

A REVISION OF THE GENERA PHRAGMITES AND SCHISMUS (POACEAE) IN IRAN

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The genera *Phragmites* and *Schismus* were morphologically studied for the ongoing project of the Flora of Iran. *Phragmites karka* (Arundineae) is reported as a rare species from NE (Khorassan province) and SE (Kerman province) Iran again. An identification key to the species of the genus and a complete description of *Ph. karka* is given. Studies on the genus *Schismus* showed that the formerly record of *Schismus barbatus* from Iran may not be correct and all collected specimens of *Schismus* species from Iran belong to *Schismus arabicus*. This result is based on the examination of diagnostic characters of both species and comparing Iranian materials with the specimens of *Schismus barbatus* from N. Africa.

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Key words. *Phragmites*, *Schismus*, Taxonomy, morphology, Iran.

آرایه شناسی جنس‌های *Phragmites* و *Schismus* از تیره گندمیان در ایران

منصوره خداشناس، مربی پژوهش مرکز تحقیقات کشاورزی و منابع طبیعی استان کرمان.

قبیله های *Arundineae* و *Danthonieae* جهت نگارش فلور ایران مورد مطالعه و بررسی قرار گرفت. در بررسی جنس *Phragmites* مشخص شد که این جنس در ایران دو گونه دارد. محدوده انتشار *Phragmites karka* علاوه بر منطقه ای محدود از جنوب شرق (دشت لوت- بلوچستان) که اولین بار توسط لئونارد گزارش شده است، مناطقی از جنوب استان کرمان (بم) و شمال شرق ایران (خراسان) را نیز شامل می‌شود. با توجه به محدود بودن دامنه انتشار گونه، این گونه به عنوان گونه ای نادر برای دومین بار از ایران گزارش می‌شود. شرح این گیاه در فلور ایرانیکا بسیار کوتاه است بنابراین شرح کامل آن به همراه کلید شناسایی جنس در ایران و مناطق پراکنش آن ارائه می‌گردد. همچنین بررسی جنس *Schismus* در ایران نشان داد که با توجه به طول پوشینک نسبت به شکافهای پوشینه (صفت کلیدی جدا کننده دو گونه) و مقایسه نمونه‌ها با نمونه‌ای از *Schismus barbatus* متعلق به شمال آفریقا صفات مرفولوژیکی نمونه‌های موجود در ایران با گونه *Schismus arabicus* مطابقت دارند و حضور گونه *Schismus barbatus* در ایران تایید نمی‌گردد.

INTRODUCTION

During the course of preparation of the treatment of Flora of Iran (Assadi, 1989), some tribes of the Poaceae family including the genera *Phragmites* and *Schismus* were taxonomically revised.

The reed genus *Phragmites* is a small genus containing four species. It is found in wet places and along flowing waters. *Phragmites* has two species in Iran including *Ph. australis* (Cav.) Trin ex Steud and *Ph. karka* (Retz.) Trin ex Steud. *Phragmites australis* is the commonest species, occurring on all continents except Antarctica. *Phragmites karka* occurring in tropical Africa and the Asian temperate and tropical areas. It is a very robust species found in warm parts of the Old World, occurring beside rivers and swamp. The

type specimen of *Ph. karka* is from India and Bor (1970) mentioned it from Pakistan in Flora Iranica area (Bor, 1970). Then Leonard (1981) reported it from Baluchestan, Dasht-e Lut, with no description. During the study of *Phragmites* in Iran, the author collected *Ph. karka* from East of Kerman province (Bam) and NE of Khorassan province.

Bor (1970) introduced 2 species of the genus *Schismus* in Iran, including *Sch. arabicus* Nees and *Sch. barbatus* (L.) Thell. Studies on a large amount of herbarium specimens and field observations showed only a single species occurring in Iran.

The aim of this paper is to give a short revision of the genera *Phragmites* and *Schismus* in Iran.

MATERIALS AND METHODS

The study has been carried out using materials deposited in Cental Herrbarium of Iran (TARI), herbarium of Ferdowsi University of Mashhad (FUMH). Some materials were collected from natural habitats by the author. Different Floras were used for the identification of materials.

RESULTS AND DISCUSSION**Key to *Phragmites* species in Iran**

- 1- Upper glumes 5.5-7.5 mm long. Leaf blades smooth and glabrous; the tips filiform and flexuous. Rachilla hairs 7.5-11 mm long **1. *Ph. australis***
 - Upper glumes 4.5-5.5 mm long. Leaf blades scabrid beneath (at least in upper half); the tip attenuate, stiff. Rachilla hairs 5.5- 7.5 mm long **2. *Ph. karka***

1. *Ph. australis* (Cav.) Trin ex Steud, Nomencl. Bot., ed.2. 2: 324 (1841).

Syn.: *Arundo australis* Cav., Anal. Hist. Nat. 1: 100 (1799); *Phragmites communis* Trin., Fund. Agrost. 134 (1820).

Perennial reed, with creeping rhizomes. Culms erect. Leaf-blades 25-50 cm long and 5-25 mm wide, glabrous, smooth beneath, the tips filiform and flexuous; sheath glabrous. Panicle 25-45 cm long. Spikelets 9-15 mm long, 4-8 flowered; the rachilla hairs 7-11 mm long, copious, silky; lower glume 3.5-6.5 mm long, lanceolate, 3-5 nerved; upper glume, 5.5-7.5 (8) mm long, lanceolate, sharply acute. Lowest lemma sharp-pointed, 8.5-12 mm long, glabrous. Palea 2.5-3 mm long, 2 keeled; palea keels minutely scabrous. Lodicules 2. Anthers 3 (2 in sterile floret). Ovary glabrous.

Distribution. Temperate regions of both hemispheres in the Old World and the New World.

The species based on the leaf character may be divided into two varieties.

1. Leaf blade flat up to 30 mm wide, smooth on the surface; apex attenuate, filiform

Ph. australis* var. *australis

- Leaf blade 15 mm wide, convolute, minutely scabrous on the surface; rough abaxially; apex attenuate, hardened ***Ph. australis* var. *stenophylla***

Var. *australis*

Selected specimens. **Gorgan:** 60 km N of Gonbad, at the margin of Atrak river, 40 m, Assadi 66381. - **Azerbaijan:** S. slopes of Bozghush mountain chains, Blukan village, 2000 m, Mozaffarian & Mohammadi 37408. - **Hamadan:** 70 km from Bijar to Hamadan, 1800 m, Assadi 61026. - **Kerman:** Between Hamune Jazmurian and Jiroft, 500 m, Assadi and Mozaffarian

25733; Kuhpayeh, 1900 m, Ebrahimi and Khodashenas 6640. - **Baluchestan:** 35 km West of Nosrat Abad, 700 m, Ahmadi 6641.

Var. ***stenophylla*** (Boiss.) Bor, Fl. Iranica, no 70: 353 (1970).

Syn.: *Ph. Communis* Trin. var. *stenophylla* Boiss., Fl. Orientalis 5: 563 (1994).

Selected specimens. **Azerbaijan:** 120 km S. of Rasht to Gazvin, Molla-Ali river Bank, 650-700 m, Zehzad & al. 67144. - **Semnan:** Turan Protected area, Ahamadabad village, Kale Shur, 700 m, Assadi 72564. - **Kerman:** Bam, 740 m, Ahmadi 6641.

2. *Ph. karka* (Retz.) Trin. ex Steud., Nomencl. Bot. ed. 2, 2 : 324 (1841).

Syn.: *Arundo karka* Retz., Obs. Bot. 4: 21 (1786).

Perennial reed, with creeping rhizomes. Culms erect. Leaf blades 10-30 cm long and 1-1.5 cm wide, glabrous, rough to the touch beneath (at least in the upper half), the tips attenuate and stiff (occasionally almost smooth or with filiform tips); sheath glabrous; ligule ciliate, membranous. Panicle open, oblong, 15-30 cm long. Spikelets comprising 1 basal sterile floret and 4-6 fertile florets, with diminished florets at the apex, 10-12 mm long, breaking up at maturity, disarticulating below each fertile floret. Callus elongated, 0.5-1 mm long, bearded, obtuse. Rachilla hairs 5-7 mm long, rather sparse. Glumes persistent, shorter than the florets, similar to the fertile lemma in texture; lower glume lanceolate, 3.5-4.5 mm long, membranous, acute, 3-5 veined; middle vein scabrous; upper glume elliptic-lanceolate, membranous, acute, 4.5-5.5 mm long,, 3-5 -veined. Lowest lemma very narrowly elliptic, 7-9.5 mm long, glabrous, with a long acute tip. Palea 2.5-2.8 mm long, 2 keeled; keels minutely scabrous, obtuse. Lodicules 2. Anthers 3 (2 in sterile floret). Ovary glabrous.

Distribution. Tropical Africa, Tropical and temperate Asia and Australia.

Specimens seen. Khorassan, 24 km East of Sabzavar, Kaleh Shoor, 1000 m, Filekesh and Eftekhari 167. - Kerman: Bam, Korook village, Roodab Zamin, 740 m, Khodashenas and Ahmadi 6641 (Agriculture & Natural Resources Research Center of Kerman herbarium).

Studies on the habitat of the species showed that it has a limited distribution and therefore is known as a rare species in Iran.

Schismus arabicus Nees, Fl. Afr. Austr. 1: 422 (1841).

Syn.: *Schismus barbatus* sensu Bor in Fl. Iranica non (L.) Thell.

