

A REVISION OF ACER MONSPESSULANUM L. IN IRAN; A NEW SUBSPECIES REPORT

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The genus *Acer* L., consisting of 8 species and also some subspecies and varieties, is one of the most important forest trees distributed in all floristic regions of Iran. Among them, *Acer monspessulanum* L. by having five subspecies has the greatest range of distribution and diversity in the genus. During a study on herbarium specimens of the Research Center of Agricultural and Natural Resources of W. Azerbaijan Province for the preparation of the flora of Iran in Persian, subspecies *oksalianum* which was previously reported from Turkey, was identified and is reported for the first time for the flora of Iran. A new identification key for subspecies is presented here. An illustration of the new subspecies is provided.

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مروری بر گونه *Acer monspessulanum* L. در ایران؛ گزارش یک زیر گونه جدید

طیبه امینی: مربی پژوهش مرکز تحقیقات و آموزش کشاورزی و منابع طبیعی مازندران

حبیب زارع: استاد یار پژوهش مرکز تحقیقات و آموزش کشاورزی و منابع طبیعی مازندران

بهمن علیزاده: کارشناس ارشد مرکز تحقیقات کشاورزی و منابع طبیعی آذربایجان غربی

جنس افرا با تعداد ۸ گونه و تعداد زیادی واریته و زیرگونه، از مهمترین گونه‌های درختی هستند که در همه مناطق رویشی ایران انتشار دارند. از بین گونه‌های مختلف افرا در ایران، گونه *Acer monspessulanum* L. با ۵ زیر گونه، ضمن برخورداری از تنوع تاکسونی بالا، بیشترین سطوح انتشار را به خود اختصاص داده است. از اینرو در همین رابطه و در حین مطالعه بر روی نمونه‌های هرباریومی مرکز تحقیقات کشاورزی و منابع طبیعی آذربایجان غربی، زیرگونه *oksalianum* که قبلاً از ترکیه گزارش شده بود، شناسایی و برای اولین بار گزارش می‌گردد. از اینرو ضمن بررسی زیرگونه‌های آن، کلید شناسایی جدیدی برای تاکسون‌های این گونه ارائه می‌شود.

INTRODUCTION

The genus *Acer* was created by Tournefort in 1700. Linnaeus (1737) accepted *Acer* as a distinct genus in the first edition of his *Genera Plantarum*. The name of *Aceraceae* was first used by Lindley (1836) for an order. The *Aceraceae* have been considered part of the order *Sapindaceae* by some old botanists: Reichenbach 1828, 1834, Horaninov 1847; Gray 1858, Braun 1860; Benthams & Hooker 1862; and Drude 1887 (Van Gelderen & al. 1995). *Acer* is classified into 16 sections: 8 of which are further subdivided into 19

series. These sections and series accommodate 230 taxa: 124 species, 95 subspecies (including the typical subspecies), 8 varieties, and one forma (Compiled by van Gelderen 1995). Fossil maples have been found only in the Northern Hemisphere. The first maplelike trees were found in the upper cretaceous about 100 M. Y. B. P. Most of which are native to Asia with a number also appearing in Europe, Northern Africa and North America. Only one species is native to the Southern Hemisphere. In Iran territory, the genus *Acer* consists of 7 species (Murray 1969, Maroofi & al.

2006, Amini & al. 2008). One of the wide distributed species with number of taxa is *Acer monspessulanum* L. As we known, *Acer monspessulanum* has distinct small, three lobed leaves. *Acer hyrcanum* and *Acer opalus* are close relatives to the species (Grimm & al. 2007). *Acer monspessulanum* in its shrubby or trees forms are widely distributed in many parts of North, Northwest and West of Iran as well as Southern parts of Central Iran. Due to the importance the widespread of natural habitat and geographical characteristics of subspecies were studied here.

