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Some Plants Which Most Visited by Honey Bees from Çelikhan (Adıyaman) and Surroundings

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Abstract

Knowing the characteristics of the beekeeping flora is very important for the productivity of beekeeping activities. Especially it is important that which plants are preferred by honey bees. In this study; important plants for beekeeping activities have been identified in Çelikhan (Adıyaman) and its surroundings. For this purpose, periodic field studies and observations were carried out. In addition, meetings were conducted with beekeepers in Çelikhan (Adıyaman) and its surroundings. As a result of this study, 112 plant taxa which were most visited by honey bees have been determined. The major families include these plant taxa: Lamiaceae (29), Fabaceae (21), Asteraceae (16), Rosaceae (11), Apiaceae (9), and other families (26).

The most visited plants of bees may vary according to ecological conditions, vegetation of the area and many factors like the appearance of flower including colour, shape, morphology, display area and odour. In the research area, the most visited plants by bees are more frequent, were detected populated in the field, pollen and nectar sources are more and the flowering period is long and more spreading ones.

Keywords: flora, beekeeping, Çelikhan, Adıyaman.

1. Introduction

Bee's foraging activities initiated by the scout bees that go to the field, return and display a dance communication and odour plume to alert the other bees in hive about the food source, location and distance. The foragers select their foraging plants for pollen, nectar and resin. While bees collect pollen and nectar from plants, they make a significant contribution to crop growth, ecosystem, ecology, agriculture and economy by pollinating plants. In addition, bees are one of the important insect species that have many benefits such as increasing the generation of plants, protecting the ecological balance, and causing high quality and excess fruit formation (Çankaya, Korkmaz, 2008). Some scientific studies have been carried out to reveal the floristic richness of and the originality of the vegetation of Adıyaman (Turkey) (Avcı, 2009; Yıldırımli, Kiliç, 2018; Yıldırımli, Kiliç, 2019; Tel, 2009; Tel, Tak, 2012; Tel, Şahin, 2016; Tel, Tak, 2015; Tel, Şimşek, 2017).

We chose this region within the scope of our project work since Çelikhan district of Adıyaman and its surroundings are original in terms of plant species and number due to different ecological factors. According to Davis's Grid system the research area is in C7 square. Our study area is in the Anatolian-Turanian phytogeographic region. The research area and its surroundings have different

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habitats such as steppe, wetland, rocky, forest areas and different ecological characteristics. Bees and plants are highly interconnected, and bees are as important for pollination of plants as plants are important for feeding bees and producing honey.

The plant diversity of area that beehives are located, especially the excess of plants preferred by the bees, the length and the difference of the vegetation period and the length of the flowering periods affect both bee nutrition and the yield and quality of bee products. The determination of the location of hives is very important for successful beekeeping. The vegetation cover, plants that bees mostly visit to get nectar and pollen, and the starting time of flowering and nectar flow time should be well known.

With this study, certain plants most visited by bees in Çelikhan district (Adıyaman) and its surroundings were determined through periodic field studies, interviews with the people of the region engaged in beekeeping in the area and its immediate vicinity. In addition, data have been obtained to contribute the more efficient continuity of beekeeping activities in the region and to contribute relevant literature.

2. Materials and methods

112 plant taxa that spread in natural areas in Çelikhan (Adıyaman) district and its surroundings and visited the most by bees constitute the materials of this study. These bee plants were collected during the vegetation period of 2019–2020 dried in accordance with the herbarium technique, and their diagnosis was made using the works of plant systematists Ö. Kılıç and Ş. Yıldırım with Flora of Turkey (Davis, 1965–1985). Plant materials are preserved in Adıyaman University Pharmacy Faculty Herbarium and Yıldırım Herbarium from Ankara. Location of research area is seen in Figure 1.

