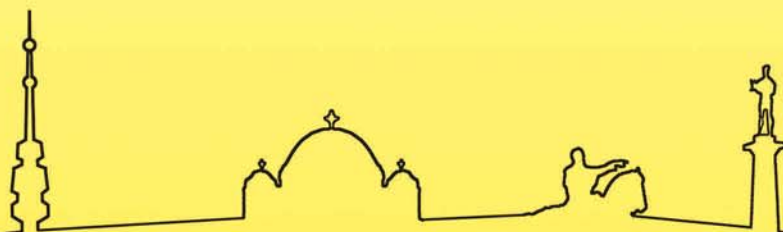**EurBee 9**
9th European Congress of Apidology
20-22 September 2022
Belgrade, Serbia

Abstract Book

SUBSPECIES AND THEIR RESILIENCE TO CLIMATE CHANGE FOR THE IMPROVEMENT OF SUSTAINABLE AGRO-ECOSYSTEMS

Raquel Martín-Hernández, CIAPA-IRIAF, Marchamalo, Spain
Antonio Nanetti, CREA- AA, Bologna, Italy
M. Alice Pinto, CIMO, Instituto Politécnico de Bragança, Bragança, Portugal
Noureddine Adjlane, UMBB-DZ, Bourmedes, Algeria
Nizar Haddad, NARC, Amman, Jordan
Chadi Hosri, Beirut, Lebanon
Mustafa Necati Muz, Tekirdağ, Turkey
Marion Zammitt Mangion, University of Malta, Msida, Malta
Ahmad Yousef Daour, Amman, Jordan
Soledad Sagastume, CIAPA-IRIAF, Marchamalo, Spain
MEDIBEES consortium

Beekeeping provides a livelihood for hundreds of thousands of beekeepers in the Mediterranean area. This activity relies on a number of different indigenous subspecies, adapted to the very diverse and harsh conditions of the region. Climate change is expected to increase the stress factors affecting bees, especially in this region, reducing both pollination efficiency and production potential. Unfortunately, our ability to address this problem is limited by the incomplete knowledge of the natural adaptation mechanisms developed by the different subspecies. In order to increase the knowledge base for future selection programs to improve bee populations for environmental changes, the MEDIBEES project is being developed. It includes 9 partners from 8 Mediterranean countries on all three shores of the Mediterranean, covering 10 local subspecies of A. mellifera, which represents a remarkable and poorly known proportion of the genetic diversity. The project aims to: a) unravel the differential genetic background of Mediterranean subspecies, b) understand their adaptation to local conditions, and c) characterize their resistance to climate change. To achieve the objectives, colonies belonging to the local subspecies will be studied phenotypically to determine their behavior under environmental conditions, covering survival, sensitivity to pests/pathogens, behavior, physiology and reproduction which will be completed by gene expression and transcriptomic assays. In addition, complete genomes of field and laboratory samples will be sequenced to find genes putatively involved in adaptation and to develop new genetic tools to characterize honey bee populations according to their resistance to environmental stress factors. This effort will encourage the use of local subspecies, to make them more attractive and avoid importing foreign breeds, and will lay the foundation 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.

Keywords: Climate change adaptations, honeybee conservation, resistance to stressors