

ROSA FREITAGII ZIEL. (ROSACEAE), A NEW RECORD FOR THE FLORA OF IRAN

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Rosa freitagii Ziel. is reported as a new species for the flora of Iran from South Khorassan province. This species is morphologically compared with its closely related species, *Rosa moschata* Herrm., previously recorded for Iran. Illustrations, distribution map and notes on biogeography, conservation status and habitats of *R. freitagii* are provided. Furthermore, previous reports concerning the peresence of *Rosa webbiana* Wall. in Iran and *R. boissieri* Crép. in Khorassan will be discussed.

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Key words: *Rosa* sect. *Synstylae*; new record; Khorassan; Iran

گونه *Rosa freitagii* گزارش جدیدی از تیره گل سرخیان برای فلور ایران

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Rosa freitagii Ziel. به عنوان گونه جدیدی برای فلور ایران از استان خراسان جنوبی معرفی می شود. این گونه از نظر ریخت شناسی با نزدیک ترین گونه خویشاوند خود یعنی *Rosa moschata* Herrm. که قبلاً از ایران گزارش شده، مورد مقایسه قرار می گیرد. تصاویر، نقشه پراکندگی و اطلاعاتی درباره جغرافیای زیستی، وضعیت حفاظتی و زیستگاه آن ارائه می گردد. همچنین گزارش های قبلی مبنی بر حضور گونه *Rosa webbiana* Wall. در ایران و همچنین حضور گونه *R. boissieri* Crép. در خراسان مورد بحث قرار می گیرد

INTRODUCTION

Rosa L. with ca. 190 shrubby species (Bruneau et al. 2007) is one of the most important genera in the subfamily Rosoideae, family Rosaceae. Species of this genus are distributed throughout the temperate and subtropical regions of the northern hemisphere such as Asia, north of Africa, North America and Europe. Asia is the center of genetic diversity of this genus (Kalkman 2004). The taxonomy of *Rosa* is complicated because of its cultivation history, polyploidy, apomixis and hybridization. The genus has been divided into four subgenera *Rosa*, *Hulthemia* (Dumort.) Focke, *Platyrhodon* (Hurst) Rehder, and *Hesperhodos* Cockerell. Subgenus *Rosa* comprises about 95% of all species and is subdivided into ten sections (Wissemann and Ritz 2005). Zielinski (1982) recorded 20 *Rosa*

species from the Flora Iranica area and classified them into two subgenera: *Hulthemia*, a monotypic subgenus, and *Rosa*. The latter subgenus comprises five sections in the area including *Pimpinellifoliae* (DC.) Ser., *Cinnamomeae* (DC.) Ser., *Caninae* (DC.) Ser., *Rosa* and *Synstylae* DC. Totally, 15 species and 7 hybrids of roses have been reported for the flora of Iran (Zielinski 1982; Khatamsaz 1992; Koobaz et al. 2011). In this paper we report an additional *Rosa* species (sect. *Synstylae*) for the flora of Iran. This work is based on a revision of the herbarium specimens and also newly collected materials from the east of Iran.

MATERIALS AND METHODS

Herbarium specimens of the genus *Rosa*, collected from Khorassan (FUMH and TARI) were examined

using relevant literatures (Komarov 1971; Zielinski 1982; Khatamsaz 1992; Mozaffarian 2004). Some fresh materials for doubtful specimens were collected from eastern parts of Iran. The distribution map of the species has been provided using geo-referenced

distribution data from Flora Iranica (Zielinski 1982) and FUMH in DIVA-GIS 7.3 software. The threat status of the species has been determined based on IUCN Red List categories and criteria (IUCN 2010).

Table 1. Comparison of morphological characters in *Rosa freitagii* Ziel. and *R. moschata* Herrm.

	<i>R. freitagii</i>	<i>R. moschata</i>
Plant height	2.5-3(-4) m	up to 10(-12) m
Leaves	evergreen	deciduous
Leaflet number	3-5	(5)-7
Leaflet shape	semi-orbicular or broad obovate	broad elliptic or ovate, rarely obovate
Leaflet length	20(-27) mm	30(-40) mm
Leaflet apex	obtuse, rounded or truncate	acute or semi-acuminate
Prickle length	8-10(-12) mm	5(-7) mm
Flower diameter	30-40 mm	40-60(-80) mm
Hypanthium	glabrous or slightly glandulose	pubescent or glandulose

RESULTS AND DISCUSSION

New record

Rosa freitagii Ziel., Fl. Iranica 152: 26 (1982), fig. 1.

Type: Afghanistan, Trin, 1400-1700m, Rechingher 35035 W.

