



A study on the taxonomic and conservation status, and ecological characteristics of *Draba lasiocarpa* (Brassicaceae): A new record for the flora of Türkiye

Hasan YAŞAYACAK¹, Muhammed Hakan ÇAKMAK^{2*}

^{1,2}Ministry of Agriculture and Forestry, General Directorate of Nature Conservation and National Parks, 06560, Ankara, Türkiye

*muhammedhakan.cakmak@gmail.com, ¹hasan.yasayacak@milliparklar.gov.tr

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Türkiye florası için yeni bir kayıt olan *Draba lasiocarpa* (Brassicaceae)'nın taksonomisi, koruma durumu ve ekolojik özellikleri üzerine bir çalışma

Abstract: *Draba lasiocarpa* (Brassicaceae), collected from Küre Mountains National Park in Kastamonu Province, is reported for the first time in the flora of Türkiye. The purpose of this study is to determine the taxonomic and conservation status, as well as the ecological characteristics of the species. During field studies conducted in 2022-2025, individual counts and coordinates of the species were recorded, along with additional field observations. A brief description of *D. lasiocarpa*, accompanied by photographs and a distribution map, is presented. Furthermore, its taxonomic relationship with closely related taxa is examined and discussed. A new diagnostic key for the section *Aizopsis* of the genus *Draba* in Türkiye is also provided. As a result, the IUCN threat categories, EUNIS habitat type, and various ecological characteristics (altitude, slope, aspect, bedrock, and soil type) of the species are determined for Türkiye. This study contributes a new distribution area for the species to the existing literature. Additionally, information regarding the IUCN threat category specific to Türkiye, the EUNIS habitat type associated with its distribution area, and the species' ecological requirements and relationships with environmental variables are compiled.

Key words: *Aizopsis*, botany, floristic study, plant ecology

Özet: *Draba lasiocarpa* (Brassicaceae), Kastamonu ili Küre Dağları Milli Parkı'ndan toplanmış olup, Türkiye florası için ilk kez kaydedilmiştir. Bu çalışmanın amacı, türün taksonomik ve koruma statüsünün yanı sıra ekolojik özelliklerini belirlemektir. 2022-2025 yılları arasında yapılan arazi çalışmaları sırasında türün birey sayımları ve koordinatları kaydedilmiş olup, buna ek olarak arazi gözlemleri yapılmıştır. *D. lasiocarpa*'nın kısa bir tanımı, fotoğraflar ve dağılım haritası ile birlikte sunulmuştur. Ayrıca, yakın akraba taksonlarla olan taksonomik ilişkisi incelenmiş ve tartışılmıştır. *Draba* cinsinin Türkiye'deki *Aizopsis* seksiyonu için yeni bir teşhis anahtarı da oluşturulmuştur. Sonuç olarak, türün Türkiye için IUCN tehdit kategorisi, EUNIS habitat tipi ve çeşitli ekolojik özellikleri (rakım, eğim, bakı, ana kaya ve toprak tipi) belirlenmiştir. Bu çalışma, tür için mevcut literatüre yeni bir yayılış alanı kazandırmaktadır. Ayrıca, türün Türkiye'ye özgü IUCN tehdit kategorisi, yayılış alanına ilişkin EUNIS habitat tipi, türün ekolojik gereksinimleri ve çevresel değişkenlerle ilişkileri hakkında bilgiler derlenmiştir.

Anahtar Kelimeler: *Aizopsis*, bitki ekolojisi, botanik, floristik çalışma

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1. Introduction

With approximately 400 species across the world, *Draba* L. is the largest genus in the Brassicaceae L. family. It is mostly found in the Northern Hemisphere, particularly in the arctic, subarctic, alpine, and subalpine regions (Al-Shehbaz, 2018; BrassiBase, 2024). Nonetheless, a number of species had their distribution ranges expanded to include the South American Andes highlands (Al-Shehbaz et al., 2010). The genus is highly recognized for its polyploidy, apomixis, hybridization, and overall taxonomic complexity (Brochmann et al., 1992; Brochmann, 1993; Scheen et al., 2002; Al-Shehbaz, 2018). Because of agamospermy and ongoing patterns of variation in the essential features, many species complexes make it challenging to identify the borders between species (Mulligan and Findlay, 1970). Furthermore, the evolutionary history of *Draba* is complicated by frequent hybridization episodes, which are frequently followed by polyploidization and occasionally apomixis (Mulligan, 1974; Grundt et al., 2004). On the other hand, due to inadequate taxon sampling, molecular

studies necessary to get a deeper comprehension of the systematics and phylogeny of this complex genus are mainly unfinished (Koch and Al-Shehbaz, 2002; Jordon-Thaden et al., 2010; Kim and Kim, 2015).

