



Biomarkers of health status in honeybees (*Apis mellifera*) and wild pollinators

Objective The demographic decline of honeybees (*Apis mellifera*) determines negative effects not only for agriculture and apiculture, but also for the ecosystems. The aim of this project is to establish objective criteria to evaluate their health status, through the detection of a panel of biomarkers in the hemolymph of *A. mellifera*.

Materials and Methods Four apiaries were chosen for this study, varying one from each other for management and location. In each apiary three hives were selected. The hemolymph was withdrawn, and total proteins were determined using the Bradford method. The proteins of the hemolymph were separated using the SDS-PAGE electrophoresis and identified using mass spectrometry. Colony-level traits were also estimated. Size exclusion chromatography was performed on honeybee cytosolic extracts and Fe, Zn and Cu were analyzed by AAS.

Conclusions and Future Proposal The four proteins identified may be valuable biomarkers of health status and they showed significant variations during the year. It is worthy to continue the study of the newly identified biomarkers by testing them in different field trials in order to set reference values, to search for a correlation with the strength of the colony, and to verify its usefulness in assessing the nutritional and health status of honeybees.

Results:

