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A STUDY OF WILD PLANT SPECIES OF *BRASSICACEAE* FAMILY IN BAYBURT REGION OF TURKEY

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Abstract

The *Brassicaceae* (*Cruciferae*) is one of the most important groups and it has 338 genera and 3709 species around the worldwide. Plant samples of the *Brassicaceae* family were collected and photographed during the vegetation period of 2017. The plant samples and the photos were taken from their natural habitat between 23 April and 11 August 2017. The locations were determined based on differences in geographical features with variable ecological conditions. 38 genera and 80 species and subspecies were identified from different locations of the study area. *Heldreichia bupleurifolia* Boiss. subsp. *rotundifolia, Aethionema caespitosum, Thlaspi lilacinum, Tchihatchewia isatidea, Bornmuellera cappadocica, Aurinia rupestris* subsp. c*yclocarpa, Alyssum stylare, Alyssum pseudomouradicum, Alyssum peltarioides* Boiss. subsp. *peltarioides* are endemic taxa for Bayburt.

Key words: *Brassicaceae*, Endemic species of Bayburt, Oil crops, Alternative energy.

Introduction

The *Brassicaceae* (*Cruciferae*) is one of the most important groups having 338 genera and 3709 species worldwide in distribution (Al-Shehbaz *et al*., 2006).

The *Brassicaceae* family includes many economically important edible and industrial oilseed, condiment, fodder crop species and vegetables. Canola or oilseed rape (*Brassica napus*) is the most important oil crop of the family (Alagoz & Toorchi, 2018). In addition, *Brassica oleracea* is one of the important vegetable crops. Additionally, *Brassicaceae* includes same biodiesel fuel or protein crops as *Camelina sativa*, *Eruca vesicaria*, *Crambe abyssinica*, *Brassica carinata* (Gugel and Falk, 2006; Warwick and Gugel, 2003; Warwick *et al*., 2006, 2007).

Turkey is one of the richest countries in the world in terms of the number of the *Brassicaceae* species (Al-Shehbaz *et al*., 2007). It is also strategically important due to its location. Bayburt is located between 40 degrees 37 minutes north latitude 40 degrees 45 minutes east longitude, 39 degrees 52 minutes south latitude 39 degrees 37 minutes west longitude in the Black Sea Region of Turkey. The city is situated at the Coruh River and has an altitude of 1550 m from the sea with a surface area of 3741 km². Erzurum neighbors the city to the east, Gümüşhane to the west, Trabzon and Rize to the north and Erzincan to the south. Bayburt has a climate showing the characteristics of both the eastern Black Sea climate and the eastern Anatolian climate with terrestrial features. Therefore, in Bayburt, summers are hot and arid, and the winters are cold and rainy (Anon., 2013).

The wild *Brassicaceae* species in natural habitats have provided information about useful genes for future breeding studies on important cultural crops such as *Brassica oleracea*, *Camelina sativa*, *Brassica napus* and have helped to find new crops for agricultural production as well as natural conservation. Although a number of researchers have determined wild species in natural habitats and have carried out taxonomic studies, there are still numerous wild species to be identified (Gıdık *et al*., 2016).

Brassica juncea, *Armoracia rusticana*, *Sinapis alba* and *Erysimum* ssp. of *Brassicaceae* are used as spices. *Brassica carinata*, *Camelina sativa*, *Crambe abyssinica* and *Eruca vesicaria* have significant potential for edible oil, protein plants, biodiesel fuel plants and molecular agriculture (Gugel & Falk, 2006; Warwick *et al*., 2007). Genus *Alyssum* is represented by 99 species of which 56 are endemic to Turkey. The genus *Aethionema* is represented with about 45 taxa in Turkey, including 20 endemic taxa (Güner *et al*., 2012). Within the family *Brassicaceae, Draba*, with 350 species, is one of the largest genera (Appel & Al-Shehbaz, 2002; Koch & Al-Shehbaz, 2002).

Despite some wild species identified in natural habitats and taxonomic studies by some researchers, there are still some wild species yet to be identified. This study aims to determine the taxa and the endemic species of *Brassicaceae* family in Bayburt.

