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Geographical and Ecological study of some Species of Tribe Cardueae in Middle and North of Iraq

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ABSTRACT

The study of the environment and geographical distribution of several species of the Cardueae tribe in middle and northern Iraq was the focus of the current investigation. The study involved doing a field survey of a several Iraqi districts to determine new areas where the Cardueae tribe species might spread. As well as, the flowering period of the examined species was identified. The findings demonstrate the studied species' spread in north, north-east, and western regions. The more widespread and tolerant of varied environmental conditions was the species *Silybum marianum* L., and the least prevalent of the studied species was *Carduus getulus* Pomel., whereas the other species were relatively common in the study area. Maps of the geographic distribution of all species under study were also created.

Introduction

Geographical differences and environmental influences Important factors that should not be disregarded and are expressed in phenotypic traits of plant species, We can also identify their and by examining their ecology and geographical distribution [1]. Geographical evidence, on the other hand, illustrates how species emerge, spread, migrate and evolve. [2]. Since each taxon exhibits a specific distribution pattern, which is one component of its definition, many elements of plant ecology and geography are relevant to plant classification [3]. The dispersion for plants represents the plant's total survival response to every environmental conditions [4]. In ecology, there is a recurring pattern of a positive association between geographic spread and organism abundance [5]. the soil's characteristics, and the altitude of a region is irrefutable proof of the existence or absence of a given species, it may be used to determine its presence or absence. When compared, the general geographical distribution of the same species follows the geographical distribution of any taxon, the nature of the growth locations of their individuals in offering taxonomic supports may signal on the existence or absence of that species [6]. Tribe Cardueae belong to family Asteraceae have About 70 genera and 2300 species: East and North Africa, Asia, Australia, Europe, N and S America [7]. In Iraq tribe Cardueae have about 13 genera [14]. This study is confined to six species from the tribe Cardueae, as well as the discovery of new locations. Because the species of these genera under investigation have spread throughout the natural geographical districts of middle and north Iraq, and some of them have been recorded, Observations on their surroundings and geographic distribution in Iraq. Geographical genera deal with environmental research and dispersion.

Materials and Methods

The current research was based on samples collected Directly from their areas of spread during field trips**.** The collection of specimens took place between 2020 and 2021. (See Table 1 & Fig. 1). and was used to describe it as a basic subject for the study as well About the dry samples deposited in the most important Iraqi herbaria, The University Herbarium (BUH), National Herbarium of Iraq (BAG), College

of Agriculture Herbarium (BUA), National History Research Center & Museum (BUNH). For each plant sample collected, a label has been set Scientific name, date, location, quality Soil, elevation and other related information. Publications have been used [8, 9, 10, 11, 12, 13, 14]. To illustrate the distribution of new disappeared regions for species under study, identification of geographical district. Altitude was measured by using a JPS device, and sometime by program AR Labs on mobile.

Table 1: Geographical regions and Elevation of species under study

species	Locality	Elevation (m)
Carduus getulus Pomel.	Tikrit, Senyia, Kopi-Qara-dagh	108-153
Carduus pyconocephalus L.	Shaqlawa, Tikrit, Senyia, Zaweiyta, Bekhal, Halabja, Kirkuk	110-1089
Carthamus lanatus L.	Erbil, Kirkuk, Siad-Sadaq, Alton-Kopri	255-366
Carthamus oxyacantha M.Bieb.	Tikrit, Senyia, Said Sadaq, Zakhu, Heibat-Sultan, Al-Sulymania	110-1100
Notobasis syriaca L.	Al-Alam, Al-Sharqat, Hamrin, Qara Dagh, Erbil, Kirkuk	102-1433
Silybum marianum L.	Tikrit, Senyia, Amadia, Al-Sharqat, Erbil, Kirkuk, Al Sulaymaniyah, Dohuk.	55-1233

