

# TWO NEW RECORDS FOR THE FLORA OF UZBEKISTAN, *ATRAPHAXIS LAETEVIRENS* (POLYGONACEAE) AND *NOCCAEA FERGANENSIS* (BRASSICACEAE)

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During study of the flora of Chatkal Mt., SW Tien Shan, Uzbekistan, two new record species were recognized for the flora of Uzbekistan. These species are *Atraphaxis laetevirens* (Ledeb.) Jaub. et Spach (Polygonaceae) and *Noccaea ferganensis* (N. Busch) Czerep. (Brassicaceae). Photos of herbarium specimens of these species are provided.

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**Key words.** Western Tien Shan, *Atraphaxis*, Polygonaceae, *Noccaea*, *Thlaspi*, Cruciferae, new record, Uzbekistan.

دو گزارش جدید برای فلور ازبکستان: *Atraphaxis laetevirens* (تیره علف هفت بند) و *Noccaea ferganensis* (تیره شب بو)

کمیلهجان ش. توجیبوف، هیئت علمی آکادمی علوم ازبکستان.

طی مطالعه فلور ارتفاعات چات کال (جنوب غرب تیان شان، ازبکستان) دو گونه به عنوان گزارش جدید برای فلور ازبکستان تشخیص داده شدند. این گونه‌ها عبارتند از: *Atraphaxis laetevirens* (Ledeb.) Jaub. et Spach (تیره علف هفت بند) و *Noccaea ferganensis* (N. Busch) Czerep. (تیره شب بو). تصاویر نمونه های هرباریومی برای هر دو گونه ارایه می گردد.

## Introduction

The author have studied flora of Uzbekistan, part western Tien Shan (more than 15 000 km<sup>2</sup>) during 2005-2010, with preparing a complete check-list for its flora (Tojibaev, 2010). Flora of six large mountain ridges of Western Tien Shan including Korjantau, Pskem, Maydantal, Koksuy, Chatkal and Kuramin were studied by route and semi-station methods, in the borders of Uzbekistan. In these investigations more than 4000 herbarium specimens were collected and determined. The specimens are preserved in Central Herbarium of Scientific Centre of Plant Production "Botanika" of the Academy of Sciences of the Uzbekistan (TASH) and in Chatkal biosphere reserve. During these studies one new genus of the family *Apiaceae*, *Kuramosciadium* Pimenov, Kljuykov et Tojibaev and five new species were described (Khasanov & Tojibaev 2009, 2010; Tojibaev, 2009c; Pimenov et al. 2011). More than 50 species were reported from Uzbekistan for the first time (Tojibaev, 2009a, 2009b).

During further analyses of materials, collected in Chatkal mountain ridge, two more new species from Uzbekistan and Western Tien Shan are reported in this paper as new records to the area.

## Materials and methods

All collected specimens are preserved in TASH. Certain herbarium specimens of *Atraphaxis laetevirens* from LE (St. Petersburg) and FRU (Bishkek) have been reviewed by Dr. G. A. Lazkov (Bishkek, Kyrgyzstan).

## Results and discussion

*Atraphaxis laetevirens* (Ledeb.) Jaub. et Spach, Illustr. Pl. Or. 2 (1844-46) 14 (Polygonaceae).

*Specimen seen.* Uzbekistan: SW Tienshan, Akhangaran valley, Chatkal mt., Kattasai, 1650 m, 6.3.2008, Tojibaev 1514 (TASH).

*Others specimens seen in TASH.* Kazakhstan. Songaria, Am Dshalanashkali, 8.7. 1841, Schrenk A. G. s. n.; Semirechisk, Zailiyskiy Alatau, Ulkun-Boguti Mt.,



Fig. 1. *Atraphaxis laetevirens* 1514 (TASH).



Map 1. Localities of *Atraphaxis laetevirens*: new locality in Uzbekistan - ■, nearest point in Kazakhstan - ▲.

Kolombai, steppes, 1917, Abolin 3617; Sirdarinsk, obl. Aulie-Atinsk. u., Tuya-kul, 4.6.1922, Drobow 1922; Sirdarinsk, gub., Aulie-Atinsk. u., S Karatau, Asi river basin, 2.6.1926, M. M. Sovetkina 311; West Tienshan, Karatau Mt., Plato Tekshe-tau, 9.6.1934, A. Pyataeva 135; West Tienshan, Karatau Mt., Plato Tekshe-tau, 1100 m, 22.5.1936, A. Pyataeva 159; Aksu-Djabagli reservation, Djabagli river basin, Aina-kul, 19.7.1948, R. Vaganova 234.

The genus *Atraphaxis* L. is mainly distributed in Irano-Turanian region. According to Kovalevskaya (1971) 17 species grow in Central Asia. Drobow (1953) indicates 9 species for flora of Uzbekistan. In that time the species of the genus *Atraphaxis* from Uzbekistan in the herbaria of Soviet Union were represented by less quantity of specimens. However, further studies have not made any essential changes to the content of *Atraphaxis* species of the flora of Uzbekistan.

During floristic study of the Akhangaran river basin we collected specimens which differ from all earlier known Uzbekistan species. According to "Conspectus Florae Asiae Mediae" (Kovalevskaya 1971) specimens

have been identified as *A. laetevirens* (Ledeb.) Jaub. et Spach (Fig. 1). This species according to all existing literature data (Vasileva, 1961, Kovalevskaya, 1971) in Middle Asia has been recorded from Saur, Tarbagatay, Djungar Alatau, Zaili Alatau, Ketmentau, Talas Alatau and Karatau and does not cover Uzbekistan territory. Examination of specimens kept in some large herbaria (LE, TASH, FRU) also supports above-mentioned Middle Asian part of area. Discovered location significantly increases distribution area of the species, being, obviously, the south border situated on the junction of Tien Shan and Pamir-Alai Mts. (map 1).

