



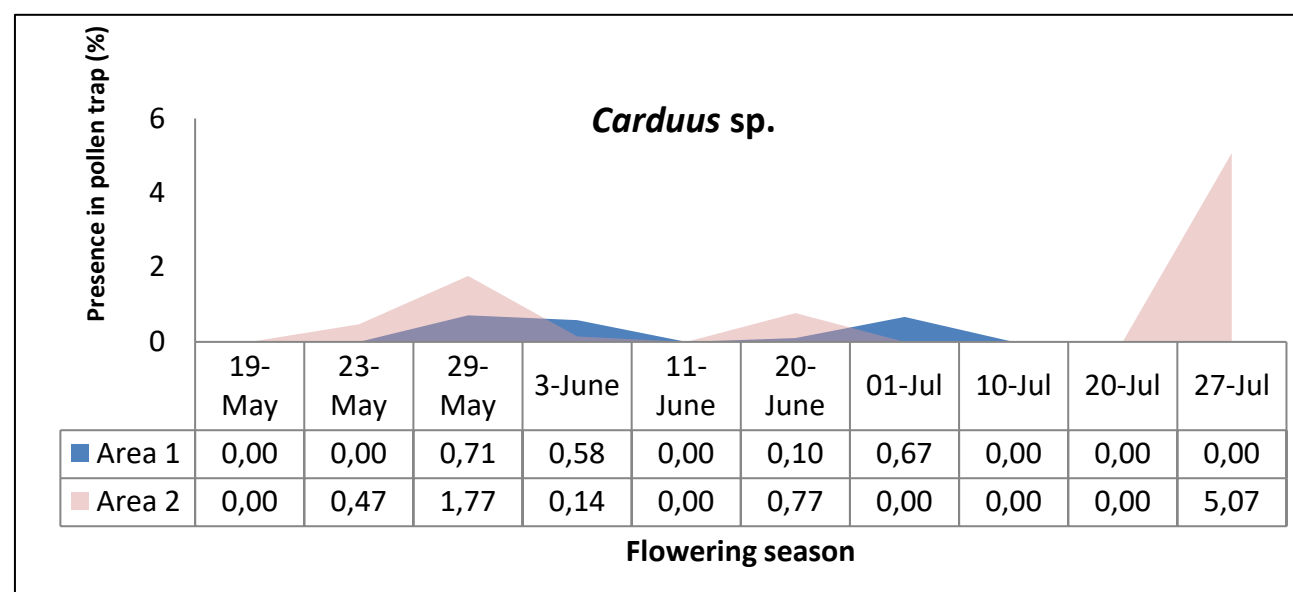
# A COMPARISON OF RECORDING METHODS OF BEEKEEPING PLANTS FLOWERING

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