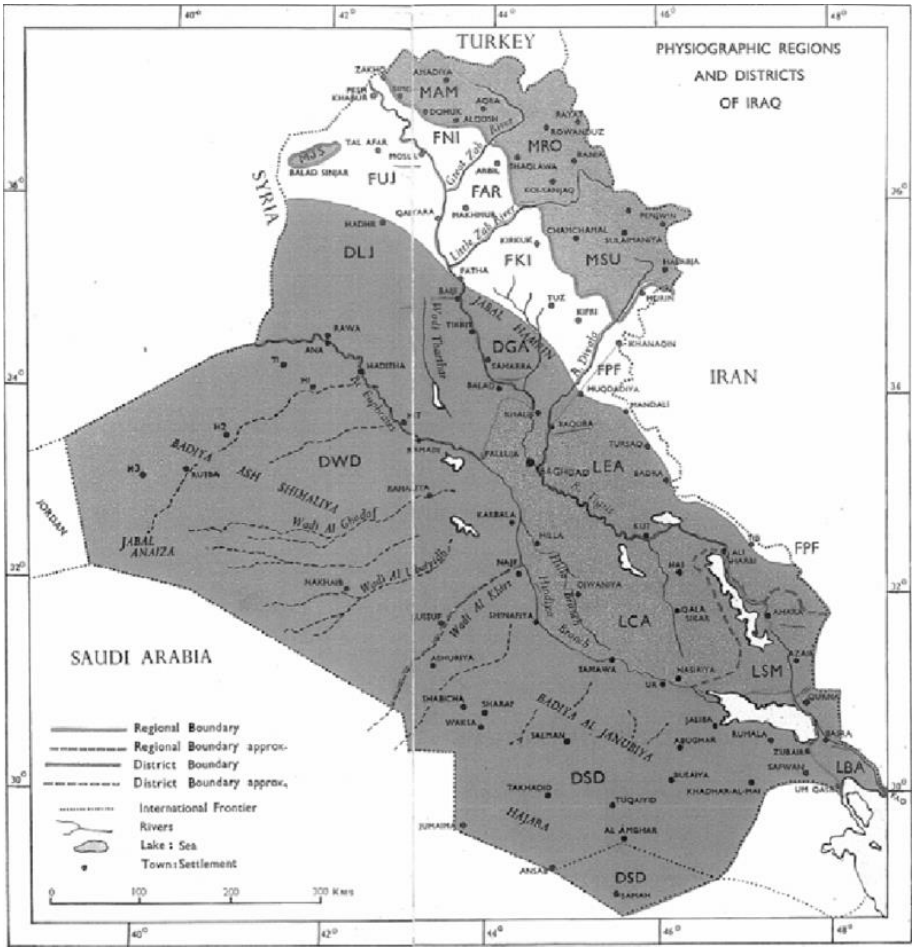


Fig. 1: Map of regions and phytodistricts of Iraq (Guest, 1966).

Results and Discussion

1- Environmental observation

By investigating the environment for some Cardueae tribe species in Iraq's middle and northern regions,, which are currently understudied, These species are found in a variety of habitats, including hilly, rocky slopes, and hills, as well as desert and semi-arid regions with clay soils, alluvial clay soils, and sandy soils. The vast bulk of species can be found in the country's northern and north-eastern areas, where the surroundings are hilly and steppe, while others are found in the desert and semi-desert regions of Upper Jazira district and the west desert distract, where the environment is desert and semi-desert. As a result, it can be divided species being studied based on the nature of prevalence and environmental ranges into two categories: The first group, typically grows in limited ecological regions. This group consists of the species *Carduus getulus* and *Carthamus lanatus*. species *Carduus getulus* is found in dry, arid, and sandy regions, whereas species *Carthamus lanatus* is found in highlands, hills, and rocky soils. This result agreed with [15,16]. The second group: include the other species under study, these species grow within different habitats. it spread broad to the hills, plains, and desert habitats; spread in the hilly environment; and on various heights and varied soils. Tables 1 and 2 show that there are significant differences in the