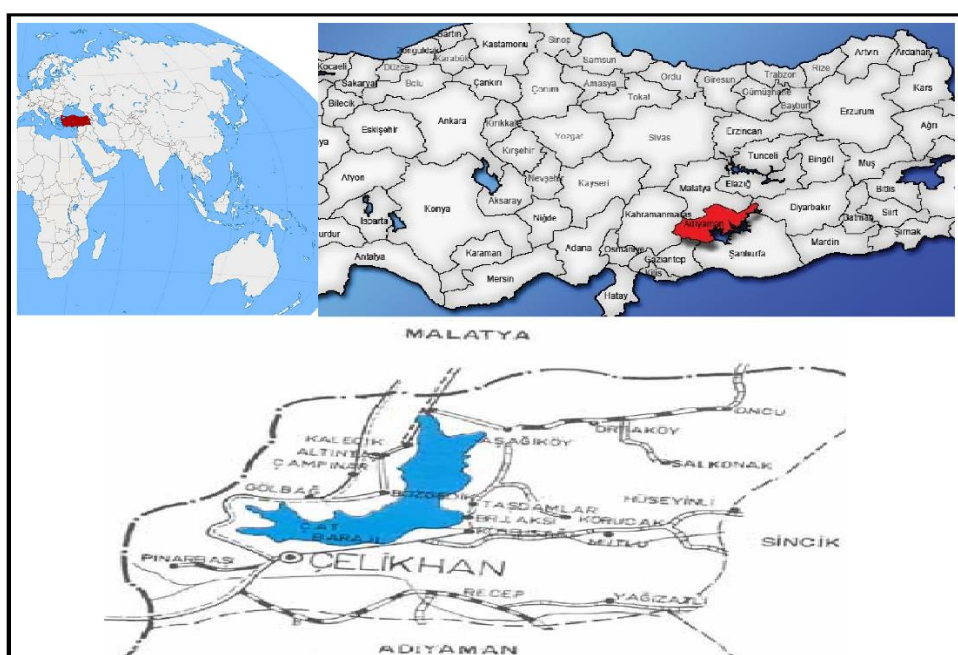


Fig. 1. Location of study area

3. Results and discussion

In the vegetation period of 2019–2020, the 112 plant taxa that spread in the natural areas in Çelikhan (Adıyaman) district and its surroundings and visited the most by bees (*Salvia multicaulis* L., *Mentha longifolia* (L.) Hudson subsp. *longifolia*, *Phlomis rigida* Labill., *Thymus haussknechtii* Velen, *Teucrium parviflorum* Schreber, *Scutellaria orientalis* L. subsp. *orientalis*, *Salvia verticillata* L. subsp. *verticillata*, *Teucrium polium* L., *Lamium macrodon* Boiss. et Huet, *Marrubium astracanicum* Jacq. subsp. *astracanicum*, *Stachys lavandulifolia* Vahl var. *brachydon*, *Nepeta nuda* L. subsp. *nuda*, *Lallemantia iberica* (Bieb.) Fisch et Mey., *Satureja boissieri* Hausskn et Boiss., *Thymus kotschyanus*