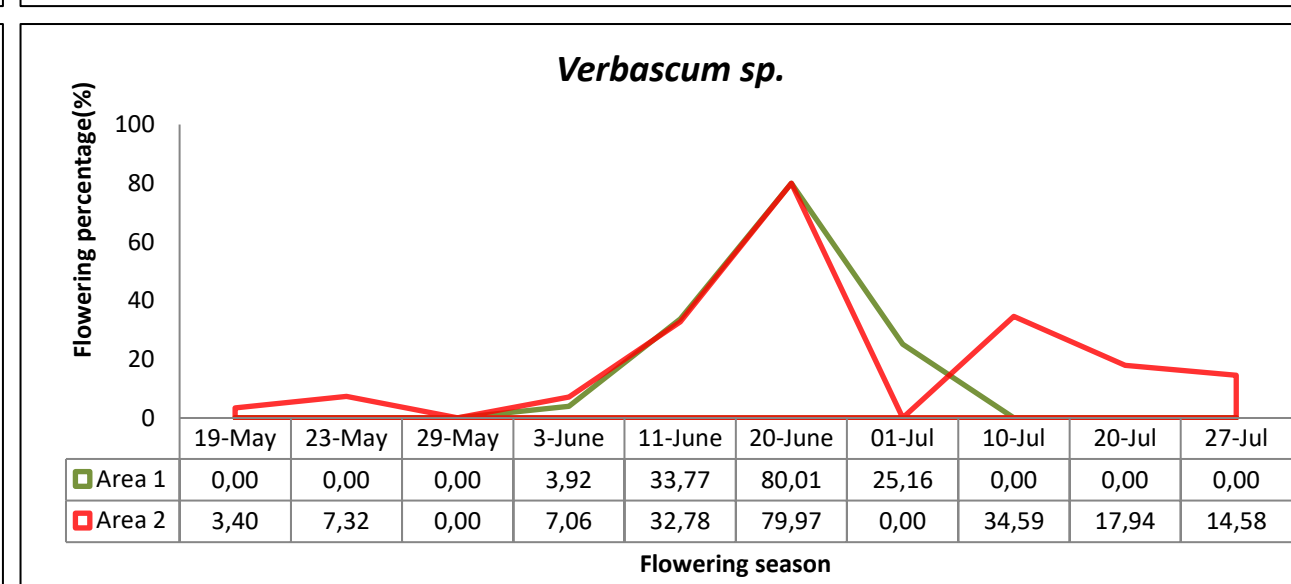
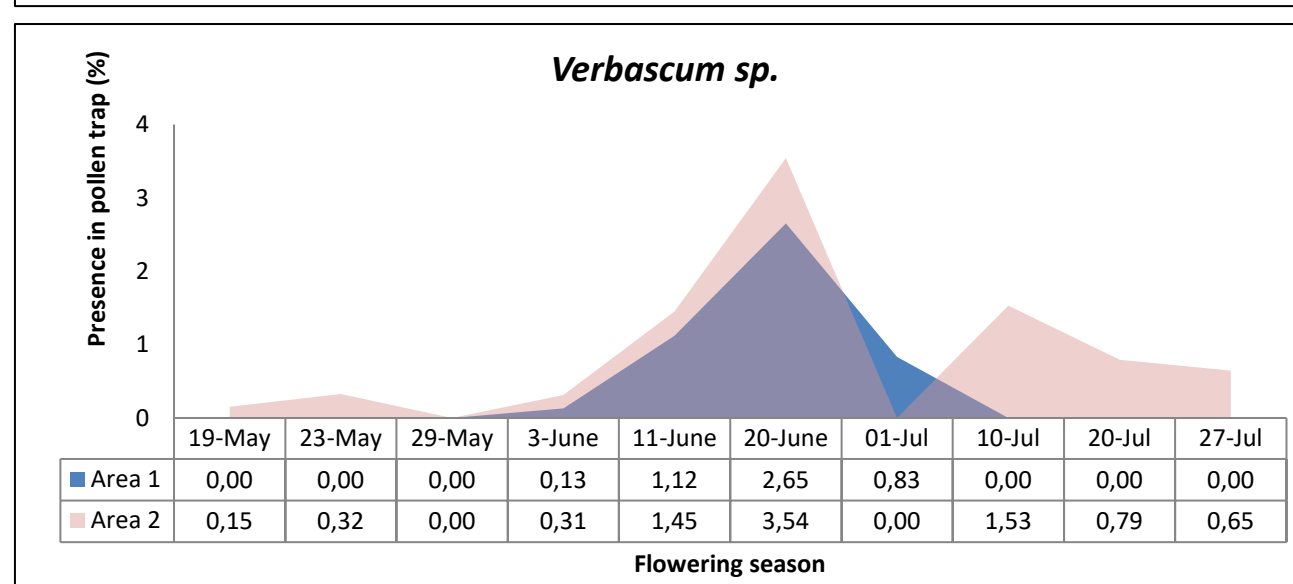
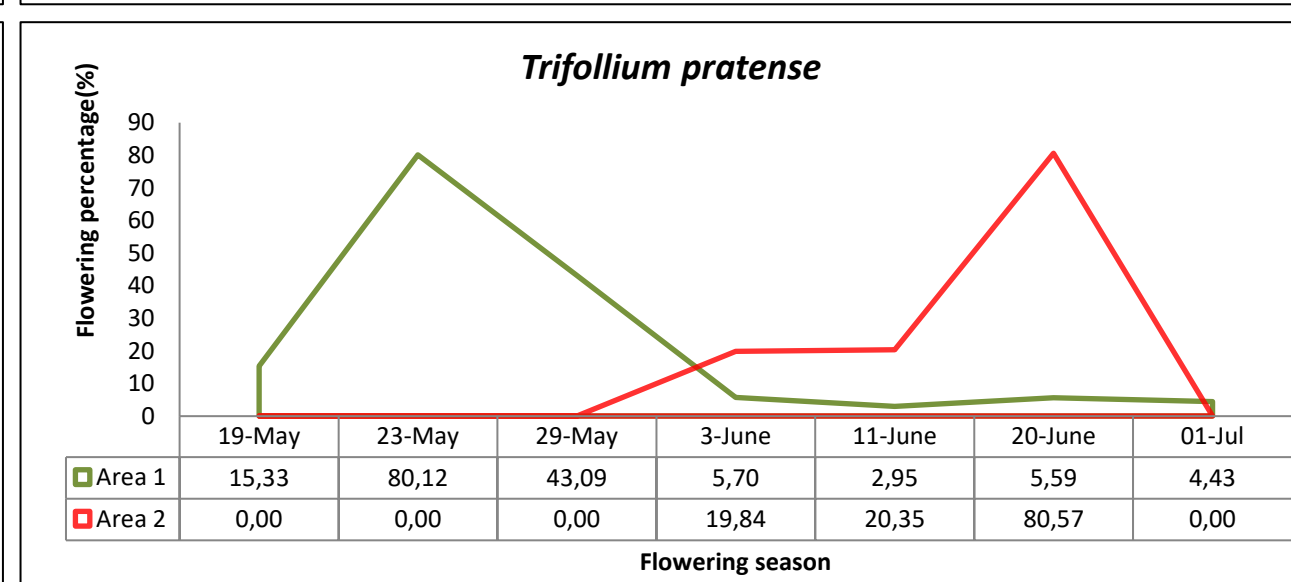
