تاکسونومی سرده سنجد (تیره سنجدیان) به عنوان گیاهی بومی و کاشته‌شده در ایران

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چکیده. سرده سنجد (تیره سنجدیان) در ایران با یک یا دو گونه به نام های *E. angustifolia* و *E. orientalis* معرفی شده است. گونه‌های سنجد در ایران در سطح وسیعی کاشته شده و در عین حال رویشگاه‌های طبیعی محدودی نیز از آن دیده می‌شود. شکل برگ و میوه گوناگونی بسیار زیادی را نشان می‌دهد. شکل و طعم میوه تنوع زیادی دارد و مبین این موضوع است که پایه‌های مناسب در طول زمان دستخوش انتخاب قرار گرفته اند. در حال حاضر چندین رقم مشخص از این گونه در ایران انتشار دارد. گونه ها و ارقام آنها بر اساس نمونه‌های هرباریومی و مطالعات صحرائی مورد بررسی قرار گرفتند و در نهایت یک گونه برای ایران تشخیص داده می‌شود. از این گونه شش رقم به نام های شکری، عنابی، خرمائی، چوروک، کلاهی و شوره‌ای تشخیص داده شد که بر اساس مفاد کتاب" اصول نامگذاری گیاهان کاشته‌شده" معرفی می گردند.

واژه‌های کلیدی. ایران، توصیف، سنجد، معرفی رقم، نمونه‌های شاهد

A contribution to the taxonomy of the genus *Elaeagnus* (Elaeagnaceae) in Iran as a native and cultivated tree

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Abstract. The genus *Elaeagnus* (Elaeagnaceae) has been introduced in Iran by one or two species, i. e. *E. angustifolia* and *E. orientalis*. The species are widely cultivated trees, but native in a few localities. They are extremely variable in shape of leaves and fruits. Fruits used to be eaten highly and as they have variable tastes, the preferred ones have been subject to selection in the course of time. Nowadays, several distinct cultivars are known in Iran. The species and cultivars were studied in the field and different herbaria in Iran. In this paper a single species *E. angustifolia* and its six cultivars, i.e. 'Shekari', 'Anabi', 'Khormai', 'Churuk', 'Kolahi' and 'Shurei' are introduced from Iran.

Keywords. descriptions, Elaeagnales, new cultivars, nomenclatural standards, Senjed

INTRODUCTION

The genus *Elaeagnus* L. (*Senjed* in Persian) belongs to the family Elaeagnaceae with about 50-70 species in the world, distributed in temperate and subtropical areas of Asia, S. Europe and N. America. It has been represented in Iran by one or two arboreal species including *E. angustifolia* L. and *E. orientalis* L. The trees are native in a few localities but as the fruits are edible, it has been widely cultivated along the streams and margins of farms. The shape and taste of fruits are highly

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variable and the taxon has been subjected to human selection in the course of time. Nowadays, several distinct cultivars are well known in Iran. This paper aims to represent the taxonomy of the genus *Elaeagnus* in Iran and to introduce six well known cultivars.

MATERIAL AND METHODS

Available literature including Flora Iranica (Murray, 1970), Flora Orientalis (Boissier, 1879), Flore de l'Iran (Parsa, 1949), Flora of Turkey (McKean, 1982), Flora of Iraq (Chalabi-Kaʾbi, 1980), Flora of Pakistan (Nasir, 1975) and Flora Europaea (Tutin, 1968) were reviewed.

Materials of different herbaria in Iran were examined. Different areas of Iran, where the species are well-cultivated, were visited in autumn to collect materials, to study fruit variation and to prepare photographs. Morphological characters were studied by a SZH Olympus binocular. Qualitative and quantitative characters of the specimens were specified and measured. Distinct taxa and cultivars were delimited based on the variation of characters. The cultivars were introduced according to the rules and recommendations of International Code of Nomenclature for Cultivated Plants (Brickell *et al.*, 2009).

Descriptions and diagnoses of known taxa and cultivars were prepared. An identification key to the known cultivars was presented.

RESULTS AND DISCUSSION

Known species

E. angustifolia L., Sp. Pl.121 (1753).

Syn. *E. spinosa* L., Syst. Nat. ed. 10, 2: 899 (1759); *Elaeagnus orientalis* L., Mantissa 41 (1767); *E. inermis* Miller, Gard. Dict. ed. 8, No. 2 (1768); *E. incanus* Lam., Fl. Fr. Ed. 1, 3: 476 (1778); *E. argenteus* Moench, Meth. 638 (1794); *E. tomentosus* Moench, l. c. (1794); *E. hortensis* M. B., Fl. Taur. Cauc. 1: 112 (1808); *E. hortensis* M. B. var. *orientals* (L.) Ludon, Arbor Fruticet. Brit. 3: 1322 (1838); *E. angustifolia* L. var. *orientalis* (L.) Kuntze, Acta Horti. Petrop.10: 235 (1887); *E. umbellate* Thunb. subsp. *parvifolia* Serventtaz, Beih. Bot. Centrbl. 35: 55 (1909); *E. angustifolia* L. var. *caspica* Sosn., Math. Fl. Kawk. 3, 9 (1912); *E. caspica* (Sosn.) Grossh., Obred. Rast. Kawk.187 (1949).

