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Full Length Research

A PRELIMINARY SURVEY OF WEST BANK PLANTS DIVERSITY AS POTENTIAL FORAGE PLANTS FOR BEES IN WEST BANK, PALESTINE.

IMADEDDIN ALBABA

Freelance Consultant & Researcher.

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ABSTRACT

Nectar and pollen are the major sources for the fulfillment of the nutritional demands of honeybees. The contents of these sources vary based on the floral diversity, seasonality and flowering phenology. Palestine is a small country rich in biodiversity, due to its location at the crossroads of three bio-geographical (Mediterranean, Desert and Steppe) and botanic regions of various climatic conditions, topography, geomorphology, geology and soils. This endows the Palestinian Territories with a rich variety of plant life including some 2780 plant species. The present study aims at surveying the diversity of honeybees foraging plant species. The survey was conducted through bi-weekly visit to the selected sites located in some reserves, agricultural fields, randomly selected in the West Bank-Palestine. Four lines transects of a thousand meters in length each, were selected and stationed on two separate points on each site at every study visit. The start and end of each transect were marked with the National flags made to enhance visibility. Moving on the transects, each and every 5 steps, flowering plants found at about two meters radius were visited and observed for the presence and foraging activities of honeybees within a predetermined period of fifteen minutes. Plants were scored as bee foraging species when at least three honeybees had visited and foraged on the flowers within the observation period. Camera shots were used to prove the honeybees' presence and identification of the plant species. The result indicated that 393 species of plants were registered as potential forages for honeybees. It was concluded that any of the studied locations can be profitably utilized for beekeeping.

KEYWORDS: Diversity, foraging plants, honeybees, Palestine.

*Corresponding Author. Email: beesresearch@gmail.com

INTRODUCTION

Palestinian beekeeping is a traditional hobby and job about seven millennia old. The archaeological remnants showed mud beekeeping in the Canaanite era in the Babb El Wad area. The ten thousand years old city, Jericho, showed remnants of apiculture activities. Two Christian brothers from Bethlehem, Emeel and Philip, quoted beekeeping activity in Palestine in 1881.

