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## A STUDY ON IDENTIFICATION OF PARASITES IN APICULTURE

Dr.P.S.Rajani<sup>1</sup> and Dr.G.S.Jyothirmal<sup>2</sup>

<sup>1</sup>Associate Professor of Zoology, Department of Zoology, Government Degree College Women,Begumpet, Hyderabad, India

<sup>2</sup>Associate Professor of Zoology, Department of Zoology, Government Degree College Women(A), Begumpet, Hyderabad, India

### Abstract:

Apiculture (bee keeping) is the practice of maintaining of honeybee colonies for honey production. It's a vital industry contributing a global. Food security and ecosystem health The bee hive is a suitable habitat for diverse pest and parasites including, omnivorous, and pollen-feeding species, and parasites. The biology and damage of the three main pest specie Identification of parasites is very important in Apiculture industry. In the present investigation an attempt has been made to identify different parasites effecting apiculture. Perfect identification of parasites only we can improve the economic growth in apiculture industry and in the present study five different parasites were observed. Varroa destructor, Acarapis woodi (Tracheal mite), . Nosema s Wax Moths (*Galleria mellonella* pp. (Microsporidian fung Small Hive Beetle (*Aethina tumida* i).

### Introduction.

Rearing of honeybees in larger scale became an economical industry which is giving an economical growth of an Indian. Apiculture provides an employment to many people. Kasina et al(2009) Significance of apiculture: is Pollination service for crops, Honey and Wax production. ecosystem health and Bio diversity. Climate change can cause different diseases (Le Conte et al (2008) Beekeeping is the practice of maintaining honeybee colonies for honey production, pollination and other benefits. However, honey bee colonies are susceptible to various parasites that can impact their health, productivity and survival. (Richer,1996) Parasites in apiculture can cause significant economic loss and threat to the sustainability of beekeeping practice. (Genersch2010). Accurate identification of parasite is crucial for effective management and control. Different parasites require different management strategies and incorrect identification can lead to ineffective or even harmful treatments. Identification of the specific parasite allows for targeted treatment reducing risk of over treatment or under treatment. Using the right treatment approach helps prevents parasites from developing resistance to treatments. By controlling parasites beekeepers optimise colony productivity. Honey production and pollination service. (Wolfgang Ritter & Akranakul FAO, (2006).

### Materials and Method:

**Materials Required :** Clean sampling jars with lids 70% isopropyl alcohol (for Alcohol Wash) Powdered sugar (for Sugar Shake) Mesh or perforated insert (fits inside sampling jar) Sticky boards and screened bottom board

The most effective methods used by beekeepers and researchers: Common Diagnostic Techniques Visual Inspection: Regularly checking adult bees, brood, and hive debris for signs like deformed wings (Varroa mites) or maggot-like larvae (small hive beetles)2. Alcohol Wash & Sugar Shake: These are quantitative methods to estimate Varroa mite infestation levels by dislodging mites from adult bees. Sticky Boards: Placed under screened bottom boards to catch falling mites, Uncapping tool or small knife White tray or sheet (for counting mites) Bee brush or soft paintbrush Protective gear (veil, gloves, hive tool) giving a rough estimate of infestation levels. Drone Brood Inspection: Varroa mites prefer drone brood; uncapping these cells can reveal mite presence. Microscopic Examination: Used to detect internal parasites like tracheal mites or microsporidia (e.g., *Bauriamorph Apis*). (Morse & Flottum, 1997).



## Parasite Detection Signs Tools Used

1. Varroa destructor Deformed wings, visible mites Alcohol wash, sticky Board.
2. Tracheal mites K-wing posture, reduced mobility Microscopy.
3. Small hive beetles Wet combs, larvae in honeycombs Visual inspection.
4. Wax moths Silk tunnels, damaged combs Visual inspection. Vairimorpha Apis Diarrhoea, distended abdomens Microscopy, lab tests.

## RESULTS:

In the present investigation it was observed that the following parasites were more prevalent.



Fig 1. Varroa destructor (Varroa mite)



Fig 2. On the body of honey bee



## Description:

1. The most significant external parasite of honeybees worldwide. Identification: Small reddish-brown mites visible on the body of adult bees. or in brood cells. Impact: Weakens bees by feeding on their fat bodies and haemolymph. (Baile, & Ball,. 1991)

2. *Acarapis woodi* (Tracheal mite)

Description: Microscopic mites that infest the tracheae (breathing tubes) of bees. Identification: Requires microscopic examination; causes reduced flight and lifespan. Impact: Can weaken colonies, especially in cold climates.



3. *Nosema* spp. (Microsporidian fungi)

4. *Nosema apis* and *Nosema ceranae*. Description: Microsporidian parasites infecting the gut of adult bees. Identification: Diagnosis through microscopic examination of spores in bee gut samples. Impact: Causes dysentery, reduced lifespan, and weakened colony, and productivity.

5. Small Hive Beetle (*Aethina tumida*) Description: Beetle larvae and adults infest hives, feeding on brood, honey, and pollen. Identification: Small dark beetles found inside the hive. Impact: Damages comb and ferments honey.

Fig 4. *Aethina tumida* larvae





6. Wax Moths (*Galleria mellonella*) Description: Larvae of Wax Moths feed on beeswax, pollen, and honeycomb. Identification: Presence of tunnels, webbing, and larvae in combs. Impact: Can destroy comb structures. (Akranakul, . 1986)



Fig 5: Wax Moths

## Discussion

Because the local beekeepers were nonprofessionals and were not aware of the signs of different parasites while they were actively involved in beekeeping more prevalence of parasites could have been observed. The occurrence and distribution of honey bee pests and parasites are not well studied. scant literature is available. it was observed that The survey revealed that most honeybee hives were damaged by pests and parasitic diseases, but the damage varied from hive to hive and from apiary to apiary. The traditional hive was found to be heavily attacked by pests, but modern hives are less affected by the materials used, and beekeepers can easily inspect and control pests in modern hives. In the present study it was observed that most of the hives were infested with wax moths then varroa mites. Similar reports were shown (Tsegaye 2015, Adeday Gidey 2012). Guesh (2015) reported less number of varroa in his study. Beekeeper awareness and knowledge are crucial in identifying parasites. Those who understand bee biology and behaviour are more likely to notice when something is wrong. Training and education in parasite identification can greatly improve early detection and treatment success. By understanding the biology, symptoms, and detection methods associated with major honey bee parasites, beekeepers and researchers can take information to manage infestations and prevent colony losses.

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