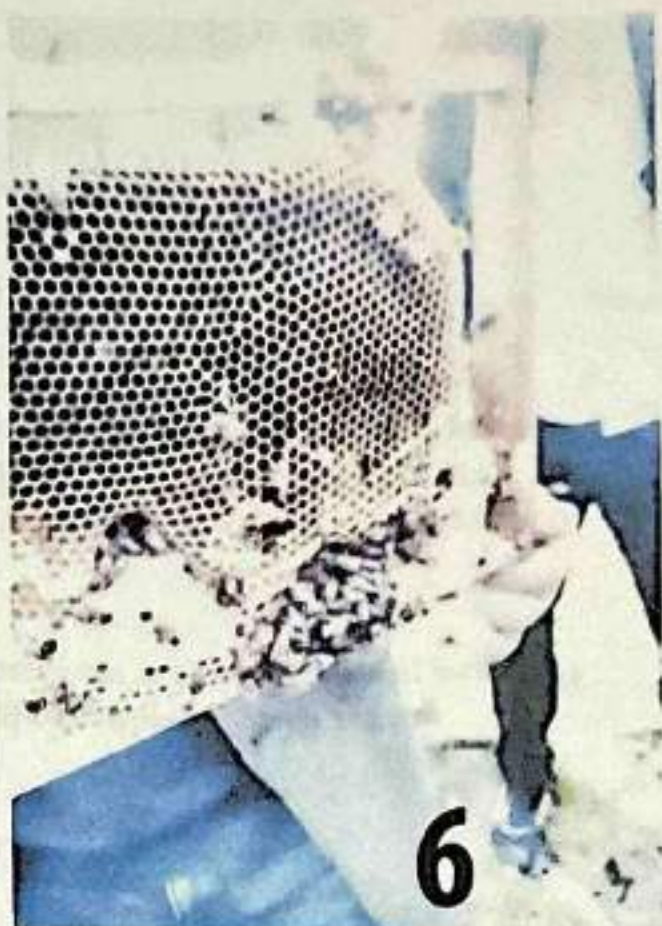






1 - TINGRI BEE FARM  
2 - BEE KEEPING BOX  
3 - BEE BOX TRY TO OPEN  
4 - BEE CHAMBER





5-BEE CHAMBER WITH BEES  
 6-HONEY COMB  
 7-HONEY  
 8-HONEY CONTAINER



## CONCLUSION

The study of this project report helps us to know the study of the social behavior, caste system and the life cycle stages of honey bee, *Apis cerana indica* (Indian Honey bee). The study of this report also helps us the knowledge of the production of honey by the honey bee.

This study of this project report of honey bee and the production of honey helps us to a new knowledge about the different types of animals and its environment.