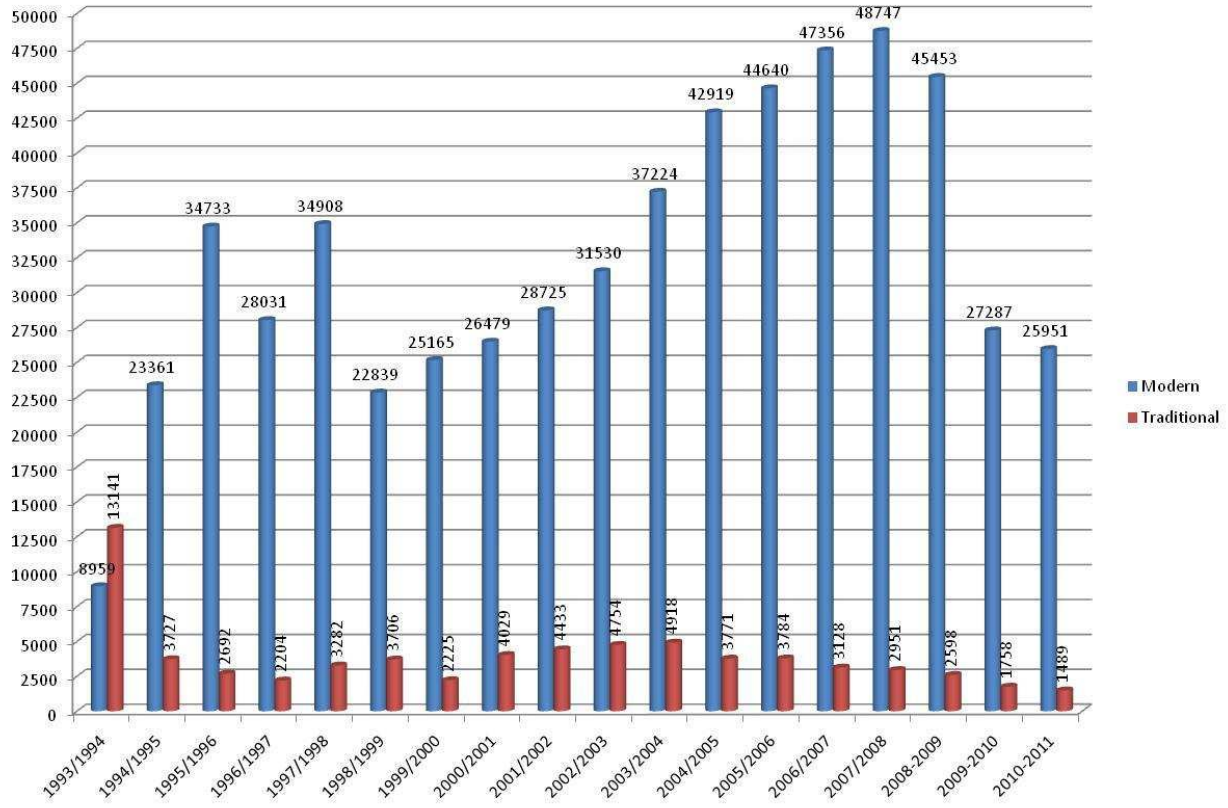

Figure 1. The Beehives population Of the West Bank: Modern &Traditional [1]

Being located in West Asia, at the edge of the Fertile Crescent and to the East of the Mediterranean Basin, the Palestinian Territories have been the center of origin and distribution of human civilizations. Palestine's is located at the crossroads of three bio-geographical (Mediterranean, Desert and Steppe) and, topography, geomorphology, geology and soils. These endow the historical Palestinian territories with a rich variety of plant life including some 2780 plant species [2]. Melliferous Plant species over 900 out of 2780 flowering plant species, Zohary, [3] which include: trees, shrubs, herbs & cultivated crops. [2]

The climate in Palestine is typical mediterranean, with a long, hot, dry summer, a rainy winter and a drier thanb spring autumn season. The temperature and the evaporation rate increases towards the south of the West Bank and towards the Jordan Valley, with rainfall ranging from 100 to 700 millimeters annually depending on the location [4].

The Palestinian territory is composed of five climatic zones: The Mediterranean shoreline coastal plain (Coastal zone), the Upper coastal plain (Semi coastal zone), the Central highlands, the Semi-Arid eastern slope steppes, and the Arid semi-tropical Jordan valley. Each of the mentioned zones is dominated by a common type of chorological and phyto-geographical flora. Figure 1 shows the Beehives population Of the West Bank: Modern &Traditional setup from 1993 to 2011

METHODOLOGY

A preliminary list of plants diversity as potential forage plants for Bees in the West Bank-Palestine was compiled based on literature survey of many existing references, [5], [6], [7], [8]. Plant systematic, phenology and other information were obtained basically from the Flora Palaestina [9] from the preliminary Checklist and Ecological Data-Base of Plants of the Cana [10].

The survey of West Bank plants diversity as potential forage plants for Bees was conducted from the 1st of January, 2011 until the 31st of December 2012, in The West Bank Governorate that represent five Phyto-climatological zones. The fieldwork part of the survey included making transects in the sites parts of the designated study areas. A 25 transects were made in the different sites of the study area so as to cover as much diversity in these sites as possible. Most of the plant species recorded in the survey was recorded during this period of the survey.

RESULTS AND DISCUSSION

A total number of 393 species of plants were identified with the recorded species belonging to 57 families.

