

## BARBAREA INTEGRIFOLIA (BRASSICACEAE), A RARE PLANT SPECIES IN NORTH OF IRAN

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*Barbarea integrifolia* (Brassicaceae) was collected during Khersan glacier studies around seasonal spring in south Alam-Kuh Mountain. Taxonomic remarks with distribution notes for the species and identification key for the Iranian *Barbarea* species are provided.

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**Key words:** *Barbarea*; Brassicaceae; Dena; Alam kuh; Iran

*Barbarea integrifolia* DC. گونه گیاهی نادر در استان مازندران

کوروش کاوسی: دانش‌آموخته دکتری گروه زیست‌شناسی دانشگاه آزاد اسلامی واحد علوم و تحقیقات تهران

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*Barbarea integrifolia* DC. از تیره شب‌بو در سال‌های ۱۸۴۲ و ۱۸۴۳ توسط پروفیسور تئودور کچی از قله دنا و دامنه جنوبی مورن یخچالی

خرسان بزرگ در جنوب شرق علم‌کوه مازندران جمع‌آوری و نام‌گذاری شد. این گونه که در هرباریم انستیتو گیاه‌شناسی کومارو با شماره‌های

۵۰۵ و ۶۱۰ ثبت شده در فلور ایرانیکا نام‌برده نشده است و اکنون بعد از ۱۷۴ سال دوباره از ایران جمع‌آوری گردیده است. مشخصات گونه،

پراکنندگی جهانی و کلید شناسایی جنس *Barbarea* برای گونه‌های تاکنون شناخته شده در ایران ارائه شده است.

### INTRODUCTION

*Barbarea* W. T. Aiton is one of the genera of Brassicaceae in flora of Iran. It has been reported with four species in Flora Iranica area. Although *Barbarea integrifolia* DC. has been collected by Theodor Kotschy (1842, 1843) from Dena and Alam-Kuh Mountain, but has not been included in Flora Iranica (Rechinger 1968).

Study of *Barbarea* specimens in Komarov

Botanical Institute (LE) and recent new collection in Hasarchal, south east of Khersan Glacier shows this species has a restrict distribution in Iran. There are three known localities for this species in the world, which will be explained here.

### MATERIAL AND METHODS

The specimens collected from Mazandaran province were identified using the identification key

in Flora of Turkey (Davis 1969) and were compared with the specimens in the Herbarium of Komarov Botanical Institute (LE).

The characteristic of leaves and fruits of the specimens were checked by stereomicroscope and specimens were evaluated with neighboring flora books (Davis 1969, Komarov 1039).

### RESULT AND DISCUSSION

*Barbarea integrifolia* DC., Syst. 2: 208 (1821). Figure 19, p 435.

*Material examined.* Mazandaran, Kelardasht, Alam-Kuh, Khersan Glacier, seasonal spring south

Hasarchal, 36 21.077 N, 50 58.453 E, 16.7.2015, 3770-3840 m.a.s.l, Kavousi & Sharifi, 45469 FUMH.-Kohgiluyeh, Dena, 10 July 1842.7000 ft, Kotschy. 610 LE, Mazandaran, Hasarchal, 13 July 1843, 7000 ft, Kotschy 505 LE.

Perennial herbs, glabrous, stem up to 40 cm, erect or arcuate. Lower leaves oblong- spatulate or spatulate, simple, entire, stem leave oblong-elliptice, entire to crenate. Flower yellow, sepal 4-5 mm, petal 7-9 mm, fruiting inflorescence up to 12 cm, silique spreading 12-14×2mm (fig. 1).

*Habitat:* Streamside near melting snow.



Fig. 1. Image of herbarium specimen of *Barbarea integrifolia* DC.

*Barbarea integrifolia* has been reported from Turkey by Sintenis from Dipsiz Gol, Gumusane province 1480 m m.a.s.l., 100 km south of Black Sea in a very small area (Davis 1969). In Armenia, George, Fayvush (Institute of Botany of the Academy of Sciences of Armenia) has collected another specimen from Selim Pass in Dogharkunik province, south of Sewan Lake, 2400 m.s.a.l in 17.5.2005, which was determined by Professor Al\_Shehbaz as *Barbarea integrifolia* DC. in 2012. Recent Iranian collection is from one of the seasonal spring glacier south of the Alam-Kuh Mountain near Hasarchal.

The first collection of this species in Iran was by Theodor Kotschy from Dena and Hasarchal during 1842 and 1843. In the recent survey this species has not been collected again from Dena Mountain but was only collected from Khersan Moraine with a small population (Kavousi & al. 2015, 2016).

Rechinger (1968) has described four *Barbarea* species with many localities for *Barbarea plantaginea* and a location for *Barbarea minor* in Iran, but *Barbarea integrifolia* DC has not been included as Iranian species.

According to IUCN 2017, *Barbarea integrifolia* DC. has been included in Least Concern category since 2014. It seems that the definition of conservation status for this species should be revised, considering its limited distribution range and population size in Iran.

Here we confirm the presence of three species of *Barbarea* from Iran, including *B. minor*, *B. plantaginea* and *B. integrifolia*. An identification key for the Iranian *Barbarea* species is provided below:

- 1-Fruit terete, 17-40 mm long ..... *B. plantaginea*
- 1-Fruit flattened, 10-15mm long.....2
- 2-Leaves entire, fruit 2mm broad, around glacier melting area ..... *B. integrifolia*
- 2-Leaves dentate or pinnatifid, fruit 1mm board, plant with alpine habitat.....*B. minor*

Further studies around glacier slopes and high mountain regions may lead to the identification of other habitats for *B. integrifolia* DC. and new species in Iran which are adapted with alpine and nival streams.

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