According to Flora of Turkey and the East Aegean Islands (Davis, 1965), there are 22 *Draba* taxa belonging to 16 species, and the section *Aizopsis* DC. contains 8 taxa belonging to 2 species in Türkiye. Following taxonomic studies, five *Erophila* DC. taxa, one *Drabopsis* K.Koch taxon, and one *Schivereckia* Andr. ex DC. taxon have been reclassified as *Draba* (POWO, 2024).

In this study, *Draba lasiocarpa* Rochel is recorded for the first time in Türkiye from Kastamonu province. Thus, the total number of *Draba* species in the flora of Türkiye has risen to thirty. In addition, habitat information, conservation status, distribution in Türkiye, ecological characteristics, morphological characteristics of the species are presented and these characteristics are compared with other *Draba* species belonging to the section *Aizopsis* DC.

in Türkiye. This paper provides a detailed description of the species, including photographs, a diagnostic key to the section *Aizopsis*, and relevant notes.

2. Materials and Method

Between 2022–2025, field studies were conducted in Valla and Horma canyons (Pınarbaşı district) and Çatak canyon (Azdavay district) in Küre Mountains National Park, Kastamonu, Türkiye. The species were observed directly, specimens were collected, and individual counts were conducted in these localities. Afterwards, specimens were analyzed and compared with materials from different herbaria for identification. Flora Hellenica, Flora of Turkey and the East Aegean Islands, and Flora Europaea were used for species identification (Tutin et al., 1964; Davis, 1965; Strid and Tan, 2002). Collected specimens are preserved in the Ankara University, Faculty of Science Department of Biology Herbarium (Herbarium Turcicum - ANK). Coordinates from field studies were digitized using ArcGIS 10.5. Using coordinate information in the digital environment, the extent of occurrence (EOO) and area of occupancy (AOO) values were calculated in square kilometers for the species with GeoCAT (GeoCAT, 2024). Field data, including coordinates, EOO, and AOO, were used to propose a threat category for the species according to IUCN (2012). EUNIS habitat types for the areas where the species is distributed were identified by the EUNIS habitat classification (EUNIS, 2024). To analyze species' relationship with environmental variables, the Shuttle Radar Topography Mission (SRTM) 1 Arc-Second Global Digital Elevation Model (DEM) data (Google Earth Engine, 2024) was used. Aspect, slope, and elevation variables were derived from DEM data using ArcGIS ArcMap 10.5. Geological data (bedrock) was obtained from MTA (2024) and soil data (major soil groups) was obtained from MoAF (2024). Then, the species coordinates were overlapped with these data to analyze their relationship with environmental variables. In addition, other companion species distributed in the areas where this species is distributed were also identified.

3. Results and Discussions

The description of *Draba lasiocarpa*, a new species record for Türkiye, is below. See Figure 1 for plant morphology documentation.

***Draba lasiocarpa* Rochel;** Sched. Pl. Hung. Exsicc. (1810)

Lectotype: *Draba aizoides* Sm. var. *scardica* Griseb. in Spic. Fl. Rumel. 1: 266 (1834) (POWO, 2024)

Synonyms: *Draba aizoides* var. *hirsuta* Bald. in Nuovo Giorn. Bot. Ital., n.s., 1: 109 (1894), nom. superfl.; *Draba aizoides* var. *scardica* Griseb. in Spic. Fl. Rumel. 1: 266 (1834); *Draba aizoon* Wahlenb. in Fl. Carpat. Princ.: 193 (1814); *Draba aizoon* var. *athoa* Griseb. in Spic. Fl. Rumel. 1: 267 (1843); *Draba aizoonia* St.-Lag. in Ann. Soc. Bot. Lyon 7: 125 (1880), orth. var.; *Draba athoa* (Griseb.) Boiss. in Diagn. Pl. Orient., ser. 2, 1: 33 (1854); *Draba athoa* var. *glabrescens* Halácsy in Consp. Fl. Graec. 1: 100 (1900); *Draba baumgartenii* Schur in Enum. Pl. Transsilv.: 65 (1866); *Draba bosniaca* (Beck) Fiala in Wiss. Mitt. Bosniamus. Wien 1: 558 (1893); *Draba boueana* Zahlbr. ex O.E.Schulz in H.G.A.Engler (ed.), Pflanzenr., IV, 105(Heft 89): 47 (1927); *Draba ciliaris* Schrank in Baier. Fl. 2: 177 (1789); *Draba ciliaris* Kit. ex C.Presl in Abh. Königl.