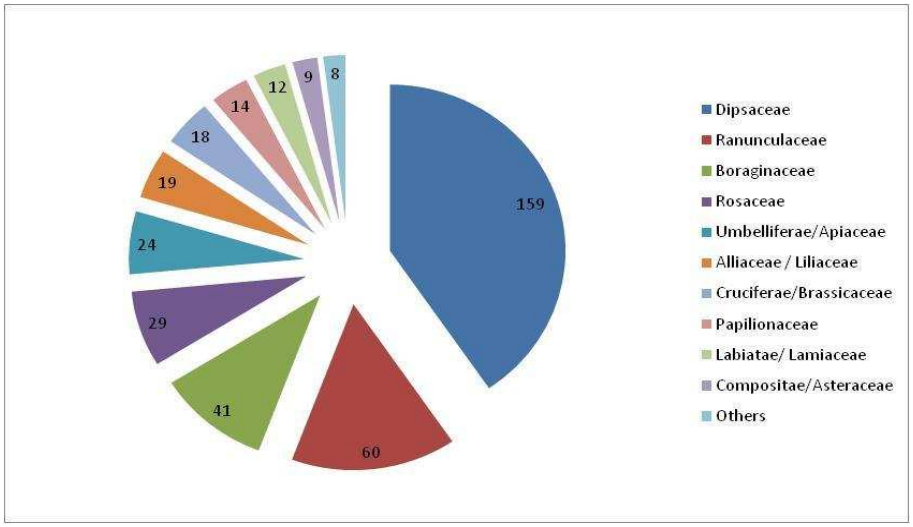

Figure 2. The distribution of plant species among major different families represented in the study.

The above figure shows the plant species distribution among major plant families identified in this study. Based on the number of plant species, the dominant families are *Dipsaceae* with 159 belonging species

followed by *Ranunculaceae* family with 60 belonging species, then followed by *Boraginaceae* family with 41 belonging species followed by other families as listed in the above figure.

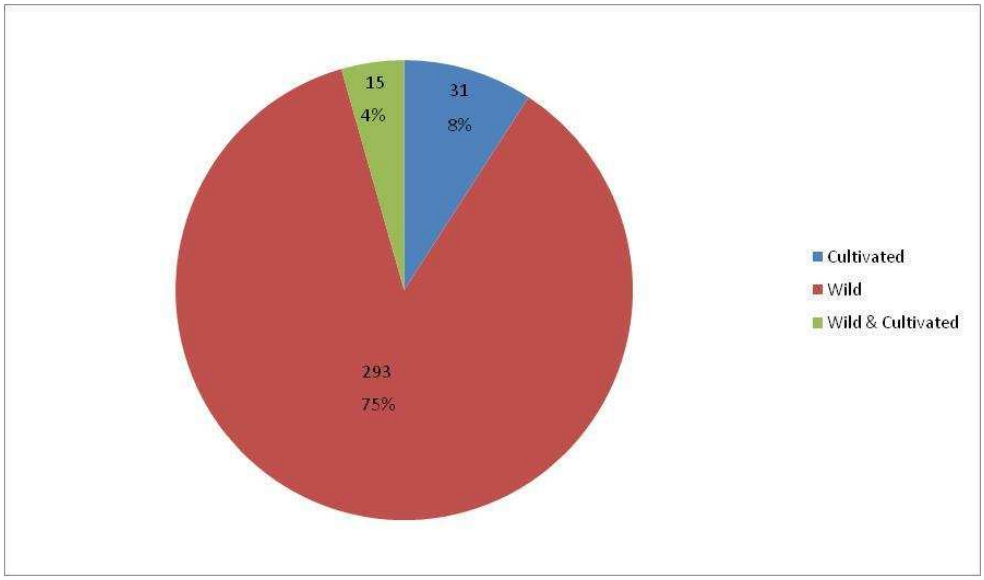

Figure 3. Plant occurrence: Wild/Cultivar

Figure 3 above, shows the plants occurrence as in wild or as a cultivated plant or in both forms. Almost 75% of the identified plants occurred in wild environment, 8% occurred in cultivated fields and 15% occurred in both fields.

