

## NOTES ON SOME SPECIES OF THE GENUS *EUPHORBIA* IN IRAN

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### Abstract

During the study on newly collected and herbarium specimens belonging to the genus *Euphorbia*, three species, namely, *E. gorenfloti*, *E. cheirolepioides* and *E. splendida* were found to be synonymous with *E. chamaepeplus*, *E. grossheimii* and *E. decipiens*, respectively. *Euphorbia saheni* as an interesting and rare species has been recognized after long time again among my material and *Euphorbia deltobracteata* is reported as a new record for the flora of Iran. Morphological characteristics, distribution, phytochoria and habitat of each species are reported. All these species are also illustrated.

**Key words:** Endemic, New record, Rare plant, Reinvestigation, Synonymous, Flora of Iran

### Introduction

Euphorbiaceae is one of the largest families of flowering plants, with ca. 300 genera and 8000 species (WEBSTER 1994, SMITH 2001). *Euphorbia* with over 2000 species is one of the largest genera in the world that is cosmopolitan, and can be found mainly in subtropics and temperate regions (SMITH 1980).

Over 80 species of *Euphorbia* are so far reported from Iran, out of which a few of them being naturalized and rest are native (AKHANI 2004, MOBAYEN

1979, NASSEH *et al.* 2006 & 2004, PAHLEVANI 2006, PARSA 1949, RECHINGER & SCHIMAN-CZIEKA 1963). In Iran, *Euphorbia* has a special ecological importance both in negative and positive respects, e.g. several species are poisonous, antipastoral, weeds or known to suppress the vegetation (e.g. *E. chamaesyce*, *E. seguieriana*, *E. granulata*, *E. helioscopia* and *E. maculata*). Some species are rare, endemic or endangered (e.g. *E. erythradenia*, *E. plebeja*, *E. malleata* and *E. sahendi*). High morphological plasticity and diversity of this genus in Iran, as well as low number of studies conducted on the genus make taxonomical studies on *Euphorbia* attractive for botanists.

### Materials and Methods

Herbarium specimens of the genus *Euphorbia* in some valid herbaria of Iran ("IRAN", "TARI", "TUH", Tabriz University etc.) and newly collected specimens from different parts of Iran were studied and identified using corresponding papers and flora (COLLENETTE 1999, KOIE & RECHINGER 1954, MOBAYEN 1984 and 1979, MOUTERDE 1986, MÜSCHLER 1912, PROKHANOV 1949, RECHINGER & SCHIMAN-CZIEKA 1963, SMITH 1980 and 1986, and ZOHARY 1972). Morphological characteristics and other information like distribution, habitats and phytochory were studied for each species, and comparison is also done for similar species if needed.

### Results and Discussion

New synonymy

Following new synonymies were recognized:

***Euphorbia chamaepeplus* Boiss. et Gaill., Diagn. Ser. 2, 4: 88, 1859**

= *E. gorenfloti* Mob., Iran. J. Bot. 2: 159, 1984

The holotype material of *E. gorenfloti* was found in "IRAN" herbarium. This specimen had been collected from Khuzestan Province under the number 17749 (MOBAYEN 1984). After detailed studies it was found to be a synonym of *E. chamaepeplus*. Due to lack of precise description for this species in Flora Iranica (RECHINGER & SCHIMAN-CZIEKA 1963), a detailed taxonomic description of this species is presented below:

Annual herb, glabrous, 5-10 cm high. Stems erect. Leaves deltoid-obcordate, entire, emarginated and mucronate, sessile or short-petioled. Rays of umbel 3, short bifid. Glands 2-horned, horns slender, somewhat longer than width of glands. Capsules ovate, 3 sulcate, keels rounded, not 2-winged. Seeds cylindrical-hexagonous, with two longitudinal furrows and four rows of transverse, irregularly scattered pits or furrows; caruncle depressed-conical (Fig. 1).