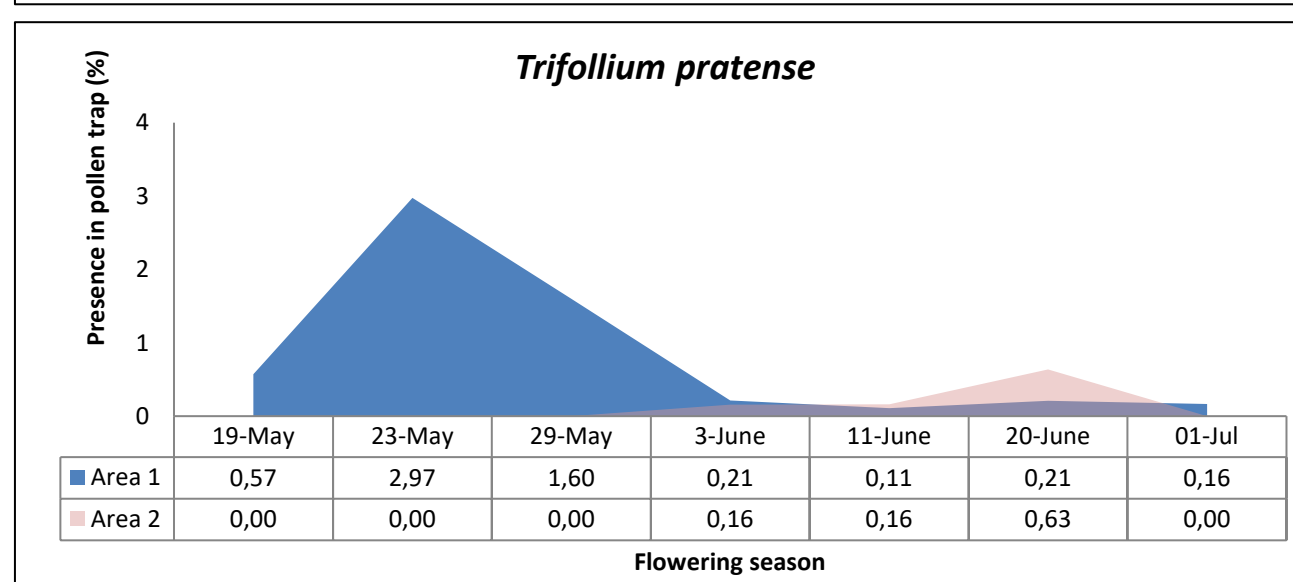
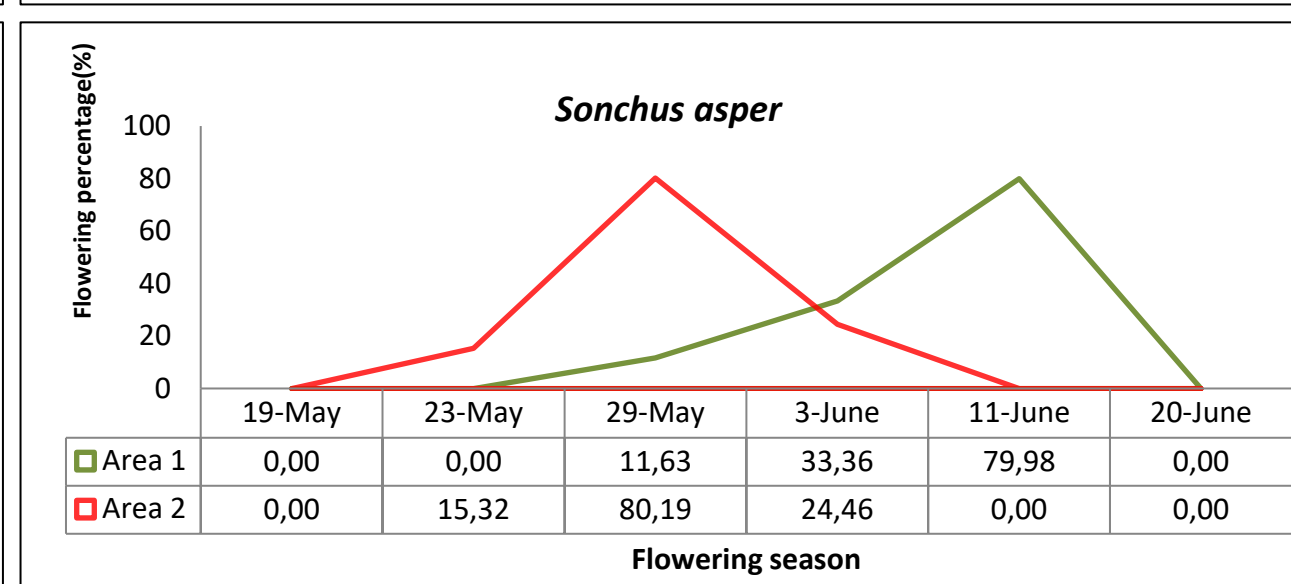
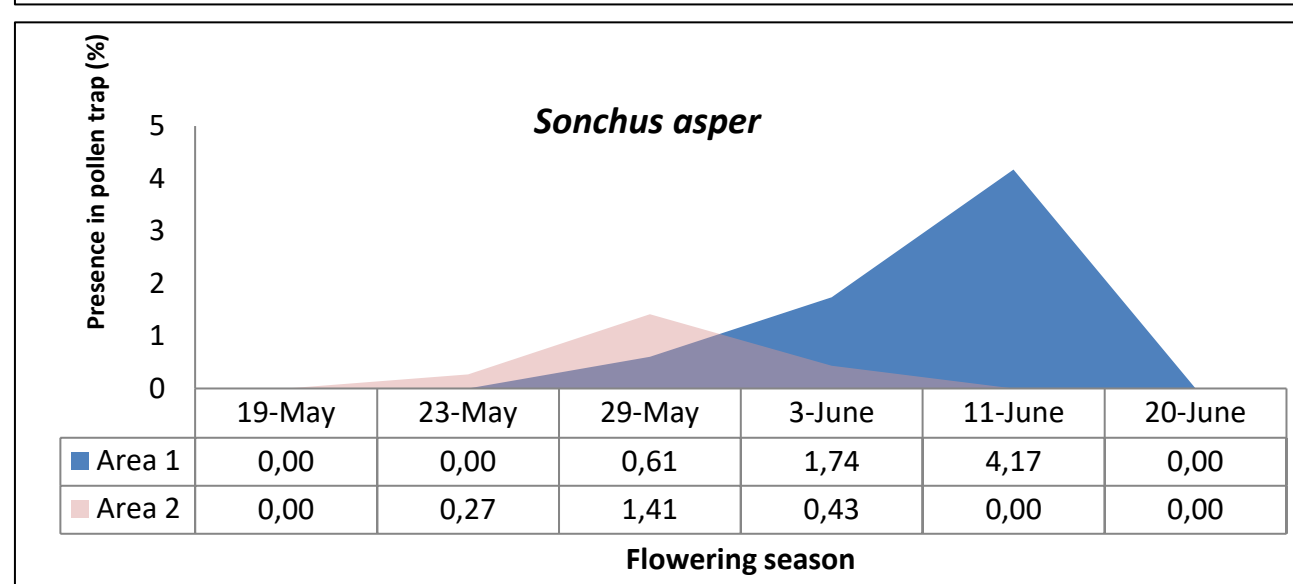
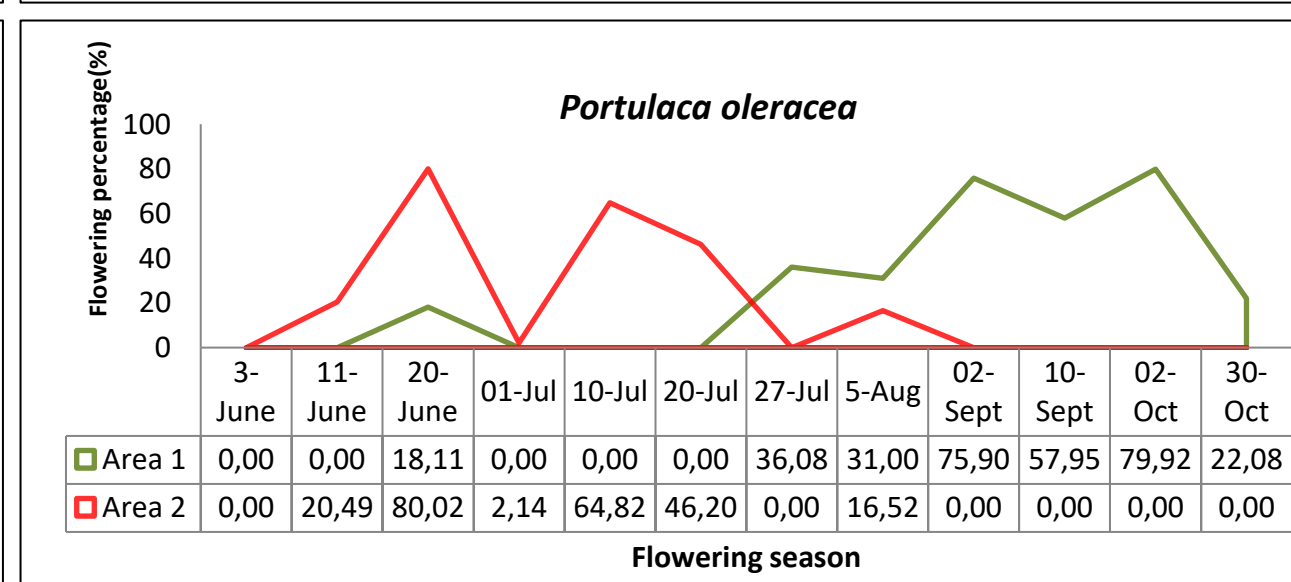