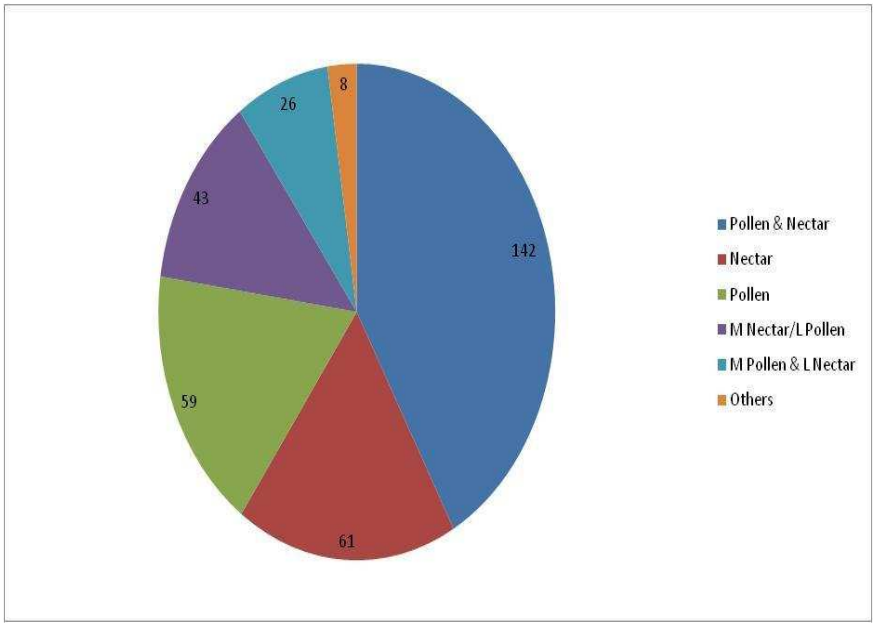

Figure 4. Used plant elements.

Figure 4 above, shows the used element of plant (Pollen or Nectar). The letter M means MORE, and the Letter L means LESS. (36%) 142 plants species as a source of Pollen and Nectar together. (16%) 61 plants species are used as a source of nectar only. (15%) 59 plants species are used as a source of Pollen only. (11%) 43 plants species are used as a source of more nectar and less pollen. (7%) 26 plants species are used as a source of more pollen and less nectar. (2%) 8 plants species are used as a source of other food components.

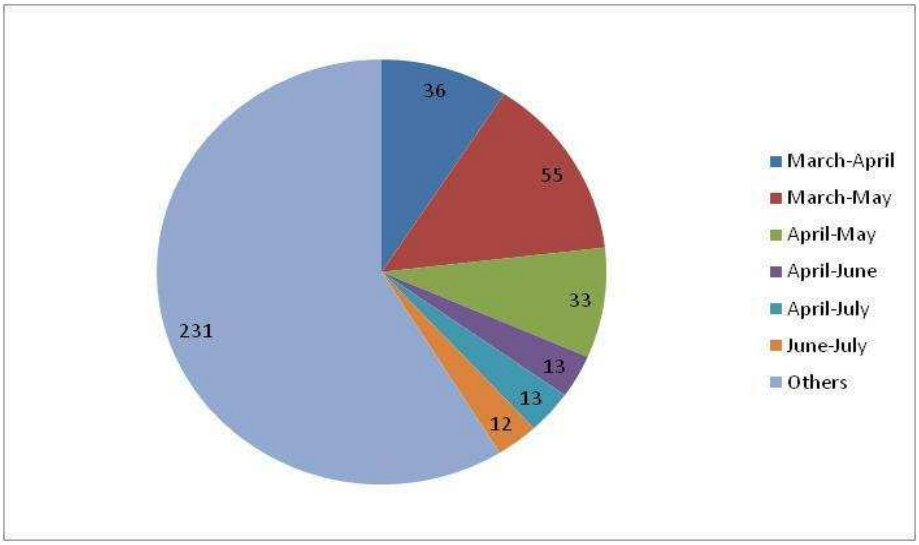

Figure 5. Plant blooming numbers/ Month/Months.

Figure 5 above, shows that the major blooming period of the studied plant species is before March and after July. The second blooming period is March-May, where (14%) 55 plant species are blooming under this period of time. This period followed by a group (9%) 36 plants species that bloom on March-April. Followed by another group (8%) 33 plants species that bloom on April-May. This is followed by another group (3%) 13 plants species that bloom on April-June, followed by another group (3%) 13 plants species that bloomed on April-July and (3%) 12 plants species that bloom on June-July.

CONCLUSION

In conclusion, the result clearly indicated that the West Bank area of Palestine is rich in bee foraging plant species. These result can equally serve as a guide for deciding where to site beehive plantations by different Palestinian agencies based on the multiple use principle and their value as bee forage as one of the uses.

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