Trees up to ca. 10 m high and stem diameter of about 50 cm or more. Bark on aged stems well-fissured, brown or dark brown. Spines 1-5 cm long, brown to reddish brown, glabrous. Old branches dark brown, glossy, glabrous or covered with scattered or dense peltate scales fringed at the margin; young flowering branches grayish, or silvery, covered with dense peltate scales fringed at the margin. Leaves 1.3-9.2 cm long and 0.3-3.5 cm broad, linear lanceolate, lanceolate, ovate, elliptic or narrow elliptic, obtuse or acute, greenish grey or silvery, variously covered with dense peltate scales fringed at the margin, rarely with stellate hairs; petioles 0.4-1.6 cm long, covered with dense peltate scales. Inflorescences lateral, 1-3 in each node. Flowers male or hermaphrodite, odorate, pedicellate, covered with dense peltate fringed scales on the outside, less dense or with stellate hairs on the inside; hermaphrodite flowers 7-11 mm long, tubular campanulate, toothed to one third of the tube at the apex. Stamens inclu- ded, 3-6 mm long: style 5-8 mm long, glabrous; male flowers shorter, 2-11 mm long. Fruits a drupe, oblong elliptic, elliptic, broadly elliptic, oblo- ng, ovate or globular, 0.8-3.5 cm long and 0.7-2 cm broad, dark brown, red, dark purple or yellow olive; fruit exocarp are sometimes easily separated from mesocarp; fruiting pedicels 0.1-1.2 cm long.

Taxonomic comments. Leaf shape in this species is extremely variable and ranges from narrow lanceolate to broadly ovate. Even on a single tree, broad leaves are found on sterile branches derived directly from stem and narrow leaved on flowering branches. The variation of leaves is continuous; therefore, it is not possible to use it as a taxonomic character. *E. angustifolia* has been introduced based on narrow-leaved specimens and *E. orientalis* on broad-leaved ones. Moreover, leaf variation is not correlated with fruit variation. Therefore, these two taxa are regarded as synonymous in this paper.

Distribution. Mediterranean and Irano-Turanian element distributed from southern Europe eastward to the slopes of Himalaya. The species seems to be an Old Mediterranean element widely cultivated in the area or escaped from the cultivation. In Iran, it is rare in natural habitats but well-cultivated at the margins of farms or along the streams.

Phenology. Flowering in May; fruit ripening in September and October.

Endangered statement. Natural habitats of the species are subject to habitation, heavy grazing and converting to crop cultivations and it must then be regarded as an endangered plant with high risk of extinction. Different cultivars of this species were formerly grown mainly along the streams of Qanats. Nowadays, most of Qanats in Iran ha-

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Fig. 1. *Elaeagnus angustifolia* 'Shekari'

ve been dried off. As a result, different cultivars are subject to elimination.

Identification key of cultivars

1. Exocarp of fruit is not separated from the mesocarp……..……..…….. 2

1. Exocarp of fruit is separated from the mesocarp easily……..……..… 3

2. Fruits elliptic-globular to globular, with dense or sparse peltate scales, light brown or yellow olive, 1-2 cm long and 0.7-1.8 cm broad …'**Shekari**'

2. Fruits oblong or broadly elliptic, with sparse peltate scales or glabrous, brown, 1.2-2 cm long and 0.8-1.77 cm broad …….…… '**Anabi**'

3. Fruits ovate, narrowed toward the tip 4

3. Fruits not ovate, not narrowed toward the tip.5

4. Fruits entire on the surface, glossy, dark or light date colour, reddish, nearly glabrous or with very sparse peltate scales, 1.4-3.3 cm long and 1-2 cm broad……..…….... '**Khormai**'

4. Fruits with distinct transversal wrinkles, light brown to yellowish, with dense peltate scales, 1.5-2.5 cm long and 0.7-1.4 cm broad…….. '**Churuk**'

5. Fruits oblong elliptic, narrow elliptic, broadly elliptic to globular, with equal width all along, date colour to yellow olive, nearly glabrous or with dense or sparse peltate scales, 1.3-3 cm long and 0.8-2 cm broad……..……..... '**Kolahi**'

5. Fruits elliptic or elongated elliptic, narrowed at the tip, 1.1-2 cm long and 0.8-1.5 cm broad, dark brown, with dense peltate scales on all parts ……...…….…... '**Shurei**'

Diagnoses of the cultivars

E. angustifolia '**Shekari**' (Fig. 1)

The local names of this cultivar in different part of Iran are: Shekari, Noghli and Shirin. Fruits in this cultivar seem to be covered with dust of sugars which is the meaning of Shekari (sugary).

