

Euphorbia khorasanica (Euphorbiaceae), a new species from Iran

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A new species, *Euphorbia khorasanica* Saeidi & Ghayormand (Euphorbiaceae), is described and illustrated from Khorasan Province, NE Iran. It belongs to sect. *Pithyusa* and is morphologically closely related to *E. kopetdaghi*, *E. microsciadia* and *E. sogdiana*, but differs from them by having very narrow cauline leaves and shorter ray leaves.

Euphorbia has about 2000 species and is one of the largest genera of flowering plants (Radcliffe-Smith 2001), with about 90 species native to Iran (Pahlevani *et al.* 2011). The species are very diverse in habit, and most Iranian ones are annual or perennial herbs. In Iran several species are known as weeds occurring in disturbed or overgrazed lands. Narrowly endemic species are not numerous in Iran, but some species such as *E. sahendi*, *E. malleata*, *E. acanthodes* and *E. plebeia* are known only from few localities. Most species of *Euphorbia* in Iran belong to the subgenus *Esula*, which is one of the four main clades of the genus (Steinmann & Porter 2002, Bruyns *et al.* 2006, Horn *et al.* 2012, Riina *et al.* 2013).

In the course of a floristic study in Ghareche area north of Quchan (NE Iran, Prov. Khorasan) we found a *Euphorbia* with few individuals, characterized by narrow leaves. Our further investigations showed that the collected specimens represented an undescribed species.

Field studies were conducted during May 2011–August 2012. The collected specimens are

deposited in the Guilan University Herbarium, M and TUH. The collections of the undescribed species were compared with identified material in TUH and M. Several references were used to identify the samples, the most important references being Prokhanov (1949), Rechinger and Schiman-Czeika (1964) and Salmaki *et al.* (2011). The material was examined under an Olympus (model SZ40) binocular microscope at $\times 64$ to $\times 400$ magnifications. For cyathium morphology dissections of numerous specimens were made.

Euphorbia khorasanica Saeidi & Ghayormand, *sp. nova* (Fig. 1)

TYPE: Iran. Prov. Khorasan Razavi; 35 km to Quchan, Ghareche, eastern slope, 37°20'32.3"N, 58°19'47.9"E, 1450–1500 m, 10 June 2012 M. Ghayormand 50287 (holotype TUH; isotype M).

ETYMOLOGY: The specific epithet refers to the type locality in Prov. Khorasan, NE Iran.

Glabrous, glaucous, perennial herbs, arising

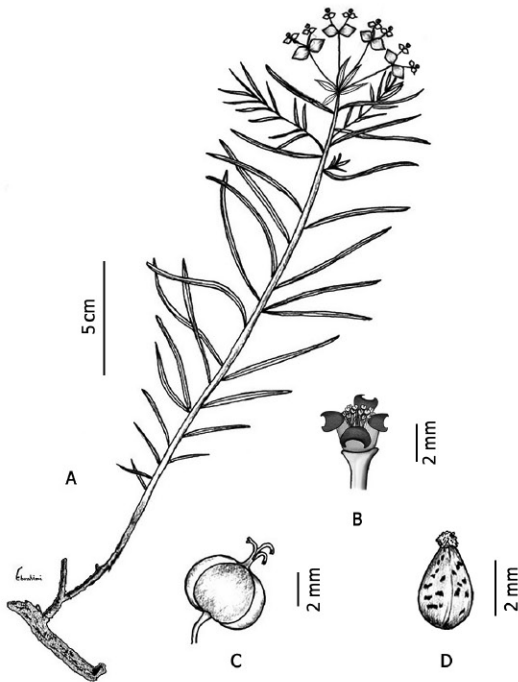


Fig. 1. *Euphorbia khorasanica* (from the holotype). — A: Habit. — B: Cyathium. — C: Capsule. — D: Seed.

from a underground rhizome, 25–40 cm tall. Main aerial shoot non-branched or with few lateral branches near apex. Cauline leaves sessile, narrowly oblong-lanceolate to linear, 3.0–6.5 cm \times 1.5–2.7 mm, cuneate at base, acute-mucronulate at apex, entire at margins, coriaceous. Terminal rays 3–5, 2–5 cm long; axillary rays 2–3, 0.7–1.5 cm. Ray leaves narrowly oblong-lanceolate to narrowly ovate, 0.6–1.4 cm \times 2–3 mm. Raylet leaves broadly ovate to rhombic, rounded at base, apex obtuse with a short mucro, 0.5–0.7 \times 0.5–1 cm. Cyathia lobes oblong-lanceolate; glands 4, semilunate, 0.5–0.7 \times 1–1.2 mm, yellowish green becoming brown. Capsules trilobite-spheroidal, pedicel up to 6 mm long, 4–4.7 \times 5–7 mm, smooth; stigmas fused at base. Seeds ovoid, 2.5–3 mm long (without caruncle), 1.2–1.5 mm wide, loosely pitted, grey to brown; caruncles orbicular-conical, yellowish, 0.5 mm long. Flowering from May to June, fruiting from June to July.