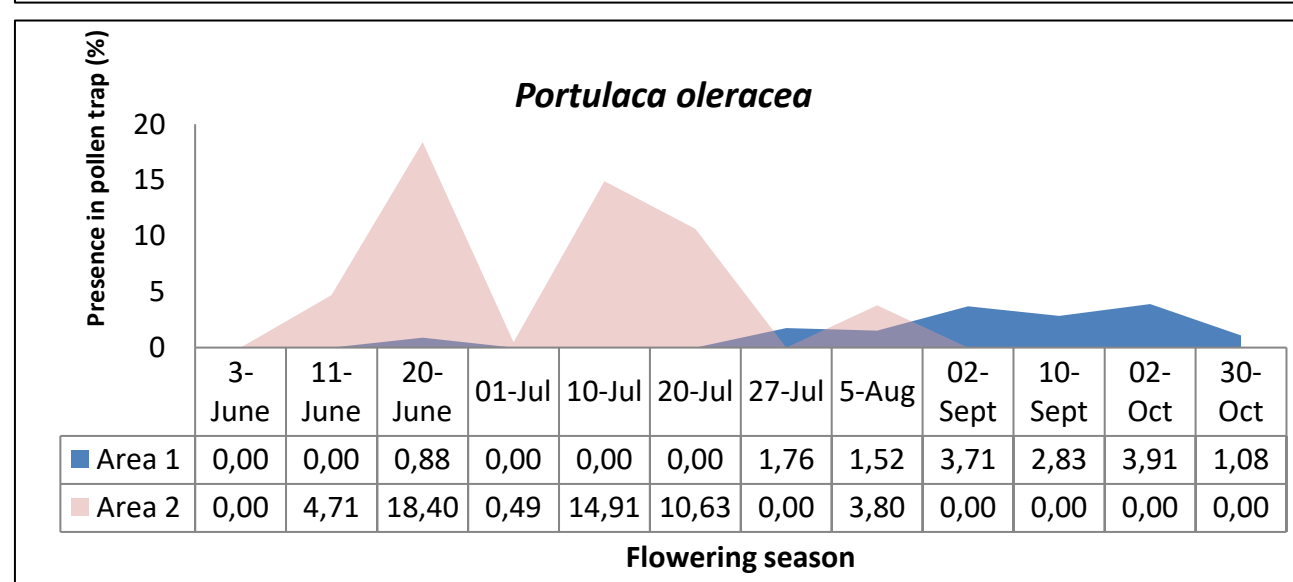
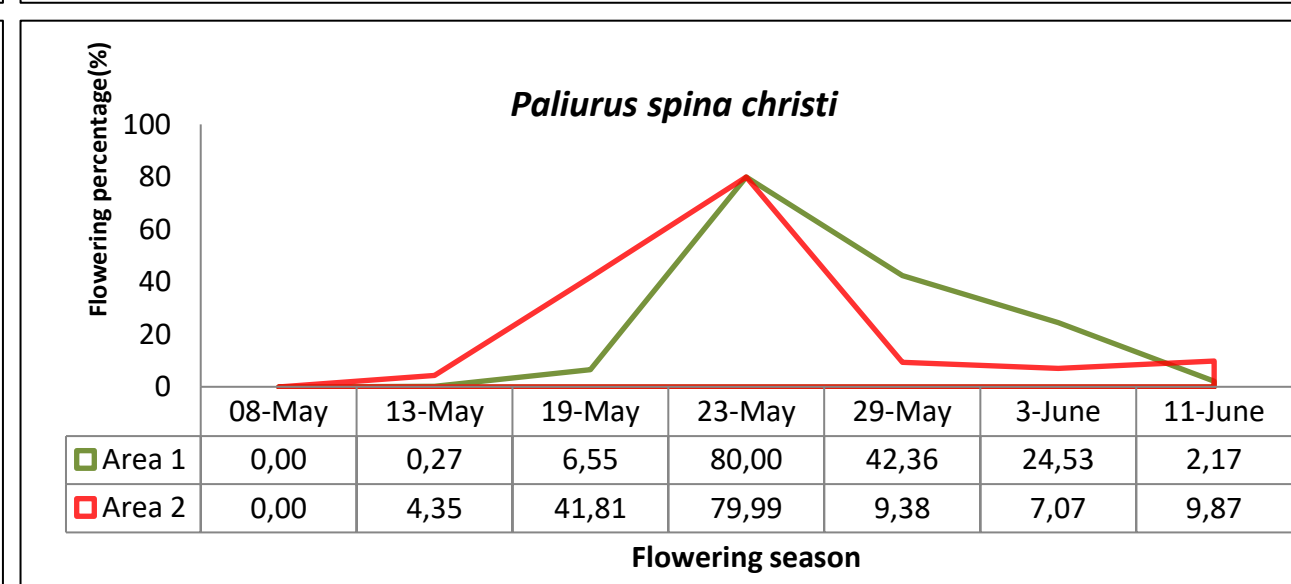
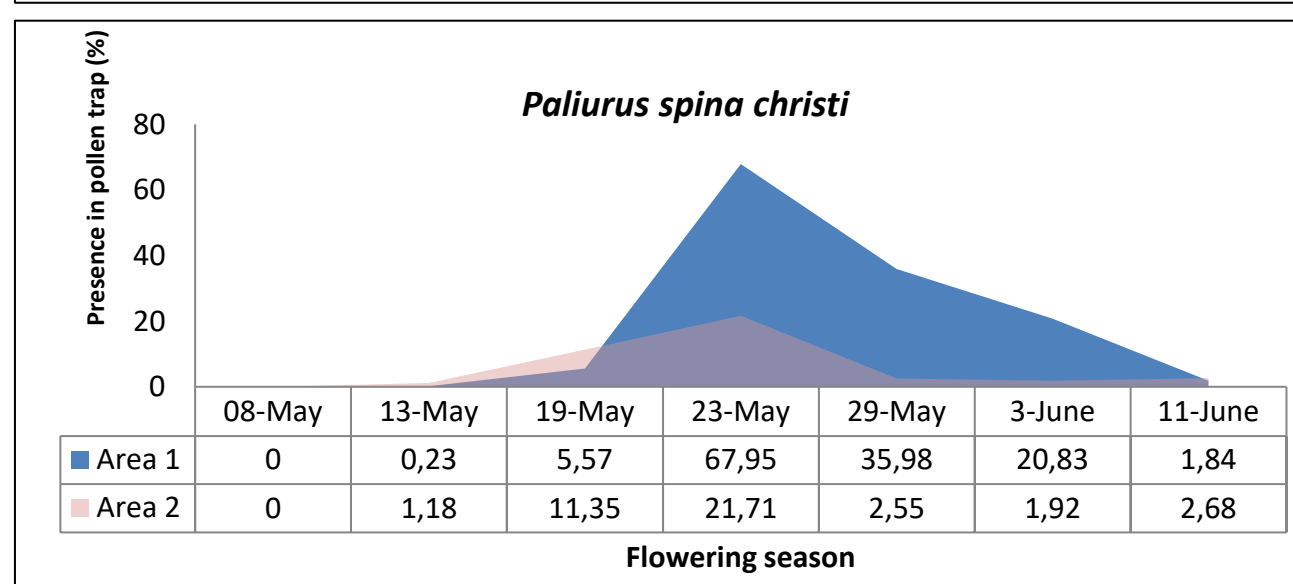
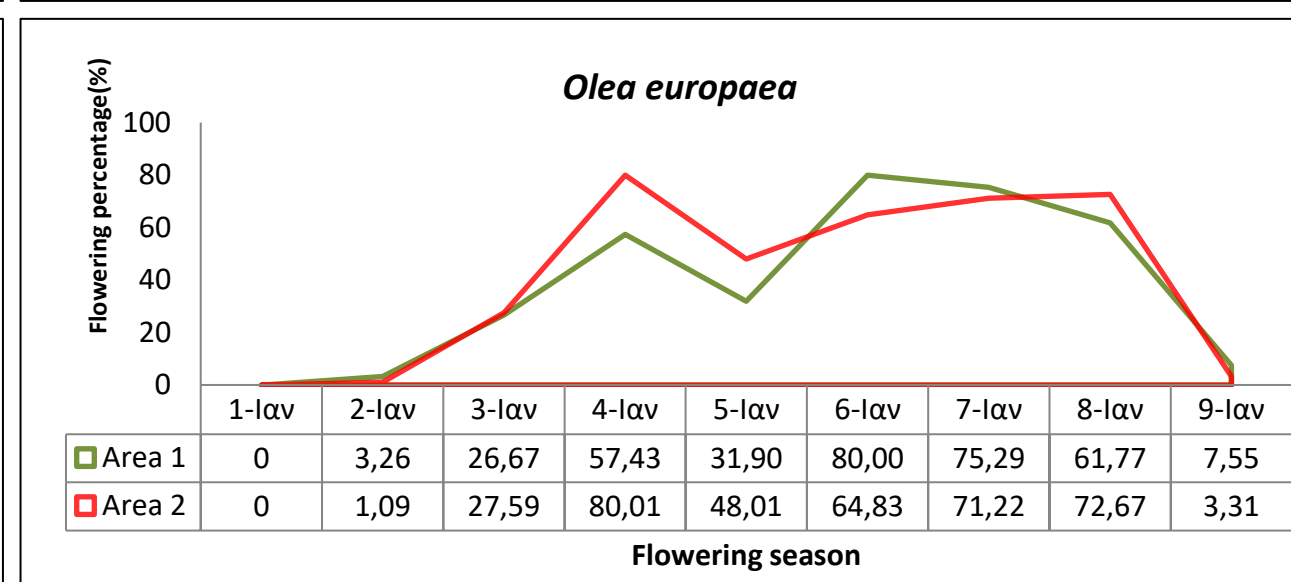
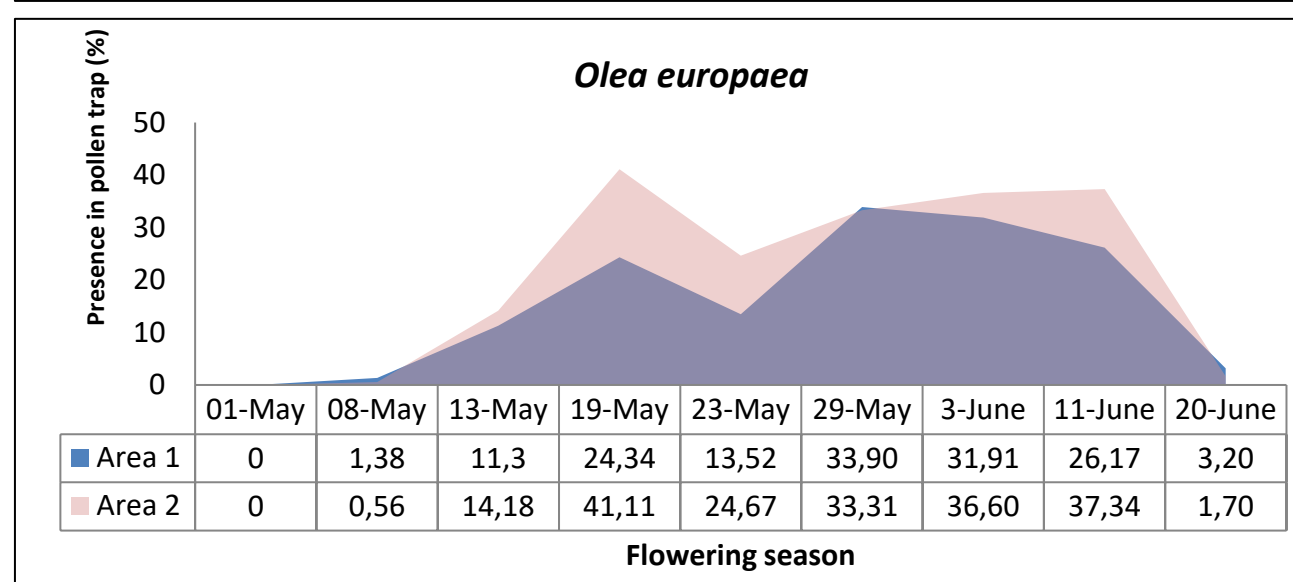
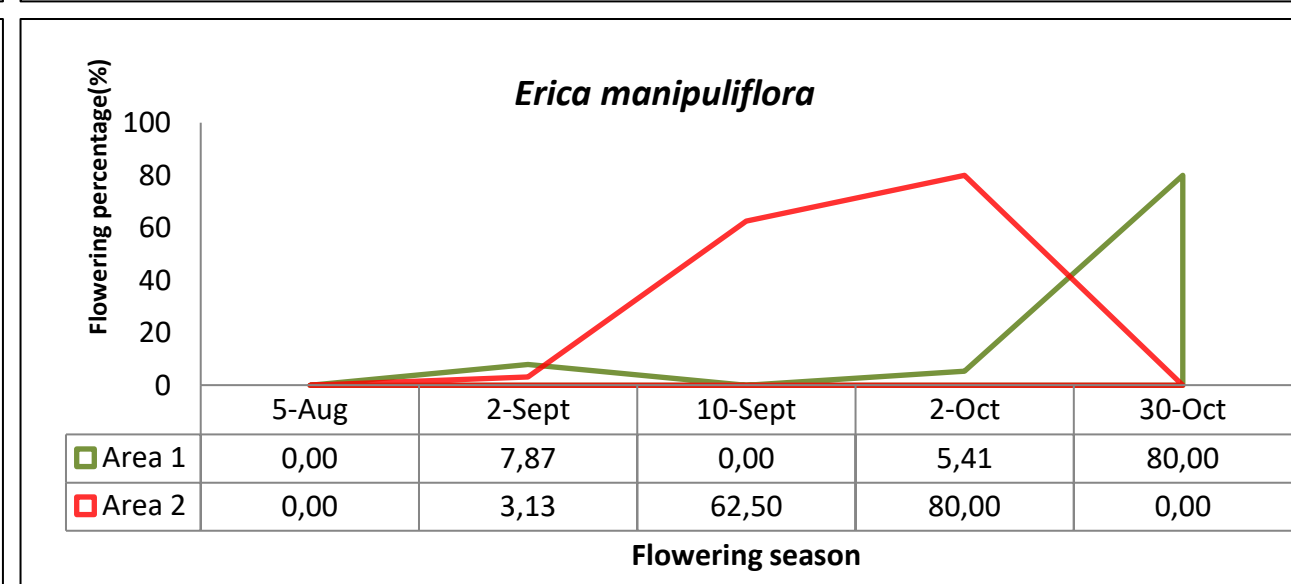
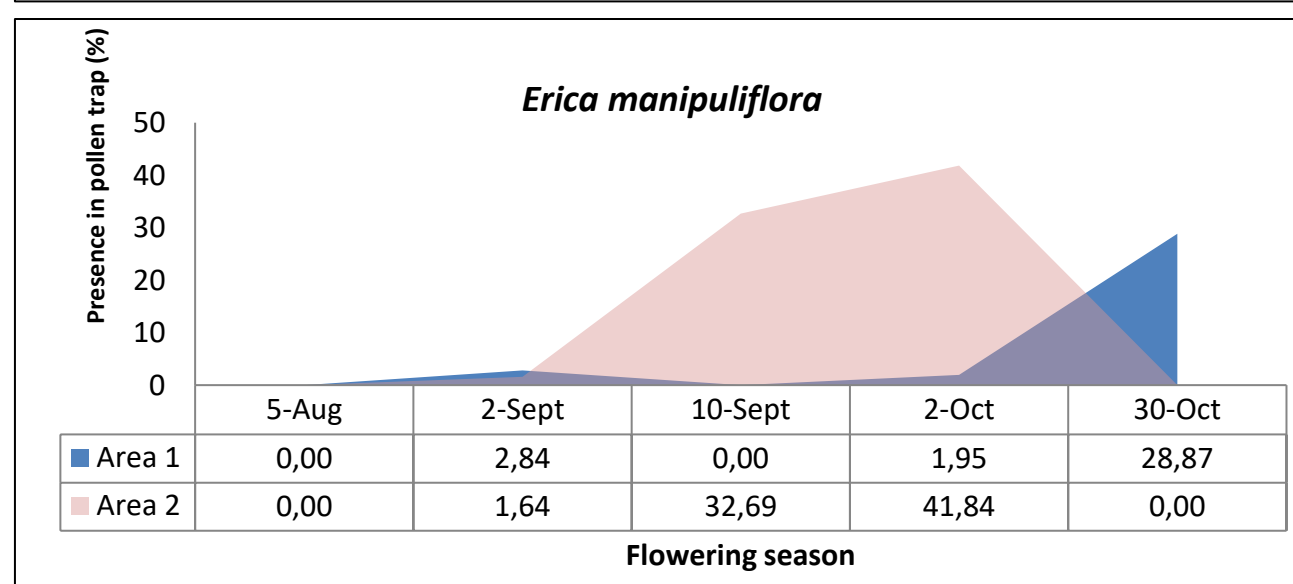
