BULLETIN OF THE IRAQ NATURAL HISTORY MUSEUM
Iraq Natural History Research Center & Museum, University of Baghdad
https://jnhm.uobaghdad.edu.iq/index.php/BINHM/Home
 Online ISSN: 2311-9799, Print ISSN: 1017-8678

Bull. Iraq nat. Hist. Mus.
(2026) 19 (1): 99-113. https://doi.org/10.26842/binhm.7.2026.19.1.0099

ORIGINAL ARTICLE

PRELIMINARY SURVEY AND ECOLOGICAL ASSESSMENT OF SOME WILD BRASSICACEAE SPECIES IN IRAQ

Fatin H. Al-Dulaimi♦ and Sukeyna A. Aliwy

Department of Biology, College of Science, University of Baghdad, Baghdad, Iraq.
♦Corresponding author: fatin.aldulaimi@sc.uobaghdad.edu.iq

Received: 4 Oct. 2025, Revised: 27 Jan. 2026, Accepted: 30 Jan. 2026, Published:20 June 2026

ABSTRACT

This study investigates the ecological roles and geographical distribution of sixteen wild Brassicaceae species across most districts of Iraq, including arid and mountainous regions. A total of 263 herbarium specimens were analyzed, including specimens preserved from the 1950s to 2025, *Erysimum cuspidatum* (M.Bieb) DC. (1821), which was recently reported by the same authors, and 8 newly collected specimens from recent field surveys.

The main objectives were to evaluate habitat preferences, soil types, and adaptive strategies of these species in arid and semi-arid regions. Results indicate that the studied species can grow in a wide range of soils, including limestone, rocky areas, sandy, and loamy substrates, demonstrating ecological plasticity and wide distribution across Iraq. This study provides a baseline for understanding the plant diversity of Iraq and contributes to future conservation efforts for Brassicaceae species and their habitats.

The species examined are: *Descurainia sophia* (L.) Webb ex Prantl (1892), *Rorippa amphibia* (L.) Besser (1821), *Barbarea vulgaris* W.T. Aiton (1812), *Barbarea plantaginea* DC. (1821), *Farsetia aegyptia* Turra (1765), *Farsetia burtoniae* Oliv. (1880), *Euclidium syriacum* (L.) W.T. Aiton (1812), *Erucaria hispanica* (L.) Druce (1914), *Erucaria cakiloidea* (DC.) O.E.Schulz. (1916), *Fibigia macrocarpa* (Boiss.) Boiss. (1867), *Strigosella grandiflora* (Bunge) Botsch. (1972), *Plagioloba crenulata* (DC.) German D.A. (2021), *Arabis auriculata* Lam. (1783), *Arabis hirsuta* (L.) Scop. (1771), *Erysimum cuspidatum* (M.Bieb) DC. (1821) and *Erysimum aucheranum* J.Gay, (1842).

Keywords: Brassicaceae, Ecological distribution, *Erysimum*, Herbarium specimens, Iraq.

INTRODUCTION

The Brassicaceae family is considered prominent and varied because it has over 3,700 species in 388 different genera. Although it is abundant in temperate and Mediterranean areas, experts have not explored its presence in the Saharo-Arabian and arid zones as much (Ross,

2024). Brassicaceae species investigated explored in these areas due to Iraq's wide range of ecosystems, which feature deserts, semi-arid plains and mountains. Many university herbaria in Iraq have records that help researchers learn about these plants' distribution and preferred habitats (Al Taie, 2023).

The distribution of this family is mainly concentrated in the northern temperate regions, particularly in the Mediterranean area (Al-Shehbaz, 2025). In Iraq, the family is represented by 75 wild species, in addition to more than 18 cultivated species used either as food or as ornamental plants (Al-Katib, 1988; Othman, 2022). Regarding the distribution of the genera under study, no studies have been conducted since their inclusion in Al-Rawi's checklist (1964) and the Flora of Iraq (Townsend and Guest, 1966) to date. This study focuses on sixteen wild Brassicaceae species distributed across Iraq, selected for their important ecological features and wide habitat range.

True endemism within the Brassicaceae in Iraq is limited, as most species exhibit wider regional distributions beyond the country. Most wild plant species in Iraq, including members of the Brassicaceae, have not yet been formally assessed under the IUCN Red List, and available information on endangered taxa endangered taxa remain limited (IUCN, 2024). In addition to their uses in farming and medicine, wild Brassicaceae sustain the environment by providing food for useful insects, reducing erosion and helping many species adapt to tough conditions. Still, scientists know very little about the ecological functions of these plants in arid areas of Iraq (Mousa *et al.*, 2024; Al-Shehbaz, 2025).

In this present study, wild Brassicaceae species in Iraq were examined to document their distribution patterns and habitat preferences across different districts, by analyzing herbarium and collected specimens and associated ecological data, this research contributes to understanding of the adaptive strategies of these plants and the overall biodiversity they support in arid ecosystems. This foundational knowledge is critical for informing future conservation strategies in Iraq's vulnerable habitats.