This species is also reported from Saudi Arabia, Cyprus, Egypt, Iraq, Jordan, Lebanon, Palestine and Syria (COLLENETTE 1999, MÜSCHLER 1912, PAUL MOUTERDE 1986, SMITH 1980, ZOHARY 1972). This species was also known from Genou mountains in Hormozgan Province from Iran (RECHINGER & WENDELBO 1985). This specimen is preserved in "TARI" herbarium and no further material is found by the author in Iran.

The most closely related species to *Euphorbia chamaepeplus* in Iran is *E. peplus*. The most important diagnostic characters for separating these species are shown in Table 1.

Table 1. Comparison between two species of *Euphorbia*

Species	Cauline leaves					
	Capsule	Blade	Apex	Petiole	Back of seed	Hight of plant
<i>E. peplus</i>	2 wings on each keel	Suborbicular-obovate	Obtuse	Petiolate	Curved	15-40 cm
<i>E. chamaepeplus</i>	Without wings on the keel	Deltoid-obcordate	Emarginate & Mucronate	Sessile-subsessile	Erect	5-10 cm

Hab.: On shady limestone cliff, rocks, steppes and desert

Flowering and fruiting time: March-April

Phytocory: Irano-Turanian and Saharo-Arabian

***Euphorbia decipiens* Boiss. & Buhse, Nouv. Mem. Soc. Nat. Mosc. 12: 197, 1860**

= *E. splendida* Mob., Rostanihayeh Iran. 2: 124, 1979 (in Persian)

