



Concurrent Sessions

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THE HEALTH STATUS INDEX: A HOLISTIC TOOL FOR THE SUSTAINABLE BEEKEEPING

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Honeybees play a crucial role in providing ecosystem services like food (e.g., honey, beebread, and royal jelly) and pollination essential for maintaining biodiversity and food security. The provision of these services is heavily influenced by the health status of the bees. The health status of a colony of bees is highly impacted by heterogeneous factors including environmental conditions, chemical and biological stressors, beekeeper conditions and practices, and agricultural practices. This complexity makes it challenging to implement management strategies that both preserve honeybee health and ensure the productivity and economic viability of beekeeping. In this work, we developed a Health Status Index (HSI) that allows the exploration of relationships between external drivers (environmental conditions and beekeeping practices) and six health dimensions. The HSI constitutes a Partial Least Squares Path Modeling (PLS-PM) framework incorporating a second-order structural equation model (SEM). We defined five core dimensions of colony health, constituting the first level of the model: Queen, Inhive Product, Disease and Infections, Demography, and Behaviour. Honeybee health is conceptualized as a second-order construct. Additionally, the model encompasses the assessment of three latent dimensions associated with external drivers: the Resource Providing Unit (RSU), the Environment (mainly related to climate), and Beekeeping Management Practices. The model has been calibrated on data produced throughout the SafeAgroBee PRIMA project, integrated with literature. The model was able to discriminate the health status of the honeybee colonies according to the characteristics of each scenario. The HSI provided a good capacity to integrate different types of data.