MATERIALS AND METHODS

Our current investigation studied the herbarium specimens collected from different Iraqi herbaria (Tab. 1). Several field surveys were conducted during the period from February to May 2025. Two field trips were carried out in Anbar Province, and one trip to each of the Erbil and Sulaymaniyah provinces. Along with repeated visits to Iraqi University herbaria, for the collection and examination of Brassicaceae specimens. Multiple species belonging to the family were collected; however, one of the genera under study, *Erucaria hispanica*, was represented by eight specimens that were collected. Their identity was confirmed, preserved and archived in the Herbarium of the University of Baghdad under the registered accession numbers (50715, 50716, 50717, 50718, 50719). Duplicate specimens were deposited in the Iraqi National Herbarium-Ministry of Agriculture and the Anbar University Herbarium, Center of Desert Studies, accession numbers are not available at present. The collected specimens from Anbar were obtained from a site located 45 km west of Ramadi. Field photographs were taken by a Canon MP camera for this genus to document its natural habitat

(Pl. 1). The study selected 16 species based on their important ecological features and wide distribution throughout Iraq. Scientific names followed the Flora of Iraq (Townsend and Guest, 1966) and were cross-checked with Plants of the World Online (POWO, 2026). Herbarium specimens and their labels were used to show what the distribution community, the year of collection, altitude, habitats and even the time of collection were. The morphological characteristics were examined to identify each species, including leaf shape, flower structure and seed development.

Specimen locations were plotted on a standard map of Iraq obtained from Natural Earth (2025) to illustrate the spatial distribution of the studied species. Table (1) lists the herbarium collections that supplied plant specimens for this study with their abbreviation's regulations from Holmgren *et al*. (1990).

Table (1): List of herbaria used in the study and their abbreviations.

No.	Abbreviation	Full Name of Herbarium
1	AUH	Anbar University Herbarium, Center of Desert Studies, Anbar
2	BAG	National Herbarium of Iraq, Ministry of Agriculture, Baghdad
3	BUA	College of Agriculture Herbarium, University of Baghdad, Baghdad
4	BUE	College of Education Herbarium, University of Baghdad, Baghdad
5	BUH	College of Science Herbarium, University of Baghdad, Baghdad
6	BUNH	Iraqi National History Research Center and Museum, University of Baghdad, Baghdad
7	BSRA	College of Science Herbarium, University of Basrah, Basrah
8	*	College of Science Herbarium, Salahaddin University, Erbil
9	*	College of Science Herbarium, University of Sulaimani, Sulaymaniyah

* There were no abbreviations for these herbaria.

Plate (1): Field-collected specimens of *Erucaria hispanica* from northwestern Iraq during the 2025 field surveys. [Photo by Dr. Othman M. O.]

RESULTS AND DISCUSSION

The following section presents the detailed ecological distribution and habitat characteristics of the sixteen wild Brassicaceae species studied. Table (2) summarizes the number of herbarium specimens collected, their distribution across districts, and the typical growth habits observed across Iraq. The accepted names follow POWO (2026). Some taxa are recorded under different generic names in the Flora of Iraq (e.g., *Strigosella grandiflora* = *Malcolmia grandiflora*) and (*Plagioloba crenulata* = *Malcolmia crenulata*), while *Erysimum aucheranum* in the Flora of Iraq is a spelling variant of *Erysimum aucherianum.*

Table (2): Herbarium specimens that included in the study.