Materials and Methods

Plant samples of the *Brassicaceae* family were collected and photographed during the vegetation period of 2017. The plant samples and the photos were taken from the natural habitat between 23 April and 11 August 2017. The locations were determined based on differences in geographical features with variable ecological conditions (Fig. 1). The altitudes of sampling locations varied from 1559 to 2978 m. Plant samples were collected, photographed and recorded at different periods from the beginning to the ending of the vegetation period. During the collection of plant specimens attention was paid to the proper preservation of different organs such as stem and leaf and the reproductive parts of the plant specimens. Plant samples were pressed and dried according to the herbarium technique and stored in the Herbarium of the Bayburt University. Flora of Turkey and the East Aegean Islands (Davis, 1965-1985; Davis *et al*., 1988; Güner *et al*., 2000) were used as the main source for the identification of these samples.

Other Floras such as Flora Iranica (Rechinger, 1965-1977), Flora Europaea (Tutin *et al*., 1964-1981), Flora of Iraq (Towsend & Guest, 1966-1985), Flora Palaestina (Zohary, 1966-1986) and Flora of USSR (Komarov and Shishkin, 1933-1964) have also been utilized in cases when Turkey's Flora was inadequate.

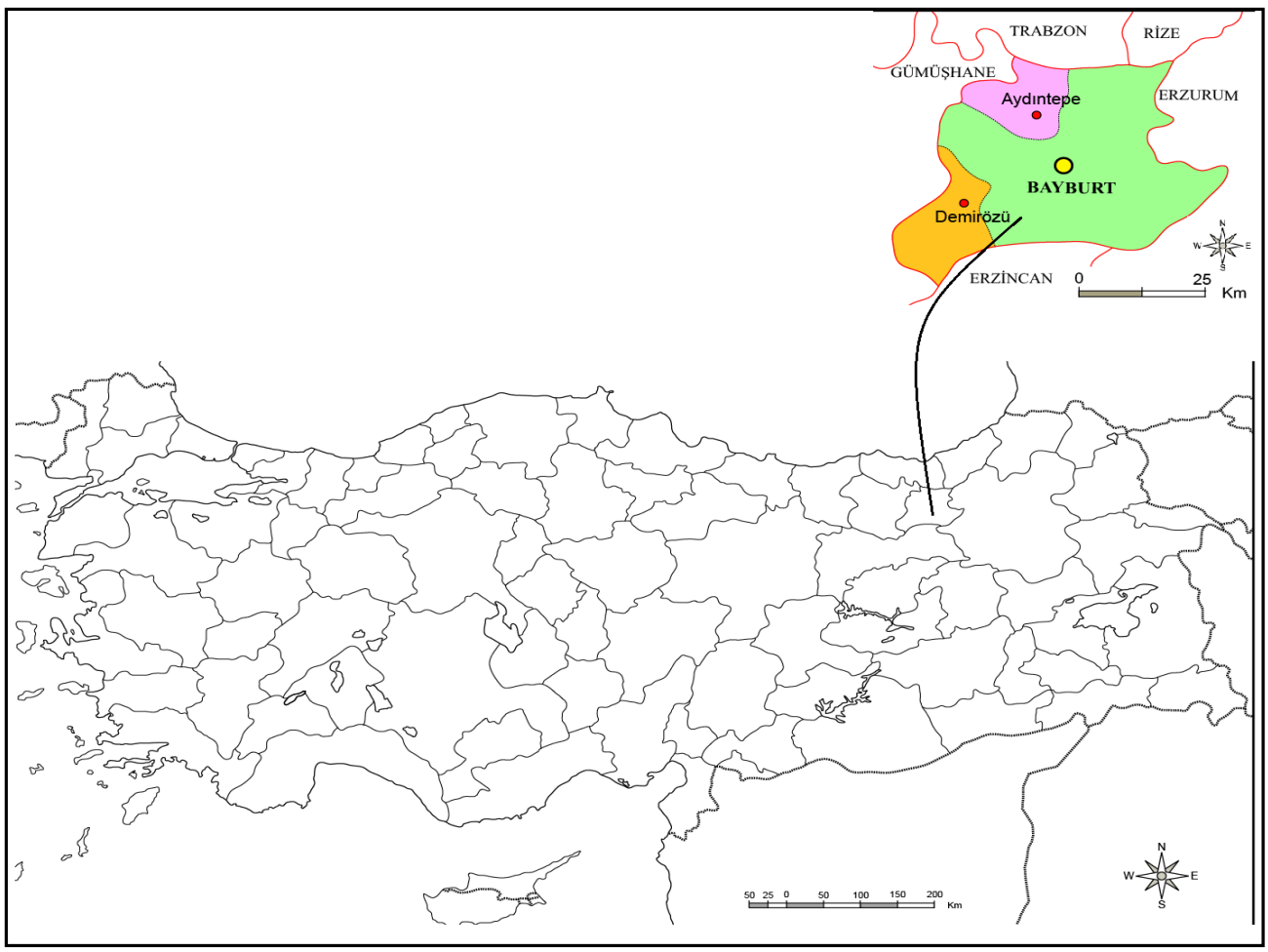

Fig. 1. The map of locations in Bayburt of Turkey.

