Shri shivaji Education Society's,
MAHASATEE ARTS,COMMERCE& SCIENCE COLLEGE,ULGA,KARWAR DEPARTMENT OF ZOOLOGY

ADD ON CERTIFICATE COURSE IN APICULTURE

LAST DATE FOR ENROLLMENT

20-10-22

Bees are responsible for pollinating around 1/3 of the world's crops, including fruits, vegetables, and nuts. Without bees, many of these crops would not be able to reproduce, resulting in food shortages and economic losses.

ಶ್ರೀ ಶಿವಾಜಿ ಶಿಕ್ಷಣ ಸಂಸ್ಥೆಯ
ಮಹಾಸತಿ ಕಲಾ,ವಾಣಿಜ್ಯ ಹಾಗೂ ವಿಜ್ಞಾನ ಮಹಾವಿದ್ಯಾಲಯ ಉಳಗಾ,ಕಾರವಾರ-581328
ನ್ಯಾಕನಿಂದ "ಬಿ". ಮಾನ್ಯತೆ ಪಡೆದಿದೆ

ShriShivaji Education Society's,
MAHASATEE ARTS,COMMERCE& SCIENCE COLLEGE,ULGA,KARWAR,
Uttar Kannada,Karnataka-581328
Accredited by NAAC with "B" Grade
Phone:08382-257033 E-mail:sesmahasateeuk@gmail.com Website:www.sesmacs.co.in

Date:17/10/2022

STUDENTS NOTICE

This is to inform all the students of B.sc that Department of zoology is conducting an Add-on Certificate course on "**APICULTURE**" from 21-10-2022

Interested students should immediately contact prof. Priyanka D. Naik, HOD of zoology on or before 21-10-2022 for detail regarding Syllabus and course details.

PRINCIPAL
MAHASATEE ARTS,
COM. & SCI. COLLEGE
ULGA, KARWAR - 581 3[illegible]

ಶ್ರೀ ಶಿವಾಜಿ ಶಿಕ್ಷಣ ಸಂಸ್ಥೆಯ
ಮಹಾಸತಿ ಕಲಾ,ವಾಣಿಜ್ಯ ಹಾಗೂ ವಿಜ್ಞಾನ ಮಹಾವಿದ್ಯಾಲಯ ಉಳಗಾ,ಕಾರವಾರ-581328
ನ್ಯಾಕನಿಂದ "ಬಿ" ಮಾನ್ಯತೆ ಪಡೆದಿದೆ

ShriShivaji Education Society's,
MAHASATEE ARTS,COMMERCE& SCIENCE COLLEGE,ULGA,KARWAR,
Uttar Kannada,Karnataka-581328
Accredited by NAAC with "B" Grade
Phone:08382-257033 E-mail:sesmahasateeuk@gmail.com Website:www.sesmacs.co.in

ADD ON CERTIFICATE COURSE IN APICULTURE2022-23

Syllabus

COURSE Periods: -30 hrs THEORY: Max. Marks: 60 Marks

UNIT 1

History of bee keeping: Definition, Bee keeping in worldwide, In India. Traditional bee keeping, Modern beekeeping, Urban or backyard beekeeping. - 07 hrs

UNIT 2

Honey bee species and identification: Introduction to honey bee; Origin, systematics and distribution; Types of honey bees, Species of honey bees. Bee identification. 07 hrs

UNIT 3

Social organization in honey bees: Colony life and social organization – Queen, drone, worker. Annual biological cycle op the bee colony. Role of Central Honey Bee Research & Training Institute. 07 hrs

UNIT 4

Bee products – An introduction, honey, pollen, royal jelly, bees wax, propolis & venom, Significance of bee products.

Value added honey products. Properties of honey products, Nutrients and composition of honey, Acid content and flavor effects. Types of value added honey products.-09

.Practical course 40 Marks

- Morphology,Anatomy, Bee behavior & management
- Practical 1- Morphology and anatomy of honey bee
- Practical2- Colony organization, division of labour and life cycle
- Practical 3- social behaviour of honey bees
- Practical 4- Bee keeping equipment
- Practical 5- Handling of honey bees colony, maintainance of apiary record.
- Practical 6- Seasonal management

PRINCIPAL
MAHASATEE ARTS,
COM. & SCI. COLLEGE
ULGA, KARWAR - 581 329

Course outcomes

1. The learner understands the basics about beekeeping tools, equipment, and managing beehives.
2. To understand the basic life cycle of the honeybees, beekeeping tools and equipments.
3. To learner for managing beehives for honey production and pollination.
4. The course is usefull for providing self employment to learner.
5. The bee keeping is use full in pollination of the flora.
6. Learner will understand the marketing of various bee products.