Climbing shrub, evergreen, up to 3 m high. Branches glabrous. Prickles numerous, pale green, 5(-8) mm long, straight or rarely curved, quite unevenly distributed. Leaves 3- or 5-foliate. Leaflets 10(-22) × 12(-25) mm, semi-circular or broad obovate, leaf apex obtuse or rounded, leaf base broad cuneate or rounded, upper surface often bright and glabrous. Stipules narrow, auricles small and divergent. Inflorescence (1-) 3 (-5)-flowered. Flowers 30-35 mm in diameter; petals white (yellowish in dried material). Pedicels 10 (-20) mm long. Sepals entire, constricted at base, terminal appendix setiform, deflexed after flowering, deciduous after fruit maturation. Bracts small, narrowly lanceolate, early deciduous. Styles long, arranged in a long column, glabrous or pilose. Fruits up to 8 (-10) mm in diameter, spherical, smooth, at maturity orange-red.

Examined specimens: South Khorassan: E Qayen, Zir-Kuh, the southern Mts. of Mohammad-Abad, 1151 m, Arjmandi & Sharghi 45147 [FUMH, duplicate in TARI (in flower and fruit)]; E Qayen, Zir-Kuh, Mohammad-Abad, 1200 m, Raafei & Hosseinzadeh 30860 [FUMH] (in flower)]; E Qayen, Zir-Kuh, at the beginning of Dahane-ye Ahangaran, 1339 m, Joharchi & Zangoeei 36263 [FUMH (in flower)].

Rosa freitagii belongs to section *Synstylae*. Members of this section in Flora Iranica area have white flowers with irregularly distributed, more or less uniform spines, and deciduous sepals after flowering. They differ from other *Rosa* species by their connate columnar styles (Zielinski 1982). Among four species

of sect. *Synstylae* in Flora Iranica area, only *R. moschata* Herrm. was previously reported from Iranian territories mainly as cultivated or naturalized plants. *Rosa freitagii* obviously differs from *R. moschata* by round shape of its leaflets and also by 3-5 leaflet number and some other morphological characters (Zielinski 1982), table 1. Although 5-foliate leaves recorded as rare in the original description, they frequently occur on older stem branches and 3-foliate leaves are restricted to younger branches in eastern Iranian specimens.

Fatemi et al. (2008 & 2012) during their taxonomic studies on *Rosa* species in Iran, misidentified the FUMH specimens of *R. freitagii* (No. 36263, and also 30860 in sheet label) as *R. webbiana* Wall. Therefore, based on new identification, the anatomical and palynological data in their works belong to *R. freitagii* not *R. webbiana*. Moreover, Khatamsaz (1988) reported *R. webbiana* as a new record for Iran based on a specimen from Khorassan (ca. 25 km SW Darreh-Gaz, Tandooreh National Park, Chehel-Mehr, 1200 m, 29.05.1984, Assadi & Maassoumi 50764 (TARI). Khatamsaz (1992) also recorded *R. boissieri* Crép. from Khorassan based on a specimen from the same location (50779 TARI). We examined both specimens carefully. They are definitely morphological variants of *R. canina* L., a variable species throughout its distribution range from Europe, Mediterranean Region to the western Asia. Biogeographically, *R. webbiana* is restricted to higher mountainous areas of Afghanistan, the Middle Asia and Himalaya in Pakistan and SW China (Zielinski 1982; Zhengyi et al. 2004). The diagnostic morphological characters of *R. webbiana* are the erect (not curved) thorns, entire (not pinnate) sepals which are not seen in 50764-TARI. Furthermore, *R. boissieri* has 7-9 leaflets which are 40-50 mm long,



Fig. 1. *Rosa freitagii* Ziel. A, Herbarium specimen (45147, FUMH). B, close-up view of herbarium specimen (30860 FUMH) showing the flower, columnar style, prickles and round shape of the leaflets; C, Early fruiting stage in natural habitat (45147 FUMH) showing the entire sepals and columnar shape of styles.

with broad lobes in its sepals, flowers 50-60 mm in diameter, and broad stipules, which are not seen in the 50779TARI specimen. Therefore, *R. webbiana* has to be deleted from the list of flora of Iran and *R. boissieri* from the flora of Khorassan.

