

DIONYSIA JAMZADIAE (PRIMULACEAE), A NEW SPECIES FROM THE FARS PROVINCE OF IRAN

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Dionysia jamzadiae Lidén, M. Irvine, Alvén & Mehregan, from the east Zagros Mountains, Fars, Iran, is described as new to science. It belongs in section *Dionysiopsis* and is similar to *D. oreodoxa* Bornm. but differs in, for example, its sparsely glandular hairy or almost glabrous corolla with emarginated lobes (densely non-glandular pubescent with entire lobes in *D. oreodoxa*). *Dionysia jamzadiae* is known from two places and is quite abundant at the type locality.

Keywords. *Dionysia jamzadiae*, Iran, new species.

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Introduction

Dionysia is found from southeast Anatolia and the Zagros mountains of Iran eastwards to Afghanistan and Tadjikistan, with southern outliers in northeast Oman and northeast Balochistan, which corresponds more or less to the *Flora Iranica* area, part of the Irano-Turanian floristic region. The highest concentration of species we find in the Zagros. About 60 species are known at present, but it is likely that, with time, more will come to light in areas still poorly investigated.

Dionysia is a well-characterised natural (monophyletic) taxon, strongly supported as sister to the genus *Evtrochis* Raf. (= *Primula* subg. *Sphondylia* (Duby) Rupr.), by both morphological and molecular data (Firat & Lidén, 2021; Mast *et al.*, 2001). We note that if *Primula* L. is treated in the broad sense advocated by Mast & Reveal (2007), both the above 'satellite' genera will have to be sunk into synonymy. For the time being, however, we prefer to keep generic rank for *Dionysia*, in order not to forejudge a systematic overhaul of the whole *Primula* group.

Dionysia differs from all other taxa in the *Primula* group in being dwarf shrubs with woolly farina and a peculiar gummy 'bark' (Decrock, 1901). All species known are extreme cliff-dwellers, often confined to vertical or even overhanging rocks. Some species in dry areas grow also on sloping ground (especially at higher altitudes), but no species can withstand having the cushions wetted for any prolonged period. Limestone is the preferred substrate of most species.

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We have, based on DNA sequences (Trift *et al.*, 2004), a rough idea of the phylogeny of *Dionysia*, based on which Lidén (2007) suggested a subgeneric classification with five named sections and a few *incertae sedis* species. The species described here, which was discovered during an excursion in April 2018 to the province of Fars, specifically aimed at finding new species of *Dionysia* in poorly visited areas, belongs in the section *Dionysiopsis* (Pax) Melchior, which is characterised by leaves with a revolute crenate-dentate margin. The section comprises 15 species, mostly from the Zagros mountains, and most are in cultivation. *Dionysia archibaldii* Wendelbo, *D. aretioides* (Lehm.) Boiss. and *D. revoluta* Boiss., for example, are often found in botanical gardens or specialist amateur collections.

An updated key to the *Dionysia* species occurring in the Zagros mountains is included in the parallel publication by Alipour *et al.* (2021).

Species description

Dionysia jamzadiae Lidén, M.Irvine, Alvéen & Mehregan, *sp. nov.*

Differs from *Dionysia oreodoxa* Bornm., to which it is most similar, in its sparsely glandular hairy or almost glabrous corolla with emarginate lobes (versus densely non-glandular pubescent with entire lobes). – Type: Iran, Fars: Kuh-e-Aqa-Hosseyni (30°11'30"N, 53°48'03"E), 2850–2980 m, NE-facing limestone cliffs, 21 iv 2018, Z-MAIL (Zagros – Mehregan, Alvéen, Irvine & Lidén) 10 (holotype GB!; isotypes E! (E01014444), IAUH!, TARI!, UPS!). **Figures 1, 2.**

Moderately dense to rather lax cushions 5–20 cm across. *Stems* finely glandular hairy, epidermis soon becoming reddish brown, eventually exfoliating. *Marcrescent leaves* persistent for three seasons; leaves in distinct yearly clusters separated by more sparsely leafy internodes, or rarely almost confluent. *Leaves* 4–5 × 0.6–0.8 mm, bluish green, oblong, with strongly inrolled margin with 6–9 sometimes obscure crenations, beset all over with minute glandular hairs up to 0.05 mm long, or rarely almost glabrous. *Farina* white to yellowish, most dense on the underside of leaves and on calyx, rather particulate and giving a peculiar scabrid-sticky sensation to the touch, but clearly woolly in high magnification. *Flowers* sessile, single or often paired. *Bracts* 1 or usually 2, equalling calyx, similar to calyx lobes. *Calyx* 2.5–3.5 mm, divided to 4/5 into lanceolate acute lobes with a sparse pubescence of short glandular and eglandular hairs to 0.1 mm long. *Corolla* bright yellow with sparse glandular hairs to 0.2 mm long, or almost glabrous; tube 10–15 mm long; limb 8–13 mm broad with ovate emarginate lobes. *Style* in long-styled flowers not or slightly exerted; anthers of long-styled flowers and stigma of short-styled flowers situated about halfway up the tube or slightly lower. *Ovary* with 5–7 ovules. *Capsules* c.2 mm, 3- to 6-seeded. *Seeds* rounded to broadly ovate, 1–1.2 × 0.8–1 mm, with a thin outer soft layer of pale fatty cells.