PRINCIPAL
MAHASATEE ARTS,
COM. & SCI. COLLEGE
ULGA, KARWAR - 581 32

Shri Shivaji Education Society's,

MAHASATEE ARTS,COMMERCE& SCIENCE COLLEGE,ULGA,KARWAR,

Uttar Kannada,Karnataka-581328

Accredited by NAAC with "B" Grade

Phone:08382-257033 E-mail:sesmahasateeuk@gmail.com Website:www.sesmacuk.ac.in

List of students enrolled for "APICULTURE" Add-on Certificate course 2022-23

SL.NO.	ULCMS NO.	NAME OF THE STUDENTS	CLASS	SIGNATURE OF THE STUDENTS
1	U02JS21S0001	Santosh K.Gavada		
2	U02JS21S0002	Swati U. Kankonkar		
3	U02JS21S0003	Pooja P. Pagi		
4	U02JS21S0004	Rahul D. Naik		
5	U02JS21S0005	Roshan S. Bandekar		
6	U02JS21S0006	Shivanand K.Achari		
7	U02JS21S0007	Pranay R. Naik		
8	U02JS21S0008	Yogesh A.Gavada		
9	U02JS21S0009	Ankush A.Gavada		
10	U02JS21S0010	Saya S. Kankonkar		
11	U02JS21S0011	Santosh D. Padwalkar		
12	U02JS21S0012	Sneha P. Rane		

13	U02JS2150015	Anuprerana N. Gawagi	B.Sc. II	
14	T02JS2150016	Siddhi S. Gonda	B.Sc. II	
15	T 02JS2150017	Sushma R. Gaonkar	B.Sc. II	
16	T.02JS2150018	Rashika E. Kutherkar	B.Sc. II	
17	T02JS2150019	Vaibhav V. Devdas	B.Sc. II	
18	T.02JS2150020	Amit A. Talekar	B.Sc. II	
19	U02JS2150021	Pratiksha S.Kamlekar	B.Sc. II	
20	U02JS2150022	Aishwarya A. Pednekar	B.Sc. - II	
21	U02JS2150023	Rohit R. Bandekar	B.Sc. - II	
22	U02JS2150024	Manali S. Naik	B.Sc. II	
23	U02JS2150025	Sanchita S. Manjrekar	B.Sc. II	
24	T02JS2150034	Gaurav K. Malewadkar	B.Sc. II	
25	T02JS2150035	Gourish R. Kothavkar	B.Sc. II	

Head of the Department
of Zoology
(Postgraduate Wing)

PRINCIPAL

MAHASATEE ARTS, COMMERCE & SCIENCE COLLEGE

ULGA, KARWAR (U.K)

A PROJECT REPORT

APICULTURE

MAHASATEE ARTS, COMMERCE & SCIENCE COLLEGE ULGA, KARWAR (U.K)

FIELD ORIENTED PROJECT REPORT ON APICULTURE

DEPARTMENT OF ZOOLOGY

2022-23

B.Sc V Sem

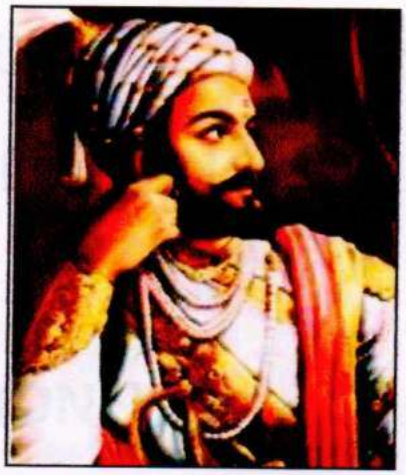
.....

UNDER THE GUIDENCE OF NAME OF PROF: PRIYANKA NAIK	SUBMITTED BY: PANKAJ R. GAONKAR REG NO. 20S17714

KARNATAKA UNIVRSITY DHARWAD

MAHASATEE ARTS, COMMERCE & SCIENCE COLLEGE

ULGA , KARWAR



CERTIFICATE

This is to certify that the Pankaj Gaonkar student of B.Sc V Sem course as satisfactory completed the project report on APICULTURE prescribed by Karnataka University Dharwad during the year 2022-23.