Results

In this study, 38 different genera were found. *Aethionema, Alliaria, Alyssum, Arabis, Aurinia, Boreava, Bornmuellera, Brassica, Bunias, Camelina, Capsella, Cardamine, Chorispora, Clypeola, Conringia, Coluteocarpus, Crambe, Descurainia, Draba, Eruca, Erysimum, Euclidium, Fibigia, Heldreichia, Lepidium, Microthlaspi, Murbeckiella, Nasturtium, Neslia, Noccaea, Rapistrum, Sinapis, Sisymbrium, Sobolewskia, Sterigmostemum, Strigosella, Tchihatchewia,* and *Thlaspi* were identified through taxonomic classification of plant samples. Information about the species are shown in Table 1.

While preparing the list, first the family name followed by the generic, species and sub specific name, if any. The author of each taxon was written after confirming from Author of Plant Names (Brummit & Powell, 1992).

In this study, 38 genera were found in different locations of Bayburt. *Aethionema*, *Alyssum*, *Draba* have more than 5 species. Genera and their species are shown in Fig. 2. Different species of *Aethionema* were found between 1645 and 2244 m altitudes. Species of *Alyssum* were found between 1611 and 2129 m and species of *Draba* were found between 1623 and 2098 m altitudes.

Heldreichia bupleurifolia Boiss. subsp. *rotundifolia, Aethionema caespitosum, Thlaspi lilacinum, Tchihatchewia isatidea, Bornmuellera cappadocica, Aurinia rupestris* subsp. *cyclocarpa, Alyssum stylare, Alyssum pseudomouradicum, Alyssum peltarioides* Boiss. subsp. *peltarioides* are endemic for the region of Bayburt. All of the species that determined in Bayburt flora were photographed by Abdurrahman Sefalı. Some endemic species are shown in Fig. 3.

A total of 9 endemic taxa were found between 1674 and 2335 m altitude including a number of different genera.

In this study when determining the hazard categories of endemic taxa at species and subspecies levels "Turkey Plant Red Data Book" (Ekim, 2000) was used (Tables 2 and 3). However, the hazard classes of these taxa have been rearranged according to the 2001 IUCN Categories (Anon., 2013).

Tarkan (1971) conducted researches in Bayburt in the 70s and stated that the region should be included in the Eastern Anatolia Region with its natural and socioeconomic characteristics. The Bayburt region is more similar to the Eastern Anatolia Region in terms of the plant species mentioned in this study rather than the Black Sea Coastal belt.

Considering the distribution of phytogeographic region; 1 Euro-Sib., 4 Euoxine, 15 Iran-Turan, 26 widespread, and the undeclared are shown in table 4.

Table 1. Plant species identified from *Brassicaceae* family growing in Bayburt and their Turkish names, collecting dates, altitudes, latitudes and longitudes.