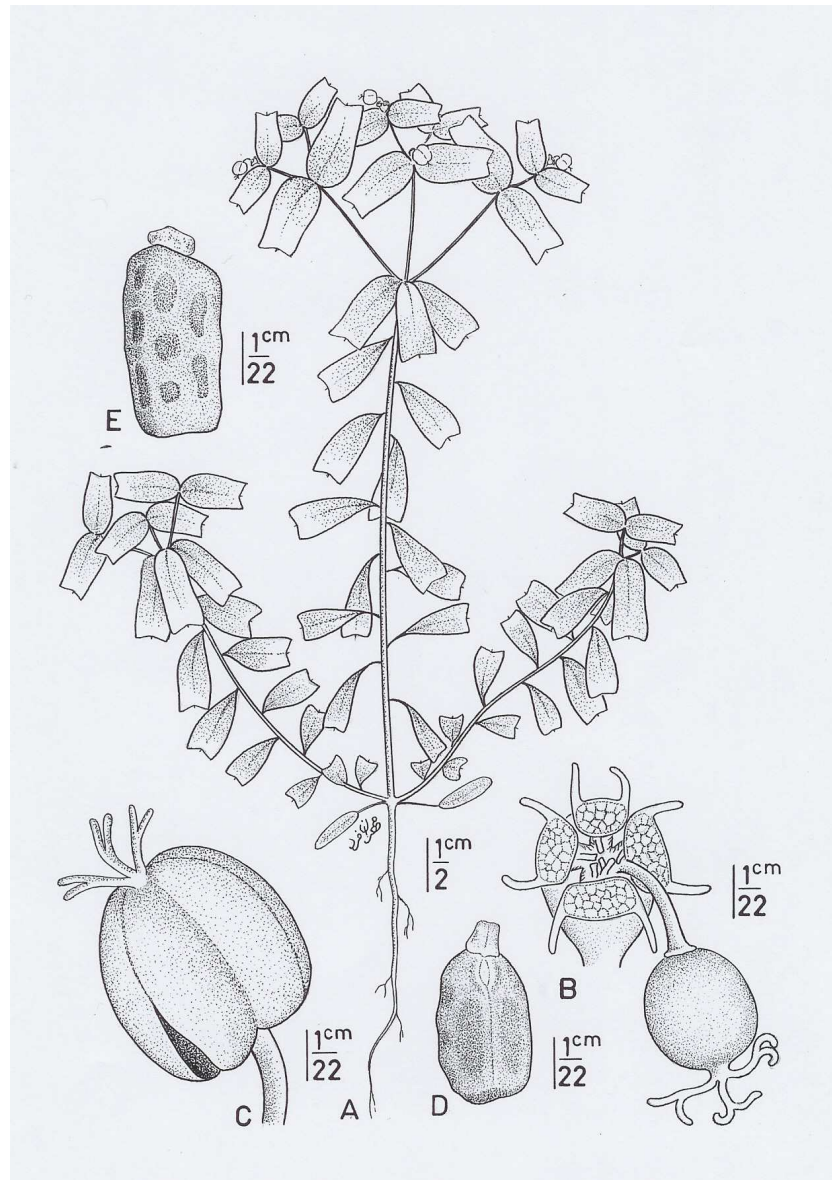


Fig. 1. *Euphorbia chamaepeplus*: A. Habit, B. Cyathium, C. Capsule, D. Seed ventral view, E. Seed dorsal view.

After examination of the holotype material of *Euphorbia splendida* Mob. (TUH 12708) collected from Lorestan Province (Doroud to Azna) and comparison of the material with the key presented in Flora Iranica (RECHINGER & SCHIMAN-CZEIKA 1963) it was found to be synonymous with *E. decipiens*. A short description of the latter based on the material examined is given below:

Erect or subascending glabrous perennial herb, 15-30 (40) cm high with many stems arising from a woody rootstock. Cauline leaves alternate, sessile, entire, obtuse or mucronate, palmately nerved, lower leaf-blades lanceolate, 1.5-3 cm × 2.5-5 mm, upper ones obovate, 1-1.5 × 0.4-1 cm. Pseudoumbels 10-30 rays, the rays usually once bifid; axillary rays usually absent or 1-6 rays below the pseudoumbels; ray-leaves 10-15, whorled, resembling the upper stem-leaves; raylet-leaves opposite, rhombic to ovoid, 0.5 × 0.5 cm, mucronate. Cyathia subsessile, 2-3 mm long, campanulate; glands 4, truncate, hornless, brownish-red. Capsule ovate-conical, 4-5 mm long. Seeds 2.5-3 mm long, grayish, malleate; caruncle sessile, flattened-conical (Fig. 2).

*E. decipiens* was reported as a rare plant in Red Data Book of Iran (JALILI & JAMZAD 1999).

Hab.: On the limestone rocks on the slope of the mountain (1900-3200 m).

Flowering and fruiting time: May-July

Phytochory: Irano-Turanian

Dist.: Endemic of Iran (N, W, C and S).

***Euphorbia grossheimii* Prokh. Izv. Glavn. Bot. Sada S.S.S.R. 29: 551, 1930**

= *E. cheirolepioides* Rech. f., Dansk Bot. Ark. 15, 4: 48, 1954

Among the collected specimens from Azarbaijan Province (30 km Marand to Jolfa, IRAN 47846, PAHLEVANI), one specimen belonging to *Euphorbia* from subsect. *Carunculares* was seen with the following characteristics:

Annual, glabrous, 10-40 cm high. Roots thin, vertical and not branched. Stems erect to ascending, internodes long. Cauline leaves alternate, 25-45 mm long, 3-6 mm wide, sessile, linear to oblong-lanceolate with broader base and truncate to