Date: 6/2/23

Valued Examiners

1) _____ 06/02/23

2) _____ 6/2/23

Staff In Charge

Head of the Department

H.O.D. of Zoology
M.A. Mahasatee College
Ulga, - Karwar (N.K.)-581 328

CONTENT

INTRODUCTION

Bee-Keeping on bee rearing is called Apiculture It is a very useful pastime and is known to have been adopted since times immemorted This practice Is still very common in the hills but their methods are very crude and unscientific .At night. burning torches one brought to the hive Thus unnecessary several honey bees one killed The combycare then removed and Squcezed for honey The honey thus extracted Is hardly pure because during Squeezing Serval Bees, larva and pupae one also squeczed. The Discovery of the Principle of MovableFrame Hive in 1851 by one rev.l l. Lang Stroth The "Honey Extractor" 1865 by major Hruschka and one smoker In 1870 by moses quln revolutionized bee keeping Now a days different kinds of artificial hives with movable frames have been introduced in which facilities for comb-making by the bees one provided Among social insects the honey bees has been most intimately associated with mankind and has reached the highest degree of domestication Bee-Keeping, therefore has developed into as important an industay as in western countries It Is still a cottage industry in India,bee keeping has not developed into as important an industry as in western Countries .It is still a collage Industry in India In Kerala (1917) the Travancore State authorities. showed interest in the modern methods of bee-Keeping. Honey bees and their products are very useful to man .Honey and bees-wax are the two useful products .Besides, one honey bees do great service in pollinating flowers .Bee venom secreted by the poison. Glands of stings have one mysterious quality of bearing muscular and ached of arthritis: Honey bees one active almost throughout one year under south Indian conditions .But during cold winter days they do not attend to any work Instead they remain clustered together in the hive them by increasing the hive temperature. The bees in a colony have a hive mind and live together by the hive odour peculian to each hive .There is close Co-operation and understanding among the different members of the colony.

HONEY BEE SPECIES

Apics indica

Scientific dassification:

Kingdom - Animalia
Phylum- Arthropodal
Class- Insecta
Order- Hymenoptera
Family-Apidae
Genus –Apis
Species - A.cerena
Sub species - A.c.indica

Commonly Found in forest and plain regions of India. This is slightly smaller then A. Dorsata they prefer to live in dark places and construct several parallel combs. Protected places like Cavities of tree trunks, Mud walls, and earthen pot,. Walls of the buildings. The production of honey is much less 1.e,6 to 7 pound per comb

Apis florae

Scientific Classifications:

Kingdom -Animalia
Phylum -Arthropoda
Class- Insecta
Order- Hymenoptera
Family-Apidae
Genus- Apis
Species- florae

This is smaller than Apis indica and yields very small amount of honey. The bees are not of gregarious nature and form a single comb. Combs can be removed easily for the honey extraction.

Social organisation of honey bee:

A good and wel developed colony of bees had 40 to 50 thousand individuals: consisting of 3 castes Queen, Drone and worker.

Queen:

It is a well developed fertile female provided with immensely developed ovaries commonly one queen is found to be present in each hive and feeds on royal jelly. Egg laying is the sole function of the queen thought her active life span. The queen is 15 to 20mm in length and can be easily distinguished her long tapering abdomen short legs and wing. Queen gets mated only once in her life but in a single chance of mating drone releases 2 crore sperms which are sufficient for the fertilization of the eggs. One queen lays about 1,500 to 2,000 eggs in a day depending upon the seasonal variations and other ecological factor.

Workers:

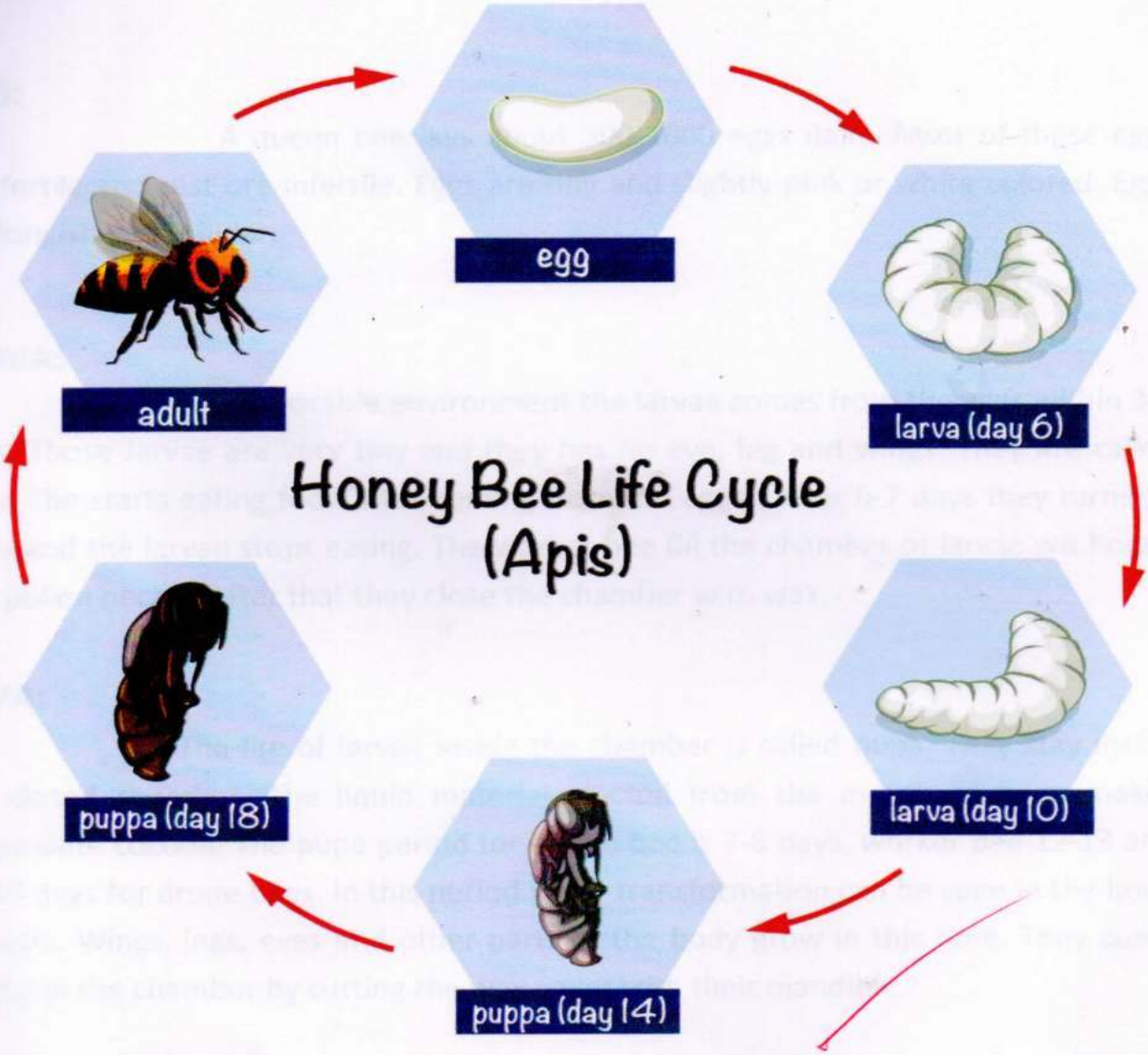
It takes 21 days in the development from the egg to the adult and the total life span of a worker is about 6 weeks. The total indoor and outdoor activities of the colony are performed by the workers only.

1) Long proboscis for sucking the nector.
2) Strong wings for fanning.
3) Wax gland for wax secretion.

Drone:

The drone is the male member of the honey bee colony which fertilizes the queen son called as "King" of the colony. They take 24 days to develop from the egg to the adult stage. The sole duty of the drone is to fertilize the virgin queen. At the time of swarming the drone follows the queen copulates and dies after copulation.

LIFE CYCLE OF HONEY BEE



FERTILIZATION:

The lifecycle of a honey bee consists of three main stages: the larval, pupal, and adult stages. Within a normal hive situation, a single queen bee lays fertilized and unfertilized eggs.

EGG:

A queen bee lays about 300-1000 eggs daily. Most of those eggs are fertile and rest ore infertile. Eggs are tiny and slightly pink or white colored. Eggs are longish and tubular.

LARVA:

In favorable environment the larvae comes from the eggs within 3-4 days. Those Jarvae are very tiny and they has no eye, leg and wings. They are called grub. The starts eating food after coming from the eggs.. After 6-7 days they turned t pupa and the larvae stops eating. The worker bee fill the chamber of larvae wit honey and pollen nectar. After that they close the chamber with wax.

PUPA:

The life of larvae inside the chamber is called pupa. They stay inside the closed chamber. The liquid material ejected from the mouth of pupa makes incomplete cocoon. The pupa period for queen bee is 7-8 days, worker bee 12-13 and 14-15 days for drone bees. In this period many transformation can be seen in the body of pupa. Wings, legs, eyes and other parts of the body grow in this time. They come out from the chamber by cutting the wax cover with their mandible.