Genus	Species	Turkish name	Date	Latitude	Longitude	Altitude (m)
Aethionema	*Aethionema arabicum* (L.) Andrz. ex DC.	Araptaşçantası	21.05.2017	40°14'40"	40°09'54"	1645
	Aethionema cordatum (Desf.) Boiss.	Kalpçantası	26.05.2017	40°06'15"	40°14'35"	2003
	Aethionema speciosum Boiss. & A. Huet subsp. *speciosum*	Somkayagülü	03.06.2017	40°03'27"	40°09'42"	2056
	Aethionema trinervium (DC.) Boiss.		28.05.2017	40°06'15"	40°14'35"	2003
	Aethionema iberideum (Boiss.) Boiss.	Akkayagülü	20.05.2017	40°15'19"	40°14'40"	1857
	Aethionema caespitosum (Boiss.) Boiss.	Demetkayagülü	28.06.2017	40°13'38"	40°14'11"	1773
	Aethionema membranaceum (Desv.) DC.	Eteklikayagülü	05.07.2017	40°17'20"	40°33'26"	2244
	Aethionema armenum Boiss.	Taşçantası	21.06.2017	40°25'31"	40°28'57"	1738
Alliaria	*Alliaria petiolata* (M. Bieb.) Cavara & Grande	Sarmısak hardalı	05.05.2017	40°15'03"	40°13'58"	1559
Alyssum	*Alyssum linifolium* Stephan ex. Willd. var *linifolium*	Çıplak kuduzotu	28.04.2017	40°17'27"	40°08'49"	1611
	Alyssum stylare (Boiss. & Balansa) Boiss.	Dallı kuduzotu	14.05.2017	40°15'36"	40°13'10"	1674
	Alyssum desertorum Stapf.	Dumanotu	28.04.2017	40°14'24"	40°04'24"	1728
	Alyssum strictum Willd.	Dik kuduzotu	28.05.2017	40°23'47"	40°05'35"	1623
	Alyssum simplex Rudolph		06.05.2017	40°14'01"	40°04'34"	1673
	Alyssum pseudomouradicum Hausskn. & Bornm. ex Baumg.	Yoluk kuduzotu	17.06.2017	40°02'13"	40°28'04"	2129
	Alyssum pateri Nyár.	Kanatlıkevke	21.06.2017	40°25'30"	40°30'00"	1811
	Alyssum murale Waldst. & Kit.	Seki kuduzotu	14.07.2017	40°02'13"	40°02'04"	2129
	Alyssum peltarioides Boiss. subsp. *Peltarioides*	Köse kuduzotu	14.07.2017	40°02'13"	40°02'04"	2129
Arabis	*Arabis brachycarpa* Rupr.	Gölkazteresi	28.06.2017	40°31'25"	40°27'07"	2978
	Arabis alpina L.	Kazteresi	03.06.2017	40°29'05"	40°33'32"	2062
	Arabis nova Vill.	Tıfılkazteresi	20.05.2017	40°25'54"	40°28'14"	1758
Aurinia	*Aurinia rupestris* subsp. *cyclocarpa* (Boiss.) Cullen & T.R. Dudley	Kayaincisi	26.05.2017	40°15'19"	40°14'40"	1857
Boreava	*Boreava orientalis* Jaub. & Spach	Sarıot	04.07.2017	40°14'59"	40°11'11"	1675
Bornmuellera	*Bornmuellera cappadocica* (Willd.) Cullen & T.R. Dudley	Periseyyahotu	28.05.2017	40°28'47"	40°01'12"	2052
Brassica	*Brassica elongata* Ehrh.	Uzun şalgam	10.06.2017	40°05'43"	40°13'44"	1940
Bunias	*Bunias orientalis* L.	Çırşalgamı	15.07.2017	40°15'03"	40°13'58"	1559
Camelina	*Camelina laxa* C.A. Mey.	Eğriketentere	22.06.2017	40°25'31"	40°28'18"	1726
	Camelina rumelica Velen.	Ketentere	25.05.2017	40°15'40"	40°13'43"	1560
Capsella	*Capsella bursa-pastoris* (L.) Medik.	Çobançantası	18.05.2017	40°14'29"	40°14'28"	1560
Cardamine	*Cardamine lazica* Boiss. & Balansa exBoiss.	Kodimotu	20.05.2017	40°06'15"	40°14'35"	2003
	Cardamine uliginosa M. Bieb.		17.06.2017	40°30'59"	40°07'46"	2061
	Cardamine impatiens L.	Sultankodimotu	22.06.2017	40°29'36"	40°33'48"	2046
Chorispora	*Chorispora tenella* (Pall.) DC.	Kokar külünk	23.04.2017	40°14'29"	40°14'28"	1560
	Chorispora iberica (M.Bieb.) DC.	Sarı külünk	06.05.2017	40°15'48"	40°12'21"	1616
Clypeola	*Clypeola jonthlaspi* L.	Akçeotu	28.05.2017	40°23'47"	40°05'35"	1623
Conringia	*Conringia orientalis* (L.) Dumort.	Kocatelkari	01.06.2017	40°14'01"	40°04'34"	1673
	Conringia planisiliqua Fisch. & C.A. Mey.	Telkariotu	29.07.2017	40°14'29"	40°14'28"	1560
	Conringia persica Boiss.	Acemtelkari	03.06.2017	40°14'01"	40°04'34"	1673
	Conringia clavata Boiss.	Topuztelkari	30.05.2017	40°14'40"	40°09'54"	1645
Coluteocarpus	*Coluteocarpus vesicaria* (L.) Holmboe subsp. *vesicaria*	Patarıkotu	12.05.2017	40°17'27"	40°08'49"	1611

Table 1. (Cont'd.).