No.	Species	Number of specimens in the Herbaria	Distribution in Districts	Habit
1	*Descurainia sophia* (L.) Webb ex Prantl (1892)	0008885- 49470-0008886- 0008887- 0008888- 0031221- 0008890- 0029290- 0029279- 0042017- 0041846- 0008889	FNI, LEA, LBA, FAR, MRO, Baghdad	Loam slope, riverside, Gardens, and Rocky soil
2	*Rorippa amphibian* (L.) Besser (1821)	0027489- 0009443- 0028485- 0040181 - 0033690- 274- 603	LBA, LSM, MAM	Sandy. loamy, and Rocky soil
3	*Barbaria vulgaris* (L.) W.T. Aiton, (1812).	0029604- 0029713- 0008677- 0029658	FAR, FUJ, MRO, FNI, MAM	Rocky soil, loam soil
4	*Barbaria plantaginea* DC. (1821)	0008673- 0029437- 0029275- 0029269-	FAR, FUJ, MRO, FNI, MAM	Rocky, loamy soils
5	*Farsetia aegyptica* Turra (1765)	0009122- 41353- 0009121- 0009119- 0032350- 0033842- 901.30938- 30.504954- 14873	LGA, LSM, DWD, DLJ	Sandy soil, loamy soil
6	*Farsetia burtonae* Oliv. (1880)	0009130- 0009128- 0009127- 2159	DWD	Silty plain, Rocky soil
7	*Eucledum syriacum* (L.) W.T. Aiton (1812)	0042728- 0042728- 0033016- 0030851- 0030899- 0029808-0029306- 2336- 2155- 2196- 00210- 1275	FUJ, FPF, MRO, FAR, Baghdad	Loamy soil
8	*Erucaria hispanica* (L.) Druce (1914)	0029802- 0031112- 33229- 0033838- 0033351- 0029625- 0029564- 0029572- 0029613- 0009236- 0009033- 0035090- 0035089- 0009060- 0009059- 0009058- 0009037- 0009038- 0009040- 0009041- 0009042- 0009061- 0025075- 0009044- 0009045- 0009046- 0009047- 0009035- 0009029- 0009031-0009034- 0009032- 0009030- 0009039- 0009043- 0009062	LEA, DWD, DGA, MJS, MAM, DSD	Foot hills, Sandy soil, Flat land
9	*Erucaria cakiloidea* (DC.) O.E.Schulz. (1916)	0025470- 0009009- 0009008-0027074- 0034516- 0009055-0009028- 0009023- 0009054-0009049- 0027632- 0029610- 0029801- 0029624- 0029806-0030862- 0030835- 0031188-0032918- 0009026- 0009025-0034090- 0034124- 0033350- 0034070- 0009024- 0034328- 0034154- 0009022- 0009007-0009021- 0009017- 0009016-0009015- 0009014- 0009013- 0009012- 0009011- 0009010-0009006- 0009020- 0009018-0009019	DWD	Sandy soil, Rocky soil
10	*Faibiga macrocarpa* (Boiss.) Boiss.(1867)	0029736- 0033408- 0041155-0029672- 0029647- 0032954-76235- 0009134- 0009145-000943- 0009148- 000949- 49638- 0027689- 0009133-0039000- 0027441- 1473-2345-2564- 5152	MAM, MRO, FUJ, MSU	Lime stone, Rocky soil
		0009308- 46859- 0028281-0009332- 0028232- 0028250-44463- 0009093-		

11	*Strigosella grandiflora* (Bunge) Botsch. (1972).	0032926-0032899- 0009328- 0009330-0009329- 0009331- 4448-0009325-0009324- 0009323-0009327- 0009326-0030817-0031016- 0031720- 0030853-0025531- 0009936- 0027629-0027688-0009333- 0009264-0030859- 0032452-0029808-0028361- 0009397- 0031017-0029799- 0009325- 0009340-0009265-0030898- 0030875-0029611- 232013-6520	LSM, DGA, DLJ, LBA, LSM	Rocky soil, Sandy soil, Gravel soil, Gypsum hills, Loamy soil
12	*Plagioloba crenulata* (DC.) German D.A. (2021)	0033330- 0009338- 0035187-0009311-0009319- 0009321-0009313- 0001312-0026542-0027790- 0009317- 0009318-0033018- 0029356- 0029605-002244-0035138- 0035139-0033331- 0033326-0033326-0033333- 0009315- 0009314-0009316-01029- 1671- 1720- 3733	MSU, FAR, FNI, MSU, MJS, DWD	Stony land, Rocky soil, Loam soil
13	*Arabis auriculata* Lam. (1783)	0041143- 0041144- 0041145-0041141-0041142- 0035002-37836 -5001- 5000-405004-395003- 00778- 5002- 00115	MSU, FNI, MJS	Gypsum rocky soil
14	*Arabis hirsute* (L.) Scop.(1771)	0038940- 0038732	DLJ	Rocky soil.
15	*Erysimum cuspidatum* (M.Bieb) DC. (1821)	0029281- 0009070- 1096- 1097-0009071- 1094- 0009100- 2866	MRO	Loamy soil, Rocky soil
16	*Erysimum aucherianum* J.Gay (1842)	0033415- 0027360- 000985-0009097-0009107	MSU, MAM, FAR	Lime stone soil

Ecology and Habitat preferences of the studied species

Owing to its versatility, the Brassicaceae family is capable of adapting to several habitats in Iraq. *Descurainia sophia* has been noted to grow in areas where it favors growing along the loamy slopes close to river and in rocky regions. The species shows habitat selection by successfully adapting to disturbed areas with different soil types. Similar habitat preferences for this species have been reported by Al-Mashhadany and Al-Mharib (2023). *Descurainia sophia* also finds optimum growth conditions in areas with loamy soils that combine organic matter with minerals, allowing it to prosper in moderate moisture environments like riverside gardens (Al-Eisawi, 2016).

Ecological observations indicate that *Rorippa amphibia* can grow in sandy, loamy, and rocky terrains. Similar behavior has been reported by Albermani *et al*. (2017), who documented its occurrence in diverse soil types. While Franzke *et al*. (2011) notes that it grows in disturbed areas with different environmental conditions.

It was observed that species such as *Barbaria vulgaris, B. plantaginea,* and *Eucledum syriacum*, grow in rocky soils, limestone, and loamy environments. The two *Barbaria* species prefer loamy rocky soils because they provide optimal drainage and nutrient access. The dry arid zones harbor rocky soils, making these areas harsh and suitable only for plants that can survive poor soils, as noted by Byrne *et al*. (2017). The loamy soil habitat fits the needs of *Eucledum syriacum*. Loamy soils provide good growth conditions by keeping some moisture while allowing drainage, thus creating suitable conditions for plants needing water retention and air circulation (Raza *et al*., 2020). The Brassicaceae family demonstrates remarkable

flexibility in surviving in desert areas because these plant species can occupy hard-to-reach mineral soil environments that other plant life finds challenging.

