

***Kickxia iranica*, a new species from Iran**

Received: 01.07.2015 / Accepted: 22.11.2015

Farrokh Ghahremaninejad✉: Prof., Department of Plant Sciences, Faculty of Biological Sciences, Kharazmi University, Tehran 15719-14911, Iran (ghahremaninejad@khu.ac.ir)

Amin Zeraatkar: PhD Student, Plant Systematics, Department of Plant Sciences, Faculty of Biological Sciences, Kharazmi University, Tehran 15719-14911, Iran

Ehsan Hoseini: PhD Student, Plant Systematics, Department of Plant Sciences, Faculty of Biological Sciences, Kharazmi University, Tehran 15719-14911, Iran

Arezoo Ebrahimnia: MSc Graduate, Plant Systematics, Department of Plant Sciences, Faculty of Biological Sciences, Kharazmi University, Tehran 15719-14911, Iran

Abstract

A new species from Iran is described and illustrated here as *Kickxia iranica* (*Plantaginaceae*). *Kickxia iranica* is morphologically similar to *K. commutata*, a species native to Mediterranean region, however it can be distinguished from the latter by leaf shape, color of corolla, habit, stem branching and length of leaf, petiole, pedicel and corolla. Notes on its distribution, ecology and phenology are also presented.

Keywords: Endemic species, *Kickxia commutata*, oak forest, *Scrophulariaceae s.l.*, SW Asia, Zagros

***Kickxia iranica* گونه جدیدی از ایران**

دریافت: ۱۳۹۴/۴/۱۰ / پذیرش: ۱۳۹۴/۹/۱

فرخ قهرمانی نژاد✉: استاد گروه علوم گیاهی، دانشکده علوم زیستی، دانشگاه خوارزمی، تهران، ایران
(ghahremaninejad@khu.ac.ir)

امین زراعتکار: دانشجوی دکتری سیستماتیک گیاهی، گروه علوم گیاهی، دانشکده علوم زیستی، دانشگاه خوارزمی، تهران، ایران

احسان حسینی: دانشجوی دکتری سیستماتیک گیاهی، گروه علوم گیاهی، دانشکده علوم زیستی، دانشگاه خوارزمی، تهران، ایران

آرزو ابراهیم نیا: دانش‌آموخته کارشناسی ارشد سیستماتیک گیاهی، گروه علوم گیاهی، دانشکده علوم زیستی، دانشگاه خوارزمی، تهران، ایران

خلاصه

گونه‌ای جدید از ایران به نام *Kickxia iranica* Zeraatkar & F. Ghahrem. (تیره بارهنگیان) با ارایه تصاویر شرح داده می‌شود. این گونه از نظر ریختی به گونه *K. commutata* که بومی منطقه مدیترانه است شباهت دارد، اما به واسطه شکل برگ، رنگ جام، شکل رویشی، انشعاب ساقه و طول برگ و دم‌برگ و دمگل و جام متفاوت است.

واژه‌های کلیدی: آسیای جنوب غربی، تیره گل میمونیان، زاگرس، گونه انحصاری، *Kickxia commutate*

Introduction

Kickxia Dumort. (*Plantaginaceae*, *Antirrhineae*), comprised of nearly 49 species before it was split into two morphologically and phylogenetically distinct genera, *Nanorrhinum* Betsche and *Kickxia* Dumort. (Ghebrehiwet 2000, Yousef Naanaie & Tavassoli 2010). The genus *Kickxia* s.s., includes nine species from Europe, W African Islands, N and NE Africa, and S and SW Asia (Fischer 2004). Iran has only two native species belonging to the genus *Kickxia* distributed in North, Northwest, Southwest and Central Iran. These species includes *K. elatine* (L.) Dumort., a widespread taxon and *K. spuria* (L.) Dumort. Both species grow in the margins of farmlands and prefer clay or saline soils (Yousef Naanaie 2011).

In this paper, a new species of *Kickxia* is introduced. It was collected during a field investigation of the lower canopy of oak woodland of mountainous forest-steppe in the northern part of Lorestan province (SW Iran), in 2012. Zagros woodlands include nearly one-fifth area of Iran and over 170 species of trees and shrubs are located in these area. The northern Zagros includes W Azarbaijan, Kordestan and Kermanshah provinces and also the northern part of Lorestan province. The vegetation of this area mainly consists of *Quercus infectoria* Oliv. mixed with other oak species, especially *Q. libani* Oliv. and *Q. brantii* Lindl. (SaghebTalebi *et al.* 2014). Prominent ecosystem among the Zagros mountains is the forest and forest-steppe areas with a semi-arid climate (Frey & Probst 1986). After initial identification of collected specimens, the unknown specimens were compared with known *Kickxia* species stored at FAR, T (Kharazmi University) and P herbaria (codes according to Thiers 2011) and the regional floras such as Flora Europaea (Fernandes 1972), the Flora of Turkey (Davis & Shepherd 1982), and Flora SSSR (Kuprianova 1997). The specimens exhibited an overall similarity with *K. commutata*, but serious mismatches in characteristics between the new species and *K. commutata*

indicating that, the specimens did not belong to any of the known taxa.

Taxonomy

Kickxia iranica Zeraatkar & F. Ghahrem. sp. nov. (Figs 1 & 2).

Type: Iran, Lorestan province: Khorramabad, Nozhian waterfall, 1400 m, 33°13'51.19"N, 48°34'29.64"E, 2012.07.01, Zeraatkar & Hoseini 12840 (holotype T, isotypes T, FAR).

Description

Perennial herbs, woody at base. Stems 35–50 cm, very fragile, numerous, prostrate, glandular-villous. Leaves polymorphic, 4–10 × 3–7(–9) mm entire, or the lowest remotely denticulate, cordate to rounded at base, obtuse to subacute, the middle and upper cordate, mucronate, the lower rarely suborbicular, glandular-villous; petiole 2–6 mm. Pedicels up to 2 cm in flower, filiform, lower part glabrous and upper villous, patent. Calyx 3–4 mm; lobes linear-lanceolate, very acute, hispid. Corolla 7–10 mm, yellowish, with bluish-violet upper lip, yellow lower lip and purple-spotted palate; spur 3 mm, strongly curved. Capsule 2.5–3 mm, globose and thick-walled. Seeds 0.75–1.0 mm, strongly tuberculate.

Kickxia iranica is morphologically close to *K. commutata*, which is distributed in Mediterranean region. The new species differs from *K. commutata* (Bernh. ex Rchb.) Fritsch in having hairs at the upper parts of the pedicel (not glabrous), longer pedicel (more than half as long as lamina), shorter calyx (3–4 mm, not 4–5 mm), shorter corolla (7–10 mm, not 11–15 mm) and different corolla color (yellowish, not whitish). Morphological differences between the two species and the other two Iranian species of *Kickxia* are summarized in Table 1.

Table 1. Morphological comparison of *Kickxia iranica* sp. nov. with the related species. The characters are based on studies of the one known population of *K. iranica* (six individuals), 25 populations of *K. commutata*, four populations of *K. elatine* and two populations of *K. spuria*

	<i>K. iranica</i>	<i>K. spuria</i>	<i>K. elatine</i>	<i>K. commutata</i>
Stem	Numerous, very fragile, 35–50 cm long	Few or numerous, not very fragile, up to 25 cm long	Few, not very fragile, up to 80 cm long	Few or numerous, not very fragile, up to 70 cm long
Leaf	Middle and upper cordate or narrowly hastate, mostly cordate, lower rarely orbicular at base	Middle and upper ovate-triangular to almost circular-cordate at base	Middle and upper cordate or rarely hastate, lower mostly hastate, toothed	Middle and upper ovate-hastate to lanceolate-sagittate, mostly sagittate, lower broadly ovate
Corolla	Yellowish, 7–10 mm long, spur 3 mm long	Yellowish, 10–12 mm long, spur 3–4 mm long	Yellowish, 8–13 mm long, spur 2–3 mm long	Whitish, 4–14 mm long, spur 5–7 mm long
Pediceel	Lower part glabrous, upper part villous, up to 20 mm long	Covered with sparsely villous, 9–16 mm long	Glabrous, 10–15 mm long	Glabrous, 10–30 mm long
Petiole	2–6 mm long, tomentose	1–2 mm long, glabrous	0–2 mm long, sparsely villous	1–8 mm long, glabrous
Habit	Perennial, woody at base	Annual, not woody at base	Annual, not woody at base	Annual or perennial, not woody at base

