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BOOK OF ABSTRACTS

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SESSION XI

XI - SOCIAL INSECTS, ETHOLOGY AND APIDOLOGY

POSTER

Influence of ancient and modern sunflower varieties (*Helianthus annuus* L.) on forage resource availability and the strength of *Apis mellifera* L. Colonies

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Bee health is threatened by multiple factors that, acting synergistically, compromise the integrity and survival of colonies. Among these factors, the availability, abundance, and diversity of forage resources play a crucial role in ensuring the proper development of *Apis mellifera* colonies throughout their biological cycle. The availability of floral resources becomes particularly critical during the summer period, when the scarcity of blooms can significantly limit the supply of nectar and pollen. Sunflower (*Helianthus annuus* L.) is a key species in agroecosystems due to its adaptation to drought conditions, its ability to improve soil fertility, and its summer flowering, a period when other forage resources are often lacking. However, in recent years, sunflower honey production has shown a significant decline, primarily attributed to the reduced nectar production capacity of modern hybrids, a factor that may further contribute to the vulnerability of colonies. The use of ancient sunflower varieties, characterized by a more staggered flowering and potentially richer resources, could represent a viable alternative to ensure more continuous nutritional support for bees. The aim of this study was to compare three ancient varieties (Elena, Gigante Mongolo, Peredovik) and one modern hybrid (MAS 830 OL) in order to assess their impact on colony strength and honey resource availability. The experiment was conducted using *Apis mellifera* colonies housed in Dadant-Blatt hives, each consisting of three brood frames and one food frame. Each colony was confined in a mesh cage (8 × 24 m) placed in correspondence with the respective sunflower variety being tested, ensuring that the bees had access exclusively to the flowers of the specific accession assigned. At the end of the flowering phase, the number of cells containing capped honey, fresh honey, pollen, capped brood, and fresh brood was quantified for each frame. The number of adults per colony was estimated. MAS 830 OL showed a higher pollen production compared to the ancient varieties, while no differences in nectar production were recorded. A critical aspect that emerged was the duration of flowering: while the modern hybrid has a concentrated bloom over a short period, the ancient varieties show a more staggered flowering, likely ensuring forage resources over a longer period. This difference could be relevant in determining honey availability within the hive and, consequently, affecting colony health and resilience. The reduced flowering duration of modern hybrids may contribute to resource scarcity in the long term, increasing the risk of nutritional stress for bees. In contrast, the ancient varieties, with their more staggered flowering, could offer more continuous honey support, meeting the colony's needs in a more balanced manner. These results suggest the need for further studies to better understand the role of ancient sunflower varieties in the sustainability of apicultural ecosystems and in mitigating challenges related to resource availability during the summer season.

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