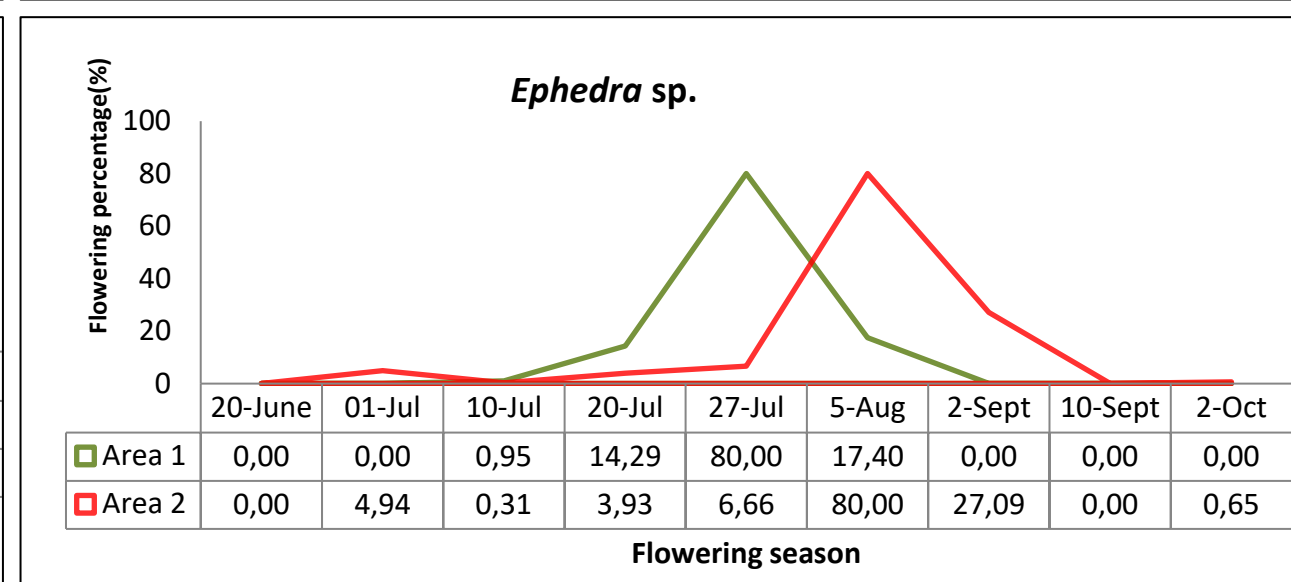
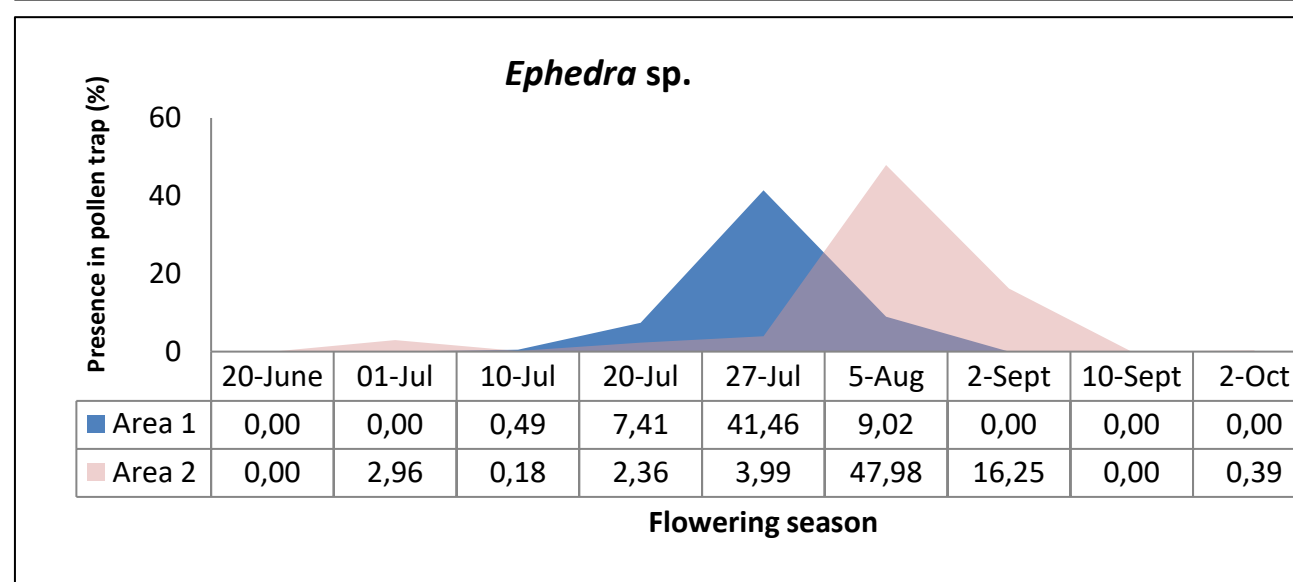
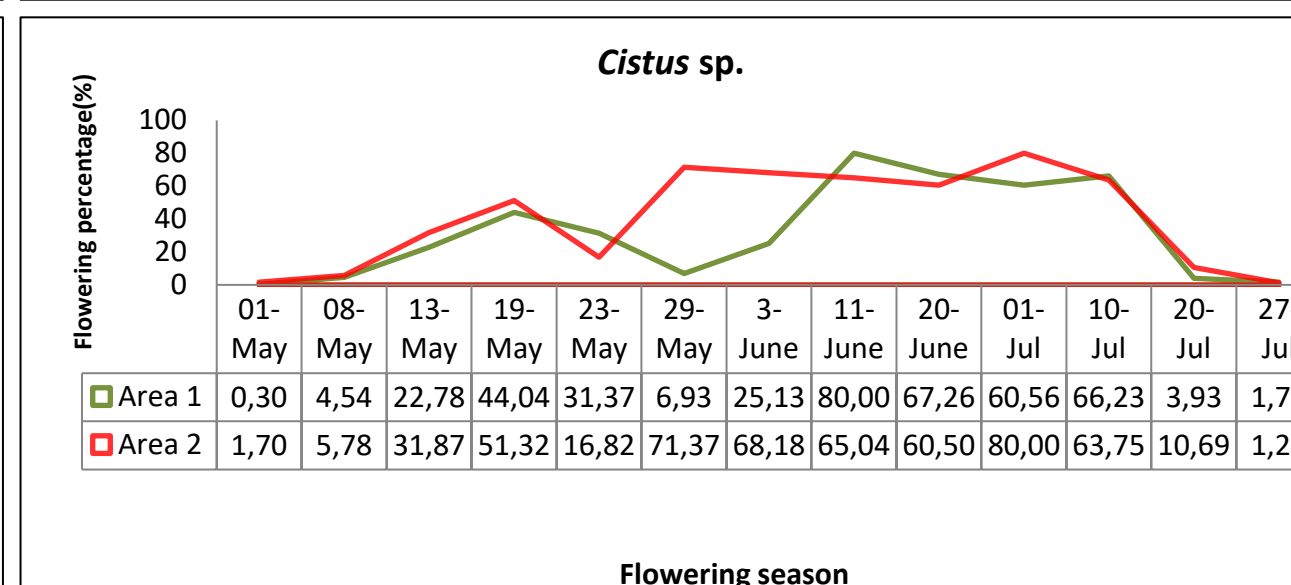
