# Polygonum khajeh-jamali (Polygonaceae), a new species from Iran

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Polygonum khajeh-jamali Khosravi & Poormahdi sp. nova (Polygonaceae) is described and illustrated from SW Iran. It can be assigned to Spinescentia group of sect. Polygonum and is characterized by its coriaceous leaves. The leaf epidermis contains a layer of tanniniferous cells with thick walls absent in the other closely similar species.

Key words: Polygonaceae, *Polygonum*, new species, taxonomy

The genus Polygonum consists of about 230 species, which occur mainly in the northern temperate regions. In Iran, the genus is represented by 37 species including 10 endemics (Rechinger & Schiman-Czeika 1968, Mozaffarian 1988). As a part of investigations on the ultramafic flora of the Neyriz ophiolite, an unkown *Polygonum* was collected on serpentine soil near a chromite mine in Khajeh Jamali village. The material matches the description of the Spinescentia group in section Polygonum. Similar specimens had been seen by the authors in the herbaria of TARI and Shiraz University. Comparison with the materials in the herbaria of TARI, IRAN, TUH and Shiraz University, as well as reviewing the relevant literature (Rechinger & Schiman-Czeika 1968, Mozaffarian 1988) revealed that the new material represents a hitherto undescribed species.

# Polygonum khajeh-jamali Khosravi & Poormahdi, sp. nova (Fig. 1)

Frutex erectus vel ascendens, 15–20 cm altus,

internodia 5–15 mm longa, tomentoso-puberula. Folia inferiora  $5-15 \times 2-9$  mm, ovata usque lanceolata, acuminata vel cuspidata, cartilaginea, ad marginem revoluta, tomentoso-puberula. Ochreae caulinae 3-4 mm longae. Flores singuli, subsessiles. Perigonium 2-5 mm longum, extus papilloso-velutinum.

HOLOTYPE: Iran. Fars province, Abadeh Tashk, Khajeh Jamali, chromite mine, 1998 m, 53°51′53.64′′E, 29°48′46′′N, 14.VI.2004 A. R. Khosravi, A. Mousavi & M. Soltani 23954 (Herbarium of Shiraz University).

ETYMOLOGY. The specific epithet refers to Khajeh Jamali village in Fars province, where the material was collected.

Perennial with a hard woody stock, up to 20 cm tall, with many stems arising from a branched base. Stems branched, hard, ascending-erect, tomentose-puberulent, internodes 5–15 mm long. Leaves coriaceous, sessile, revolute, tomentosepuberulent, acuminate to cuspidate, in lower part of stem ovate to lanceolate,  $5-15 \times 2-9$  mm, in upper parts of stem lanceolate to linear,  $3-10 \times$ 1-3 mm. Leaf epidermis contains a layer of tan-

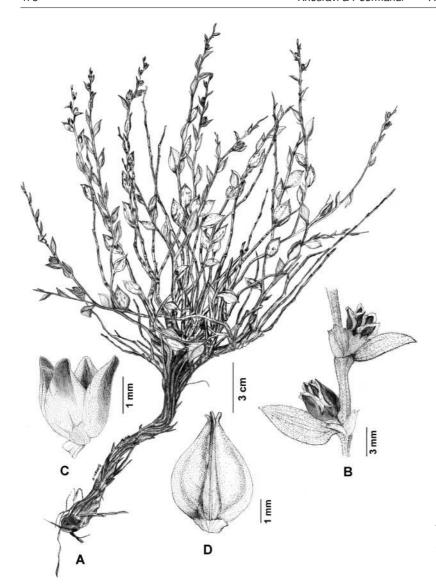


Fig. 1. Polygonum khajehjamali Khosravi & Poormahdi (from the holotype). — A: Habit. — B: Portion of infloresence. — C: Flower. — D: Fruit.

niniferous cells with thick walls. Ochreae 3–4 mm long, acute  $\pm$  tubular, lanceolate, setaceous-mucronate, lacerate or fimbriate, membranous, shorter than leaves. Flowers axillary, solitary 2–3 mm in diameter, sessile or subsessile, Ochreolae 2–3 mm long, lanceolate-ovate, lacerate, membranous, glabrous. Tepals 5, pink, 2–5  $\times$  1.5–2 mm, ovate, obtuse at tip. Stamens 8, filaments short, unequal, dilated at base, anthers basifixed. Ovary 1–1.5  $\times$  0.5–0.8 mm, oblanceolate, trigonous with three styles and capitate stigmas. Nuts trigonous, 4.5–5  $\times$  2.5–3.2 mm, brown, shining, glabrous. Flowering and fruiting from (April) May to June (July).

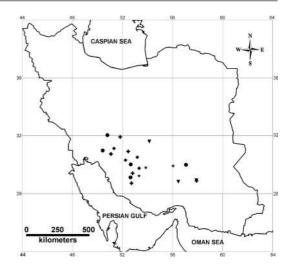
DISTRIBUTION. *Polygonum khajeh-jamali* seems to be restricted to east of Fars and west of Kerman provinces in SW Iran (Fig. 2) and it thus represents one of the narrow endemics of the Irano-Turanian region in Iran (Hedge & Wendelbo 1987).