ADULT :

The pupa turned out to mature or adult bee from inside the cocoon. A bee becomes adul through modification. It takes about 20 days to turn from pupa to adult. After tha they stay in the hive for 2-3 weeks. An adult bee survive for a certain period. A queen be survives about 3-5 years, drone 1-3 years and the worker 2-3 months.

MODERN METHOD OF APICULTURE

To overcome the drawbacks of indigenous method advanced method based on scientific facts has been developed. It has opened a new era for the cottage industry in India and has also given an opportunity for lacks of unemployed persons to keep them busy in business. From this cottage industry programme the routine agricultural work may not suffer. First of all care was taken to improve the texture of the hives and during this race hive patterns were introduced in India. The Newton model with 7 to10 frames (21 x 14.5 cm) in the brood chamber with a shallow super (21 x 6.5 cm sized frames) has been most popular in south, east and central India .Longs troth hive containing 8 frames (44.8 X23cm) has been used has a standard hive in Himachal Pradesh. Jammu & Kashmir,& Punjab .In Uttar Pradesh another type of hive has been in used which was evolved at jeolikote apiaryn and contained 8 frames (30x18cm). After gaining experience from the above mentioned hives Indian Standard Institute has standardized the hives of small and big sizes accommodating frames 21 x 14.5cm and respectively.

TYPICAL MOVABLE HIVE

An artificial movable hive is constructed by wooden box based on bee's base theory. The size and number of frames is variable from hive to hive according to the need. A small space is enough to permit the entrance and exit of workers and drones but queen one placed in hive never comes outside the hive, the perforation size on zinc sheet is only of cm but the thorax of the queen is 0.43 cm to 0.45 c, so the queen can never pass through this pore. This typical hive consists of 6 parts as given below:

(a) STAND:

It is the basal part of the hive on which the whole hive is constructed .The stands are adjusted to make slope for the hive .Due to this slope rain water comes down quickly.

(b) BOTTOM BOARD:

It is situated above the stand and forms the proper base for the hive having two gates in the front position .One gate functions as an entrance while the other as exit.

(c)BROOD CHAMBER:

The bottom board caries the brood chamber which is the most important part of the bee hive .It is the large in size provided with 5 to 8 frames In each frame a wax sheet bearing hexagonal frames is held up by a couple of wires in a vertical position.

(d) SUPER:

It is also without cover and the basin super is provided with many frames containing comb foundation to provide additional space for expansion of the hive.

(e) INNER COVER:

It is a wooden piece used for the covering of this super it has many holes for proper ventilation.

(f) TOP COVER:

It is meant for protecting the colony from rains. It is fitted with zinc sheet which is plain and sloping.

HONEY EXTRACTING MACHINE

A honey extractor is a mechanical device used in the extraction of honey from honeycombs. A honey extractor extracts the honey from the honey comb without destroying the comb. Extractors work by centrifugal force. A drum or container holds a frame basket which spins, flinging the honey out. With this method the wax comb stays intact within the frame and can be reused by the bees. Bees cover the filled in cells with wax cap that must be removed (cut by knife, etc.) before centrifugation.

BY PRODUCTS & ECONOMIC IMPORTANCE OF HONEY & BEESWAX

The chief products of bee keeping industry are

1. HONEY **2. BEES WAX**

Honey:

It is truly an insect product of high nutritive value. The food value of Honey may be estimated by the presence of about 80% sugar in it.

PRODUCTION OF HONEY:

One should not be confused that honey is a direct plant product because the nectar. Pollen and cane -sugar bearing secretions of flowers are ingested by honey bees, get mixed with the saliva and undergo certain chemical changes due to enzyme action At this stage cane-sugar (sucrose) is converted into invert sugars i.e. dextrose and levulose .At this very time some ingredients of bees are also added to the mixture and reduce the water content .The whole mixture is then collected in the honey sac (crop) until the honey reaches the hive .As the honey bee reaches the hive this compound is regurgitated in the hive cell and his known as the honey. Now honey is concentrated by a strong current of air produced by the rapid beating of worker's wings, crawling over the cells. Honey is very much sweet in taste and white to black in colour with variable smell in accordance with the juices collected from different flowers.

CHEMICAL COMPOSITION OF HONEY

Honey is sugar rich compound having the following constituents.