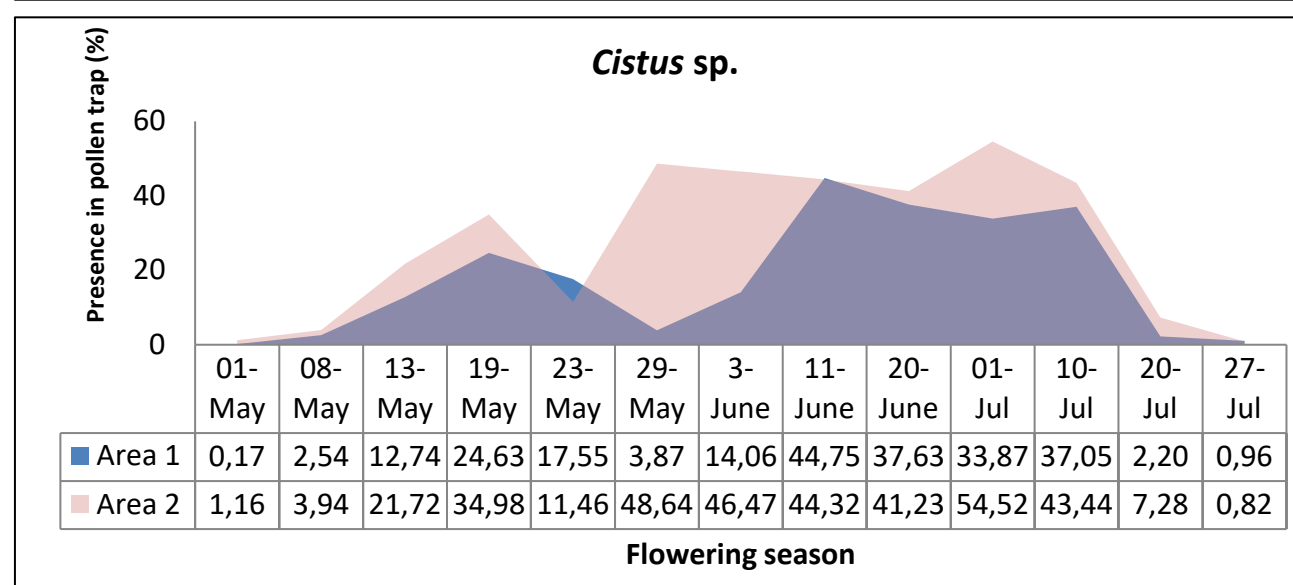
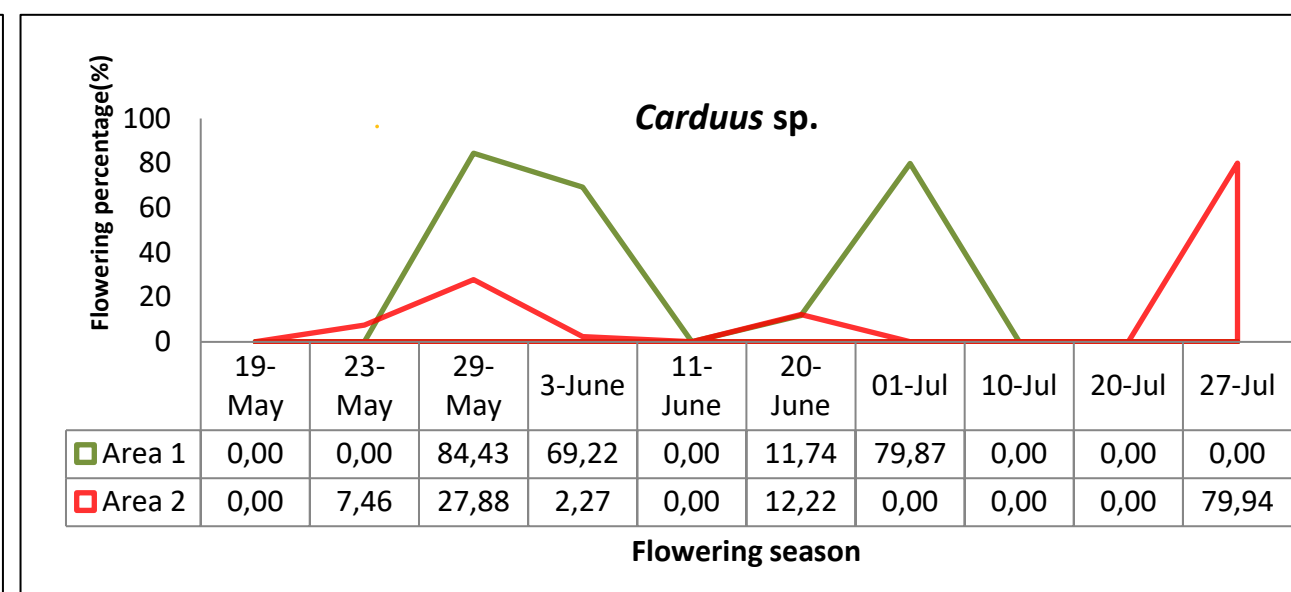
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## Results