Tufted annual. Culms 2-15 cm high. Leaves mostly basal, tufted, glabrous; blades, filiform; sheath glabrous, often with a few long hairs near the mouth; ligule shortly hairy. Panicle contracted, 15-30 mm long; spikelets laterally compressed 5.5-8.5 mm long, shortly pedicellate, 4-7 flowered; rachilla disarticulation above the glumes and between the florets. Glumes subequal, nearly as long as spikelet, lanceolate, acuminate, at the margins white membranous; the lower 5-7-nerved, 3.5-7 mm long; the upper 5-nerved, 4.5-7 mm long; lowest lemma 9-nerved, 2.5-4 mm long, broadly elliptic, deeply 2-lobed; the lobes narrowly triangular, acute; apical notch 1-1.5 mm deep. Palea hyaline, spatulate, with veins near the margins, broad, obtuse or acute, shorter than lemma, reaching the middle of the lobes (0.7 lemma's lobes). Anthers 0.3-0.5 mm long. Ovary obovate. Ludicules 2, cunneate. Grain obovoid, 1 mm long.

Fl. & Fr. Per. February-May; up to July in the mountains.

Distribution. Mediterranean area from North Africa and South Europe eastwards through Arabia to Central Asia and Kashnir.

Specimens seen. **Gilan.** beside Ghezel Ozon river, 350 m, Assadi & Shahmohammady 60249.- **Isfahan,** Ghamishlo, 1900 m, Yousofi 1913; Natanz to Ardestan, near Emamzadeh Abyazan, 1380 m, Wendelbo & Foroughi 1470.- **Hormozgan,** 10 km from Hajiabad to Sirjan, 1100 m, Mozaffarian 52575. - **Fars:** 7 km Lar road, 900 m, Assadi & Sardabi 41688. -**Booshehr:** 63 km from Borazjan to Genaveh, 40 m, Runemark & Mozaffarian 27334. -**Khuzestan:** 80 km from Ahvaz to Andimeshk, 20 m, Roohi Pour 249, Telvari 242. -**Kerman:** Sirjan to Hajiabad, Khodashenas 6811, 6813; Bardsir to Sirjan, Chah Choghook 1800 m, Khodashenas 6812; Sirjan to Shiraz, Before Pasgah, 1900 m, Khodashenas & Goncheii 6814; South of Sirjan, Pabot 27926, 35 km Zarand, 1660 m, Poormirzaii 6815; Bam, Darzin 1400 m, Babakhanloo 22988, 1380 m, Foroughi 15894. -**Balouchestan,** 100 km from Zahedan to Nosrat abad, 1000 m, Assadi 22736. -**Semnan:** Touran protected area, 1120 m, Freitag & Mozzafarian 228450. -**Tehran:** Karaj to Shahdasht, 1160 m, Foroughi 12293; Karaj 1400 m, Sabeti 12298.- Ghom to Kashan, 860 m, Babakhanloo 17722.

Studies on *Schismus (Danthinieae)* specimens showed that the morphology of the lobes of the lemmas of the upper florets of a spikelet is highly variable, so

lowest floret in a spikelet should be examined to distinguish the species. (Brooks & Pyke 2000)

Schismus barbatus (Danthonueae) was originally described from Spain. It looks remarkably like *Sch. arabicus* that was originally described from Arabian region. In *Sch. barbatus* the lemmas (lower floret bract) are less deeply notched at the tip with the notch lobes being broadly pointed to rounded. The lemma is pilose (long hairy) on the lower area of the margins and back. Also, within the floret the palea (upper floret bract) is nearly as long as the lemma. In *Sch. arabicus*, within each floret the palea (upper floret bract) is shorter than the lemma and reaches to approximately the base of the apical notch.

Studying of Iranian *Schismus* species showed that in all specimens palea is obviously shorter than lemma and reaches to approximately the base of the apical notch or a little longer and never is equal, subequal or longer than lemma. Tips of lemma's lobes are narrowly triangular (not broadly triangular). *Sch. barbatus* specimens from N. Africa were studied and compared with the Iranian specimens. The characters of Iranian specimens do not fit to the characters of *Sch. barbatus*. Therefore, it seems record of *Sch. barbatus* from Iran is an erroneous.

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REFERENCES

- Assadi, M. 1989: Plan of the Flora of Iran. -Tehran.
 Bor, N. L. 1970: Phragmites in K. H. Rechinger Flora Iranica no, 70: 352-353. -Graz.
 Brooks, M. L. & D. A. Pyke 2000: Invasive plants and fire in the deserts of North America.
 Faruqi, S. A. & H. B. Quraish. 1979: Studies on Libyan grasses. V. Population variability and distribution of *Schismus arabicus* and *S. barbatus* in Libya. -Pakistan Journal of Botany 11 (2): 167-172.
 Feinbrun-Dothan, N. 1986: Flora Palestina, Part Four - Text. Israel Academy of Sciences and Humanities, Jerusalem, Israel. 465 pp.
 Leonard, J. 1981: Contribution a l'etude de la Flore et de la Vegetation des Deserts d'Iran, fas. 1. -Jardin botanique nationale de Belgique.