Boiss. et Hohen var. *kotschyanus*, *Salvia trichoclada* Benth., *Origanum vulgare* subsp. *gracile* (K.Koch) Ietsw., *Phlomis kurdica* Rech. Fil., *Sideritis vulcacina* Hub. Mor., *Salvia frigida* Boiss., *Thymbra spicata* L., *Marrubium globosum* subsp. *globosum*, *Origanum acutidens* (Hand.-Mazz.) Ietsw., *Ziziphora taurica* M.Bieb. subsp. *taurica*, *Teucrium polium* L., *Salvia viridis* L., *Phlomis armeniaca* Willd., *Clinopodium graveolens* Kuntze. subsp. *rotundifolium* (Pers.) Govaerts, *Lamium garganicum* L. subsp. *reniforme*, *Inula helenium* L. subsp. *pseudohelenium* Grierson, *Helichrysum graveolens* (Bieb.) Sweet, *Achillea millefolium* L. subsp. *millefolium*, *Tripleurospermum parviflorum* (Willd.) Pobed, *Centaurea spectabilis* (Fisch. & C.A.Mey.) Sch.Bip. subsp. *microlapha* (Boiss.) Wagenit, *Achillea vermicularis* Trin., *Helichrysum plicatum* DC. subsp. *plicatum*, *Cirsium macrobotrys* (K.Koch) Boiss, *Achillea biebersteinii* Afan., *Anthemis armeniaca*, *Carduus nutans* L. subsp. *leiophyllus*, *Arctium minus* (Hill.) Berhn subsp. *minus*, *Anthemis coelopoda* Boiss. var. *coelopoda*, *Scorzonera latifolia* (Fisch. & C.A.Mey.) DC., *Tanacetum parthenium* (L.) Sch.Bip, *Echinops orientalis* Trautv., *Robinia pseudocacia* L., *Astragalus aduncus* Willd., *Trifolium pratense* L. var. *americanum* Harz, *Astragalus densifolius* Lam. subsp. *densifolius*, *Astragalus gummifer* Lab., *Vicia cracca* L. subsp. *stenophylla* Vel., *Medicago sativa* L. subsp. *sativa*, *Colutea cilicica* Boiss. & Balansa, *Lotus gebelia* Vent. var. *gebelia*, *Astragalus compactus* Lam., *Melilotus officinalis* (L.) Desr., *Trifolium pratense* L. var. *pratense* Boiss. et Bal., *Astragalus kurdicus* Boiss. var. *kurdicus*, *Trifolium arvense* L. var. *arvense*, *Astragalus bicolor* Lam., *Vicia sativa* L. subsp. *nigra* var. *nigra*, *Coronilla varia* L. subsp. *varia*, *Ebenus haussknechtii*, *Hedysarum syriacum* Boiss., *Vicia canescens* Lab. subsp. *canescens* *Hedysarum varium* Willd. subsp. *nitidum* Willd., *Pimpinella tragium* Vill. subsp. *pseudotragium* Matthews, *Prangos pabularia* Lindl, *Heracleum persicum* Desf., *Anthriscus nemorosa* (M.Bieb.) Spreng, *Prangos pabularia* Lindl., *Zosima absinthifolia* (Vent.) Link, *Bunium paucifolium* DC. var. *brevipens*, *Stenotaenia macrocarpa* Freyn et Sint., *Pimpinella adiyamanensis* Yild & Kılıç, *Celtis tournefortii* Lam., *Pyrus syriaca* Boiss. var. *syriaca*, *Prunus divaricata* Ledeb. subsp. *divaricata*, *Malus sylvestris* (L.) Mill. subsp. *orientalis* var. *orientalis*, *Crateagus monogyna* subsp. *monogyna*, *Crateagus orientalis* subsp. *orientalis*, *Rubus sanctus* L., *Crateagus meyeri*, *Rosa canina* L., *Potentilla reptans* L., *Cerasus mahaleb* (L.) Mill. var. *mahaleb*, *Aethionema adiyamanense* Kılıç & Yild, *Aethionema armenum* Boiss., *Galium verum* L. subsp. *verum*, *Cruciata taurica* (Pall. ex Willd.) Ehrend, *Allium scorodoprasum* L. subsp. *rotundum* (L.) Stearn, *Hypericum scabrum* L., *Silene compacta* Fisch., *Hypericum perforatum* L., *Aethionema grandiflorum* var. *sintensisii*, *Acantholimon acerosum* (Willd.) Boiss. var. *acerosum*, *Acanthus dioscoridis* L. var. *dioscoridis*, *Morus alba* L., *Rhus coriaria* L., *Ficus carica* L. subsp. *carica*, *Phacelia tanacetifolia* Benth, *Ranunculus arvensis* L, *Campanula involucrata* Aucher ex A.DC, *Alcea calvertii* (Boiss.) Boiss., *Cephalaria procera* Fisch. & Avé-Lall., *Silene spergulifolia* (Willd.) M.Bieb, *Pistacia eurycarpa* Yalt, *Verbascum lasianthum* Boiss. ex Benth, *Echium italicum* L., *Anchusa azurea* Mill. var. *azurea*, *Onosma sericeum* Willd., *Alkanna tinctoria* (L.) Tuasch subsp. *tinctoria*) were detected.