Farsetia aegyptica, Erucaria hispanica, and *Strigosella grandiflora* exhibit an affinity for growing in sandy conditions, loamy and gravel substrates. *Farsetia aegyptica* is naturally found in sandy-loam steppes but it can also grow in desert and semi-desert areas. It therefore requires to have intricate irrigation systems to sustain itself in areas with low water retention and poor soil fertility, as noted by Raza *et al*. (2020). It has moderate water demand and it grows well in foothills, sandy areas, and flat lands, which are referred to as level grounds. This is because it relies on a continuous cycle of water and nutrients for growth (Nasser and Manfy, 2023; Abood *et al*., 2024). *Strigosella grandiflora* is found in sandy and loamy clays, rocky rises and gypsum-rich areas. It can be found in sandy, gravelly and other soil types (Raza *et al*., 2020).

Both of *Farsetia burtonae* and *Erucaria cakiloidea* were recorded in alluvial and rocky environments. *Farsetia burtonae* occurs in silty plains, and rocky substrates with variable soil types (Lange *et al*., 2022). These soils contain fine particles that retain more moisture than sandy soils but have high density, which limits root penetration (Salariato *et al*., 2022). Such specialized survival strategies enable *Farsetia burtonae* to thrive in compacted soils, as it grows well in wet conditions (Rhida and Twaij, 2021). *Erucaria cakiloidea* occupies habitats with specific ecological conditions, being endemic to areas that are not accessible.

The distinct ecological niches of *Arabis auriculata, A. hirsuta, Erysimum cuspidatum,* and *Erysimum aucherianum* showcase the wide ecological adaptability of the Brassicaceae family species. Since *Arabis auriculata* thrives in desert conditions, the arid and semi-arid environment provides the best conditions for growth in gypsum-rich, rocky locations. These species can survive in the harsh environments of gypsum soil because they can regulate the gypsum soil elements with high alkalinity levels and low nutrient values (Rhida and Twaij, 2021). *Arabis hirsuta* is distributed in rocky soil and soils that are disturbed and do not face intense competition for resources. As a member of the Brassicaceae family, *Erysimum cuspidatum* is mainly adapted to loamy and rocky conditions and performs well in moderately fertile sites with favorable drainage patterns. *Erysimum aucherianum* grows well in limestone soils because it is a plant adapted to grow in alkaline rock substrates that provide moderate water holding capacity and good drainage (Rhida and Twaij, 2021). The family Brassicaceae is versatile owing to the plant members' ability to adapt to various environmental settings, from stony mineral grounds to well-drained moist soil (Mutlu, 2010).

Geographical distribution patterns of studied species

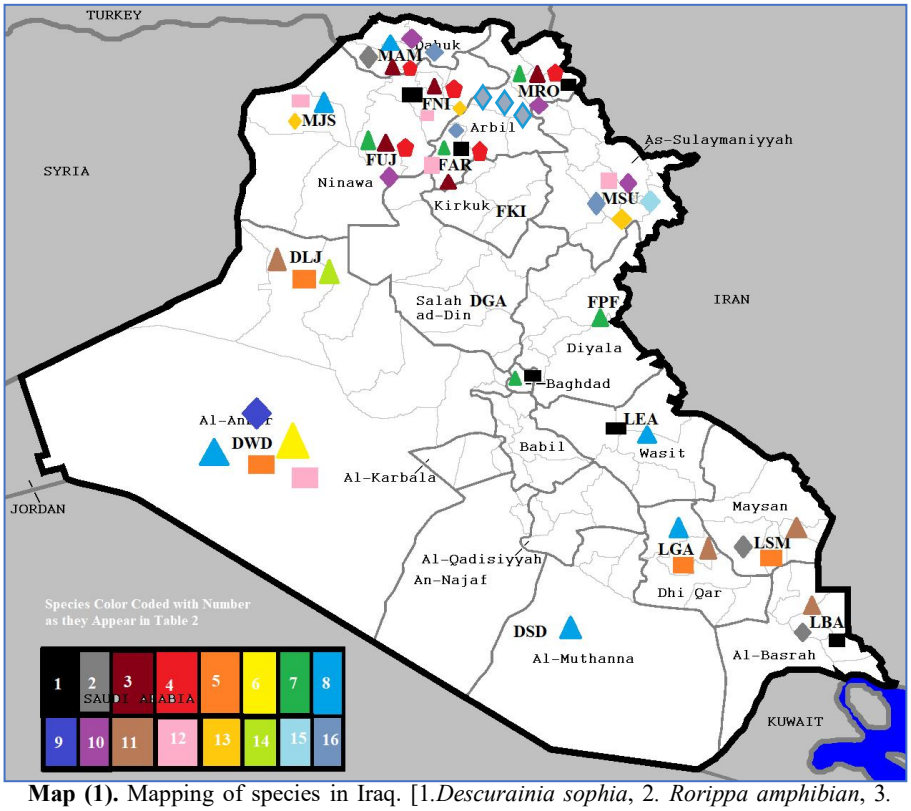
Each Brassicaceae variety in Iraq adapts perfectly to its native habitats. *Descurainia sophia* can be found in Al-Anbar and other regions such as Baghdad, Diyala, and Al-Basrah. These districts show semi-desert environmental conditions with habitats influenced by anthropogenic activities (Al-Saadi *et al*., 2019). *Descurainia sophia* is seen to be most successful in disturbed habitats, as stated by Raza *et al*. (2020), because it prefers areas that

