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An analysis of fidelity among honey bee reared in Gujranwala, Pakistan

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Abstract

Honey bees belong to family Apidae and contained about 20,000 species. Honey bees are social insects living together meaning that individuals are present in castes with specific characters and completing their life cycle in a common nest. In January to July 2016 at Districts Gujranwala and Gujrahoney bee farm containing 130 boxes was observed keenly and notice mutual cooperation among various castes of Bees outside and inside their boxes. It was observed that honey bees served each other during their life cycle. All the members of the caste selected Queen, who worked a lot in favor of Bees Farm. The fertilization of Queen takes place outside of the box, leaving the others undisturbed. Once a box lost Queen it is very difficult to accept other if provided, but there may be a chance to accept a new one when soak/wet with honey. Other female Bees (worker) lay eggs inside the box losing Queen. All the members worked according to instruction given by Queen. The caste of Workers and Drones of Honey Bee colony sacrificed themselves in feeding and securing their generation and Queen respectively. Foreign Bees were not allowed to enter into another box according to the order of Queen. Honey Bees of different box accepted larvae's of each other if they hatch their eggs nearly at the same time.

Keywords: Honey bee, Apidae, fidelity

1. Introduction

Honey bees belong to family Apidae and contained 20,000 species [1]. Honey bees are social insects living together meaning that individuals are present in castes with specific characters and completing their life cycle in a common nest [2]. Each colony comprises of three castes for instance, single queen (fertile), thousands of workers (females) and few hundred drones (male) [3, 4]. The queen controls the entire honey bees' physiology and behavior using various pheromones [5]. Workers perform activity inside, entrance and outside their nest [6]. Drones are only for mating with virgin female [7-9]. The aim of the research work was to carry out the analysis of Fidelity among Honey Bee reared in Gujranwala, Pakistan.

2. Materials and Methods

A honey bee farm containing 130 boxes was observed in January to July 2016 at Districts Gujranwala and Gujrat and notice mutual cooperation among various castes of Bees outside and inside their boxes.

3. Results and discussion

3.1 Fidelity among Honey Bee

It was observed that honey bees served each other in many respects during their life cycle. All the members of the caste selected Queen in many (if present), those one who worked a bundle in favor of the Bees in Farm. The fertilization of Queen by two or three Drones takes place at the time when all the bees on the farm are busy in their own box and leaving them undisturbed. Queen gave birth to their offspring after fertilization. The queen, when dead is expelled out from the box when it is not laying eggs. It is very difficult to accept other Queen by Box if exposed, but there may be a chance to accept a new one when soak/wet with honey. The eggs were not identifiable. All the members worked according to instruction given by Queen. The caste of Workers and Drones of Honey Bee sacrificed themselves in serving their generation and Queen respectively. Foreign Bees were not allowed by the bees of another box (not their own) according to the order of Queen, but allowed when the box is carried 4 km away from the farm. Honey Bees of different box accepted pupa's of each other if they hatch their eggs

nearly at the same time. In 2016, Saqib. R *et al* [10] was carried out an observational study in a Private apiary situated in Gujrat, Panjab. Feeding behavior was observed throughout the year in that Apiary. All observations were recorded in questionnaires. Bee farmers were also investigated about their past experience of feeding Bees. About 130 boxes of Honey bees were examined in this study throughout the year. Those boxes were provided with artificial as well as natural food as they were situated in Gujrat, Panjab. Where there was abundance of food at a specific season of the year. In 2016, Saqib. R, [11] *et al* conducted once again in an observation was carried out in Gujrat in a private Apiary. Variation in the activity of the honey bee with change in an available food month wise throughout the year was observed in the Apiary. All observations were recorded in questionnaires by carrying out visit to the Apiary, interview of Bee farmers and pictures by mobile phone. Examination of activity of honey bee of 130 boxes was observed throughout the year. The activity of honey bee involved food utilization (nectar, pollen and Sugar solution) throughout the year, comb production, honey production, egg laying and hatching of eggs. The months provided with a natural food show somewhat more positive yield. Bees were totally facilitated with natural food in the month of April, May, September and October. This study revealed that food variation in honey bee to ensure their existence as well as progeny production. And the increased amount of artificial food was utilized by Honey bees when there was no/ scarce amount of food in the environment while this consumption became less when there was a large amount of food present in that area. A large amount of artificial food was utilized in the month of December, January and February. Whenever a bee farm is displaced to a new area drones come out of each box to forage/search out pollens, nectar and water. All the information they get from surrounding Journy communicated among species of the respective colony/box. Some members standing at entry gate provide security to the box by stopping the coming member from outside. These member check food brought by coming member are either poisonous or useful one. Some member at the entry gate provide cold air when there is hotness inside and same member produces warm air to compensate inner coldness by moving their wings quickly. During summer or cold when there is heat or coldness inside the heat and coldness simultaneously by movement of their wings. Fidelity analysis were showed in fig.1 to 8.



Fig 1: Bringing of water to colony by worker.

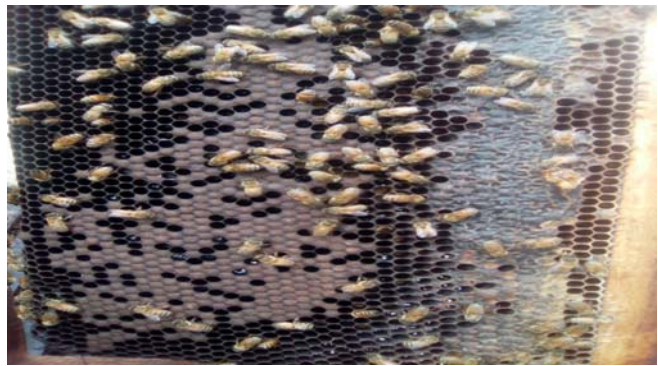


Fig 2: Few bees are found in rooms showing prepare room for the next generation.



Fig 3: Showing honey bees cooperative work on the frame.



Fig 4: The area covered with conjoined bee is actually a queen cell where queen develops



Fig 5: Sacrificing of member of honey bees.



Fig 6: The queen instructed all the worker for their job on the top of the box is cloth where they form comb neither stopping their work because of all the frames filled from the comb.



Fig 7: The selected queen for colony



Fig 8: The three honey bee at the margin of entry gate find rival bee of other box.

4. Conclusion

The study threw light on the wonderful aspects of honey bee showing in their life cycle. The type of study is not found in any publication of literature. The observation is carried out to explore the loyalty find among them for each other and their upcoming generation in a colony. Research can be carried out on hormones and genetics of Honey bee to know the exact cause of the study.

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