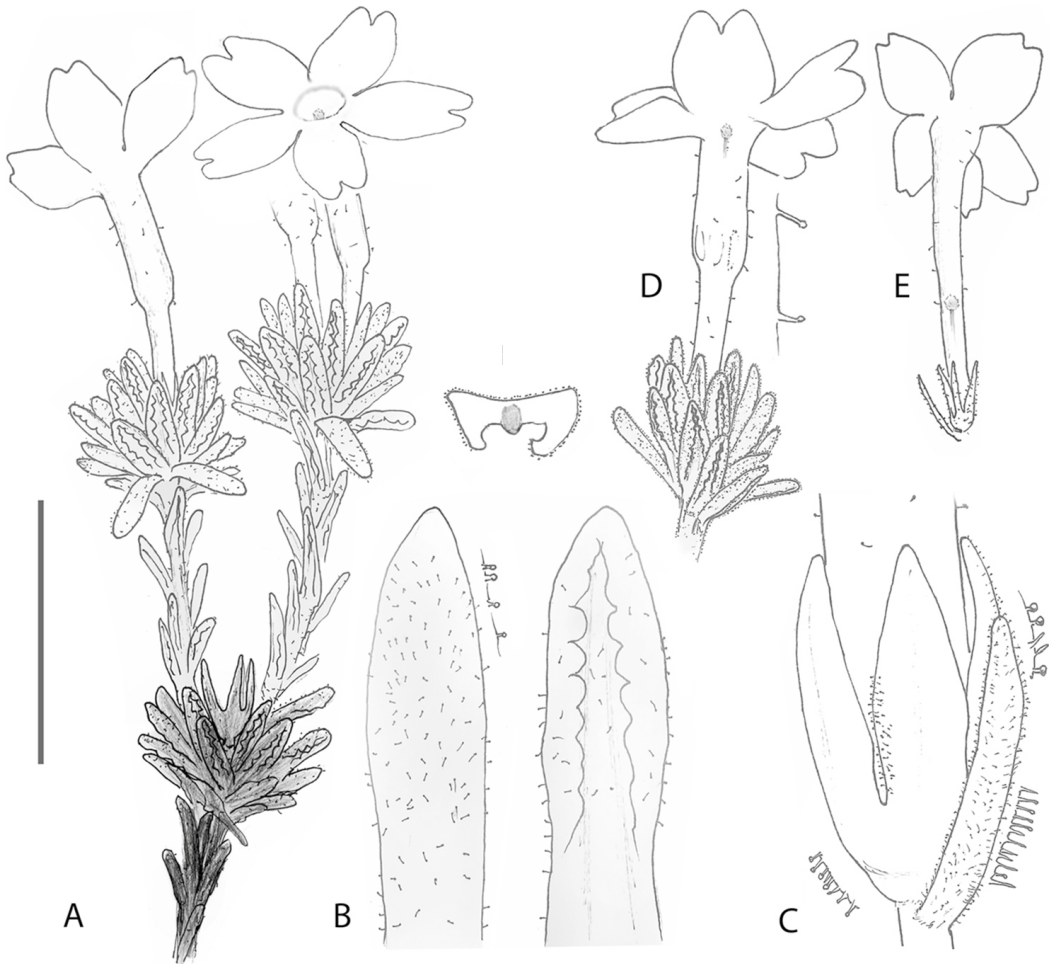


Figure 1. *Dionysia jamzadiae* Lidén, M. Irvine, Alvé & Mehregan, sp. nov. A, Habit; B, leaves, adaxial view (left), abaxial view (right), and cross-section (above); C, calyx with bract; D, longistylous flower; E, brevistylous flower. Hairs are drawn adjacent to their position. Scale bars: A, D and E, 10 mm; B and C, 2.5 mm; hairs, 1 mm. Drawn from the type specimen by M. Lidén.

Altitudinal range. 2850–3050 m.