RESULTS

Acer monspessulanum L. is one of the small trees which sometimes appears as a shrub in some harsh conditions. This species has a large number of subspecies and varieties, most of them are not accepted because they are variations affected by environmental conditions. Yaltirik (1967-1968), in flora of Turkey, introduced 3 new combinations and subspecies: subsp. *ibericum* (M. Bieb.) Yaltirik, subsp. *cinerascens* (Boiss.) Yaltirik and subsp. *oksalianum* Yaltirik. Murray introduced five subspecies of *Acer monspessulanum* in flora Iranica (1969) including subsp. *persicum*, subsp. *turcomanicum*, subsp. *ibericum*, *cinerascens*, subsp. *assyriacum*, furthermore Khademi & al. (2016) in their results, cited and studied the existence of five subspecies by using ITS region of nuclear ribosomal DNA. Their data analysis indicates that the classification of species according presence or absence of hairs in inner or outer surface of loculus is a true morphological characteristic for delimitation of subspecies in *Acer monspessulanum*. In this regard, in the course of investigation of the *Aceraceae* family for the Flora of Iran, in one of the studies on the specimens of the herbarium of Eastern Azerbaijan, the *A. monspessulanum* specimens was found a taxon which was different from the other subspecies known previously (Murray, 1969). A complete study revealed that the specimen is related to subsp. *oksalianum* Yaltirik; thus, the taxon is described as a new record for the flora of Iran and subspecies of *Acer monspessulanum* increased to 6 taxa. According to this subsp.study, a new identification key for *Acer monspessulanum* subspecies is presented here.

The new identification key to the subspecies. of *A. monspessulanum* L. in Iran

- 1- Nutlets glabrous, leaves less than 2 cm long
subsp. *persicum*
- Nutlets pubescent, leaves longer than 2 cm 2
- 2- Leaves cuneate at the base, pubescent on lower surface, hairs short and dense, shoots pubescent, (grows in northeast of Iran) subsp. *turcomanicum*

- Leaves rounded or cordate at the base, glabrous or with sparse hairs, shoots usually glabrous or tomentose 3
- 3- Leaves 3 lobed (5 lobes), margins unclearly toothed or entire 4
- Leaves 5 lobed, margins distinctly toothed, similar to *A. hyrcanum* subsp. *oksalianum*.
- 4- Leaves beneath densely pilose, 2-3 cm long and 3. 5-4 cm wide, nutlets inside densely hairy, sparsely hairy outside subsp. *cinerascens*
- Leaves beneath sparsely hairy, hairy on the veins or almost glabrous, more than 5 cm long and 7 cm wide, nutlets inside not densely hairy and usually glabrous outside 5
- 5- Leaves 3 lobed, lobes ovate or triangular, usually entire but sometimes dentate at the margins, lower surface hairy at first, later glabrous or only hairy on the veins, plant growing in north of Iran subsp. *ibericum*
- Leaves lobes indistinct, margins with obtuse tooth, sparsely hairy at first, later glabrous or only hairy on veins, plant growing in west of Iran subsp. *assyriacum*

Acer monspessulanum L.

1-subsp. *monspessulanum*.

6-12 m tall with a rounded crown, branches glabrous, reddish brown to gray, leaves extremely variable, coriaceous, 3 lobed, obtuse, 3-5 cm broad, dark green, shining, glaucous beneath, margin entire or sometimes serrate, petioles long, 3-5 cm. inflorescences pendulous, corymbose, Flowers yellow-green, flowering in April or Mey. Fruits subconnivent, wings reddish, 2-2/5 cm long, carpels glabrous, nutlets small, hard and often parthenocarpic.

2-subsp. *microphyllum* (Boiss.) Bornm.

A densely branched shrub, leaves very small, with glabrous, rather small and deeply lobed leaves, grows in the mountains of Anatolia. It occurs elsewhere in Lebanon and Syria. (van Gelderen & al, 1995)

3-subsp. *ibericum* (M. Bieb. Ex Willd.) Yalt.