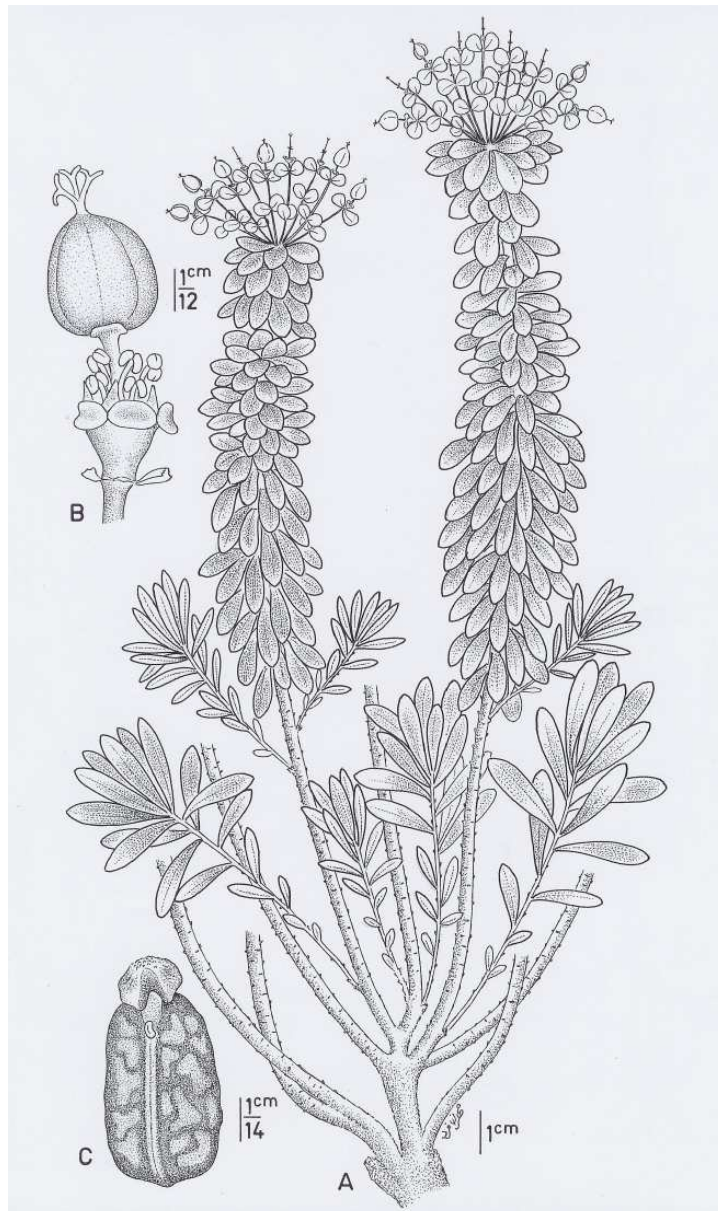


Fig. 2. *Euphorbia decipiens*: A. Habit, B. Cyathium and Capsule, C. Seed.

subacute apex, dentate with scattered sharp teeth especially at base and apex with 3 obscure parallel veins; ray-leaves like cauline leaves. Rays 2-3, once to thrice branched. Cyathia 1.5-2 mm long, stalked, campanulate; glands 4-5, minute, transversely ovate, truncate; styles 1-2 mm long, nearly free. Capsules 6-8 mm long, ovoid-conical, smooth with rounded keel. Seeds 3-3.5 mm long, subspherical to ovoid, grayish, smooth, mottled or not, if mottled, greenish-grey; caruncle conical, yellowish, 3-4 mm long, stipitate, 2-lobed below (Fig. 3).

Based on the above-mentioned characteristics and referring to flora of the USSR (PROKHANOV 1949), flora of Iraq (SMITH 1980) and flora of Pakistan (SMITH 1986), the specimen was identified as *Euphorbia grossheimii*.

In the Flora Palestina (ZOHARY 1972) this species was named as *E. isthmia* which in turn was considered as synonymous with *E. grossheimii* in flora of Iraq and Pakistan (SMITH 1980 & 1986).

After comparison of this material with the flora Iranica (RECHINGER & SCHIMAN-CZEIKA 1963), it was identified as *Euphorbia cheirolepioides* Rech.f. This species recorded as endemic to the Flora of Iran (RECHINGER & SCHIMAN-CZEIKA 1963 and KOIE & RECHINGER 1954). As there is no difference between the descriptions of these two names, the latter should also be reduced into synonymy of *E. grossheimii*. Moreover, there is a sheet in "IRAN" Herbarium under the number 817 which identified as *E. cheirolepioides* in the Flora Iranica. *Euphorbia grossheimii* has recently been recorded for Iran (NASSEH & JOHARCHI 2005).

Hab.: In the desert, on the sandy gravel and dry hills

Flowering and fruiting time: In tropical and sub-tropical regions (S. Iran, Iraq etc.) in March-April and in temperate regions (N. Iran, Caucasus) in May-June

Dist.: Caucasus (Nakhichevan), Iraq, Palestine, W. Pakistan, Egypt, N. Saudi Arabia, Sinai and Iran (NE, NW, S and SE) (COLLENETTE 1999, PROKHANOV 1949, SMITH 1980 and ZOHARI 1972).