Genus	Species	Turkish name	Date	Latitude	Longitude	Altitude (m)
Crambe	*Crambe orientalis* L. subsp. *orientalis* var. *orientalis*	Akyumak	06.08.2017	40°14'29"	40°14'28"	1560
Descurainia	*Descurainia sophia* (L.) Webb ex Prantl	Sadırotu	05.07.2017	40°14'13"	40°14'33"	1560
Draba	*Draba rigida* Willd.	Diri dolama	03.06.2017	40°06'42"	40°14'12"	1828
	Draba polytricha Ledeb.	Rize dolaması	15.05.2017	40°28'47"	40°01'12"	2052
	Draba hispida Willd.	Kıllı dolama	17.06.2017	40°32'24"	40°08'23"	1935
	Draba siliquosa M. Bieb.	Yıldız dolama	28.06.2017	40°28'47"	40°01'12"	2052
	Draba nuda (Bélanger) Al-Shehbaz & M. Koch	Cıbıl dolama	01.05.2017	40°25'31"	40°28'57"	1738
	Draba nemorosa L.	Orman dolaması	05.05.2017	40°23'47"	40°05'35"	1623
	Draba huetii Boiss.	Çayır dolaması	03.06.2017	40°05'42"	40°03'38"	2098
	Draba verna L.	Çırçırotu	14.05.2017	40°23'47"	40°05'35"	1623
Eruca	*Eruca vesicaria* (L.) Cav.	Roka	06.08.2017	40°14'29"	40°14'28"	1560
Erysimum	*Erysimum cuspidatum* (M.Bieb.) DC.	Kuyruklu zarife	21.06.2017	40°05'20"	40°14'11"	1965
	Erysimum repandum L.	Çatal zarife	18.05.2017	40°14'29"	40°14'28"	1560
Euclidium	*Euclidium syriacum* (L.) Aiton	Fındık hardalı	18.05.2017	40°14'29"	40°14'28"	1560
Fibigia	*Fibigia clypeata* (L.) Medik.	Sikkeotu	26.05.2017	40°06'15"	40°14'35"	2003
	Fibigia macrocarpa (Boiss.) Boiss.	Kocasikkeotu	25.06.2017	40°29'05"	40°33'32"	2062
Heldreichia	*Heldreichia bupleurifolia* Boiss. subsp. *rotundifolia* (Boiss.) Parolly, Nordt & Mumm. var. *rotundifolia*	Topaç hardalı	20.07.2017	40°02'36"	40°28'55"	2335
Lepidium	*Lepidium campestre* (L.) Aiton	Horozcuk	25.05.2017	40°14'29"	40°14'28"	1560
	Lepidium perfoliatum L.	Gübreotu	06.05.2017	40°15'45"	40°13'51"	1605
	Lepidium latifolium L.	Nujdar	15.06.2017	40°15'14"	40°13'13"	1590
	Lepidium draba L.	Diğnik	18.05.2017	40°14'29"	40°14'28"	1560
	Lepidium ruderale L.	Tuzık	30.07.2017	40°15'36"	40°13'35"	1556
Microthlaspi	*Microthlaspi perfoliatum* (L.) F.K. Mey.	Giyle	18.05.2017	40°14'01"	40°04'34"	1673
Murbeckiella	*Murbeckiella huetii* (Boiss.) Rothm.	Ovitkodimi	17.06.2017	40°31'40"	40°13'54"	2315
Nasturtium	*Nasturtium officinale* R.Br.	Suteresi	11.08.2017	40°16'38"	39°58'35"	1622
Neslia	*Neslia paniculata* (L.) Desv.	Tophardal	25.05.2017	40°14'01"	40°04'34"	1673
Noccaea	*Noccaea tatianae* Bordz.	Karsdağarcıkotu	03.06.2017	40°03'27"	40°09'42"	2056
Rapistrum	*Rapistrum rugosum* (L.) All.	Kedi turpu	06.08.2017	40°14'29"	40°14'29"	1560
Sinapis	*Sinapis arvensis* L.	Hardal	06.08.2017	40°15'53"	40°12'30"	1599
Sisymbrium	*Sisymbrium altissimum* L.	Ergelenotu	11.06.2017	40°15'59"	40°12'41"	1596
	Sisymbrium orientale L.	Tarlabülbülotu	18.05.2017	40°14'29"	40°14'28"	1560
	Sisymbrium irio L.	Çalgıcıotu	05.07.2017	40°15'40"	40°13'43"	1560
	Sisymbrium loeselii L.	Bülbülotu	25.05.2017	40°15'40"	40°13'43"	1560
Sobolewskia	*Sobolewskia clavata* (Boiss.) Fenzl	Akyelotu	14.05.2017	40°12'13"	40°19'24"	1701
Sterigmostemum	*Sterigmostemum incanum* M. Bieb.	Boz süsün	21.05.2017	40°14'40"	40°09'54"	1645
Strigosella	*Strigosella africana* (L.) Botsch.	Keçe teresi	18.05.2017	40°14'29"	40°14'28"	1560
Tchihatchewia	*Tchihatchewia isatidea* Boiss.	Allıgelin	14.05.2017	40°06'32"	40°25'35"	1820
Thlaspi	*Thlaspi arvense* L.	Ekin dağarcığı	18.05.2017	40°14'29"	40°14'28"	1560
	Thlaspi lilacinum Boiss. & Huet	Mor dağarcık	20.05.2017	40°06'15"	40°14'35"	2003
	Thlaspi ceratocarpon Murray	Yetim dağarcık	19.07.2017	40°15'39"	39°57'42"	1625