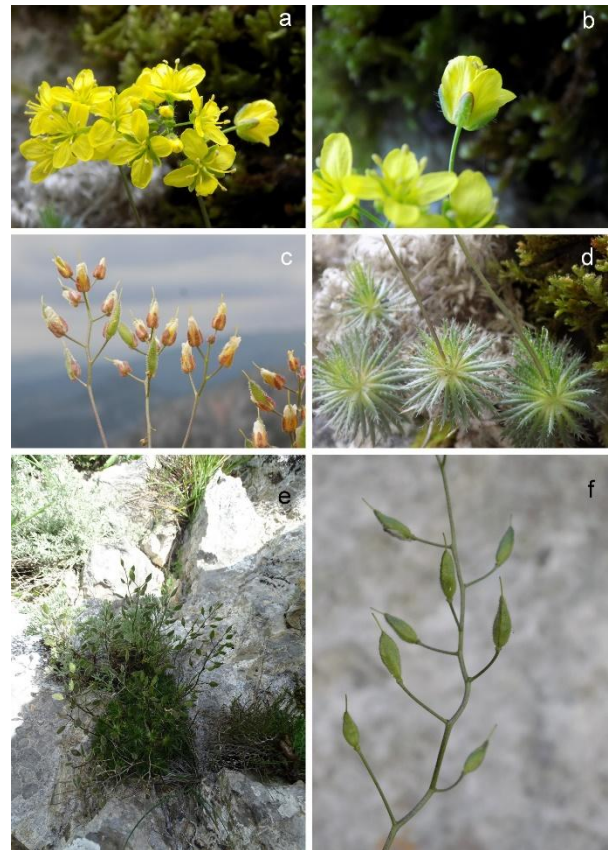


Figure 1. General appearance of *Draba lasiocarpa*. a) inflorescence, b) red margined sepal at apex, c) subsaccate sepal form, d) basal leaves and stems, e) plant habit, f) siliculae

Böhm. Ges. Wiss., ser. 5, 3: 439 (1845); *Draba dolichostyla* (O.E.Schulz) Kit Tan & Stevan. in Fl. Hellenica 2: 238 (2002); *Draba elongata* Host in Fl. Austriaca 2: 237 (1831); *Draba elongata* var. *skrivanekii* Röhl. in unknown publication; *Draba kitaibeliana* C.Presl in Abh. Königl. Böhm. Ges. Wiss., ser. 5, 3: 439 (1845); *Draba lasiocarpa* var. *bosniaca* Beck in Ann. K. K. Naturhist. Hofmus. 2: 75 (1887); *Draba lasiocarpa* subsp. *dolichostyla* (O.E.Schulz) Buttler in P.A.K.Strid & Kit Tan (eds.), Mount. Fl. Greece 1: 311 (1986); *Draba parnassica* Boiss. var. *dolichostyla* O.E.Schulz in H.G.A.Engler (ed.), Pflanzenr., IV, 105(Heft 89): 34 (1927); *Draba scardica* (Griseb.) Degen & Dörfel. in Denkschr. Kaiserl. Akad. Wiss., Wien. Math.-Naturwiss. Kl. 64: 707 (1897); *Draba skrivanekii* (Röhl.) Chrték in Folia Geobot. Phytotax. 14: 202 (1979) (POWO, 2024); *Draba klasterskyi* Chrték in Preslia 50: 153–154 (1978) (Strid and Tan 2002).