A small tree up to 8m high. Trunk with grey bark, young shoots glabrous, light brown, the older grayish brown. leaves 3 lobed, coriaceous, glaucous – green shiny and glabrous above, paler beneath, densely cobwebby-hairy at first, later sparsely hairy at surface and along the nerves, usually broadening up to 7 cm long and 9 cm wide, rounded or cordate at the base, lobes ovate or triangular, obtuse or acute, usually longer than the blades. Flowers sessile corymbs, pendulous, simply or rarely compound, with glabrous long pedicels, petals oblong-ovate, slightly longer than

sepals, stamens two times longer than corolla, ovary densely hairy. Samaras 2. 5-3. 5 cm long, wings vertical, rarely diverging at an acute angle, dilated above, nut woody, glabrous outside, hairy inside

4-subsp. cinerascens (Boiss.) Yalt.

Often as a shrub, rather densely branched, young shoots tomentose, later glabrous. Leaves variable in size and shape, 3 lobed, 2-6 cm long, grayish green, blunt, pilose beneath, basal lobes often strongly reduced, margins entire or coarsely toothed. Flowers appearing with the leaves in April-May, similar to the typical subspecies. Samaras almost parallel, nutlets small and hard. Bark olive-green with blackish spotting.

5-subsp. turcomanicum. (Pojark.) E. Murr.

rather tall tree, densely branched shrub to 2-3 m tall, leaves 3 lobed, 3-4 cm long and 3-5 cm wide, leathery, almost evergreen in mild winters, rusty and pilose below, lobes diverging almost horizontally, veins prominent. Samaras connivent, nutlets small, hard, often parthenocarpic in unfavorable conditions.

6-subsp. assyriacum. (Pojark.) Rech. f.

A shrub or dense shrub like tree, leaves 3 lobed, occasionally 5 lobed, dentate on sterile shoots.

7-subsp. persicum (Pojark.) Rech. f.

Small trees or shrub, up to 5 m. height and 50 cm diameter, with smooth light brown to gray in young twigs, leaves in fertile branches 15-20 mm broad, coriaceous or subcoriaceous, glabrescent on the both surface, with 3 entire lobes, weakly dentate especially on the sterile branches, samaras 15-20 mm long and 5 mm broad, inside and outside of loculus.

New record

Acer monspessulanum L. subsp. *oksalianum* Yalt. is reported for the first time for the flora of Iran and except subsp. *microphyllum*, other 7 subspecies are native to Iran and among them subsp. *persicum* is endemic.

subsp. oksalianum Yalt. (fig. 1)

Shrub or small tree up to 5 (-7) m. young branches tomentose at first, later glabrescent except for the junction of the petiole, reddish-brown with many lenticels, grayish-brown at the old branches, rather branched and crown seen dense, buds dark brown and densely tomentose. Petioles 10-40 mm long, usually tomentose or with sparingly long hair and very dense nearly blade and branches, leaf blade similar to *Acer hyrcanum* but very smaller than, often 3 lobes sometimes with a second pair of weakly developed lobes at base especially in the upper and juvenile leaves, clearly and coarsely dentate at 2/3, usually acuminate obtuse at apex, rounded or subcordate at base. subcoriaceous, olive green in upper surface thoroughly covered with dispersed long hair, lower surface light green and more or less densely tomentose, main vein prominent, yellowish. 23-55 mm long and 23-65 mm broad. Peduncle up to 10 mm. pedicle 12-17 mm. even in young samaras with 1 or 3 long hair and tomentose at base, loculus (outside) and its stalk more or less tomentose. Angle between the outside edges of the wings less than 45 degrees. It grows on the rocky slopes especially on the edges of high river bank and shrubby thickets on mountain slopes, usually mixed with *Quercus infectoria* ssp *boissieri* , *Salix* spp., *Colutea* spp.

Distribution: Turkey and Iran

Type: Holotype H. Kayacik, Sarimsak, Andirin, Maras, Southeastern Turkey.

Specimens seen: Iran, Western Azerbaijan, Urmia, Serro road, Eshkesoo village, 1500-1700m, Alizadeh & al. 4751.

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Fig. 1. *Acer monspessulanum* subsp. *oksalianum*.

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