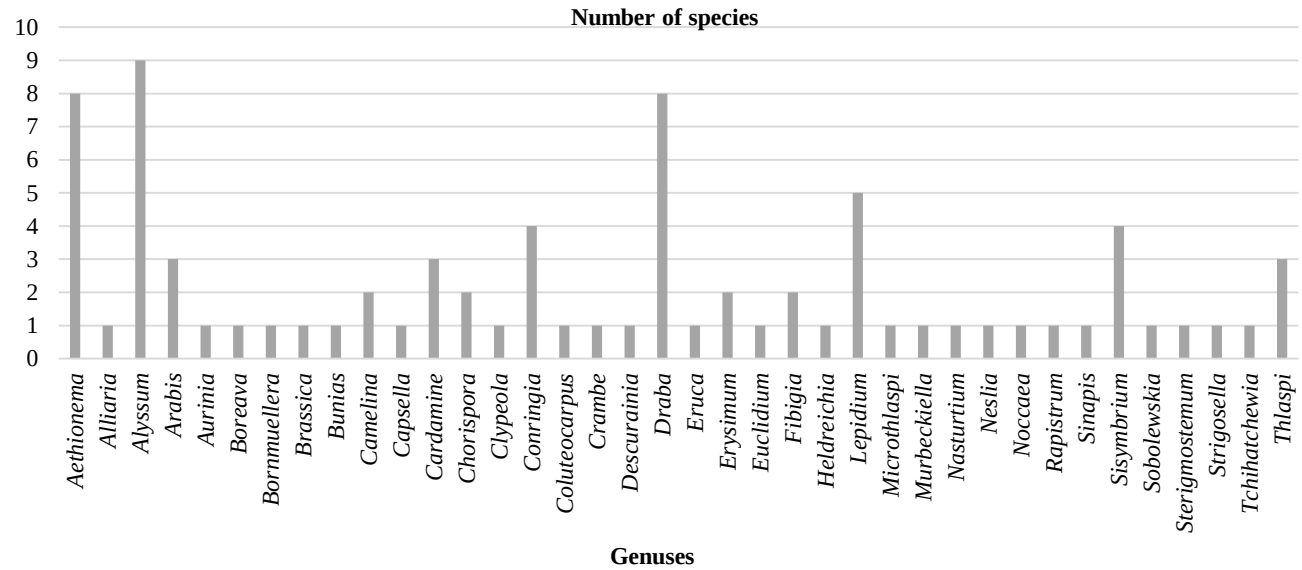

Fig. 2. The number of species beloging to the genuses that found in flora of Bayburt.

Fig. 3. Taxa of *Brassicaceae* that endemic for Bayburt (a). *Heldreichia bupleurifolia* Boiss. subsp. *rotundifolia* (b). *Aethionema caespitosum* (c). *Tchihatchewia isatidea* (d). *Thlaspi lilacinum.*

Table 2. Endemic taxa of *Brassicaceae* for Bayburt.