presence of studied species in various environments and at various altitudes. It was observed that the species *Silybum marianum* grows as a shrub plant that is suited to exist in a variety of habitats and spreads over lands and agricultural fields like wheat, barley, and corn fields, as well as close to the banks of rivers and irrigation canals. Where clay soil and sand are also desirable Mixed soils on both sides of the highways, as well as in waste-filled open spaces and It is common on limestone foothills and slopes, and literature suggests that it may rise as high as 1833 m above sea level. And this was approved with [14]. Due to their distribution throughout a range of elevations, *Notobasis syriaca* and *Carthamus oxyacantha* were the next most widely dispersed species. where it was distributed on the broad plains and farmed fields and soils clay, sand, and rocky soil They may grow with wheat, along the sides of the road, in alluvial and calcareous soils, between volcanic and limestone rocks, in sandy depressions, and on sandstone that is in the shape of individuals spaced apart from the rocks. This result agreed with [17, 18]. species *Carduus pyconocephalus* is common in orchards and cultivated fields with clay or sandy soils, gravel soils, or road sides. *Carthamus lanatus* can be found in clay soils, gravel soils, or on road sides. The species *Carduus getulus*, common on limestone foothills and slopes, research indicates that it could rise up to 200 meters above sea level, and this was accepted by [14].

Table 2: Geographical district and type of Environment of the studied species

Species	Geographical district	No. of district	Ecology
Carduus getulus	FPF, DLJ	2	sandy soils, dry clay soils
Carduus pyconocephalus	MAM, MRO, MSU, FKI, FAR &DLJ	6	side of the road, soil mixed with gravel,
Carthamus lanatus	MSU, DLJ, FKI	3	side of the road, silty alluvial soils,
Carthamus oxyacantha	MAM, MRO, MSU, FNI, FAR, FPF & DLJ	7	side of the road, dry sandy, desert soils
Notobasis syriaca	MAM, MRO, MSU, FNI, FAR, FKI, FPF & DLJ	8	side of the road, clay soil, side of the wheat field, hills
Silybum marianum	MAM, FUJ, MRO, FAR, FNI, DLJ, FKI, FPF & MSU	9	side of the road, rocky soil, side of the wheat field, mountainous areas

Due to their distribution throughout a range of elevations, *Notobasis syriaca* and *Carthamus oxyacantha* were the next most widely dispersed species. where it was distributed on the broad plains and farmed fields and soils clay, sand, and rocky soil They may grow with the wheat, along the sides of the road, in alluvial and calcareous soils, between volcanic and limestone rocks, in sandy depressions, and on sandstone that is in the shape of individuals spaced apart from the rocks. This result agreed with [17, 18]. species *Carduus pyconocephalus* is common in orchards and cultivated fields with clay or sandy soils, gravel soils, or roadsides. *Carthamus lanatus* can be found in clay soils, gravel soils, or on road sides. The species *Carduus getulus*, the least common of the investigated species, was found in sandy soils and arid places, as well as soils mixed with gravel. Agreed with [19]. The study relied on field observations as well as samples and observations recorded by certain researchers in terms of species overlapping. The study found instances of species overlap, between the species *Silybum marianum* and *Notobasis syriaca* in some regions, as well as between *Carthamus oxyacantha* and *Carthamus lanatus* on the side road in Alton kupri.

2- Geographical distribution

In a field survey, and the previous collection of the species of the tribe Cardueae in middle and north Iraq, it spread in some geographical districts of the country, it does not spread in some of them, and the least widespread was in the district DLJ and FUJ, according to the data. There are new locations recorded for certain species that did not mention in Previous research before. Most species are recognized as population aggregates or individually in certain circumstances, according to field observations. Environment studies revealed a range of interactions. The examples of species belonging to various plant groups, as well as the ideal environmental conditions for each species under investigation. The species' frequency ranges from common to rare.

Silybum marianum is a widely distributed species. (see fig 2).