Phytogeography and ecology: *Rosa freitagii* was originally known as an endemic species from south-central parts of Afghanistan (Zielinski 1982). The newly recorded specimens from South Khorassan province extend the distribution range of this species

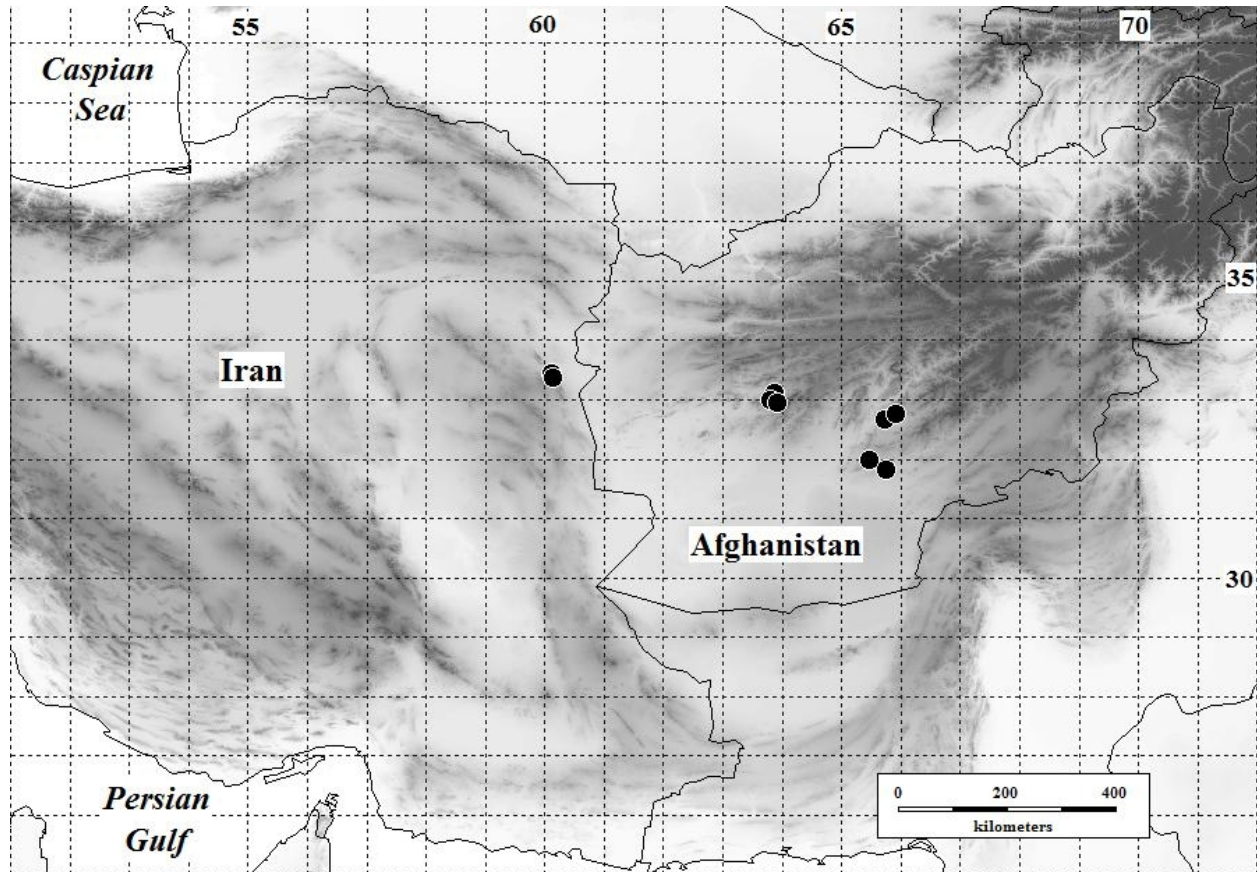


Fig. 2. Distribution map of *Rosa freitagii* Ziel. based on the distribution data in Flora Iranica and herbarium records in FUMH.

more westward to the east of Iran (fig. 2). According to the distribution data in Flora Iranica, this species grows in middle to higher altitude (1400-2800m) of Afghanistan. Based on our specimens, *R. freitagii* also occurs on middle altitudes (1100-1350 m) in the east of Iran where it grows between the rock cracks in deep canyons. The main ecological trait of this species is having persistent and evergreen leaves. This is a unique character among *Rosa* species in the Flora Iranica area.

The extent of occurrence and area of occupancy of this species is slightly more than the thresholds defined by IUCN (2010) Red List criteria, therefore, it is not evaluated as a globally threatened species. However, *R. freitagii* is evaluated as Near Threatened (NT) because of the number of locations and its very peculiar habitats. So, it is likely to qualify for a threatened

category in the near future. Regionally, the species has a very restricted distribution and populations in Iranian territories and it is considered as a Critically Endangered (CR) plant in the country. Propagation and cultivation of this *Rosa* species in botanical gardens and green space is highly recommended.

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