Nomenclatural standard. Iran, Esfahan p., Esfahan, Kaveh street, Emamzadeh Ghasem, 1670 m, 2.11.209, M. Janighorban & M. Feyzi 15283 (TARI).

E. angustifolia '**Anabi**' (Fig. 2)

Local names are Anabi (similar to the *Ziziphus spina-christi* (L.) Willd. fruits) and Keshmeshi (meaning raisin). Fruits in this cultivar are oblong or elliptic-oblong, somewhat sweet (less than the former cultivar) and not farinose, with the width equaling all along; exocarp is not separated from the mesocarp easily.

Nomenclatural standard. Iran, Esfahan p., Esfahan, Rodasht station, 1500 m, M. Janighorban & M. Feyzi 15338 (TARI).

E. angustifolia '**Khormai**' (Fig. 3)

Fruits ovate, narrowed toward the apex, sweet and softer compared with the former; exocarp is separated from the mesocarp easily.

Nomenclatural standard. Iran, Zanjan p., between Zanjan and Mianeh, climatology station, 1700 m, 23.10.2010, M. Janighorban 15307 (TARI).

E. angustifolia '**Churuk**' (Fig. 4)

Fruits of this cultivar are orange-red, with a white powder on the surface, similar to 'Khormai' the width of fruits are narrowed from the base toward the apex, but with cross wrinkles. Fruits are not delicious.

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Fig. 2. *Elaeagnus angustifolia*ʻ **Anabi**ʼ

Fig. 3. *Elaeagnus angustifolia* ʻ **Khormai**ʼ

Fig. 4. *Elaeagnus angustifolia* ʻ**Churuk**ʼ

*Nomenclatural standard.*Iran, Markazi p., Arak to Shzand road, Chopoghli park, 1755 m, 22.10.2010 M. Janighorban& M. Feyzi 15318 (TARI).

E. angustifolia ʻ**Kolahi**ʼ (Fig. 5)

Fruits of Kolahi (meaning hat and that is because the exocarp of fruits similar to hat is taken easily) cultivar are oblong (not ovate) and similar to ʻKhormaiʼ the exocarp of fruit is separated easily, but the width of them is equal from the base to the top. Fruits of this cultivar resemble the cultivar ʻAnabiʼ in shape but, contrary to it, the exocarp is taken easily.

Nomencalatural standard. Iran, Hamadan p., between Hamadan and Malayer, 2100 m, 31.10.2009, M. Janighorban & M. Feyzi 15303 (TARI).

E. angustifolia ʻ**Shurei**ʼ (Fig. 6)

Fruits elliptic, not ovate nor narrowed from the base to the top, dark brown densely covered with white dust on the surface, not delicious.

Nomenclatural standard. Iran, Esfahan p., Ardestan road, Dizeloo, 1750 m, 24.10.2009, M. Janighorban 15292 (TARI).

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Fig. 5. *Elaeagnus angustifolia* '**Kolahi**'

Fig. 6. *Elaeagnus angustifolia* '**Shurei**'

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REFERENCES

Boissier, E. 1879. Elaeagnaceae. Flora Orientalis, vol. 4: 1055-1056. – H. Georg, Genevae and Basileae.

Brickell, C.D., Alexander, C., David, J.C., Hetterscheid, W.L.A., Leslie, A.C., Malecot, V., Xiaobai Jin and Cubey, J.J. 2009. International Code of Nomenclature for Cultivated Plants, eight ed. – International Society for Horticultural Science.

Chalabi-Ka'bi, Z. 1980. Elaeagnaceae. In C.C. Town send & Guest, E. (ed.) Flora of Iraq vol. 4: 424-427. – Ministry of Agriculture & Agrian reform Republic of Iraq, Baghdad.

McKean, D.R. 1982. Elaeagnaceae. In Davis, P.H. (ed.) Flora of Turkey and East Aegean Islands vol. 7: 532- 534. – University Press, Edinburg.

Murray, E. 1970. Elaeagnaceae In: Rechinger, K.H. (Ed.) Flora Iranica no. 55: 1-3. – Akad. Druck- und Verlagsanstalt, Graz.

Nasir, Y. 1975. Elaeagnaceae. In Nasir, E. & Ali ,S.I. (eds.) Flora of West Pakistan no. 85: 1-6. – Rawilpindi.

Parsa. A. 1949. Elaeagnaceae in Flore de l'Iran vol. 4: 1188-1191. – Imprimerie Danesh, Tehran.

Tutin, T.G. 1968. Elaeagnaceae. In: Tutin, T.G., Heywood, V.H., Burges, N.A. Moore, D.M., Valentine, D.H.,Walters, S.M. & Webb, D.A. (eds.) Flora Europaea vol. 2: 261. – Oxford University Press, Oxford.

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