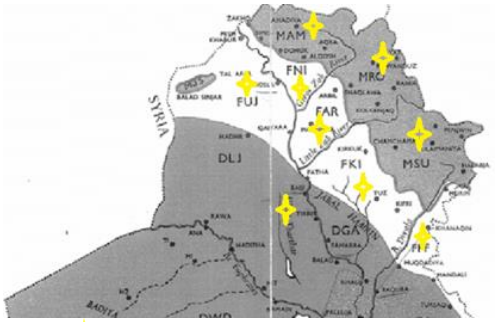


Fig. 2: *Silybum marianum* distribution map of middle and northern Iraq

It was gathered in MAM district from the checkpoint of Dohuk city and the highway side between Dohuk and Sersanq. This species is found in MRO district in Rawandwz, in Gali-Ali Beik, and located in Shaqlawa. Also found in FNI district in Mosul, on the highway side among Mosul and shirqat, and in the side road between Mosul and Dohuk and gathered

from FAR district in Erbil city, found in Makhmor, in the road side among Makhmor and Erbil, also located in Qara-Qaosh is about 8 km of Erbil. Furthermore, this species spread out in FKI district in Kirkuk, Mula-Ali region is About 8 km near Kirkuk city, collected from Taza and Tawzkhaormato, found in Al- Riyadh near about 23 km of Kirkuk city. Additionally, this species is found in the MSU district and was found at Tasluja, which is about 6 kilometers from Al- Sulaymaniyah city on the highway leading to Per-Maqron. on the roadside among AL-Sulaymaniyah and Halabcha, and collected from Said-Sadaik is about 48 km near Al-Sulymaniyah city. As well as, the species *Silybum marianum* gathered from FPF district, it was found in Khanaqein, in Mandily, road side among Mandily and Badraa and Sadyia. In the DLJ district, this species was widespread, it was gathered from Samraa, in Abasi about 12 km near Samaraa, on the roadside among Samaraa and Tikrit, in Mikashefa about 16 km from Tikrit, in Tikrit, and also collected from Al-Qadesyiah about 5 km near Tikrit city, located in Tikrit University, Al-Hamraa about 16 km near Tikrit, from the highway side among Tikrit and Beiji, and found in Beiji city about 42 km of Tikrit, it was gathered from Al-Senyah about 46 km near Tikrit, from road side among Beiji and Al-Senyah, from Beiji refinery, Al-shekh Ali village north Tikrit about 63 km of Tikrit, from the highway among Tikrit and AL-Shairqat and gathered from AL-Shairqat city.

The species *Notobasis syriaca* is less common than the preceding species since it is only found in 8 districts. (see fig. 3). The species *Notobasis syriaca* is distributed in MAM district, was gathered from Zawita about 22 km near Dohuk and the road side among

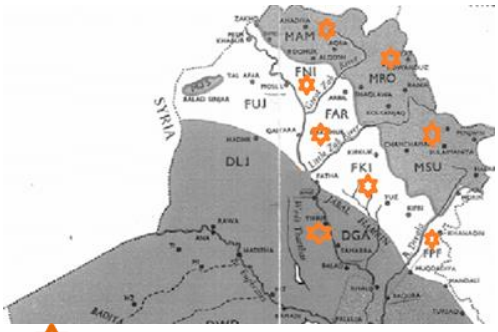


Fig. 3: ***Notobasis syriaca*** **distribution map of middle and northern Iraq**

Dohuk and Sirsank, and collected from Sharanish about 2 km near Solaf. This species is distributed western in MRO district it was collected from Haji-Omaran, in Khani-Mame, Sherein, and found in Shaqalawa.. as well as, found in FNI district in Mosul, located in Al-haj Ali village about 20 km from Mosul, and gathered from FAR district in Erbil, located in Makhamor about 19 km near Erbil, the highway side among Makhamor and Erbil, also gathered from Qara-Qaosh about 11 km near Erbil. Furthermore, *Notobasis syriaca* scattered in FKI in Kirkuk, in Mola-Ali area about 9 km near Kirkuk, located in Taaza and Towzkhormato, and gathered from Al- Ryaidh is about 22 km near Kirkuk. In addition to, this species found in MSU, it was gathered from Tasaloja about 8 km near Al-Sulymaniyah, the highway side among Al-sulymaniyah and Per-Magrun, the road side among AL-sulymaniyah and Halabcha, and located in Siad-Saadaq about 49 km near Al-sulymaniyah. Moreover, this species was found in FPF, it was collected from Al-Adadhim, Mandely, the highway side among Mandily and Badraa, and Tilkana region near Khanaqeen city. Also, it is dispersed in DLJ, this species is located in Albo-Ajeel region 7 km near Tikrit, Al-Alam city, from the highway between Tikrit and Kirkuk, and found near Beiji refinery, collected from Al-Zawyia about 24 km from Beiji, located in Al-shikh Ali village north beiji city about 35 km near beiji, found in Makhol region about 30 km near Beiji, and collected from the highway side near AL-Shairqat city and collected from AL-Shirqat.