humans have altered. It is found in Baghdad during both rainy and dry seasons. It grows in several habitats, including sandy hills and river gardens.

Across both lowland and upland areas in Iraq, it was observed that *Rorippa amphibia* occurs in Basrah, Al-Muthanna, and Maysan, where the climate changes with altitude. Its preferred natural habitats are loamy soils with rocks and sand (Ren *et al*., 2020). It grows best in waterlogged riverbed and wetland areas of Al-Muthanna, as the soil conditions here are most suitable for this plant. *Barbaria vulgaris* and *Barbaria plantaginea* inhabit different locations in Iraq, spanning Al-Muthanna, Maysan, Al-Anbar, and Diyala. The regions with flat plains and rocky hills experience harsh dry heat for extended periods (Al-Dulaimi, 2023). The plants prosper best in rock formations because they thrive without competition from other plants.

Eucledum syriacum is found in five different regions including An-Najaf, Maysan, Babil, Baghdad, and Diyala. It prefers loamy soils of medium fertility. This area combines dry flat terrain and rolling slopes, allowing plants to survive in moderate dry land with adequate drainage systems. Despite urban development, *Eucledum syriacum* continues to grow in Baghdad, where suitable habitats remain (Warwick *et al*., 2006).

Populations of *Farsetia aegyptica* exist in regions, such as Al-Muthanna, Diyala, Baghdad, and Salah ad-Din. It grows best at coastlines and in field areas in sandy or loamy soil environments (Al-Joboury and Zurgany, 2024). These plant species live naturally in dry environments because they grow best in the selected regions. The districts of Al-Muthanna and Diyala experience regular droughts because they receive only limited rainfall. While *Erucaria hispanica* populations are found in An-Najaf, Dhi Qar, Wasit, Diyala, and Al-Anbar provinces. In this study, specimens of *E. hispanica* were collected during field trips conducted from February to May 2025. *E. hispanica* grows well on sandy mountain soils of Wasit and Diyala (Warwick *et al*., 2006). The specimens collected from Anbar were obtained from a site located 45 km west of Ramadi. It adjusts to unpredictable moisture changes that help it gather water during wet seasons, and then survive through dry times. Plant distribution research reveals that these species settle in rain-dependent areas with irregular rainfall (Sahar *et. al.*, 2019). The distributions of various species are mapped according to the symbols of districts of Iraq in Townsend and Guest (1980) (Map 1).



Map (1). Mapping of species in Iraq. [1.*Descurainia sophia*, 2. *Rorippa amphibian*, 3. *Barbaria vulgaris*, 4. *B. plantaginea*, 5. *Farsetia aegyptica*, 6. *F. burtonae*, 7. *Eucledum syriacum*, 8. *Erucaria hispanica*, 9. *E. cakiloidea*, 10. *Faibiga macrocarpa*,11. *Strigosella grandiflora*, 12. *Plagioloba crenulate*, 13. *Arabis auriculata*, 14. *A. hirsute*, 15. *Erysimum cuspidatum*, 16. *E. aucherianum*].

Farsetia burtonae and *Erucaria cakiloidea* plants grow best in soil types of Diyala districts, which consist of silt plains and rocky surfaces. The distinct moisture-variable habitats encouraged particular species to develop adaptations to this ecosystem (Byrne *et al*., 2017). Silty soils allow *Farsetia burtonae* to keep more water because sandy soils quickly absorb water. The combination of these regions and their rocky, dry terrain in An-Najaf, Al-Muthanna, Maysan, and Ninawa enables *Fibigia macrocarpa* to thrive. Scientific research by Salariato *et al*. (2022) demonstrates that plant growth is limited in limestone soil regions because these areas lack essential plant nutrients (Al-Saadi *et al*., 2019). *Fibigia macrocarpa* has unique survival methods that allow it to grow successfully in areas with limited water and nutrient supplies. *Strigosella grandiflora* grows in many districts in Al-Muthanna, Dhi Qar, and Salah ad-Din provinces, which have a high environmental diversity that has helped many genera spread in these areas, particularly in sandy and rocky soils (Abdullah *et al*., 2019).