Phytocory: Irano-Turanian and Sahara-Sindia

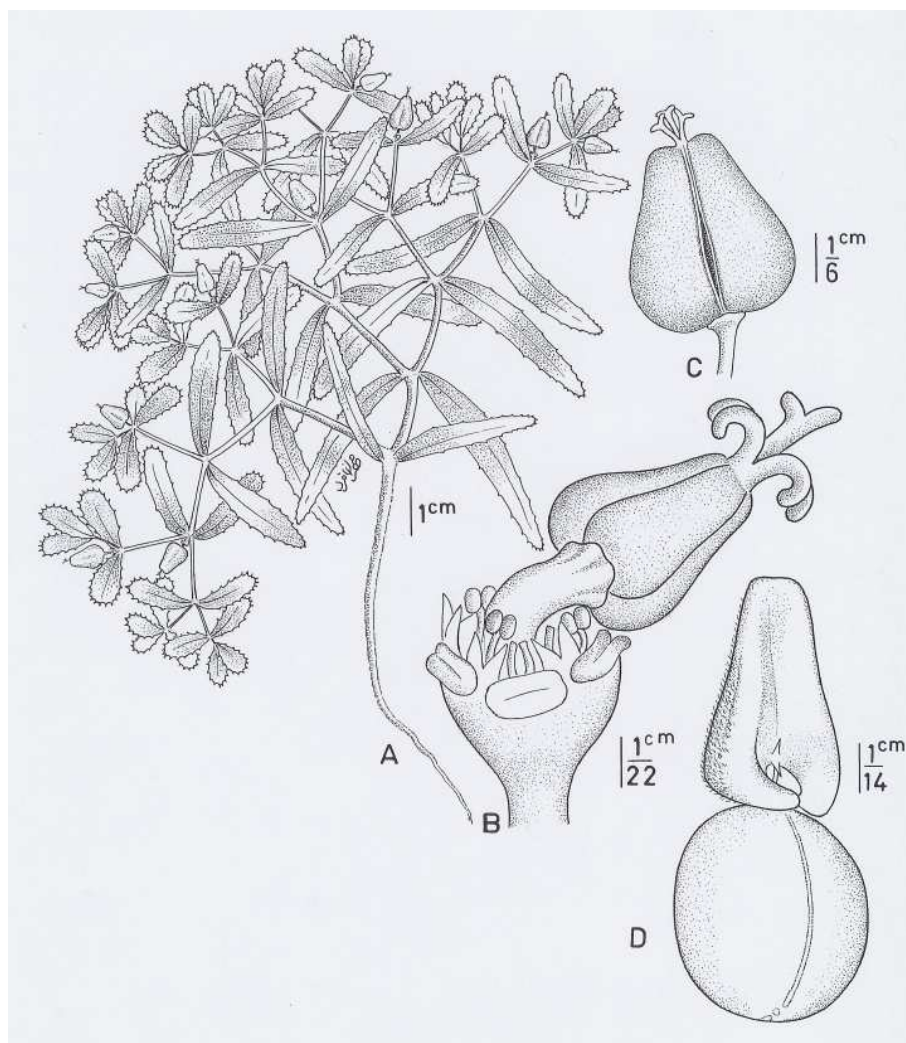


Fig. 3. *Euphorbia grossheimii*: A. Habit, B. Cyathium, C. Capsule, D. Seed.