Ecology. In crevices of limestone cliffs facing north, east and west, mostly in apparently dry situations but sometimes where water was seen oozing from the cliff.

Etymology. The species is named in honour of Ziba Jamzad, monographer of Iranian *Dionysia* and head of the botany research division at the Research Institute of Forests and Rangelands, Tehran. She is also editor of the *Iranian Journal of Botany*.

Phenology. Flowering in April (and presumably in May).

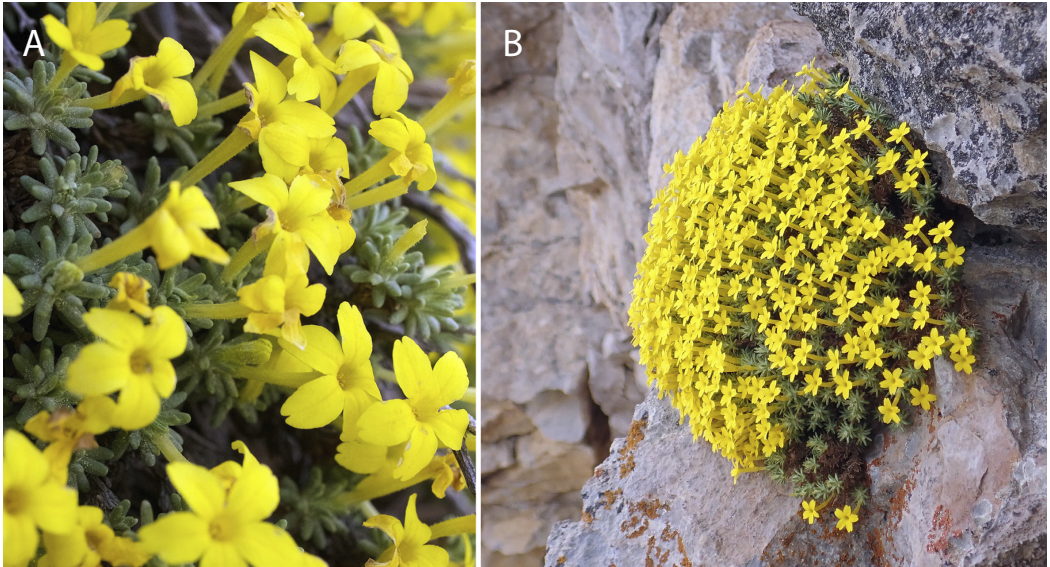


Figure 2. *Dionysia jamzadiae* Lidén, M.Irvine, Alvé & Mehregan, sp. nov. Brevistylous (A) and longistylous (B) plants in the type locality. Photograph: M. Lidén.

Distribution. Known from two localities WSW of Kuh-e-Khataban, in a parallel (but lower and more disrupted) mountain chain. In the type locality it was fairly abundant, with several hundred individuals. In the second locality we found it in three spots, but with far fewer plants (**Figure 3**).

Provisional IUCN category. The restricted known distribution (extent of occurrence, < 100 km²; area of occupancy, < 10 km²), the few localities known, and the number of known individuals possibly < 1000, suggest the category Vulnerable following IUCN (2012). We see no current threats, however, save for climate change and habitat destruction in the immediate vicinity of the quarry, and we acknowledge that there are several cliffs between the two known localities where our new species might be expected to occur. We therefore list *Dionysia jamzadiae* as LC (Least Concern).

Additional specimens and observations. IRAN. Fars: close to type locality (30°12'06"N, 53°47'02"E), 2900 m, N-facing limestone cliffs, 21 iv 2018, Z-MAIL 10B (IAUH!, UPS!); Kuh-e-Qal'eh-ye-Şefr 'Ali (30°21'45"N, 53°33'20"E), 3000 m, E-facing limestone cliffs near limestone quarry, 22 iv 2018, Z-MAIL 12 (IAUH!, UPS!); (30°22'00"N, 53°32'29"E), NE-facing, 3022 m (photograph); (30°21'54"N, 53°33'33"E), isolated small cliff, W-facing, 2930 m, growing together with a few individuals of *Dionysia esfandarii* Wendelbo, 22 iv 2018, Z-MAIL 12B (UPS!).