In research area, forests consisting of deciduous trees and bushes, steppes in treeless areas, rocky area, creek, aquatic and meadow formations are the main vegetation types. The vegetation characteristics that dominate most of the area have been effective on the soil properties in the study area and as a result, different soil types have emerged. Determination of conservation methods (on-site management, in-situ conservation, ex-situ conservation complementary conservation methods) to ensure the sustainable continuity of natural plant species, which are economically valuable and especially the most visited by bees in this study, and these methods complement each other. Implementation is one of the most important factors in making beekeeping activities in and around the area more profitable. In order to evaluate the existing potentials of Adiyaman in terms of beekeeping in the best way, the importance of nectar honey herbal resources in the field, preserving them with apiary, their conscious use in their natural habitats and supporting studies within this scope are of great importance. For this purpose, the current profile of the province, especially in terms of plant resources preferred by bees, is planned with the continuation of beekeeping accordingly, new investments for the future, determination of project goals and strategies are among the issues that should be seriously dwelled on.

In a study, 65 Lamiaceae taxa that are important, valuable and most visited by bees in Bingöl province-Sancak district (Turkey) were collected, identified and photographed through regular field studies and interviews with local people doing apiculture during the 2018–2019 vegetation period (Kılıç et al., 2019). In another study, 78 bee plant taxa were identified and the big families of the taxa as follows families: Lamiaceae (20), Fabaceae (16), Asteraceae (14), Rosaceae (7),

Boraginaceae (6) (Demirpolat, Kılıç, 2019). In this study, from Çelikhan (Adıyaman) and surroundings 112 plant taxa which were most visited by honey bees have been determined; the major families were: Lamiaceae (29), Fabaceae (21), Asteraceae (16), Rosaceae (11), Apiaceae (9), and other families (26). In this study, some detected species have economic and ethnobotanic importance (Kilic, Bagci, 2013; Kilic, 2016a) and some researches were carried out with these species (Kilic, Bagci, 2012; Kilic, 2016b; Kilic et al., 2011; Özdemir, Kilic, 2017; Kilic, 2014).

Plants that secrete nectar in nature are examined in three groups as cultivated plants, naturally growing plants and trees and shrubs, and the rich plant flora of Adıyaman and especially the richness of nectar plants have made Adıyaman and Çelikhan an ideal production area for beekeeping. In order to obtain different bee products with the desired characteristics in terms of quality and quantity, it is one of the most important issues to ensure that the plants most preferred by bees are known and protected and to become widespread, and to know the starting and continuing period of flowering and nectar flow.

4. Conclusion

Since the material studied in beekeeping is especially bees and plants, the way to be successful in this field is to know the materials well, to have knowledge about the plants where bees get the most nectar, to use the knowledge in the field and activities, and to know the necessary maintenance, method and management well. In this study, members of Lamiaceae, Asteraceae, Fabaceae were determined as the most visited families by bees. With this study obtained basic data that will contribute to beekeeping activities in Adıyaman and its surrounding. In addition this kind of studies are expected to contribute to the literature, Adıyaman and Çelikhan beekeeping activities and the specialization of Adıyaman University in this field.