Species	Altitude (m)
Heldreichia bupleurifolia Boiss. subsp. *Rotundifolia*	2335
Aethionema caespitosum	1773
Thlaspi lilacinum	2003
Tchihatchewia isatidea	1820
Bornmuellera cappadocica,	2052
Aurinia rupestris subsp. *cyclocar*	1857
Alyssum stylare	1674
Alyssum pseudomouradicum	2129
Alyssum peltarioides Boiss. subsp. *peltarioi*	2129

Draba is the largest genus in the *Brassicaceae* with over 370 species (Al-Shehbaz *et al*., 2006). In this study, eight taxa were found belonging to *Draba* genus, including *Draba rigida*, *Draba polytricha*, *Draba hispida*, *Draba siliquosa*, *Draba nuda*, *Draba nemorosa*, *Draba huetii*, *Draba verna*. These taxa were found between 1623 m and 2098 m ASL.

Camelina genus is economically important in that it is used for producing bio-fuel. Several authors report that the biofuel, produced from Camelina oil, can cut greenhouse gas emissions (GHG) by up to 75% compared to that of petroleum-based jet fuel (Agusdinata *et al*., 2010; Shonnard *et al*., 2011). *Camelina laxa* and *Camelina rumelica* were found growing between 1560 m and 1726 altitudes in this study.

Conclusions and Discussion

The results of this research show that the Bayburt region of Turkey possesses number of species of the *Brassicaceae* family belonging to different genera indicating that Bayburt has a suitible climate and eco-geographic conditions for *Brassicaceae*.

Furthermore, species which are important in terms of their economic values such as *Sinapis arvensis*, *Camelina laxa* and *Camelina rumelica* can grow there and some endemic species such as *Heldreichia bupleurifolia* Boiss. subsp. *rotundifolia*, *Aethionema caespitosum*, *Thlaspi lilacinum*, *Tchihatchewia isatidea*, *Bornmuellera cappadocica*, *Aurinia rupestris* subsp. *cyclocarpa*, *Alyssum stylare*, *Alyssum pseudomouradicum*, *Alyssum peltarioides* Boiss. subsp. *peltarioides* are found in Bayburt.

Table 4. Phytogeographic regions of taxa.