### Pollen traps



### In situ assessment



## Introduction

The knowledge of bee flora of an area as well as the prediction of the flowering period of target plants are necessary and basic for beekeeping, as they remarkably contribute to the planning of bee hives transport and thus to the reduction of production costs. At the same time, the climate change and its impact on the flowering of beekeeping plants creates additional problems and leads to failures in the moving schedule of the bee hives.

## Purpose

The aim of the present study was to investigate the use of pollen traps as an easy and reliable tool for recording the flowering period of beekeeping plants in an area compared to the classical method of on-site recording in the field.

## Materials and Methods

### Installation of experimental apiaries / Inspections / Pollen collection

Two semi-mountainous areas of the prefecture of Thessaloniki were selected as target areas for the installation of the experimental apiaries. Entrance pollen traps with a separation grid were located on front of the hives after the moving of bee colonies in the target areas. Pollen collection was done at regular intervals, by removing the drawer and simultaneously replacing it with a clean collection drawer. The samples after their harvest were placed in the freezer until the time of their separation, to avoid any alteration in texture and color.

### Pollen separation and identification

Pollen, depending on its botanical origin, has various shades that start from white to black with many gradations of basic and complementary colors, with yellow being the predominant. The pollen loads were separated mainly based on color, shape and size. For the identification of pollen grains, the method of Louveaux (1978) was used, according to which a small amount of pollen is placed on a slide and the pellets are dissolved with 2-3 drops of diethyl ether. After the evaporation of the solvent, one drop of aqueous isoglucose solution (2:1) is added on the slide to hydrate the pollen grains and one drop of aqueous fuchsine to color them. The slides are placed on a heating plate to remove the moisture and covered with coverglass containing a drop of Entellan. For the identification of the pollen grains we used the database of the Laboratory of Apiculture-Sericulture, AUTH. At the same time, slides were also prepared from flower stems collected from the fields around the bee colonies, followed by microscopic examination for their identification.

### Flowering Rate Calculation – Flowering Period

The estimation of flowering days was based on the presence of the pollen loads in the pollen traps. Days were recorded when the first pollen loads of a species appeared in the pollen traps and ended when no more pollen loads were found. At the same time, in order to cross-check the results, a visual recording was carried out. The flora recording of an area by field visits of observers is the main method of recording taxa in systematic botany. For field observation, areas were marked and then the number of blooming flowers of the target plants was counted. Taxa with at least 10% of their flowers open, marked the beginning of flowering, while full flowering corresponded to 80% of blooming.

## Discussion-Conclusions

Although the preference of bees in terms of the harvested quantity of pollen is influenced by many parameters (e.g. abundance of plants, plant supply, etc.), it seems that the estimation of the period and the maximum flowering can be predicted with great accuracy with the use of pollen traps.

The use of pollen traps for bee flora recording presents the advantage of ease application, as bees travel long distances every day in order to collect pollen, while the removal of the collected pollen is easy, without additional beekeeping treatments. It is disadvantaged though in the laborious process of color separation of pollen grains and simultaneously requires knowledge of melissopalynology. On the contrary, the on-site recording of plants in the target areas requires several time-consuming visits to the field, enabling the researcher to understand the plant populations and their flowering stage, but not have access to information about the bees' feeding habits.



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