1. Levulose	:	38.9%
2. Dextrose	:	21.28%
3. Maltose & other sugar	:	8.81%
4. Enzymes & Pigments	:	2.21%
5. Ash	:	1.0%
6. Water	:	17.20%

ECONOMIC IMPORTANCE OF HONEY:

- It is used as a source of natural sweets for preparing cakes, breads, biscuits etc.
- It is also used in the production of powerful tonics and syrups.
- Honey has a great medicinal value. It is a mild laxative, antiseptic and sedative.
- In helps in the formation of haemoglobin in anemic patients.
- It prevents cough, cold and fever.

Beeswax:

Beeswax is a very useful by product of bee keeping industry. It is yellowish to grayish brown in colour and insoluble in water but completely soluble in ether commonly it is a wrong impression to suppose that honey bees convert the pollen in to beeswax because beeswax is also a natural secretion of the worker bees and is poured out in thin delicate scales or flakes. Chibnall (1934) has reported that all insect waxes are complex mixture of varying proportions of:

1. Even numbered alcohols ranging from C24 to C36.
2. Even numbered normal fatty acids from C24 toC34, and
3. Odd numbered normal paraffin's ranging from C23 to C37

The various beeswaxes differ only due to change in the proportions of these constituents Large quantities of beeswax produced and exported come from beeswax in order to facilities its export.

ECONOMIC IMPORTANCE OF BEES WAX:

- Bee wax is very useful by-product of Bee keeping industry.
- It is yellowish to grayish brown in colour.
- It is insoluble in water and completely soluble in ether.
- Bee wax is used in manufacture of cosmetic for Catholic Church, face cream, paints, insulation, plastics, polishers, carbon paper and many other lubricants.
- It is also used in laboratory for lock preparation of tissue.
- It is also said to have medicinal importance

BEE ENEMIES

Wasp

Bee eater

King Crow

Wax Moth

Black Ant

Enemies of the bees harm the colony in different ways so they have attracted considerable attention in the different regions of the country .The wax moths (Galleria mellonella and Achroia grisella,) Wasp Wespa spp.and palarus sp)black ants (Componotus) and bee eaters (Merops orientalis] and kinggerow (Dicrurus macrocercus) are common enemies of the honey bee's comb and honey .Man is the last but worst enemy of honey bees.

Before 1958 bees were considered to be free from the diseases though suspected cases of NOSEMA from punjab and kashmir were known .But a parasitic mite -Acarapis woodi Rennie caused Acarine disease in the adult honey bee in Kulu valley in punjab in 1956 It was later reported from Himachal Pradesh Uttar Pradesh and Jammu and kashmir This disease was controlled by the scheme in co-operation with United States of America at the college of Agriculture Ludhiana Punjab Now a days Indian honey bees are commonly free from any such disease Astrict quarantine measure is being taken to check the spread of any disease from foreign countries. But in European countries bees are commonly attacked by Microsporadian which is injurious.

BEE DISEASES

DISEASES OF HONEY BEES

There are a number of diseases which affect the honeybee in India. Of the major diseases which affect honeybee are the Acarine and Noserna diseases of the adult bees and the brood diseases of larval stages.

1. **NOSEMA DISEASE:**

This disease is caused by a protozoan, Nosema apis. The Nosema infestation leads to dysentery. The flies are unable to fly and void loose excreta on the combs, frames and ground in front of the hive. It mainly affects the flight during cold weather. An antibiotic known as Fumagillin is useful in controlling the infection. The drug is administered by giving a feed of 100 mg fumagillin per colony in 250 ml of sugar syrup for 10 days continuously.

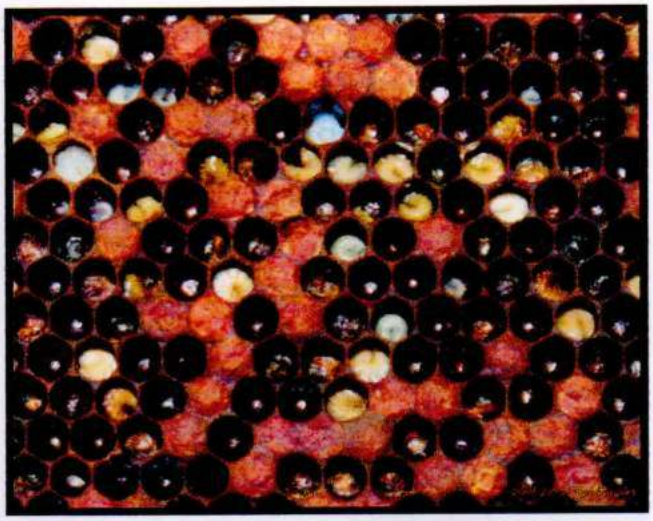
2. **BROAD DISEASES:**

Honey bee broods suffer from variety of diseases. Loss of brood affects the colony strength. Adult bees are not affected by brood diseases but they can spread the casual organisms. Brood diseases are more serious than adult diseases. Brood diseases of bees are described below,

a. European foul-brood
b. Sac foul-brood
c. Thai Sac brood virus (TSBV)
d. Chalk foul-brood and stone brood disease

These brood diseases, the European foul-brood disease and the Thai Sac-brood disease are common in India.