Species	PR	Species	PR
Brassica elongata Ehrh.	-	*Euclidium syriacum* (L.) Aiton	Widespread
Sinapis arvensis L.	Widespread	*Neslia paniculata* (L.) Desv.	-
Eruca vesicaria (L.) Cav.	Widespread	*Bunias orientalis* L.	-
Crambe orientalis L. subsp. *orientalis* var. *orientalis*	Ir.-Tur.	*Tchihatchewia isatidea* Boiss.	Ir.-Tur.
Rapistrum rugosum (L.) All.	-	*Fibigia clypeata* (L.) Medik.	-
Conringia orientalis (L.) Dumort.	-	*Fibigia macrocarpa* (Boiss.) Boiss.	-
Conringia planisiliqua Fisch. & C.A.Mey.	Ir.-Tur.	*Bornmuellera cappadocica* (Willd.) Cullen & T.R. Dudley	Ir.-Tur.
Conringia persica Boiss.	-	*Aurinia rupestris* subsp. *cyclocarpa* (Boiss.) Cullen & T.R. Dudley	-
Conringia clavata Boiss.	-	*Alyssum linifolium* Stephan ex. Willd. var *linifolium*	Widespread
Lepidium campestre (L.) Aiton	-	*Alyssum stylare* (Boiss. & Balansa) Boiss.	Ir.-Tur.
Lepidium perfoliatum L.	-	*Alyssum desertorum* Stapf	Widespread
Lepidium latifolium L.	Widespread	*Alyssum strictum* Willd.	Ir.-Tur.
Lepidium draba L.	Widespread	*Alyssum simplex* Rudolph	Widespread
Lepidium ruderale L.	-	*Alyssum pseudomouradicum* Hausskn. & Bornm. ex Baumg.	-
Coluteocarpus vesicaria (L.) Holmboe subsp. *vesicaria*	Ir.-Tur.	*Alyssum pateri* Nyár.	Widespread
Heldreichia bupleurifolia Boiss. subsp. *rotundifolia* (Boiss.) Parolly, Nordt & Mumm. var. *rotundifolia*	Ir.-Tur.	*Alyssum murale* Waldst. & Kit.	Widespread
Aethionema arabicum (L.) Andrz. ex DC.	Widespread	*Alyssum peltarioides* Boiss. subsp. *peltarioides*	Ir.-Tur.
Aethionema cordatum (Desf.) Boiss.	Ir.-Tur.	*Clypeola jonthlaspi* L.	Widespread
Aethionema speciosum Boiss. &A.Huetsubsp. *speciosum*	Ir.-Tur.	*Draba rigida* Willd.	-
Aethionema trinervium (DC.) Boiss.	-	*Draba polytricha* Ledeb.	-
Aethionema iberideum (Boiss.) Boiss.	Widespread	*Draba hispida* Willd.	Euxine
Aethionema caespitosum (Boiss.) Boiss.	-	*Draba siliquosa* M.Bieb.	-
Aethionema membranaceum (Desv.) DC.	-	*Draba nuda* (Bélanger) Al-Shehbaz&M.Koch	Ir.-Tur.
Aethionema armenum Boiss.	Ir.-Tur.	*Draba nemorosa* L.	Widespread
Microthlaspi perfoliatum (L.) F.K.Mey.	Widespread	*Draba huetii* Boiss.	-
Thlaspi arvense L.	-	*Draba verna* L.	Widespread
Thlaspi lilacinum Boiss. &Huet	Euxine- Ir.-Tur.	*Arabis brachycarpa* Rupr.	Euxine
Thlaspi ceratocarpon Murray	-	*Arabis alpina* L.	Widespread
Noccaea tatianae Bordz.	-	*Arabis nova* Vill.	-
Capsella bursa-pastoris (L.) Medik.	Widespread	*Nasturtium officinale* R.Br.	Widespread
Boreava orientalis Jaub. &Spach	Widespread	*Cardamine lazica* Boiss. & Balansa ex Boiss.	Euxine
Chorispora tenella (Pall.) DC.	-	*Erysimum cuspidatum* (M.Bieb.) DC.	Widespread
Chorispora iberica (M.Bieb.) DC.	-	*Erysimum repandum* L.	Widespread
Strigosella africana (L.) Botsch.	-	*Alliaria petiolata* (M.Bieb.) Cavara & Grande	-
Sterigmostemum incanum M.Bieb.	Ir.-Tur.	*Sobolewskia clavata* (Boiss.) Fenzl	Ir.-Tur.
Sisymbrium altissimum L.	Widespread	*Descurainia sophia* (L.) Webbex Prantl	Widespread
Sisymbrium orientale L.	-	*Murbeckiella huetii* (Boiss.) Rothm.	-
Sisymbrium irio L.	-	*Camelina laxa* C.A.Mey.	-
Sisymbrium loeselii L.	Widespread	*Camelina rumelica* Velen.	-

PR: Phytogeographic region

Habitats of wild taxa of *Brassicaceae* and the other plant families are damaged by rapid urbanization. In addition, the widespread use of pesticides and other chemical applications has decreased the diversity of these taxa. Therefore, in order to preserve natural flora of Bayburt, the environment and the habitat of different species need to be protected and urban development needs to be planned.

In the Bayburt region, there are several important taxa of the *Brassicaceae* family, of which nine are endemic. Some species in this family have the potential to be used as biofuels and alternative sources of energy. Condiering the ever-increasing need for energy, the value and importance of wild species in this family is increasing. For this reason, it is important to increase the work on wild species found in the *Brassicaceae* family.

Table 3. The hazard categories of endemic taxa that belong to *Brassicaceae* family

Species	The hazard categories
Heldreichia bupleurifolia (Boiss.) Parolly, Nordt & Mumm. Boiss. subsp. *rotundifolia* var. *rotundifolia*	LR (lc)
Aethionema caespitosum (Boiss.) Boiss.	LR (nt)
Thlaspi lilacinum Boiss. & Huet	LR (lc)
Tchihatchewia isatidea Boiss.	VU
Bornmuellera cappadocica (Willd.) Cullen & T.R.Dudley	LR (lc)
Aurinia rupestris (Sweet) Cullen & T.R. Dudley subsp. *cyclocarpa* (Boiss.) Cullen & T.R.Dudley	LR (nt)
Alyssum stylare (Boiss. & Balansa) Boiss.	LR (lc)
Alyssum peltarioides Boiss. subsp. *peltarioides*	LR (lc)

LR: Lower risk, VU: Vulnerable, lc: Least Concern, nt: Near Threatened

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