Recollection of an interesting species

***Euphorbia sahendi* Bornm., Verh. Zool. Bot. Ges. 60: 171, 1910**

Among the collected specimens from Azarbaijan Province (Tabriz to Bostan-abad, Iranagh-Matanagh road, Sahand mt., 3100-3700 m., IRAN 47845, PAHLEVANI & AMINI RAD) one specimen of *Euphorbia* from Sect. *Tithymalus* and subsect. *Esulae* was found with the following characteristics:



Plant caespitose, perennial, 15-20 cm high, velutinous. Cauline leaves lanceolate to rhombic with prominent palmate nerves, 1.5-2 cm long and 0.8-1.8 cm wide, acute, entire, sessile, both end and apex equally attenuate, superior leaves larger than the inferior; umbellar and floral leaves like cauline leaves but smaller than them. Umbels 5 (3) rayed, rays 1-2.5 cm long. Ciathia about 2-2.5 mm long, pedicellate; glands transversely ovate to oblong, truncate and cornate. Capsules 4-5 mm, ovoid, velutinus, pedicellate. Seeds about 3 mm, obsolete tetragonous, ovoid, pale yellow, pitted, curved, prominently grooved in back; caruncle 0.5 mm long and corrugated (Fig. 4).

Based on the above-mentioned characteristics and referring to Flora Iranica, the specimen was identified as *Euphorbia sahendi* Bornm. (RECHINGER & SCHIMAN-CZEIKA 1963). Under this name in the Flora Iranica (RECHINGER & SCHIMAN-CZEIKA 1963), only one specimen is given from Azarbaijan Province: Isperokhan in Sahand mountain (the type material collected by KNAPP in about 1835). The species is recollected after more than 100 years passed from its first collection. Of course, there is no specimen from *E. sahendi* present in valid herbaria e.g. "IRAN", TARI, TUH, Tabriz University (Khalatpushan station) and Agricultural Research Center & Natural Resource of E. Azarbaijan Province. This species was named as a rare plant in Red Data Book of Iran (JALILI & JAMZAD 1999). Some plants that were present in the same area along with *E. sahendi* are as follows: *Alopecurus dasyanthus*, *A. aucheri*, *Astragalus pauperiflorus*, *Campanula stevenii*, *Dianthus* sp., *Didymophysa aucheri*, *Helichrysum psychrophilum*, *Minuartia glandulosa*, *Onobrychis cornuta*, *Physoptychis gnaphalodes*, *Senecio taraxacifolius* and *Tripleurospermum caucasicum*.

Hab.: Oreophilus plant

Flowering and fruiting time: August-September

Dist.: Endemic of Iran (Sahand mountain)