Species like *Arabis auriculata*, *A. hirsuta*, *Plagioloba crenulata, Erysimum cuspidatum,* and *E. aucherianum* occur in different natural environments in Iraq. In northern and central

Iraq, *Plagioloba crenulata* is commonly found on rocky land and soil subtypes, particularly around Al-Mosul, Al-Fallujah, Baghdad and Diyala (Hashim *et al*., 2023). *Arabis auriculata* grows well in stony areas with high levels of gypsum, like An-Najaf, where it has developed successful drought tolerance (Al-Shehbaz *et al*., 2006). *Arabis hirsuta* thrives on well-drained, dry soils and prefers rocky landscapes, especially in Diyala Province.

The Brassicaceae family member *Erysimum cuspidatum* is found in Erbil Province, while *Erysimum aucherianum* thrives on limestone soils throughout northern and central Iraq, especially in Mosul and Muthanna. In general, these provinces provide a rich and diverse environment that support the spread of many types of this family whether it is economic, medical or otherwise (Moussa *et al*., 2015). Plate (2) shows the herbarium specimen, including an older preserved specimen alongside a newly collected specimen.

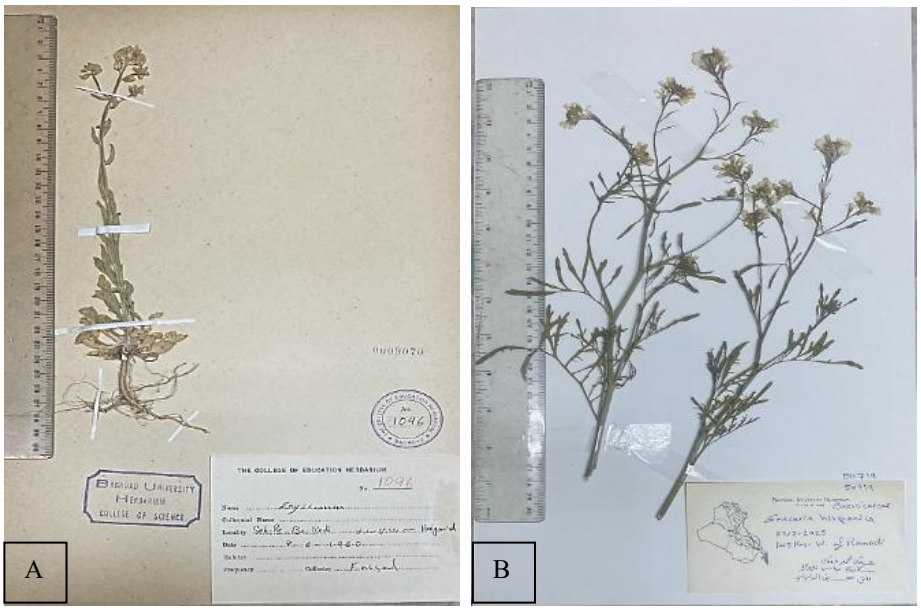


Plate (2): (A) Old herbarium specimen of *Erysimum* sp., (B) Newly collected specimen of *Erucaria* sp. [Photo by Fatin H. Al-Dulaimi].

CONCLUSIONS

The study findings describe the distribution of sixteen wild Brassicaceae species across various Iraqi districts. These species thrive in rocky limestone formations and sandy and loamy soils. These plants spread across different climate zones because they can tolerate dry and semi-arid conditions. Researchers examined preserved plant specimens in herbaria to assess the distribution of Brassicaceae family across Iraq. The study results enhance the botanical knowledge and allow further exploration Brassicaceae species throughout Iraq. The results contribute to botanical knowledge in Iraq and help understand the ecological habits and potential agricultural value of these plants. Researchers recommend conducting further studies to evaluate the environmental benefits or harms of these wild species and to control

those factors that may threaten ecological diversity due to the species' wide environmental tolerance.

ACKNOWLEDGMENTS

We would like to express our great appreciation to: Dr. Sahar A. Malik Al-Saadi Department of Biology- College of Science- Basrah University, Dr. Sirwan Taha Saleh Department of Field Crops- College of Agriculture- Salahaddin University- Iraq and Dr. Ali Mala Khedir Galalaey, Department of Biology- College of Science- Salahaddin University-Erbil, for their assistance during this research .

Special thanks are extended to Dr. Othman Mohammed Othman Department of Biology-College of Education and Pure Science, University of Anbar for supervising the field surveys across Iraqi provinces, which greatly contributed to the success of this study.

CONFLICT OF INTEREST STATEMENT

"The authors have no conflicts of interest to declare.