The species *Carthamus oxyacantha* is distributed in 7 district. (see fig. 4).

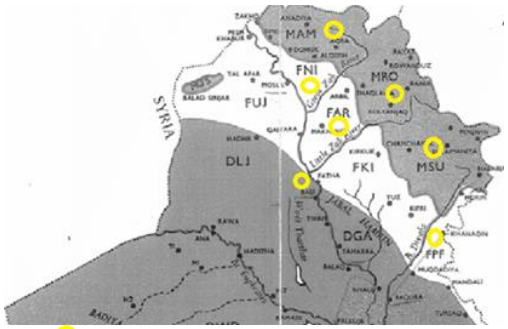


Fig. 4: ***Carthamus oxyacantha*** **distribution map of middle and northern Iraq**

This species was distributed starting from MAM district, it was found in Zaweiyta about 31 km near Dohuk on the way to Zakhu in the dry hillside, and collected from solaf. Forward east to MRO, it was gathered from Hajei-Omraan about 113 km near Erbil, and located in from Heibat-Sultan about 75 km near Erbil. As well as, forward southeast MSU district in Dukan about 69 km near Al-Sulymaniyah, and gathered from Qara-dagh about 11 km near Al-Sulymaniah and located in the highway side Said-Sadiq forward Penjoen about 71 km northeast Al-Sulymaniya, the highway side Qara-henger to jamjamal, and located in the check point of Tasaloja about 7 km near Al-Sulymania. also gathered from FAR district, it was collected from Erbil, this species grows thickly on the highway side among Erbil and Shaqalawa, found in Aski-kalac, located in the highway side among check point of Erbil city and Qara-Teba, found in the checkpoint of Erbil city. Furthermore, This species was gathered from FPF district, it was spread on the highway side between Baaquba and Al-Khalis, located in Tilkhana region about 11 km near Kanaqeen, and found in Qazaniya

near Mandily, collected from Qara-Taba and Shahraban forward northern east to Hamrin mountain. Also, this species is widespread in DLJ district, it was gathered from Samraa, in Abasi about 12 km near Samaraa, in the road side among Samaraa and Tikrit, in Mikashefa about 16 km from Tikrit, in Tikrit, also collected from Al-Qadesyiah about 5 km near Tikrit city, located in Tikrit University, Al-Hamraa about 16 km near Tikrit, from the highway side among Tikrit and Beiji, and found in Beiji city about 42 km of Tikrit, it was gathered from Al-Senyah about 46 km near Tikrit, from road side among Beiji and Al-Senyah, from Beiji refinery, Al-shekh Ali village north Tikrit about 63 km of Tkrit, from the highway among Tikrit and AL-Shairqat and gathered from AL-Shairqat city.

The species *Carduus pyconocephalus* spread in six district (see fig. 5). It was observed in MAM district collected from Sulaf about 51 km near Dohuk, found in Zaweiyta about 42 km near Dohuk, the highway side among Sersank and Dohuk, about 4 km after the checkpoint of Dohuk. Also, it was spread out in MRO district especially