A. EUROPEAN FOUL-BROOD DISEASE STREPTOCOCCUSPLUTON:



This disease was first noticed in Mahabaleshwar and is now widespread. The disease is believed to have been introduced along with Apis mellifera imported from exotic sources. The disease is caused by non-sporeforming bacterium, Streptococcus pluton along with Bacillus alvei as secondary invader. The disease affects larvae of all castes. The symptoms are: the larvae turn watery, yellow then brown and lastly dark coloured. The tracheal system becomes visible and larva dies in a coiled stage causing foul smell. In advanced stages, a hempy non-elastic thread is formed. Dead larvae are usually found in un kept cells with no predominant odour.

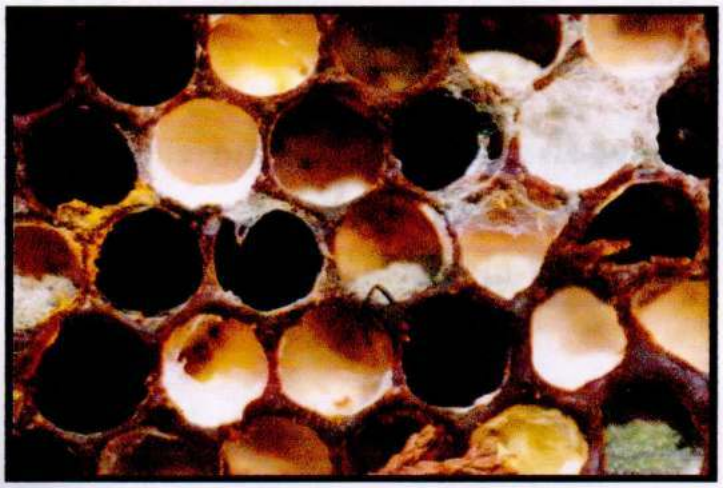
B. SAC-BROOD DISEASE (SBV)

Sac brood is a virus disease attacking The diseased larvae appear sac like and hence the name. But so far this disease is not reported in India.

C. THAI SAC BROOD VIRUS (TSBV):

The causative agent is Thai Sac-brood virus. This virus attacks specifically Apis corona indica. The dead brood is found in propupal but sealed stage. The pupae turn into sac-like structures filled with lemon-coloured liquid at the posterior end. In advanced stage, the larvae change their appearance from yellowish to brownish to black colour. No discernible foul odour is noticed. Many Indian bee colonies were destroyed by TSB V in South India during early 90s and caused severe loss to bee keeping industry. Noeffective method to control this disease is known as yet.

D. CHALK BROOD DISEASE AND STONE BROOD DISEASE



The fungus Ascosphaera apis that causes chalk brood only attacks larvae. When the spores are ingested, they germinate and mycelia grow through the body penetrating the epidermis and covering the pre-pupa in a short time-span. They cause mummification of the diseased larvae.

CONCLUSION:

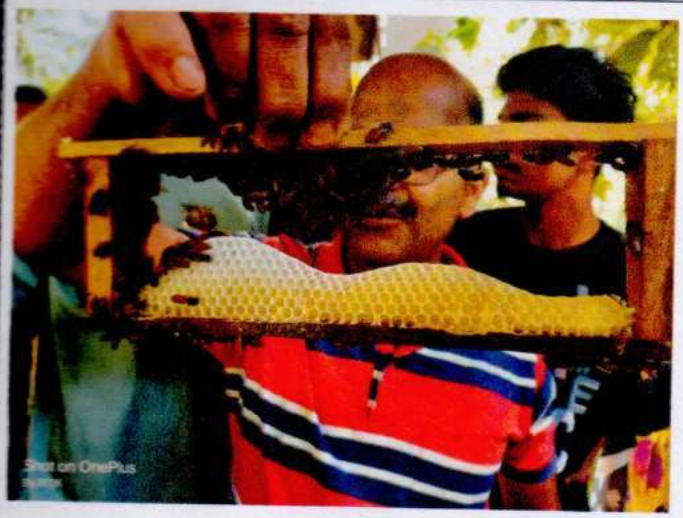
The conclusion is that what I have experienced and what I have learned from this field oriented project work.