Habitat Ecology. Polygonum khajeh-jamali grows on serpentine and non-serpentine soils in xeromorphic, very open dwarf-shrub lands dominated by Ebenus stellata, Astragalus fasciculifolius and Convolvulus acanthocladus. Other characteristic species accompanying this species are Acanthophyllum gracile, Achillea eriophora, Amygdalus scoparia, Centaurea micro-

lonchoides, Ephedra pachyclada, Gymnocarpus decandar and Platychaete aucheri.

LEAF ANATOMY. A histological study of leaves of P. khajeh-jamali and the assumed close allies, i.e. P. dumosum and P. aridum, was conducted using herbarium materials. Non-secretory trichomes are present in these species. The leaf epidermis in P. khajeh-jamali contains a layer of tanniniferous cells with thick walls. Such cells are absent in P. dumosum and P. aridum (Fig. 3). The mesophyll in all species contains two layers of palisade parenchyma on the upper and lower sides of the leaf. Secretory elements were seen in enlarged crystalliferous cells restricted to the middle layer of the mesophyll. Such a pattern of crystalliferous cell distribution is rare in other dicot families, but common in *Polygonum* (Metcalfe & Chalk 1950, Mitchell 1971, Lersten & Curtis 1992).

TAXONOMIC RELATIONSHIPS AND DISTINCTION. The occurrence of erect and rigid flowering branches with hard and persistent branches after anthesis allows the inclusion of *P. khajeh-jamali* into the *Spinescentia* group of sect. *Polygonum* (sect. *Avicularia*). The group includes also *P.* 



**Fig. 2.** Distribution of *Polygonum khajeh-jamali*  $(\star)$ , *P. salicornioides* (+), *P. dumosum*  $(\bullet)$ , *P. aridum*  $(\bullet)$  and *P. spinosum*  $(\blacktriangledown)$  in Iran.

aridum, P. dumosum, P. salicornioides and P. spinosum. These species are Irano-Turanian and common in the mountainous regions of the Iranian highlands (Fig. 2). The widest distributed species in the group are P. salicornioides, P.

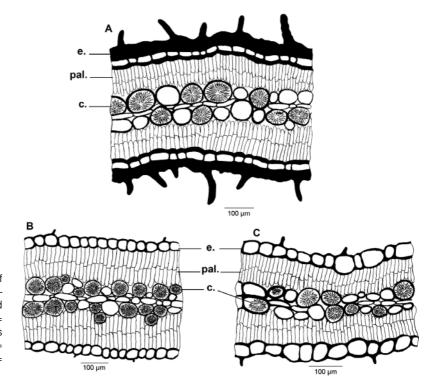


Fig. 3. Cross section of leaf in (A) *Polygonum khajehjamali*, (B) *P. aridum* and (C) *P. dumosum.* e = epidermal tanniniferous parenchyma cell, pal. = palisade mesophyll, c = crystalliferous cell.

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	P. khajeh-jamali	P. dumosum	P. aridum	P. salicornioides	P. spinosum
Ochrea	acute ± tubular	acute ± tubular	acute ± tubular	truncate ± campanulate	truncate ± campanulate
Leaf duration	persistent	persistent	decidnons	deciduous	decidnous
Length of lower leaves (mm)	5–15	10–12	1-3(7)	4–10	4-10
Width of lower leaves (mm)	2–9	1–2	1–2	1–2	1–2
Shape of lower leaves	ovate to lanceolate	linear-elliptic	linear-lanceolate	oblonge-lanceolate	linear-lanceolate
Leaf texture	coriaceous	not coriaceous	not coriaceous	not coriaceous	not coriaceous
Thickness of tanniniferous cells in					
epidermal layer	thick	thin	thin	thin	thin

dumosum, and P. aridum. Polygonum khajeh-jamali and P. spinosum are local endemics. In some remarkable morphological features, such as the persistent leaves, length of internodes and shape of ochrea, P. khajeh-jamali is most related to P. dumosum (Table 1). Polygonum khajeh-jamali differs from P. dumosum and the other species in the group mainly by having coriaceous (often ovate) leaves and thick tanniniferous cells in the epidermal cell layer of leaves (Table 1).

Additional Specimens examined (paratypes). Iran. Prov. Fars, Abadeh-Tashk, Khajeh Jamali, chromite mine, 2000 m, 53°51′53.76′E, 29°48′38′N, 14.VI.2004 A. R. Khosravi, A. Mousavi & M. Soltani 23953 (Herb. Shiraz University); ibid, 4.6 km north of Khajeh Jamali, 1950 m, 53°48′50.76′E, 29°51′18.24′N, 14.VI. 2004 A. R. Khosravi, A. Mousavi & M. Soltani 23955 (Herb. Shiraz University); Fars, 10 km S. E. of Sarvestan, Post-e Chenar, 1750 m, 4.VI.1983 V. Mozaffarian, 46720 (TARI); ibid, 22.X.2006 A. Hatami (Herb. Shiraz University); Kerman, Kuh Panj Bardsir, Derkht Gaz village, 2600 m, 5.V.1990 Y. Emamipoor (Herb. Shiraz University).

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