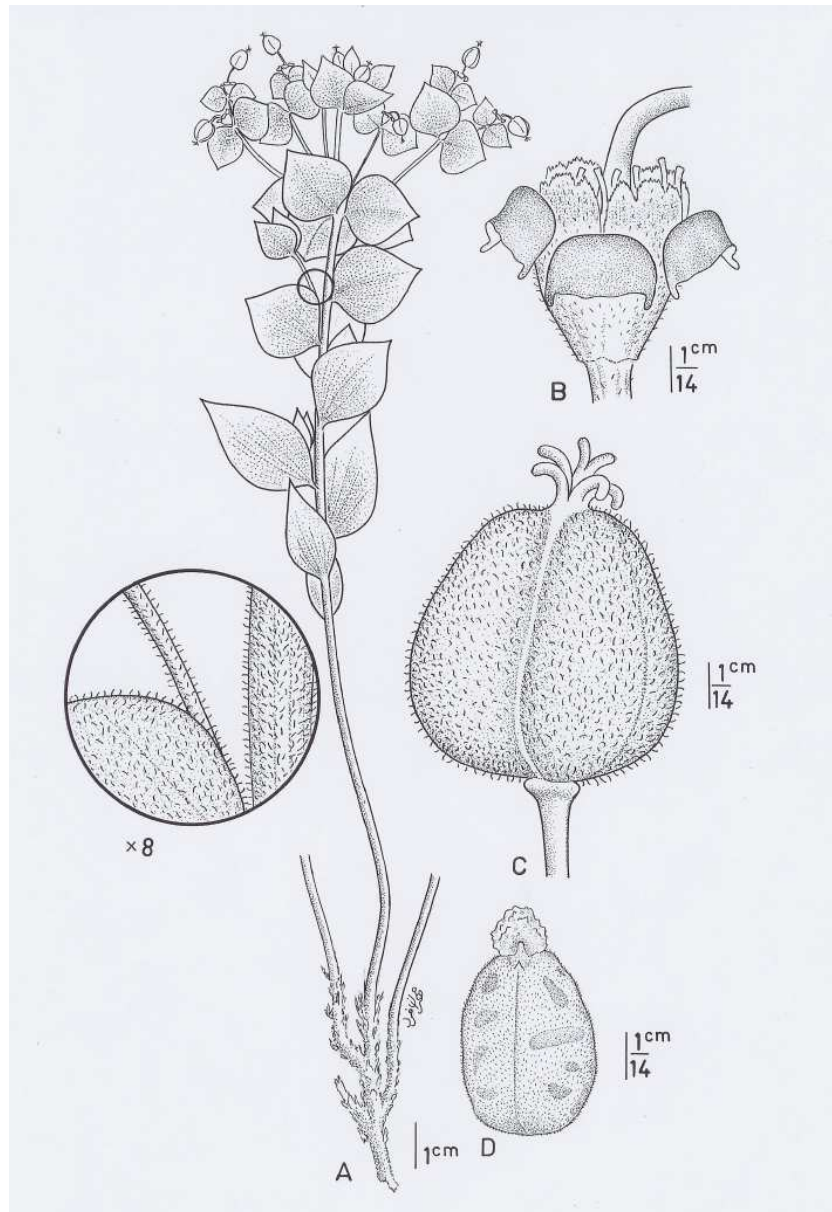


Fig. 4. *Euphorbia sahendi*: A. Habit, B. Cyathium, C. Capsule, D. Seed.

New record

***Euphorbia deltobracteata* Prokh., Consp. Syst. Tithym. Asiae Mediae 149, 1933**

During the study on *Euphorbia* in "IRAN" Herbarium and Akhani's private collections (IRAN 47323 & AKHANI 11045), a species belonging to subsect. *Esulae* was identified with the following characteristics:

Perennial, 15-30 cm high, glabrous. Roots descending. Stems many, erect, thin (0.5-2 mm diam.), becoming woody at base, simple, sometimes with a single axillary ray below the pseudumbels. Basal leaves squamiform, oblong; cauline leaves rather dense, 7-20 mm long and 2-4 mm wide, sessile to subsessile, oblong-linear or oblong-lanceolate, obtuse or slightly cuspidate, usually serrate and slightly cartilaginous, with 1 inconspicuous nerve. Rays of umbel 5-7, 2-7 cm long, simple or bifurcate; ray-leaves 4-6, sessile, truncate or rounded at base, elliptic-ovate or elliptic-lanceolate, 10-13 mm long and 3.5-7 mm wide, acute, finely serrate; raylet-leaves 2, triangular-ovate or deltoid, 6-12 mm long and 4.5-11 mm wide, more or less cuspidate, crenate or rarely serrate. Cyathia campanulate, villous inside; glands dark reddish, crescent-shaped, 2-horned, horns subulate and as long as width of glands or slightly longer; styles 1-2 mm long, connate at base. Capsules ovoid, truncate, 3-3.5 mm long, trisulcate with rounded keels. Seeds 2-2.5 mm long, oblong or sometimes hexahedral, with concave faces, glabrous or faintly and sparingly tuberculate; caruncle oblique, flattened-conical and sessile (Fig. 5).

Based on the above-mentioned characteristics and referring to Flora Iranica (RECHINGER & SCHIMAN-CZEIKA 1963) and Flora of the USSR (PROKHANOV 1949) the specimen was identified as *Euphorbia deltobracteata* Prokh. In both floras, it was reported as an endemic species from Turcomanica. Presently, it is reported as a new species for flora of Iran.

The closet relative to *Euphorbia deltobracteata* in Iran is *E. aucheri* Boiss. The differences between these two species are given in Table 2.