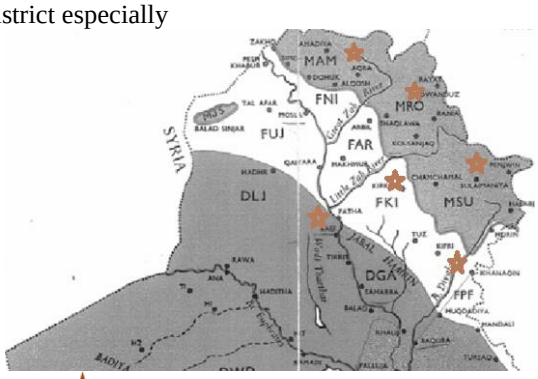


Fig. 5: *Carduus pyconocephalus* distribution map of middle and northern Iraq

in the village Seri-Hassan Bik, collected from Meir-Kasur, and found in Bekhal, as well as, this species gathered from FAR district, it was located in Erbil city, collected from Leiyra-Beir village, and located in the highway side among Erbil and Shaqallawa, and gathered from Koyia about 11 km near Erbil. In MSU district this species spread on the highway side among Jamjamal and Tasaloja, also found in Qara-Dagh mountain, collected from Siad-Sadaq, located in Halbja and Hawraman mountain. Also, it is found in FKI district in southwest Kirkuk city, on the highway side between Kirkuk and Alton-Kupri. In DLJ district collected from Al-Qadesyiah about 5 km near Tikrit, located in Samaraa, and collected from Beiji, and located in Senyah and AL-Shairqat.

The species *Carthamus lanatus* is distributed in three district (see fig. 6). This species distributed in MSU district gathered from Siad-Sadaq about 48 km near Al sulymaniya, the highway side among Al-Sulymaniya and Qara-dagh, found on the highway side between Siad-Sadaq and Penajawen. Also, it was spread in FKI district, it was collected from the highway side from Kirkuk to Qara-

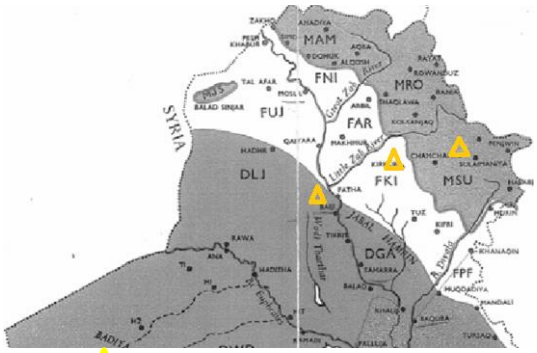


Fig. 6: *Carthamus lanatus* distribution map of middle and northern Iraq

Hanjir, located in Kirkuk, collected from the highway between Alton-Kupri and Kirkuk. As well as gathered from DLJ district in Al-Tharathar valley, and collected from the highway side between Al-Hajaj and beiji city.

The species *Carduus getulus* was the least widespread among the studied species, it was found in only MSU and DLJ districts (see fig. 7).

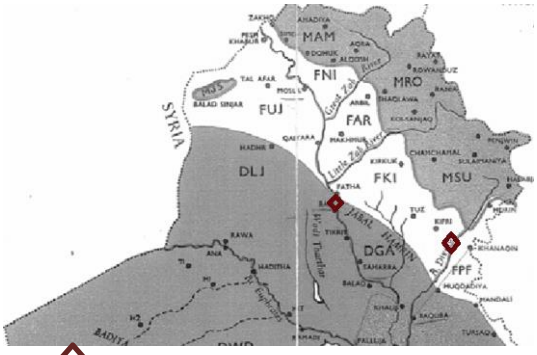


Fig. 7: *Carduus getulus* distribution map of middle and northern Iraq

This species spread in MSU collected from Kopi-Qara-dagh mountain about 11 km near Al-Sulymaniyah, found in gona-masi the road side about 50 km near Al-Sulymaniyah, and located in hills near Penjwen. In DLJ district, it was distributed in Sandy and dry areas collected from Senyah, found in the road side between Senyah and Beiji, located in Al-Shiraqat.

3- Flowering period

shown the current study and through field trips and on-site recording of information ,and the study of species samples deposited in the most important herbaria in Iraq, there is a noticeable difference in the duration of flowers for the studied species, and the total flowering period for all species, starting from mid-February to the beginning of September, while the optimum flowering period for most species it falls between April, May, and June. (see fig. 8). Some species flowered earlier than others during the overall flowering time., as in the two species *Carduus pyconocephalus* and *Carduus getulus*. The first species started flowering at the end The month of February begins with the formation of fruits at the

month of end March. There are other species that are early, and last longer, as in