Description: Densely caespitose perennial plant. Spring leaves elliptic-lanceolate to linear, 5–20 × 1.5–3.5 mm; Summer leaves 0.5–1.7 mm broad, usually glabrous, sometimes with simple or 2-fid hairs, ciliate. Scapes glabrous, 2–15 cm. Inflorescences 3–30-flowered, subumbellate to elongated in fruit. Sepals 2–3.5 mm., broadly elliptic-ovate, glabrous or weakly pilose. Petals 3–9 mm, obovate, indistinctly clawed; shallowly notched to almost rounded, pale to bright yellow. Stamens equaling to shorter than petals. Pedicels erecto-patent to horizontally patent, glabrous. Fruits 3.5–14 × 1–4 mm; valves flat to slightly inflated, often greyish-purple, glabrous to moderately pilose with simple, erecto-patent hairs 0.1–0.6 mm, rarely densely adpressed-hirsute or patent-pilose with

hairs up to 0.8 mm. Styles long, 1.4–5.2 mm. Seeds 4-to 14 per loculus. 0.8–1.8 mm, funicles 0.4–2 mm. 2n:16, 16* (Strid and Tan, 2002).

Flowering: April to July (Strid and Tan, 2002).

Ecology and habitat: Rock crevices and ledges, cliffs, stabilized scree, also in stony meadows, open woodland or scrub, on limestone, serpentine, schist and flysch, 1100–2500 m a.s.l. (Strid and Tan, 2002). In Türkiye, *D. lasiocarpa* grows in cliffs, rocky slopes, rock crevices and ledges in the Küre Mountains at altitudes of 500 to 1200 m a.s.l..

Distribution: Widespread in the Balkan Peninsula, South and East Carpathians, northwards to the foothills of the East Alps and North Carpathians (Strid and Tan, 2002) (Fig. 2) and now Türkiye (Fig. 3).

Notes on the species: An extremely variable species exhibiting considerable differences in style and petal length as well as in fruit dimensions and indumentum. Taxa such as *Draba scardica*, *D. elongata*, *D. athoa*, *D. klasterskyi*, etc., are perhaps better treated as geographical variants within the *D. lasiocarpa* complex (Strid and Tan, 2002).

Specimens examined: [Türkiye] **Kastamonu:** Pınarbaşı District, Valla Canyon, 800 m a.s.l., rock crevices, 28.04.2025, *H.Yaşayacak* 60710 (ANK!); *ibid.*, Horma Canyon, 1200 m a.s.l., 29.04.2025, *H.Yaşayacak* 60711 (ANK!); Azdavay District, Çatak Canyon, Küre Mountains National Park, 30.04.2025, 500 m a.s.l., *H.Yaşayacak* 60712 (ANK!) (Fig. 4).

Conservation status: It is a new species record for Türkiye; the species is rare across the country. Specimens



Figure 2. General distribution of *Draba lasiocarpa* (POWO, 2024)

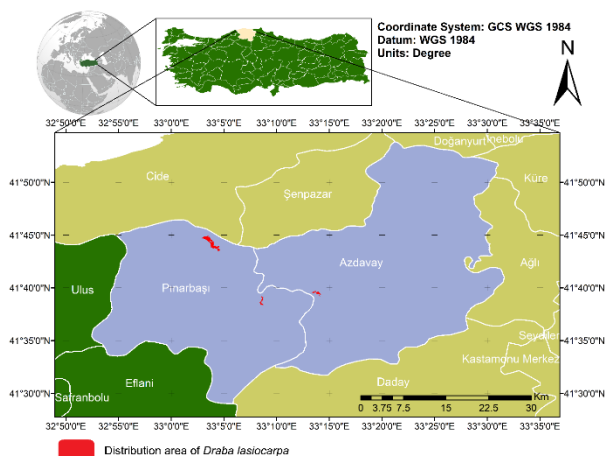


Figure 3. Distribution area of *Draba lasiocarpa* in Türkiye

were collected in three different localities in Türkiye: Horma, Valla and Çatak canyons. Its IUCN threat category for Türkiye was determined as “Vulnerable” (VU).

With this study, by adding *Draba lasiocarpa* to the flora of Türkiye, the number of *Draba* taxa has increased to 34 taxa belonging to 30 species, and the section *Aizopsis* contains 9 taxa belonging to 6 species (Davis, 1965; Yıldırım, 2000; Karabacak and Behcet, 2009; Karaer, 2012).

