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Honey Bee



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Honey is a sweet food made by bees using nectar from flowers. Honey has a long history of human consumption, and is used in various foods and beverages as a sweetener and flavoring agent. Goa State with wide diversity of natural flora and different crops like coconut, cashew and other flowering plants are a good source of pollen and nectar which required for honey production by bees. Another important role of bees is in pollination and thus bee keeping and honey production can be additional enterprise to the farmer to generate extra income. Small farmers usually consider honey as a cash crop instead of a product for home consumption. Honey has high cash value relative to its weight and bulk. It is essentially a non-perishable product, economical and easy to transport. These characteristics make honey an attractive crop for small-scale and often isolated producers. Rearing the colonies collected from nature by providing natural conditions and without harming their routine works and collecting the honey using extractors without harming their youngones makes it a profitable venture.

Invertase

Nectar ----- Honey
(Sugar + water) (Levulose + Dextrose)

Composition of Honey (%)

Water - 17%, Dextrose - 40-50%, Levulose - 34%,
Sucrose - 1%, Phosphorus - 3.18%, Gum - 0.15%, Acids -
0.08%, Nitrogenous - 0.04%

Why Develop Beekeeping?

Beekeeping is an activity that fits well with the concept of small-scale agricultural development. It is not a labor-intensive enterprise which can be easily integrated into larger agricultural or forestry projects. Bees not only aid in the pollination of some crops used in such projects, but they make use of otherwise unused resources - nectar and pollen.

All the inputs necessary for carrying out a beekeeping venture can be made locally. Smokers, protective clothing, veils, and hives can be made by local tinsmiths, tailors, carpenters, or basket makers. Thus, a beekeeping project can create work and income for these people.

Advantages of Beekeeping

- ✓ Supply an additional non-perishable food for rural people.
- ✓ Provide cash crops for rural people, honey and wax.
- ✓ Be a means of gainful work when the farmer is not involved in planting staple crops.

- ✓ Create work for local craftsmen who make equipment.
- ✓ Increase the production of other crops such as peanuts, coffee and citrus through better pollination as insect pollination is important for many cultivated plants.

Beekeeping is a family activity which has the following advantages over other types of agriculture

- ✓ It needs a relatively small investment.
- ✓ It uses little land and the quality of the land is not important.
- ✓ It is a flexible activity for both sexes of any age.
- ✓ It can be carried on as a productive secondary activity with low level technology, or as a primary undertaking with more complicated techniques.
- ✓ Beekeeping does not compete for resources with other types of agriculture - the nectar and pollen of plants are a true bonus.

Types of bees:

There are four species in the bee genus Apis-- three which are native to Asia and one which is native to the Euro-African region. All of these are similar in appearance, though there are size and color differences. All build vertical combs that are two cells thick.

The giant or rock honey bee (Apis dorsata) and the little honey bee (A. florea) are found in Asia. Both of these bees build a single-comb, exposed nest. Nests are often seen hanging from branches of trees, roofs, or ceilings. The adult bees hang in curtains around the nest to control nest conditions. Brood and honey stores are in the same comb - the brood in the lower section and the honey in the upper section.

Two other species of Apis mellifera and A. cerana) normally build multi-comb nests in enclosed cavities. These bees can be kept in hives, and methods have been devised to allow for a more rational utilization of their potential. It is with these two species that a potential for beekeeping development exists.

Stingless bees

In tropical regions, some species of stingless bees-- notably Trigona and Melipona- are robbed of their honey. All of these bees build their nests inside cavities. Even though these bees do not sting, they defend their colony by biting the intruder. Some secrete irritating substances along with the bite.

Characters of bee species desirable for beekeeping:

- ✓ High honey production
- ✓ Gentleness
- ✓ Low tendency to swarm
- ✓ Low tendency to abscond
- ✓ Calm on combs when colony is worked
- ✓ Disease resistant
- ✓ Little use of propolis
- ✓ Little brood-rearing during dearth periods to conserve stores

The bee colony

A bee colony comprises of bees which live in hexagonal wax cells and is composed of-queen, drones and workers.

QUEEN:

In a bee colony only one queen can live at a time. It is the mother of the colony and has total control over the colony. Its main job is to lay eggs depending on season it controls the bee population in a colony. It can lay 500-1500 eggs/day. It takes about 15-16 days for the development of queen from egg stage. It is larger than worker, longer than drone and has long, tapering abdomen. It lives for 4-5 years.

Development of queen

The queen is developed due to death or aging. The workers build queen cells, eggs are laid in that cell, egg stage is for 3 days, larva, 5-6 days. A special proteinaceous food called 'Royal jelly' is fed and then they seal the cell. The pupal stage is for 7-8 days. The adult stays for 2-3 days and flies out with drones for mating. It mates with 8-10 drones and collects sperms in spermatheca.

Drones

The drones are larger, fatter than queen and drone and have short tongue. They can not collect pollen as they don't have pollen basket. They don't have wax glands and also no sting to defend. Their number varies from 0-1000 in a colony. It takes about 24 days for the development of a drone from egg stage. It does no work in the hive and mates with queen and dies. It is the only male in colony.

Workers

They are smaller than queen, drones. There are about 5000-75000 in a colony. They do all hive, field works, collect water, pollen, nectar, protect hive, clean hive, build wax comb, nurse young ones, control hive temperature. It takes 21 days from egg-adult stage. It lives for 6 weeks, equipped with pollen baskets, has wax glands and has sting to defend.



