Chapter 1

THE EFFECTS OF HYGIENIC BEHAVIOR ON HONEY BEES DISEASES AND PESTS

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Introduction

Honey bees (*Apis mellifera L.*) have existed in the nature for thousands of years. They have spread to a large part of the world with their high adaptability, diligence and social behaviors that make them privileged and durable. According to Food and Agriculture Organisation of the United Nations (1) there are 90,999,730 hives spread all over the world except deserts and poles. In addition, the presence of honey bee colonies in the nature living in rocky areas or tree hollows are known.

The activities of honey bees to sustain their lives contribute greatly to maintaining natural balance and improving the quality of human life. In addition to honey, which is beneficial nutrition for human health, bee products such as royal jelly, pollen, bee bread, propolis, bee venom are produced by honey bees. Honey bees are the most important pollinator in the world. According to Spivak, more than 1/3 of the world's grain production depends on honey bees pollen carrying behaviour (https://www.ted.com/talks/marla_spivak). These factors make it necessary to sustain and protect the honey bees' vital activities for all living beings.

However, as in other organisms, there are diseases and pests that prevent honey bees' activities and even cause them to disappear. The most important problem which has caused significant damages in the last 40-50 years is an exo-parasite called varroa destructor (2). In addition, regular and continuous use of synthetic drugs and chemicals against honey bee diseases and pests for many years causes serious residue problems in bee products (3). In fact, strong honey bees colonies have the ability to fight against diseases and varroa pests naturally, without the need for such intensive use of synthetic chemical drugs. This natural defense is called as "hygienic behavior".

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same researchers found that the American Puppy Rot, lime and varroa parasite decreased significantly in the hygienic line, where they continued their selection and breeding studies for resistance to varroa in honey bees for a long time at Minesota University (13).

Conclusion

Hygienic behavior, which is the natural defense system of honey bees, have been negatively affected due to synthetic chemicals, negative environmental conditions, global warming, genetic structure and nutritional deficiencies. Identifying colonies with high hygienic behavior and growing them in good care-management and feeding conditions are extremely important for the future of beekeeping. Due to the significant effects of the genetic structure on the level of hygienic behavior, the use of queen bees from hygienic hives in the selection stage is of great importance. The development of simple but effective methods for the detection of hygienic lines, which concern the manufacturer closely, will accelerate the spread of hygienic behavior. Increasing the number and quality of studies related to hygienic behavior in honey bees, usage of less synthetic chemical drugs and production of residue-free bee products are important for healthy and sustainable beekeeping.

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