So first we visited Apiculture field is situated at Devalmakki village in Karwar. First the member and also owner of this field explained about their work in the form of theory classes and give us sufficient knowledge of the apiculture. Honey bee species are situated in his field, life cycle of the honey bee, modern method of honey bee keeping, how to extraction of honey from filled wax through centrifugal machine of honey extraction, how to handle the honey bee from predators, cleanliness, attack of parasites, detection of diseases in the honey bees and bee wax and honey is preserved in glass bottle it is most important for preservation and he told when the nectar amount is less in environment then we feed them to sugar solution and many more.

In the field there are many typical movable hive are situated. Then we went to near the typical movable hive there he explained the parts of artificial movable hive and said how to separate the honey bees from inner cover and shows the honey bee social organization in the hive.

From this field oriented project work came to know that different types of honey bee species, feeding time, species involved in apiculture to meet protein requirements to the people who depending on these resources.

This project mainly deals with modern method of apiculture and their culture and it was a great experience to study these things in detail. Which is subject of wide scope in future.


Shot on OnePlus


Shot on OnePlus


Shot on OnePlus


Shot on OnePlus

MAHASATEE ARTS, COMMERCE AND SCIENCE COLLEGE, ULGA, KARWAR (U.K.)

ATTENDENCE REGISTER FOR THE ACADEMIC YEAR 2022 - 2023

SEMESTER : ADD ON CERTIFICATE COURSE in APICULTURE SUBJECT : Apiculture

Admission No.	Roll	Name of the Student	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	1	Mr. Santosh K. Gavada																															
	2	Miss Swati V. Kankonkar																															
	3	Miss Pooja P. Pagi																															
	4	Mr. Rahul D. Naik																															
	5	Mr. Rushan S. Bandekar																															
	6	Mr. Shivanand K. Achari																															
	7	Mr. Pranay B. Naik																															
	8	Mr. Yogesh A. Gaonkar																															
	9	Mr. Ankush A. Gaonkar																															
	10	Miss Sneha P. Rane																															
	11	Miss. Anupama N. Gunaga																															
	12	Miss Siddhi S. Chodankar																															
	13	Miss. Sushmita R. Gaonkar																															
	14	Miss Rashika S. Kothoskar																															
	15	Mr. Amit A. Talekar																															
	16	Miss. Pratiksha S. Kankonkar																															
	17	Miss. Aishwarya A. Pednekar																															
	18	Miss Mandvi S. Naik																															
	19	Miss Rashmika R. Kolamkar																															
	20	Miss Sanchita S. Marivekar																															
	21	Mr. Rohit R. Bandekar																															
	22	Miss Siya S. Kankonkar																															
	23	Mr. Ankush A. Gaonkar																															
	24	Mrs. G. K. Malgaonkar																															
	25	Mr. Ganesh R. Kothoskar																															

Signature of Teacher :

Signature of Principal

PRINCIPAL
MAHASATEE ARTS,
COM. & SCI. COLLEGE
ULGA, KARWAR - 581 32[illegible]

Shri Shivaji Education Society's,

MAHASATEE ARTS, COMMERCE & SCIENCE COLLEGE,

Ulga, Karwar, Uttar Kannada, Karnataka - 581328

Accredited by NAAC with "B" Grade

Affiliated to Karnataka University Dharwad

ADD-ON COURSE

Conducted by

DEPARTMENT OF ZOOLOGY

APICULTURE

This is to certify that Mr./~~Ms~~ Ankush. A. Gavada

Class B.SC-IInd satisfactorily completed the course during the year 2022 - 2023

HOD. ZOOLOGY

PRINCIPAL
MAHASATEE ARTS, COMMERCE &
SCIENCE COLLEGE, Ulga, Karwar

Shri Shivaji Education Society's,

MAHASATEE ARTS, COMMERCE & SCIENCE COLLEGE,

Ulga, Karwar, Uttar Kannada, Karnataka - 581328

Accredited by NAAC with "B" Grade

Affiliated to Karnataka University Dharwad

ADD-ON COURSE

Conducted by

DEPARTMENT OF ZOOLOGY

APICULTURE

This is to certify that ~~Mr./~~Ms Rashmika. R. Kolamkar.

Class B.Sc-IInd satisfactorily completed the course during the year 2022-2023

HOD. ZOOLOGY

PRINCIPAL
MAHASATEE ARTS, COMMERCE &
SCIENCE COLLEGE, Ulga, Karwar