LITERATURE CITED

Abdullah, A. O., Saleh, S. T. and Mahmood, B. J. 2019. Some characters of different genotypes of *Brassica napus* in Erbil City-Kurdistan Region-Iraq. *Zankoy Journal of Pure and Applied Sciences,* 31(S4): 71-82. [ResearchGate]

Abood, A. S., Kanaan, H. and Jassim, H. 2024. Spatial distribution of plant regions in Iraq. *In*: Awadh, S.M. and Al-Dabbas, M. (eds) The Geography of Iraq. *World Regional Geography Book Series*. Springer, Cham, p. 99-115 [CrossRef]

Albermani, S. S., Albermani, A. and Altameme, H. J. 2017. Systematic study of the genus *Nasturtium* R. Br (Brassicaceae) in Iraq. *Journal of Chemical and Pharmaceutical Sciences*. 10(1): 352-358. [Click here]

Al-Dulaimi, F. H. 2023. Distribution and classification of medicinal plants in Zakhikhah Area of Al-Anbar Desert. *Journal of Agriculture and Crops*, 9(2): 257-265. [CrossRef]

Al-Eisawi. D. 2016. Taxonomic synopsis of Brassicaceae for the flora of Jordan. *Webbia*, 71(2): 219-226. [CrossRef]

Al-Joboury, K. R. and Zurgany, L. M. 2024. Investigation of wild land plants of the riparian area of the Dujail River, Salahaldin province, north of Baghdad, Iraq. *Bulletin of the Iraq Natural History Museum*, 18(2): 315-356. [CrossRef]

AL-Katib, Y. M. 1988. Taxonomy of seed plants. Baghdad University. 590 pp (In Arabic).

Al-Mashhadany, A. H. and Al-Mharib, M. Z. K. 2023. Effect of fertilizers starter solutions on growth and production of broccoli (*Brassica oleracea* var. *italica*). *Research on Crops*, 24(1): 119-122. [CrossRef]

Al-Rawi, A. 1964. Wild plants of Iraq with their distribution. Baghdad: Ministry of Agriculture and Irrigation, Government Press, 232 pp. [Click here]

Al-Saadi, S., Qader, K. and Fetah, H. 2019. Anatomical characters used to delimit species of some genera of Brassicaceae in Iraq. *Sulaimani Journal for Pure pplied Sciences*, 21(1): 37-46. [CrossRef].

Al-Shehbaz, I. A. 2025. The Brassicaceae then and now: Advancements in the past three decades, a review. *Annals of Botany*, mcaf055. [CrossRef]

Al-Shehbaz, I. A., Beilstein, M. A. and Kellogg, E. A. 2006. Systematics and phylogeny of the Brassicaceae: An overview. *Plant Systematics and Evolution*, 259(2-4): 89-120. [CrossRef]

Al.Taie, G. R. I. 2023. Molecular characteristics study of the plants of two species from the genus *Eruca mill* of the Brassicaceae family, which are growing in Iraq. *Nabatia*, 11(2): 108-116. [CrossRef]

Byrne, S. L., Erthmann, P. Ø., Agerbirk, N., Bak, S., Hauser, T. P., Nagy, I., Paina, C. and Asp, T. 2017. The genome sequence of *Barbarea vulgaris* facilitates the study of ecological biochemistry. *Scientific Reports*, 7: 40728. [CrossRef]

Franzke, A., Lysak, M. A., Al-Shehbaz, I. A., Koch, M. A. and Mummenhoff, K. 2011. Cabbage family affairs: the evolutionary history of Brassicaceae. *Trends in Plant Science*, 16(2): 108-116. [CrossRef]

Hashim, N. S., Dawood, W. M., and Al-Shahwany, A. W. 2023. Taxonomic study of wild species of the Brassicaceae family in Diyala Province-Iraq. *Journal of Agricultural, Environmental and Veterinary Sciences*, 7(2): 1-13. [CrossRef]

Holmgren, P. K., Holmgren, N. H. and Barnett, L. C. 1990. Index herbariorum standard. IUBS Commission for Plant Taxonomic Databases (TDWG). [Click here]

IUCN. 2024. The IUCN Red List of Threatened Species. [Click here]

Lange, C. B. A., Hauser, T. P., Deichmann, V. and Ørgaard, M. 2022. Hybridization and complex evolution of *Barbarea vulgaris* and related species (Brassicaceae). *Molecular Phylogenetics and Evolution*, 169:107425. [CrossRef]

Moussa, M. O., AlAni, M. A., Sabri, N. A. and Alalwany, A. A. 2015. The distribution of some medicinal plants in three zone of western desert of Iraq. *Anbar Journal of Agricultural and Sciences*, 13(1): 288-304. [ResearchGate]

Mousa, M. O., Shahatha, S. S., AlFahdawy, H. S. M., Abood, N. M. and Mukhlif, F. H. 2024. Identifying and check names of wild plants from Brassicaceae family in Western Desert District of Iraq. IOP Conference Series: *Earth Environmental Scinces*, 1325: 012047. [CrossRef]

Mutlu, B. 2010. New morphological characters for some *Erysimum* (Brassicaceae) species. *Turkish Journal of Botany*, 34(2):115-121. [CrossRef]

Nasser, N. S. and Manfy, E. A. 2023. Biological aspects of pollen development in six species of Brassicaceae. *Iraqi Journal of Science*, 55(4B): 1770-1779. [Click here]

Natural Earth. 2025. Standard Map of Iraq. [Click here]

Othman, M. O. 2022. Taxonomic ecological comparison of some species of the Brassicaceae family in western desert district- Iraq. MSc thesis. College of Education for Pure Sciences, University of Anbar, Iraq, 224 pp.