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References

- Çankaya, Korkmaz, 2008 – Çankaya, N., Korkmaz, A. (2008). Samsun Tarım İl Müdürlüğü Çiftçi Eğitimi ve Yayım Şubesi Yayını.
- Avci, 2019 – Avci, H. (2019). T.C. İnönü Üniversitesi Fen Bilimleri Enstitüsü Yüksek Lisans Tezi, Akdağ (Çelikhan/Adıyaman) Florası Biyoloji Anabilim Dalı Ocak.
- Yıldırım, Kılıç, 2018 – Yıldırım Ş., Kılıç Ö. (2018). A New Species *A. adıyamanense* From Turkey. *The Herb Journal of Botany*. 25: 25-30.
- Yıldırım, Kılıç, 2018 – Yıldırım Ş., Kılıç Ö. (2019). A New Species, *Allium adıyamanense* (Amaryllidaceae/Alliaceae/Liliaceae) From Turkey. *Ot Sistemik Botanik Dergisi*. 26: 33-39.
- Tel, 2009 – Tel, A.Z. (2009). Contributions to the flora of Nemrut Mountain (Adıyaman/Turkey). *BioDiCon*. 2: 36-60.
- Tel, Tak, 2012 – Tel, A.Z., Tak, M. (2012). Perre (Pirin) Antik Şehri (Adıyaman) Vejetasyonu. *Biyoloji Bilimleri Araştırma Dergisi*. 5: 45-62.
- Tel, Şahin, 2016 – Tel, A.Z., Şahin, M.S. (2016). Ali Dağı ve Ziyaret Tepesi (Adıyaman/Türkiye) Vejetasyon Tiplerinin Kompozisyonu üzerine Bir Araştırma. *Adıyutayam*. 4: 1-19.
- Tel, Tak, 2015 – Tel, A.Z., Tak, M. (2015). Some endemic plants of Çelikhan Çat Dam Basin (Adıyaman). *Adıyutayam*. 3: 1-6.
- Tel, Şimşek, 2017 – Tel, A.Z., Şimşek, A. (2017). Ulubaba Dağı' nın (Adıyaman) Vejetasyon Yapısının Endemik ve Nadir Taksonları ve Bunların IUCN Kategorilerine Göre Değerlendirilmesi. *Commagene Journal of Biology*. 1: 51-56.
- Davis, 1965–1985 – Davis, P.H. (1965–1985). Flora of Turkey and the East Aegean Islands, vols. 1-9, Edinburgh Univ.
- Kılıç et al., 2019 – Kılıç Ö., Demirpolat A., Çobanoğlu D.N., Yıldırım Ş. (2019). Bingöl İliinden (Türkiye) Arıcılık Açısından Önemli Olan Bazı *Lamiaceae* Taksonları. *Ot Sistemik Botanik Dergisi*. 26(1): 85-91.
- Demirpolat, Kılıç, 2019 – Demirpolat, A., Kılıç, Ö. (2019). Genç (Bingöl-Merkez) İlçesi ve Çevresi Florasında Arıcılık Açısından Önemli Bitkiler. *International Journal Of Eastern Anatolia Science Engineering and Design*. 1(2): 135-141.

[Kilic, Bagci, 2013](#) – Kilic, O., Bagci, E. (2013). An ethnobotanical survey of some medicinal plants in Keban (Elazığ). *Journal of Medicinal Plant Research*. 7(23): 1675-1684.

[Kilic, 2016a](#) – Kilic, O. (2016). An ethnobotanical survey from Bingol (Turkey). *Journal of Applied Research*. 2(10): 685-691.

[Kilic, Bagci, 2012](#) – Kilic O., Bagci E. (2012). Chemical composition essential oil of *Tripleurospermum parviflorum* (Willd.) Pobed (Asteraceae) from Turkey. *Asian Journal of Chemistry*. 24(3): 1319-1321.

[Kilic, 2016b](#) – Kilic, O. (2016). Chemical Composition of Four *Salvia* L. Species From Turkey, a Chemotaxonomic Approach. *Journal of Essential oil Bearing Plants*. 19(1): 229-235.

[Kilic et al., 2011](#) – Kilic, O., Hayta S., Bagci, E. (2011). Chemical composition of essential oil of *Nepeta nuda* L. subsp. *nuda* (Lamiaceae) from Turkey. *Asian J. of Chem*. 23(6): 2788-2790.

[Ozdemir, Kılıç, 2017](#) – Ozdemir F.A., Kılıç, O. (2017). Essential oil composition of two *Origanum* taxa from Bingol. *Progress in Nutrition*. 19(1): 80-84.

[Kilic, 2014](#) – Kilic, O (2014). Essential Oil Composition of Two *Sideritis* L. Taxa from Turkey: A Chemotaxonomic Approach. *Asian Journal Chemistry*. 26(8): 2466-2470.