Dionysia jamzadiae is similar to *D. oreodoxa*, which differs in its densely non-glandular pubescent corolla with entire lobes. *Dionysia archibaldii*, although habitually similar, differs in, for example, its glabrous corolla with violet limb. *Dionysia jamzadiae* could possibly be

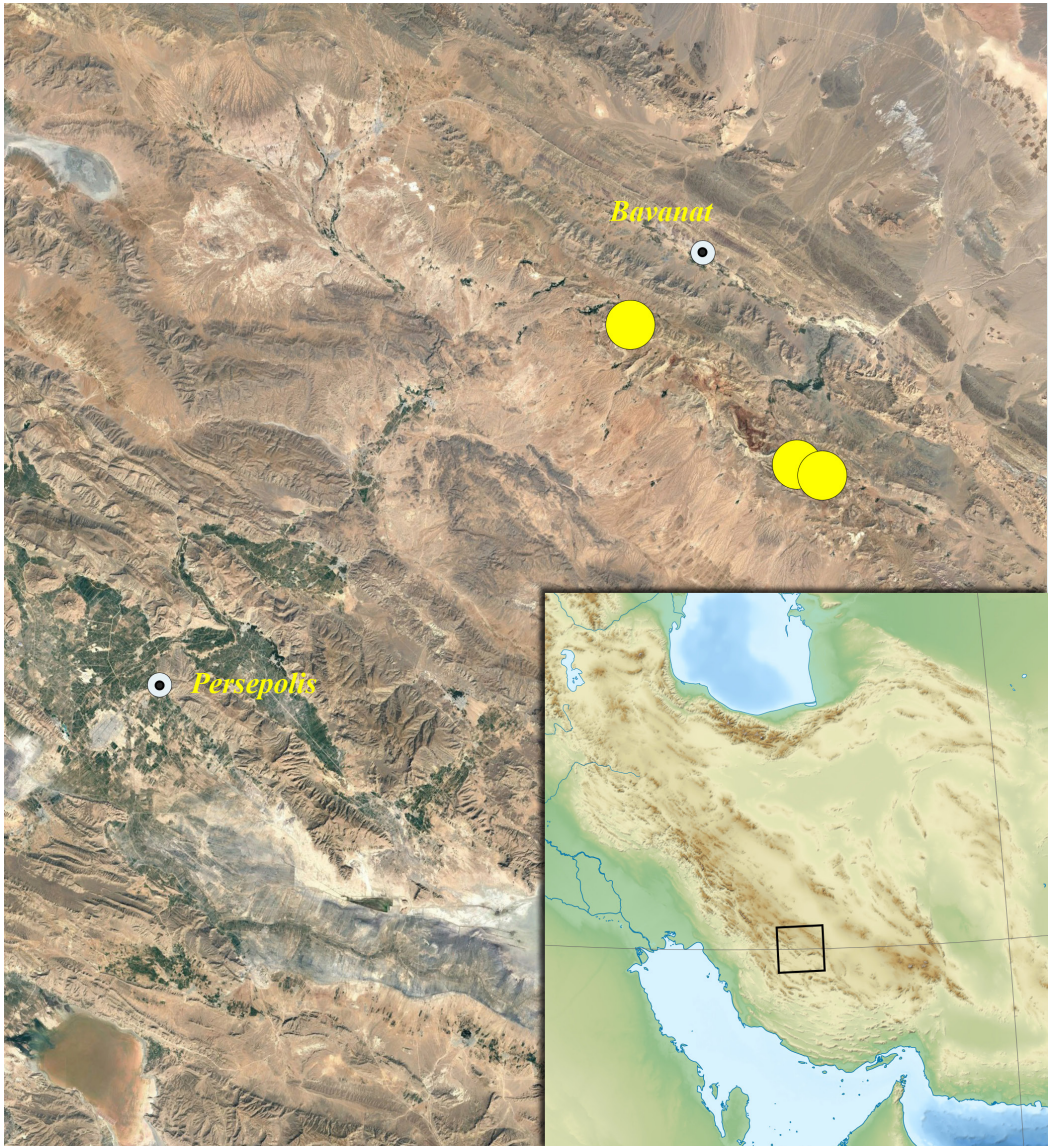


Figure 3. Map of Iran, showing the known distribution of *Dionysia jamzadiae*.

confused with the widespread and variable *D. revoluta*, but that species has larger leaves with at least some long non-glandular hairs, many-seeded capsules (30–70 versus 3–6), small angular seeds, and usually less dense habit.

In January 2020, three seeds germinated in Göteborg Botanic Garden. The first few branches are decumbent and slender with broader leaves. Along these branches numerous condensed axillary shoots are produced throughout (Figure 4), eventually transforming the habit into a



Figure 4. *Dionysia jamzadiae*, 1-year-old plant cultivated at Göteborg Botanic Garden from seeds of Z-MAIL 12. Note the presence of early long shoots. Photograph: M. Lidén.

cushion. This early growth behaviour is similar to that of other species of sect. *Dionysiopsis*, such as *D. archibaldii*, while being quite different from what we see in sect. *Dionysia*.

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