While determining the IUCN threat category for the species, the guidelines outlined in the IUCN (2012) were followed. In this study, although the approximate number of individuals (population size) was determined to be around 850, no observational or literature data were available regarding observed, estimated, inferred, or suspected ongoing declines or extreme fluctuations in population size reduction or the number of mature individuals of the species. Moreover, no quantitative analysis was conducted to determine the probability of extinction in the wild, rendering Criteria A, C, and E inapplicable. On the other hand, the EOO was calculated to be 63.674 km², and the AOO was determined as 28 km² using GeoCAT. These values approach the thresholds for listing under Criterion B as Critically Endangered (CR, based on EOO) and Endangered (EN, based on AOO). However, due to the lack of evidence for ongoing decline or extreme fluctuations in distribution, habitat quality, or population size, Criterion B could not be applied conclusively. According to Criterion D1, the estimated population size of fewer than 1,000 individuals (approximately 850) qualifies the species for listing as VU. Therefore, despite the limited distribution and potential concerns regarding its habitat, the available data support assigning the species to the VU category under Criterion



Figure 4. Herbarium material of *Draba lasiocarpa*

D1. Although no specific threat has been identified for this species, it is nevertheless subject to the overarching impact of global climate change, which affects all living organisms. In addition, its restricted population size and limited distribution across only three known locations support its assessment under the VU category. Consequently, it was concluded that the species should be assessed as VU (D1) in Türkiye.

Draba lasiocarpa species was collected from Valla and Horma canyons in Pınarbaşı district and Çatak Canyon in Azdavay district. In its locality the following taxa were abundant: *Asplenium ceterach* L., *Alyssoides utriculata* (L.) Medik., *Arabis alpina* L. subsp. *caucasica* (Willd.) Briq., *Aubrieta canescens* Boiss. subsp. *macrostyla* Cullen & Hub.-Mor., *Anemone blanda* Schott & Kotschy, *Dianthus monadelphus* Vent. subsp. *pallens* Greuter & Burdet, *Minuartia micrantha* Schischk., *Aegokeras caespitosa* (Sm.) Raf., *Seseli resinosum* Freyn & Sint., *Saxifraga rotundifolia* L., *Anthemis cretica* L. subsp. *albida* (Boiss.) Grierson, *Tripleurospermum rosellum* (Boiss. & Orph.) Hayek var. *album* E.Hossain, *Centaurea reuteriana* Boiss., *Centaurea drabifolia* Sm. subsp. *floccosa* (Boiss.) Wagenitz & Greuter, *Sideritis germanicopolitana* Bornm. subsp. *germanicopolitana*, *Euphorbia herniariifolia* Willd., *Globularia cordifolia* L., *Veronica pectinata* L., *Allium rupestre* Steven, *Muscari armeniacum* H.J.Veitch, *Gagea granatellii* (Parl.) Parl., *Alopecurus vaginatus* (Willd.) Pall. ex Kunth.

Table 1 compares the morphological traits of *Draba heterocoma* Fenzl that is most similar to *D. lasiocarpa* for the flora of Türkiye. *D. lasiocarpa* is distinguished from *D. heterocoma* by the distinctly long style.

It is proposed that the following diagnostic key be used for the species of *Draba* section *Aizopsis* occurring in Türkiye.

Leaves linear or linear-obovate, stiff, $\pm$ pectinate, with a well-developed midrib beneath (Tutin et al., 1964).

(Section *Aizopsis*)

1. Scape glabrous; style longer or shorter
 2. Style longer, more than 1.4 mm in fruit.....***lasiocarpa***
 2. Style shorter, not more than 1.0 mm in fruit
 3. Ovary with 32–36 ovules; siliculae glabrous, 1.0 mm
 4. Leaves spreading, 3–6***rigida***
 4. Leaves inflexed, up to 2 mm***bryoides***
 3. Ovary with 4–10 ovules; siliculae pubescent, shorter than 1.0 mm
 5. Leaves with hairs on the lamina as well as on the margin, some branched***nana***
 5. Leaves with hairs on the margin only, all simple***heterocoma***
1. Scape villose; style shorter than 1.0 mm.....***bruniifolia***

Draba lasiocarpa is widely recognized as a polymorphic species which is mainly distributed in Southeastern Europe, especially in the Balkan Peninsula and nearby areas (Strid and Tan, 2002; Euro+Med PlantBase, 2024; POWO, 2024; World Plants, 2024). According to the Strid (1986), this species encompasses multiple local variants, with certain variants having been classified as separate taxa. Nevertheless, there is significant overlap in the ranges of

Table 1. Comparison of morphological traits of *D. heterocoma* and *D. lasiocarpa* in Türkiye (Strid and Tan, 2002)