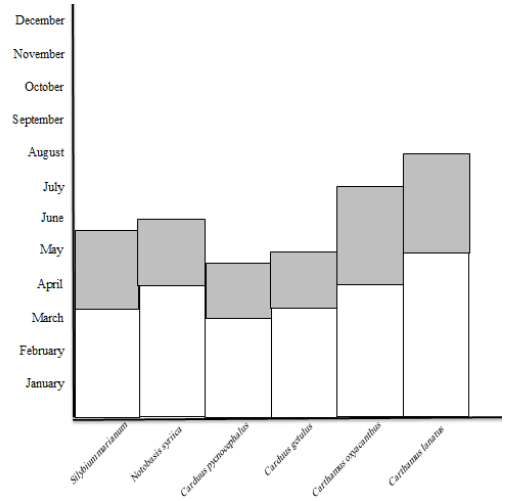
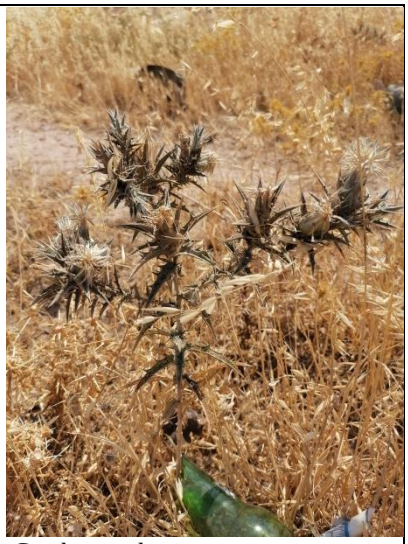


Fig. 8: The duration of flowering in the studied species of tribe Cardueae

Carthamus lanatus and *Carthamus oxyacantha* begins late to flowered at the end of April it continues until July or mid-August. It was typically clear in some species of tribe Cardueae under investigation that individuals growing in desert areas were early flowering from February to the beginning of June due to high temperatures and intense solar radiation.

Carduus getulus

Carduus pyconocephalus



Carthamus lanatus

Carthamus oxyacantha

Notobasis syriaca

Silybum marianum

Plate 1: Shows the studied Cardueae species in their natural environments.

Conclusion

The current study confirmed that the mountainous and hilly regions include the majority of the tribe Cardueae species growing in Iraq, particularly in the districts MSU, MAM, and MRO, due to the adaptation of these species and completely for growth at different altitudes in mountainous areas, as well as the nature of the soil and environmental conditions. The two species *Notobasis syriaca* and *Silybum marianum* members are spread in most of the geographical districts in middle and northern Iraq. Because their individuals possess genetic, physiological and anatomical characteristics that gave them flexibility and enabled them to grow in different environments, and withstand extreme cases of environmental conditions. As well as the individuals of the two species showed clear morphological variations. It is important to note that during field surveys, the geographical distribution of the Cardueae species under study changed as a result of shifting environmental factors, the phenomenon of desertification, overgrazing, population growth, and the expansion of cities, which had an impact on many natural areas and resulted in the disappearance or decline of some species in regions where they had been recorded in previous collections. furthermore The success of some species in adapting to grow in new environments, as opposed to their native environments, can be seen by the discovery of those species in those new environments.

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References

[1] Radford, A. E.; W. C. Dikson, J. R. Massy and C. R. Bell (1974). Vascular Plants Systematic. Harper and Row, 891.

[2] Aseel Fuad Abbas; Ali H. Al-Mousawi and Ali H.E.Al-Musawi (2013). The Ecology and geographical distribution for the species of the genus *Salvia* L. of labiatae in Iraq. Baghdad Sci.J, vol. 10, no. 4, 1082-1087

[3] AL-Doskey, Z. AB. S. (2014). Comparative Systematic Study of the Genera *Rosa* L. and *Rubus* L. (Rosaceae) in Kurdistan Region of Iraq. Ph. D. Thesis, Faculty of Agriculture and Forestry/University of Dohuk .

[4] Sardar, Ab. Sh. (2013). Systematic Study of Crassulaceae DC. Family in Kurdistan Region, Iraq. Ph. D. thesis, College of Education / University of Salahadlin.