- Distribution, ecology and phenology

Kickxia iranica grows in crevices of cliffs in oak woodlands of Zagros mountains (Fig. 3). The height of the area is around 1400 m. The annual precipitation ranges from 400–800 mm and occurs mostly in the winter-spring period. The winters are severe, the temperature being often below -25° C. The region exemplifies the continental variation of the Mediterranean climate pattern with a cold snowy winter and mild rainy spring followed by dry summer and autumn (Frey & Probst 1986). It seems that *Kickxia*

iranica is a shade-loving species, and prefers the nursery of its arboreal neighbors, which protect it from scorching sunlight.

Acknowledgements

Senior author thanks the curators of P herbarium (Paris, France) for providing him with the opportunity to study their *Kickxia* collections. Authors also thank Mr. Farshid Yekani and two anonymous referees for editing the text.



Fig. 1. Holotype of *Kickxia iranica* (Zeraatkar & Hoseini 12840 T).



Fig. 2. *Kickxia iranica*: Flower (Zeraatkar & Hoseini 12840 T).



Fig. 3. Distribution map of *Kickxia iranica* sp. nov. in Iran.

References

- Davis, P.H. & Shepherd, G.J. 1982. *Kickxia* Dumort. In: Davis, P.H. (ed.). Flora of Turkey and the East Aegean Islands, Vol. 6. Edinburgh: Edinburgh University Press, pp. 674–677.
- Fernandes, R. 1972. *Kickxia* Dumort. In: T.G. Tutinet *al.* (ed.). Flora Europaea, Vol. 3. Cambridge, UK, Cambridge University Press, pp. 238–239.
- Fischer, E. 2004. *Kickxia* Dumort. In: Kadereit, J.W. (ed.). The families and genera of vascular plants. Vol. VII. Berlin, Springer-Verlag, pp. 379–380.
- Frey, W. & Probst, W. 1986. In: Kürschner, H. (ed.). A synopsis of the vegetation in Iran. Contributions to the vegetation of Southwest Asia. Wiesbaden, Germany: L. Reichert, pp. 9–43.
- Ghebrehiwet, M. 2000. Taxonomy, phylogeny and biogeography of *Kickxia* and *Nanorrhinum* (*Scrophulariaceae*). Nordic Journal of Botany 20(6): 655–690.
- Kuprianova, L.A. 1997. *Kickxia* Dumort. In: Shishkin, B.K. & Bobrov, E.G. (eds). Flora SSSR, Vol. 22. Izdatel'stvo Akademii Nauk SSSR. Leningrad, pp. 157–159.
- Yousef Naanaie, S. 2011. *Kickxia* Dumort. In: Assadi, M. (ed.). Flora of Iran, Vol. 68. Research Institute of Forests and Rangelands, pp. 341–346.
- Yousef Naanaie, S. & Tavassoli, A. 2010. Taxonomy of the genus *Nanorrhinum* (*Scrophulariaceae*) in Iran. Iranian Journal of Botany 16(1): 114–124.
- Sagheb Talebi, K., Sajedi, T. & Pourhashemi, M. 2013. Forests of Iran: a treasure from the past, a hope for the future. Springer Link Online (e-book).
- Thiers, B. 2011. Index herbariorum, a global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. Available in: <http://sweetgum.nybg.org/ih/>.

ROSTANIHA