Characteristics	<i>D. lasiocarpa</i>	<i>D. heterocoma</i>
Leaves	5–20 × 1.5–3.5 mm	<16 × 0.4–2.0 mm
Stems	2–15 cm	1–10 cm
Silicula	3.5–14 × 1–4 mm	2.5–7 × 2.0–3.3 mm
Silicula hairs	0.1–0.6 mm	0.3–1.0 mm
Styles	1.4–5.2 mm	0.3–0.6 mm
Ovary	4–14 ovules	2–6 ovules

variation, and these variants are interconnected through intermediates. When considering the species' overall distribution, there are observable gradients from south to north, particularly in traits such as style and petal length; however, individuals exhibiting deviations from the local average can be found across all regions (Strid, 1986). On the other hand, this new distribution area in Türkiye aligns with the general European-Siberian distribution and habitat preferences of the species. This new record of the species' easternmost distribution further strengthens the floristic link between the Balkans, Southern Alps, and northern Türkiye. The presence of the species recorded in Kastamonu province also suggests its potential existence in Thrace and Northwestern Türkiye, which are in closer proximity to the Balkan region.

A comparison of various morphological and ecological characteristics of the populations in Türkiye, based on field observations, with those of the populations in the primary distribution area of *Draba lasiocarpa* is presented in Table 2. As shown in Table 2, the primary reason for the observed character differences in the species population in Türkiye is believed to be the polymorphic structure of the species, along with its significant ecological variation.

Although the taxon *Draba klasterskyi* is recognized as a subspecies of *D. lasiocarpa* in many sources (Euro+Med PlantBase, 2024; POWO, 2024; World Plants, 2024), it was considered synonymous of *D. lasiocarpa* in the Strid and Tan (2002). This assessment is compatible with the polymorphic structure of the species.

A comparison of *Draba bruniifolia* Steven subsp. *kurdica* Coode & Cullen with other Northwestern Iran populations is needed to clarify its systematic status based on fruit hair structure variations.

Table 3 depicts the relationship between *Draba lasiocarpa* and environmental variables. Within the scope of the study, the species is distributed in Türkiye between 500 and 1200 meters, predominantly between 500 and 1100 meters. Strid and Tan (2002) states that the species is found at elevations of 1100 to 2500 meters. The species spreads at relatively lower altitudes in Türkiye due to its high ecological variance. The altitudinal distribution of species populations in Türkiye is based on the altitudinal distribution characteristics of its synonym, *D. klasterskyi*. Chrtek (1978) notes that the type specimen of *D. klasterskyi* was collected at 650 m in Slovakia. It also has been stated that in the same study, while identifying the *D. klasterskyi*, the examined specimens were collected at altitudes ranging from 250 to 700 meters. Besides, *D. lasiocarpa* is distributed at higher altitudes (around 1100 m.) as noted by Chrtek (1978). The data show that the altitude range of the

Table 2. Ecological variations of the species in literature and observations

	Literature (Tutin et al., 1964; Strid and Tan, 2002)	Observation
Sepal shape	The inner not or only slightly saccate at the base	Subsaccate at the base
Sepal hair	Moderately pilose to glabrous	Densely pilose to glabrous
Sepal length	2–3.5 mm	2–4.0 mm
Sepal color	-	Greenish to red tinged or at apex red margined
Fruit broad	1-4 mm	1-5 mm
Altitude range	1100–2500 m	500–1200 m

D. lasiocarpa in Türkiye is not significantly different from its general distribution area. It is thought that it would be sensible to use the “mountain zone” and “alpine zone” together for the altitude range of *D. lasiocarpa* and that this would align with the existing literature data.

When the relationship between *Draba lasiocarpa* and slope is examined, it is seen that the species is distributed in the 0-70% slope range, and predominantly in the 30-60% range (Table 3). The species demonstrates variations in its relationship with the slope, just like in altitude. In the literature regarding *D. lasiocarpa*, it is noted that the species is found exclusively in sloping areas (Sekulić et al., 2023). This study has identified the slope range preferred by the species.

The distribution of *Draba lasiocarpa* across different aspect classes is presented in Table 3. As shown in Table 3, approximately half of the individuals of the species (46.59%) are located in the southwest, about a quarter (24.47%) in the west, and 14.47% in the south. This indicates that the species particularly prefers southern and western aspects.