[5] Brown J. H. and Maurer B. A. (1989). Macroecology: the division of food and space among species on continents. Science 243 (4895): 1145–1150.

[6] Majeed, Kh. R. (2016). Biosystematic study of certain species of the genus *Astragalus* L. from the family Leguminosae in Iraq. Ph. D. thesis, College of Education for Pure sciences (Ibn- Al- Haitham), University of Baghdad.

[7] Shi, Z., Raab-Straube, E. von, Greuter, W. & Martins, L. (2011). Cardueae. Pp. 42–194 in: Wu, Z. Y., Raven, P.H. & Hong, D. Y., eds., Flora of China Volume 20–21 (Asteraceae). Science Press (Beijing) & Missouri Botanical Garden Press (St. Louis).

[8] Guest, E. (1933). Notes on plant and plant products with their Colloquial names in Iraq. The Government press. 27 , Baghdad, 111.

[9] Zohary, M. (1950). The Flora of Iraq and its Phytogeographical. Sub. Division. Dep. Agr. Iraq. Bull. , 31 : 201.

[10] Blackelock, R. A. (1949). The Rustam herbarium , Iraq. (parts 1 – 5 and 8) in Kew Bull., 3 : 546 – 548.

[11] Rechinger, K. H. 1964. Flora of Lowland Iraq. Verlag Lowland Iraq. Verlag Von. J Gramer, wein, 746.

[12] Al-Rawi, A. (1964). Wild Plants of Iraq with their Distribution. Tech. Bull. 14. Dir. Gen. Agr. Res. Government. Press. Baghdad, 232.

[13] Guest, E. (1966). Flora of Iraq Vol. 1 , Ministry of Agriculture of Iraq, 213.

[14] Ghazanfer, S. A., Edmondson J. R. and Nicolas Hind, D. J., (2019). Flora of Iraq Compositae. Vol. 6, Ministry of Agriculture republic Iraq by Royal Botanic Garden, KEW, 111-158.

[15] Wagenitz, G. & Davis, P. H. (1975). Flora of Turkey and East Aegean Islands, Edinburgh, Univ. Press. Vol. V : 465-585.

[16] Abdollahi, M. R. (2011). Effect of method of seed treatment with plant derived smoke solutions on germination and seedling growth of milk thistle (*Silybum marianum* L). Seed Sci. Technol, 112.

[17] Post, G.E. (Ed.) (1932). Flora of Syria, Palestine and Sinaii. Vol. II,.Beirut, American University of Beirut, 928.

[18] Arabacı, T. (2012). "Cardueae" In A Checklist of the Flora of Turkey (Vascular Plants), edited by A. Güner, S. Aslan, T. Ekim, M. Vural and M. T. Babaç,. İstanbul: Nezahat Gökyiğit Botanik Bahçesi ve Flora Araştırmaları Derneği Yayını, 122–125.

[19] Ridda, T. J. and Daood, W. H. (1982). Geographical Distribution of Wild Vascular Plants of Iraq. National Herbarium of Iraq, 120.

دراسة جغرافية وبيئية لأنواع من العشيرة Cardueae في وسط وشمال العراق

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الملخص

كان محور البحث الحالي هو دراسة البيئة والتوزيع الجغرافي لعدة أنواع من العشيرة Cardueae في وسط وشمال العراق. وتضمنت الدراسة مسح ميداني لعدة مقاطعات عراقية لتحديد المناطق الجديدة التي قد تنتشر فيها أنواع العشيرة Cardueae, وكذلك تحديد فترة الازهار للأنواع المدروسة. توضح النتائج انتشار الأنواع المدروسة في المناطق الشمالية والشمالية الشرقية والغربية. كان النوع *Silybum marianum* L الأكثر انتشارًا وتحملا للظروف البيئية المختلفة. وكان أقل الأنواع المدروسة انتشارًا هو *Carduus getulus* Pomel. بينما كانت الأنواع الأخرى شائعة نسبيًا في منطقة الدراسة. كما تم إنشاء خرائط للتوزيع الجغرافي لجميع الأنواع قيد الدراسة.