Queen Worker Drone
 ● Female ● Male

Division of labour in workers

Age (in days)	Works
1-3	Hive cleaning, maintaining temp
3-6	Feeding baby bees, develops stinging ability
6-10	Production of Royal jelly, feeding
10-15	Learn flying
15-20	Knowing the details of hive, flowers
20-30	Food collection, wax comb preparation
Till aging	Supply of things required for colony
Aged-death	Maintains hygenity, protection

Parts of beehive

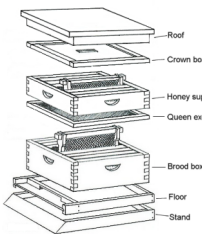
- | | | |
|-----------------|----------------|---------------|
| 1. Bottom board | 2. Family room | 3. Super |
| 4. Frames | 5. Top cover | 6. Bee spacer |

What bee needs to live ?

- | | | |
|------------|-----------------------|-----------|
| 1. Bee wax | 2. Nectar | 3. Water |
| 4. Flowers | 5. Tree / flower buds | 6. A home |

Equipments for beekeeping

- | | | |
|---------------------|--------------|-----------|
| 1. Hat with netting | 2. Gloves | 3. Smoker |
| 4. Honey Extractor | 5. Hive tool | |



Where hive should be kept ?

- ✓ Good source of pollen
- ✓ Cool places
- ✓ Less enemy attack, total dark in night
- ✓ Free flying areas
- ✓ Avoid factories, both room, kitchen
- ✓ Avoid disturbances, ants
- ✓ Manageable heights

Source of nectar

- | | | |
|------------|--------------|---------|
| 1. Teak | 2. Arecanut | 3. Neem |
| 4. Sesamum | 5. Sugarcane | etc... |

Source of pollen

- | | | | |
|-------------|------------|------------|--------|
| 1. Champaka | 2. Coconut | 3. Sorghum | |
| 4. Onion | 5. Paddy | 6. Ragi | etc... |

Plants - Source of Honey+Pollen

- | | | | |
|---------------|---------------|---------------|--------|
| 1. Jamun | 2. Tamarind | 3. Pongamia | |
| 4. Orange | 5. Lime | 6. Drum stick | |
| 7. Eucalyptus | 8. Coffee | 9. Cardamom | |
| 10. Banana | 11. Horsegram | 12. Mustard | etc... |

Care during June - November

- ✓ Preserve frames of super, expose to sulphur or neem smoke or carbon disulphide fumes or paradichlorobane (P.D.B.)
- ✓ Protect hive from rain, wind
- ✓ Frames from super removed, bees occupy family room
- ✓ Clean the area near hive
- ✓ Clean the entire hive once in a week
- ✓ Protect against enemies
- ✓ Feed sugar syrup-100ml water once week

Care during December - March

- ✓ Best to capture new colonies.
- ✓ Reduce drones if more.
- ✓ Fix the frames in super with artificial comb.
- ✓ Remove aged queen, if young queen then remove queen cell.
- ✓ If required replace colony.
- ✓ Avoid frequent disturbance.

Food & medical value of honey

- ✓ Preservative food, fruits stored.
- ✓ With lime recommended for health.
- ✓ Maintains body temperature in cold places.
- ✓ Players, swimmers, mountaineers use for continuous energy supply
- ✓ For cough and respiratory problems
- ✓ Antiseptic -for burns
- ✓ Good for heart, diabetic patients
- ✓ Good for infants and aged

Enemies of bees

- | | | | |
|----------|------------|------------------------|-------|
| 1.moths | 2.ants | 3.yellow harnet, wasps | |
| 4.snails | 5.tree dog | 6.mangoose | |
| 7.rats | 8.frogs | 9.owl | etc.. |

Diseases

- ✓ Nosema Disease
- ✓ European foul-brood
- ✓ American foul-brood
- ✓ Sac foul-brood
- ✓ Thai Sac brood virus (TSBV)
- ✓ Chalk foul-brood and stone brood disease

When bees sting ?

- ✓ Self and colony protection
- ✓ Absence of queen in hive
- ✓ When bees of other colony try steal
- ✓ Rough handling
- ✓ Unfavourable climate
- ✓ Inspecting hive by interuoting bees hive entry
- ✓ Bad smell
- ✓ Suspicion as enemy
- ✓ Presence of queen cells in the hive
- ✓ Increased enemy attack
- ✓ Removing the honey
- ✓ If injured while inspecting

How to avoid bees sting ?

- ✓ Smearing green leaf extract
- ✓ Smearing onion juice
- ✓ Smearing honey
- ✓ Use gloves, cap with net

Thus beekeeping can be profitable from the beginning. After it is started and expertise is gained, it is easy for a beekeeper to increase the number of hives. A dependence on outside resources or inputs is not necessary to do this. Bees feed themselves from the existing nectar and pollen resources of the area by foraging far beyond the small amount of land.

Types of Honey Bee



Apis dorsata



Apis florea



Apis cerana indica



Apis mellifera



Trigona

Contact addresses for honeybee related materials and information

S.No.	Office address	Contact person	Number
1	Central Bee Research Institute, Near HP Petrol Pump, University Road, Shivajinagar, Pune, Maharashtra 411016	Director	020 25675865
2	BeeKeepers Co op.Soc.Ltd., Honnavaara,Karnataka	Mr. Sridhara Hegde	09448221450
3	BeeKeepers Co op.Soc.Ltd., Ankola,Karnataka	Mr.Nandakumar Raikar	09242847622
4	Farmers and Beekeepers Association, Goa	Mr.Rudolf A.Fernandes	9822100062
5	Dept.of Agriculture, Krishi Bhavan, Tonca, Panaji	Director	08322465443 08322465840 08322465441
6	Khadi Village Industries Board Junta House 2nd Floor, Panaji, Goa	Chief Executive Officer	08322221452

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