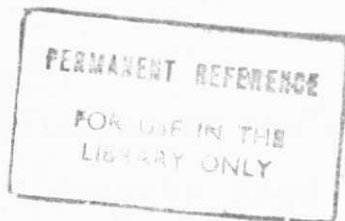


**BEE PASTURAGE POTENTIAL  
OF TWO KANDYAN HOMEGARDENS  
IN SRI LANKA  
WITH EMPHASIS ON  
PALYNOLOGICAL STUDIES**



**A thesis  
presented for the degree of  
Master of Philosophy  
in the University of Peradeniya**

**by**

**NELIYA MIRIAM MENDIS**

**Department of Botany  
University of Peradeniya  
Peradeniya**

**Date: 17th October 1989**

**426051**

## ABSTRACT

Non-availability of adequate bee forage is one of many factors limiting successful bee keeping. In this study bee pasturage in two Kandyan home-gardens and their surroundings in the village of Walgampaya was identified by examining the local flora, its flowering phenology and pollen morphology.

Out of the 262 Angiosperms recorded in the area, 98 species comprising 51 trees, 19 shrubs and 28 herbs were visited by bees for pollen and/or nectar at varying intensities and at different times of the day and year. Cocos nucifera L. was the most important of the 39 major pollen sources whereas Albizia moluccana Miq. was the main nectar producer out of the 16 major nectar sources. In addition, many economically important species grown in the Kandy district, viz. Coffea sp (coffee), Swietenia macrophylla King (mahogany), Myristica fragrans Houtt. (nutmeg), Artocarpus spp. (jak and breadfruit), Melia dubia Cav. (lunumidella), Persea americana Miller (avocado), Mangifera indica L. (mango) and Camellia sinensis (L.) Kuntz. (tea) were visited by bees. Further, wild tree species of the locality viz., Terminalia bellirica (Gaertn.) Roxb. (bulu), Vitex pinnata L. (milla), Wendlandia bicuspidata Wight & Arn. (rawanidala), Syzygium operculatum (Roxb.) Nied (bata-domba) and Sapocarpus obscura Thw. (badulla) and common herbaceous weeds viz., Mimosa pudica L. (nidikumba), Bidens pilosa L. (Val The) and

Pennisetum sp. were also important bee forage sources. Whether preferences of bees for certain species were governed totally by the availability and/or abundance of these species has been critically examined. In the case of bee forage species providing pollen, this preference could not be attributed to any distinct characteristic in the morphology of the pollen grain.

During the dry and wet seasons of the year, the three plant life forms varied in importance as food resources. Trees were the major life form visited during the relatively dry season ie. January to April, when peak flowering in trees as well as the honey flow of the area occurred. During the wet season of May to August shrubs and herbs were the main food sources which helped to maintain bee colonies. However this was also the dearth period of this locality when egg-laying, brood rearing and pollen and nectar storage were at a minimum. Hence only a combination of all three life forms was found to provide year-long bee pasturage. This aspect is discussed in detail.

The examination of pollen samples collected at the study site from different colonies revealed different floral preferences. The total number of species visited throughout the study period by each of the experimental colonies varied between 26 and 53. That this was possibly due to

genetic differences of the colonies and/or to the inefficient foraging strategy of the colonies is discussed.

The total number of species visited by all experimental colonies also varied in the two years of this investigation. That this could be related to environmental factors such as differences in flowering phenology or bee responses to these factors, is also discussed.

The examination of individual corbicular pollen loads revealed the phenomenon of mixed or bifloral loads during certain months of the year. Though this could not be related to any specific factor, the suggestion that it was due to low floral fidelity of the experimental bees has been considered.

Though the experimental bees have foraged on a wide variety of species available in the study site and on a combination of all three life forms, the number of individuals of such species have been inadequate for successful bee keeping in this area as revealed by the performance of the colonies. It is discussed that the preferred bee plants have to be in higher densities, and in an appropriate combination to improve the bee pasturage in the area. It is recommended that higher densities of these suitable species be planted if bee keeping is to be made economically successful.