NEW SPECIES AND NEW RECORDS OF THE GENUS SALIX (SALICACEAE) FROM IRAN

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Received: 15.12.2007. Accepted for publication: 27.5.2008.

Maassoumi, A. A., Moeeni, F. & Rahiminejad, M. R. 2008 06 30: New species and new records of the genus *Salix* (*Salicaceae*) from Iran.. - *Iran. J. Bot. 14 (1): 1-6.* Tehran.

Among the rich materials of the genus *Salix* collected from different localities of Iran and also based on the identification of unknown herbarium specimens in TARI, two new species namely *Salix baladehensis* and *S. issatissensis* are described. *S. baladehensis* is close to *S. aegyptiaca* but with shorter male catkin up to 2 cm and sparsely hairy bracts. *S. issatissensis* is an affinity of *S. excelsa* formerly described as *S. excelsa* var, *rodonii*. *S. denticulata* and *S. fedtschenkoi* are respectively recorded from Khorassan and Semnan provinces as new to Iran.

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Key words. Taxonomy, *Salix*, new species, new records, Iran.

معرفی دوگونه جدید و گزارش دوگونه جدید بید از ایران

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در میان نمونه‌های جمع‌آوری شده جنس بید از نقاط مختلف و بر اساس نامگذاری نمونه‌های ناشناخته، دو گونه جدید به نامهای *Salix baladehensis* Maassoumi, Moeeni & Rahiminejad و *S. issatissensis* Maassoumi, Moeeni & Rahiminejad شرح داده می‌شوند. همچنین دو گونه *S. denticulata* Andersson و *S. fedtschenkoi* Goerz برای اولین بار از ایران معرفی می‌گردند.

Introduction

A revision of the genus *Salix* is the main goal to prepare a treatment for Flora of Iran in the Persian language. For this purpose a part of the collected materials cultivated in Karaj experimental station was identified by accurately paying attention to variation and morphological plasticity and by using the available references. In some cases the first author attempted to collect the fresh materials from several natural habitats to check the variation. New collections with reproductive organs, vegetative parts, and in autumn with the buds have been taken from male and female trees. In this article a part of the results with presenting some findings is reported.

New species

Salix baladehensis Maassoumi, Moeeni & Rahiminejad, **sp. nov.** (Fig. 1)

Differt ab *S. aegyptiaca* L. masculis amentis brevioribus, ca. 1.5-2 cm longis et 7-9 mm latis (nec 20-45 mm longis et 13-17 mm latis); bracteis sparse pilosis, pilis a bractea ca. 1.5 mm excedentibus (nec 1.5-3 mm excedentibus).

Tall shrub or small tree c. 3-3.5 m high. Twigs greenish, yellow, rarely purplish, densely covered with short white appressed to subappressed hairs c. 0.4-0.6 mm long, later glabrescent; flowering buds ovoid, c. 7 mm long, shortly acuminate, densely covered with short subappressed hairs, nearly attached to the stem. Decorticated wood predominantly with numerous scattered longitudinal long striae and edges. Leaves discolor, elliptic-lanceolate, broadest part at the upper half, c. 4-9 cm long and 2-2.5 cm wide, acute, abruptly tapering into the apex, in young stage dentate at the upper half, in older stages sinuate-undulate at the margin, usually entire towards the base, at the upper side covered with short appressed hairs, soon glabrescent in fall, in lower side densely covered with short and long spreading hairs, on the midrib more densely covered with short and long spreading hairs,

Fig. 1. *Salix baladehensis*, male,(holotypus).

secondary venation prominent, densely covered with a double indumentum of different size, between the secondary venation densely covered with short and long tangled spreading hairs; petiole 5-15. mm long, in young stage sparsely pilose, later densely covered with short and long spreading hairs. Stipules oblique lanceolate to narrow oblique, reniform, densely tomentose, margin glandulose-dentate, caducous. Catkins appearing with the leaves, cylindrical. Bracts dark black, ovate or obovate, retuse to emarginate at apex, c. 2 mm long, sparsely covered with long tangled hairs, upper ones rarely overtopping the apex by 1.5 mm, at the inner side densely covered with long hairs, at the margin ciliate; male catkin shortly cylindrical to elliptic, c. 1.5-2 cm long and 7-9 mm wide, erect, close to the stem. Stamens 2; filaments distinct, c. 4 mm long, at the base sparsely pilose; anthers c. 0.6 mm long; female catkin long, cylindric, erect, horizontal or shortly curved, c. 4-9 cm long, at the base shortly pedunculate; peduncle (phylloclade) c. 5 mm long, densely covered with long appressed hairs; cataphyll glabrous on the upper side and densely covered with long silky appressed hairs on the lower side. Ovary tomentose; capsule c. 7 mm long, conical, stipitate at the base; stipe c. 0.6 mm long. Style green, c. 0.2 mm long, densely pilose, extended to the outer side of the stigma; stigma brown, spathulate, bifid, c. 0.4 mm long, pilose on the outer side.