Table 3 presents information on the preferred bedrock and soil types by *Draba lasiocarpa*. Accordingly, it is evident that the species prefers alkaline environments, particularly neritic limestone (limestone bedrock) found in Türkiye. While the literature indicates that the species prefers limestone bedrock (Sekulić et al., 2023), there is also evidence suggesting a preference for other bedrock types, such as serpentine (Hopewell et al., 2021). On the other hand, the species predominantly prefers gray-brown podzolic soils that are rich in bases in Türkiye. Basic characters, including both bedrock and soil type, play a crucial role in the distribution of the species.

This study has revealed the various ecological requirements of *D. lasiocarpa*, including altitude, slope, aspect, bedrock, and soil type, based on its newly identified distribution area in Türkiye. This information will serve as the foundation for studies aimed at uncovering the various ecological requirements of the species. It also serves as a crucial basis for other studies, such as conservation efforts and modeling related to the species.

Within the scope of the present study, the locations where *D. lasiocarpa* distribute are classified as “U373 – Temperate, lowland to montane bare limestone inland cliffs” according to the EUNIS habitat classification (EUNIS, 2024). The corresponding level-three habitat type, “U37 – Temperate, lowland to montane base-rich inland cliff” holds legal status under both Annex I of the EU Habitats Directive and Resolution No. 4 of the Bern Convention. Furthermore, this habitat is listed in the Red List of Habitats under the code RLH3.2c and assessed as

Least Concern (LC). Given its recognition under multiple international conservation instruments and frameworks, the habitat type (U373) encompassing the distribution range of the species is of notable conservation importance.

Within the scope of this study, the distribution area of *D. lasiocarpa* has been classified as U373 according to the EUNIS habitat classification. Information on the companion species and the environmental variables (such as altitude, aspect, slope, geology, and soil type) can also be utilized for habitat U373, which represents the distribution area of the species. In conclusion, this information can be added for the U373 habitat type in the EUNIS habitat system.

In taxonomic studies, relying solely on the morphological and/or genetic characteristics of species may result in

Table 3. Relationship between *D. lasiocarpa* and environmental variables

Environmental Variables	Number of Individuals	Ratio (%)
Altitude (m)	500-599.9	168
	600-699.9	187
	700-799.9	126
	800-899.9	128
	900-999.9	100
	1000-1099.9	117
	1100-1199.9	24
	0-9.9	40
	10-19.9	64
	20-29.9	98
Slope (%)	30-39.9	162
	40-49.9	226
	50-59.9	166
	60-69.9	91
	70-79.9	3
	North	22
	Northeast	20
	East	11
	Southeast	30
	South	123
Aspect	Southwest	396
	West	208
	Northwest	40
	Neritic limestone	769
	Clastics and carbonates	81
	Brown forest soil	198
	Gray-brown podzolic soil	652
	Total	850
		100

deficiencies in the analysis. It is believed that prioritizing the habitat and ecological data of the species, alongside other characteristics, will produce more accurate and effective results. In floristic studies, which concentrate more intensively on the taxonomic status and inventory of species, the findings tend to appeal to a more specialized scientific audience. However, species interact with one another and with their surrounding habitats in nature. For this reason, addressing the issues that reveal their ecological relationships in these studies will also broaden the scientific scope of the research.

Although this study provides valuable insights into the existing literature, it also presents potential limitations. One limitation is related to the spatial resolution (1 arc-second = approximately 30 meters) of the data used. As is widely known, more detailed information is required when working with narrowly distributed species, such as *D. lasiocarpa*. Therefore, the inability to utilize higher spatial resolution data can be regarded as a limitation within the context of this study. To address this issue, altitude, slope, and aspect data may be analyzed manually in the field for each species. However, this presents a challenge for researchers in terms of both time and resources. Additionally, the rugged geomorphological structure of the terrain complicates this process. Perhaps new techniques can be developed in future research to address these challenges.

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4. Conclusion

This study contributes a new distribution area for the species to the existing literature. Information regarding the IUCN threat category of the species specific to Türkiye, the EUNIS habitat type to which its distribution area belongs, and the species' ecological requirements and relationships with environmental variables (such as altitude, aspect, slope, bedrock, and soil structure) has been compiled. Besides that, the species identification key for the *Aizopsis* section in Türkiye, which includes this species, has been updated. On the other hand, the ecological variations of the species were revealed, and the complexities arising from its polymorphic structure were addressed. As a result, this study contributes original information to the literature on the *Draba* genus, the *Aizopsis* section, and *D. lasiocarpa*.

Conflict of Interest

Authors have declared no conflict of interest.

Authors' Contribution

The authors contributed equally.

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