POWO. 2026. Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. [Click here]

Raza, A., Hafeez, M. B., Zahra, N., Shaukat, K., Umbreen, S., Tabassum, J., Charagh, S., Khan, R. S. A. and Hasanuzzaman, M. 2020. The plant family Brassicaceae: Introduction, biology, and importance. *In* Hasanuzzaman M. (Ed.), The Plant Family Brassicaceae, Springer Singapore, p. 1-43. [CrossRef]

Ren, T., Xun, L., Jia, Y., and Li, B. 2024. Complete plastomes of ten *Rorippa* species (Brassicaceae): comparative analysis and phylogenetic relationships. *Agronomy*, 14(5): 913. [CrossRef]

Rhida, B. M. and Twaij, S. D. A. A. 2021. The effect of Brassinolide application in the anatomical and physiological characteristics of the vegetative parts of a species from the genus of *Brasscia aleracea* cabbage cultivated in Iraq. *Annals of the Romanian Society for Cell Biology*, 25(6): 9838-9847. [Click here]

Ross, I.A. 2024. The History of Brassicaceae Plants. *In*: Plant-Based Therapeutics, Volume 2. Springer, Cham, 820 pp. [CrossRef]

Salariato D. L, Trinidad H., Cano A., Zuloago, F. O. and Al-Shehbaz, I. A. 2022. Interplay between conservatism and divergence in climatic niche evolution of Brassicaceae tribe

Eudemeae shaped their distribution across the different environments of the Andes. *Botanical Journal of the Linnean Society*, 200 (3): 314-343. [CrossRef]

Townsend, C. C. and Guest, E. 1980. Flora of Iraq. Vol. 4. Part 2. Baghdad, p. 1051-1063.

Warwick, S. I., Francis, A. and Al-Shehbaz, I. A. 2006. Brassicaceae: species checklist and database on CD-Rom. *Plant Systematics and Evolution*, 259: 249-258. [CrossRef]

Bull. Iraq nat. Hist. Mus.
(2026) 19 (1): 99-113.

رصد أولي وتقييم بيئي لِستة عشرَ نوعاً برياً من العائلة الصليبية في العراق

فاتن حسين الدليمي و سكينة عباس عليوي
قسم علوم الحياة، كلية العلوم، جامعة بغداد، بغداد، العراق.

الاستلام: 2025/10/4، المراجعة: 2026/1/27، القبول: 2026/1/30، النشر: 2026/6/20

الخلاصة

تناولت هذه الدراسة الأدوار البيئية والتوزيع الجغرافي لستة عشر نوعًا بريًا من العائلة الصليبية في معظم مقاطعات العراق، بما في ذلك المناطق الجافة والجبلية. تم تحليل ما مجموعهُ 263 عينة معشبية، شملت عينات محفوظة منذ خمسينيات القرن العشرين حتى عام 2025، بما في ذلك النوع *Erysimum cuspidatum* (M.Bieb) DC. (1821) الذي تم تسجيله حديثاً من قبل نفس الباحثين، بالإضافة إلى ثمانية عينات جديدة جُمعت خلال السفرات الحقلية للدراسة الحالية.

تمثلت الأهداف الرئيسة للدراسة في تقييم تفضيلات الموائل، وأنواع التربة، والاستراتيجيات التكيفية لهذه الأنواع في المناطق الجافة وشبه الجافة. وأظهرت النتائج أن الأنواع المدروسة قادرة على النمو في نطاق واسع من أنواع التربة، بما في ذلك الترب الجيرية، والصخرية، والرملية، والطمية، مما يعكس مرونتها البيئية وانتشارها الواسع في مختلف أنحاء العراق. وتوفر هذه الدراسة قاعدة بيانات أولية لفهم التنوع النباتي في العراق، وتسهم في دعم الجهود المستقبلية للحفاظ على أنواع العائلة الصليبية وموائلها البيئية.

الأنواع التي تم تقييمها هي:

Descurainia sophia (L.) Webb ex Prantl (1892)

Rorippa amphibia (L.) Besser (1821)

Barbarea vulgaris W.T. Aiton (1812)

Barbarea plantaginea DC. (1821)

Farsetia aegyptia Turra (1765)

Farsetia burtoniae Oliv. (1880)

Euclidium syriacum (L.) W.T. Aiton (1812)

Erucaria hispanica (L.) Druce (1914)

Erucaria cakiloidea (DC.) O.E.Schulz. (1916)

Fibigia macrocarpa (Boiss.) Boiss. (1867)

Strigosella grandiflora (Bunge) Botsch. (1972)

Plagioloba crenulata (DC.) German D.A. (2021)

Arabis auriculata Lam. (1783)

Arabis hirsuta (L.) Scop. (1771)

Erysimum cuspidatum (M.Bieb) DC. (1821)

Erysimum aucherianum J.Gay, (1842).