Typus. Mazandaran: c. 12 km on the road from Pol-e Zangouleh to Baladeh, 2359 m, 27.05.2007, Maassoumi 90547 (male) (holotypus TARI); ibidem, Maassoumi 90543 (female) (TARI). –Paratypus. Mazandaran: c. 16 km on the road from Haraz road to Lasem village, 2470 m, 29.05.2007, Maassoumi 90590 (male); 90594, 90592; c. 33 km on the road from Pol-e Zangouleh to Baladeh, 2340 m, 27.05.2007, Maassoumi 90557; c. 12 km on the road from Pol-e Zangouleh to Baladeh, 2350 m, 27. 05. 2007, Maassoumi 90546.

Salix issatissensis Maassoumi, Moeeni & Rahiminejad, **sp. nov.**
(Fig. 2)
= *Salix excelsa* Gmelin var. *rodonii* A. Skvortsov, Nov. Syst. Pl. Vasc.: 97 (1965).
Affinis ab *S. excelsa* Gmelin sed differt foliis obovatis, basi leviter cordatis (nec anguste lanceolatis, basi attenuatis), petiolis longis et curvatis vel deflexis (nec erectis), stipulis semicordatis (nec lanceolatis), gemmis minoribus, masculis amentis longioribus et latiobribus.
Typus. Kuhgilouyeh and Boirahmad: Yasuj, Abshar, 1860 m, 30. 06.1993, V. Mozaffarian 72166 (holotypus TARI). –*Paratypus.* Fars: c. 20 km from Abadeh to Shiraz, 2100 m, Maassoumi & Safavi 89627. -Kuhgilouyeh and Boirahmad: Yasuj, Kakan, 2250, Hemati & Safavi 83396; Sisakht, Kougol and Kokhedan, 2000 m, Mozaffarian 74438; Yasuj, Abshar-e Maregoon, 2000-2100 m, Jamzad et al. 69529 (DNA extracted). -Kerman: c. 65 km S. W. Of Kerman, around Sirch village, 1650 m, Hemati & Safavi 85898; 20 km on the Mahan to Shahdad road, Sirch village, 1667 m, Maassoumi & Savafi 89601. -Yazd: Darreh Abshar, SE. Shirkuh, 2100 m, Edmondson & Miller 1516; Nadushan, between Sadrabad and Hematabad, 2400-2500 m, Mozaffarian 77771.
Notes. Salix excelsa var. *rodonii* described from Afghanistan based on sterile materials by Skvortsov (Skvortsov, 1965). The holotype specimen has not been investigated, but authentic specimens from Afghanistan were carefully checked by the first author in the herbarium of Munich . These materials with oblong to elliptic leaves are similar to those of typical *S. excelsa* Gmelin which is widely distributed in high altitude of Elburz range in the tree line area and in open woodlands at the high altitude of Caspian forest. This species is traditionally well known in this area as black willow. In Flora Iranica (Skvortsov 1969), the distribution area of the *S. excelsa var rodonii* extends to the central part of Iran, around Fars area, Sepidan and Yasuj, where the species shows big differences from those of Elburz and Afghanistan. Not only the herbarium materials but the living trees in flowering condition and in vegetation periods were carefully checked. *Salix issatissensis* with broad and nearly cordate leaves with long deflexed petioles and long and thick catkins differs fundamentally from those of authentic specimens of typical *S. excelsa* which grows in the Caspian area. Recently, molecular analysis shows that this species nested so far from *S. excelsa* clade (ined.). For this reason we have decided to segregate this variety as a separate and distinct species. The species is named after the old name of Yazd city.

New records

Salix denticulata Andersson in Kung Svenska Vet-Akad. Handl.: 481(1851); A. K. Skvortsov in Rechinger f., Fl. Iranica 65: 35 (1969). (Fig. 3)

Close to *S. excelsa* Gmelin but it is distinguishable by the ovate leaves which are abruptly attenuate towards the apex and by apically dentate bracts.
Specimens seen. Khorassan: Boujnoord, Badranlou toward Raz and Jargalan, 1200 m, Maassoumi, Safavi and Sohrabi 83380; 70 km on the road from Neyshabur to Chaploo, 1830 m, Maassoumi, Safavi & Sohrabi 83299; Semnan: Parvar to Hikuh, Shali, 1800 m, Mozaffarian 72649.
Gen. dist. According to Fl. Iranica, the distribution pattern of this species is East Afghanistan, Pakistan, Kashmir and Nepal.

Salix fedtschenkoi Goerz, Salic. As. 1: 21, 25 (1931); Feddes Repert 32: 121(1933); Fl. SSSR 5: 118 (1936). (Fig. 4).

A species with long, and capsules laxly dispersed along the female catkin, leaving the axis visible.
Gen. dist. Afghanistan, Pakistan, Tadzhikistan and Iran.
Specimens seen. Khorassan: Neishabur, Bezghan, Dahaneh Heidari, protected area, 1400 m, Maassoumi, Safavi & Sohrabi 83292; Khorassan: 2 km after Bajguiran diviation, Hamzee (s.n).

References

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Fig. 2. *Salix baladehensis*, female.

Fig. 3. *Salix fedtschenkoi***.**

Fig. 4. *Salix denticulata*.