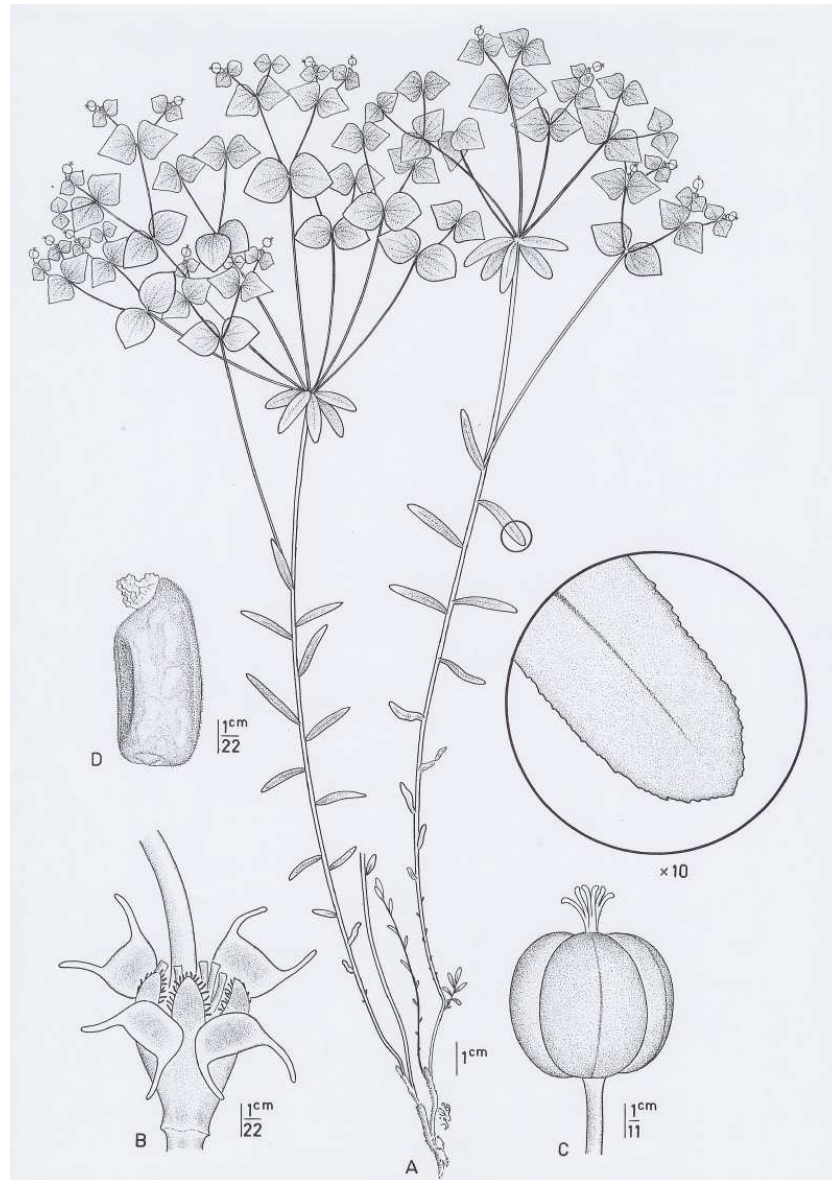


Fig. 5. *Euphorbia deltobracteata*: A. Habit, B. Cyathium, C. Capsule, D. Seed.

Table 2. Comparison between two species of *Euphorbia*

Cauline leaves							
Species	Blade	Margin	Petiole	Length/ Wide	Ray number	Raylet- leaves	Hight of plant
<i>E. deltobracteata</i>	Oblong-linear or oblong-lanceolate	Serrate	Sessile	(3) 4-6	5- 7	Triangular-ovate or deltoid	15-30 cm
<i>E. aucheri</i>	Obovate to elliptic-ovate	Entire & somewhat cartilaginous	Petiolate to subsessile	2-2.5 (3)	1- 5	Ovate-rhombic or ovate	5-12 cm

Hab.: Slopes of the valley and steppe grassy slopes

Flowering and fruiting time: April-May

Phytochory: Irano-Turanian

Dist.: Turcomanica (W. Kopet-dagh, Khosar mountain), Iran (Golestan National Park, 5 km E. Almehr and Soulgerd to Darreh-Khersou).

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