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ABSTRACT BOOK

Beekeeping provides subsistence to hundreds of thousands of beekeepers in the Mediterranean area. This activity is supported by a range of different native subspecies, adapted to highly diverse and harsh conditions of the region. Actions directed to the conservation of *A. mellifera* subspecies in the Mediterranean are expected to promote the quantity and quality of crops, increasing food availability in an efficient, cost-effective, and sustainable way.

Climate change is expected to increase the stress factors affecting the bees, especially in this region, reducing both pollination efficiency and production potential. Unfortunately, our ability to tackle this problem is limited by our incomplete understanding of the natural adaptation mechanisms developed by the different subspecies, and so the basic knowledge needed for future selection programs aiming to improve bee stocks for environmental changes. The MEDIBEES project includes 9 partners from 8 Mediterranean countries on the three Mediterranean shores, covering 10 local *A. mellifera* subspecies, which are a remarkable and poorly understood proportion of genetic diversity.

The project aims to: a) unravel the differential genetic background of the Mediterranean subspecies, b) understand their adaptation to the local conditions, and c) characterize their resilience to climate change. To reach the objectives, both phenotype of colonies belonging to local honey bee subspecies and environmental conditions will be studied by covering survival, sensitivity to pests/pathogens, behaviour, physiology, and reproduction using gene expression and transcriptomic assays. The whole genomes of the samples from field and laboratory assays will be sequenced for finding genes putatively implicated in adaptation and to develop new genetic tools to characterize the honey bee populations for their resilience to environmental stressors. This effort will encourage the use of local subspecies, hinder the import of foreign breeds, and establish the basis for future selection programs.

Besides, the valorization of honey by both promoting its use and developing Quality labels, and the evaluation of beekeeping by-products as modifiers of soil fertility and biota are also approached to help the beekeepers improve the sustainability of their farms in an economical and environmental sound manner.

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PP-103 [Bee Health]

Main Practices, Challenges and Expected solution identified in the Mediterranean Beekeeping Industry (MEDIBEES project)

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Globally honeybees are threatened by a plethora of biotic and abiotic stressors. One factor of great concern is climate change due to its direct impact on wild and agricultural ecosystems. Indeed beekeeping, with its symbiotic interdependence with vegetation, is an industry that will be strongly affected by climate change. Although the Mediterranean is a region that is highly vulnerable to climate change, no study has comprehensively analysed the possible effects on honeybees. The MEDIBEES project aims to remedy this situation by studying the honeybee subspecies native to the Mediterranean region and their resilience to climate change, in an attempt to safeguard the beekeeping sector. In this framework, the following approaches were adopted to determine the common Practices, Challenges and Problems in the region and to identify scientific gaps and solutions expected by beekeepers:

- Review of the effects of biotic and abiotic stressors on honeybee colonies as well as legislation in the MEDIBEES consortium to identify common threats.
- Study of current challenges, priority areas considered by beekeepers as important to survive as an industry, beekeeping practices and existing resources in each country to determine common trends and challenges across the Mediterranean.
- Analysis of the responses to a questionnaire distributed among 1160 beekeepers to obtain information on stakeholder practices, challenges faced and the main problems encountered.

In this way, a profile of beekeeping activity and beekeepers in the region was obtained. The main challenges and problems identified were: a) changes in weather patterns that could affect colony dynamics, production losses and increasing mortality; b) of incidence of pathogens in the area (*Varroa destructor*, *Nosema ceranae*, SBV and DWV) and the lack of training programmes to control them; c) agricultural insecticides and acaricide residues. As main areas of interest, beekeepers pointed out the possible existence of adapted ecotypes, the need for training to distinguish between hybrids and purebreds, and the study of the effect that climate change will have on phenology and plant availability and on changes in the distribution areas of pathogens in the area.

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