DISTRIBUTION AND HABITAT: In subalpine gravelly slopes; known only from the type locality in Khorasan, Iran (Fig. 2).

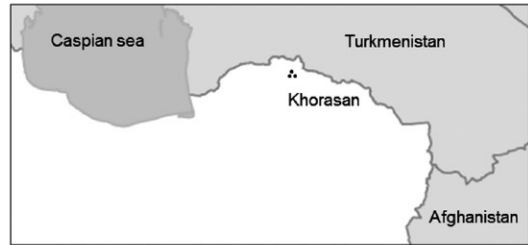


Fig. 2. Locality of *Euphorbia khorasanica* (•) in Iran.

The new species belongs to sect. *Pithyusa* characterized by semi-lunate cyathial glands, glabrous capsules, and caruncle which is shorter than half of the seed. The section name *Pithyusa* has long been ignored, but recently Riina *et al.* (2013) reinstated it for a group of species known as sect. *Paralias* subsect. *Conicocarpae*. Frajman and Schönswetter (2011) elevated this group to sectional level.

The species appears related to *E. kopetdaghi*, *E. microsciadia* and *E. sogdiana* and may occur sympatrically with *E. kopetdaghi* near Quchan, but it has the narrowest leaves among these taxa. The linear leaves in this species make it readily distinguishable from other perennial species of *Euphorbia* distributed in Iran. Such narrow leaves may also occur in some individuals of *E. buhsei* (sect. *Esula*) only on sterile shoots, but the cyathial glands in *E. buhsei* are almost triangular rather than semilunate. Because of its narrow leaves, *E. khorasanica* can also be compared with *E. virgata* (sect. *Esula*), which includes much taller plants growing in wet places such as streamsides. For the same reason *E. khorasanica* is also comparable with *E. seguieriana*, which has semilunate glands, but its seeds have small caruncles. The latter is widely distributed and known from westernmost Spain to easternmost Turkmenistan. *Euphorbia khorasanica* is also similar to *E. hebecarpa* (sect. *Esula*), growing in W Iran in subalpine vegetations of Zagros mountain range, in its narrow leaves. However, the latter has hairy capsules and taller shoots. Furthermore, the ray leaves of *E. khorasanica* are narrowly oblong-lanceolate to narrowly ovate, whereas they are rhombic-oblong to broadly ovate in *E. kopetdaghi*, *E. microsciadia* and *E. sogdiana*. The most important diagnostic characters of these four species are given in Table 1.

Table 1. Diagnostic characters of *Euphorbia khorasanica*, *E. kopetdaghi*, *E. microsciadia*, *E. sogdiana* and *E. seguieriana*.

Species	Leaf length (cm)	Leaf width (mm)	Ray leaf blade	Capsule diameter (mm)	Capsule surface	Seed length (mm)
<i>E. khorasanica</i>	3.0–6.5	1.5–2.7	narrowly oblong-lanceolate to narrowly ovate	5–7	smooth	2.5–3
<i>E. kopetdaghi</i>	1–8	3–13	rhombic-oblong to ovate-rhombic	4–5	smooth	3–4
<i>E. microsciadia</i>	0.5–1.7	2–10	obovate-suborbicular	3–3.5	smooth, minutely white-punctate	2.25
<i>E. sogdiana</i>	2–4	5–15	broadly ovate or oblong-lanceolate	3–4	smooth	3–3.5
<i>E. seguieriana</i>	1–4	1.5–3	obovate-suborbicular	ca. 3	smooth	2–2.5

Euphorbia kopetdaghi and *E. sogdiana* are known so far from NE Iran, Turkmenistan, Uzbekistan, Tajikistan and Afghanistan, but *E. microsciadia* is distributed in C and S Iran, Pakistan and Afghanistan (Prokhanov 1949, Rechinger & Schiman-Czeika 1964, Govaerts *et al.* 2000, Geltman 2006). The flora around Quchan is fairly similar to that of Kopet Dagh mountain range in Turkmenistan, but there are also some endemic species, such as *Astragalus ghouchanensis* (Souzani *et al.* 2009) and *Phlomooides binaludensis* (Salmaki & Joharchi 2014).

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