***Noccaea ferganensis*** (N. Busch) Czerep. (*Thlaspi ferganense* N. Busch)

Plants up to 40 (50) cm height. Caudex is weakly expressed or not expressed. Stems strong, sometimes branched in upper part. Buds single or several. Petals 3.8-6.2 x 1.9-3 mm. Styles (0.5) 0.7-1 (1.2) mm long.

*Distribution.* Kazakhstan, Central Asia and Northwest Xinjiang (German 2008).

*Specimen seen.* Uzbekistan, SW Tienshan, Chatkal Mt., top part of the Kelinchaksai river, 2900 m, 6. 6. 2007, Tojibaev 2424 (TASH).

*Studied specimens in TASH. Tadjikistan.* Zeravschanckiy Mt., northern slope to the Zeravschan glacier, 22.7. 1927, Drobow 343; Slopes near Zaraphschanskiy glacier, 21.7.1918, Balabaev 237; *Kirgiziya.* Central Tienshan, Semirechensk district, Pishpekskiy u., Tashtutor, 16.6.1914, Balabaev 71413; Alaiskiy Mt., Ak-bosaga, Juniper forest, 30.6.1934, I. A. Raikova; Alayskiy Mt., Djailau "Shaud", the most usual plant on slopes, 26.7.1948, P.I. Shafeev; East Alay, Tau-Murun pass, 7.8.1933, Tischenko 645; Foothills of Zaalayskiy range, 207 km on Pamirskiy path, subalpine meadow, 2.7.1935, without collector s.n.; Fergana Mt., Chaartash, 18.6.1962, M. Pryachin s. n.; Central Tienshan, Chaartash, 5.8.1932, P. Gomolizkiy 312; Fergana Mt., top of the left inflow of the Arslonbob, 16.7. 1926, E. P. Korovin 564; Fergana Mts., Arslonbob, 6.7.1928, E. P. Korovin 118; Chatkal Mt., top part Chetberg-Sai, inflow Ters river, Juniper forest, 2500 m, 17.7.1959, B. Petrov s. n.; Fergana district, Namangan region, basin river Turduksai, near Kumbel pass, 6.9.1909, Molchanov p. p. *Kazakhstan.* West Tienshan, basin river Sairam, 60 km to the south from village Samsonovka, A. I. Vlasova s. n.; Aleksandrovskiy Mt., near Akir-Tyube, Tamdi-Bulak, subalpine and alpine zones, 12.7.1924, Popov & Mokeeva 461; *Uzbekistan.* West Tienshan, Pskem Mt., Urungachsai, S slopes, 17.5.1958, Pechischeva s. n.; West Tienshan, top part of the Oigaing river, 29.8.1956, Zukervanik 1577.

Genus *Noccaea* Moench (*Cruciferae* Juss.) is the type genus of the tribe *Noccaeae* Al-Shehbaz, Beilstein et E.A. Kellogg and counts more than 80 species, distributed in Europe, Mediterranean, Asia Minor and Central Asia, Caucasus and Siberia. There are several species in North and South America (German, 2008). Five species grow in Middle Asia (Vinogradova, 1974), there are three species on the territory of Uzbekistan (Botschanzev & Vvedenskiy, 1955).

During floristic study of Chatkal Mt. ridge (the upper Akhangaran, Tashkent region) the author collected some specimens of biennial plants of genus *Noccaea*. According to "Conspectus Florae Asiae Mediae" (Vinogradova, 1974) and analysis of specimens kept in TASH, the specimens determined as *Th. ferganense* N. Busch, that is new record species for flora of Uzbekistan (Fig. 2). Also, in the collection of TASH two other specimens from Uzbekistan territory were determined as this species (Pskem river valley).

Within many years, beginning from N. Busch's studies (1936, 1939) some details of systematic of perennial taxa, growing in Altai, Mongolia, Chinese Xinjiang and

Central Asia appeared not to be solved and raised many different disputes.

In 1936 Busch marked out all the Middle Asian specimens of *Thlaspi cochleariforme* DC. to *Th. ferganense* N. Busch (Busch 1936). At this, he used the length of the pedicel and silicles. As opposed to European plants with thick roots and short branches, Middle Asian plants are up to 50 cm high, with wider leaves and long pedicels and silicles, thus Busch related them to the new species. According to Busch *Th. ferganense* is also well differs by its geographical distribution: Sirdarya, Pamir-Alai, Tien Shan. In further floristic processing (Vasileva, 1961; Vinogradova, 1974; Yunusov, 1978) for differentiation of two species also used the length of pedicels and sizes of embryo. However, in many specimens, including those specimens from TASH, these parameters are strongly overlapped and usually it is not possible to distinguish them. Due to this, Middle Asian specimens of *Th. ferganense* were described by N. Busch as *Th. cochleariforme* DC. In the Flora of Tajikistan, Yunusov (1978) considers *Th. ferganense* to be the synonym of *Th. cochleariforme* DC.

Clarity to the general picture was put by the studies of D. A. German (2008). On the basis of revision of materials by *Noccaea* of Xinjiang, Mongolia, South Siberia, Kazakhstan and Middle Asia (AA, ALTB, LE, MW, NS, PE, TK, XJA, XJBI and Herbarium of Altai Botanic Garden) he showed morphological and geographical differences between these species. According to German, for identification of Middle Asian species, it is necessary to pay attention to additional morphological features including character of stems (length, thickness and quantity) and also sizes of petals). Moreover, *N. ferganensis* and *N. cochleariformis* have sufficiently good geographical isolation.

*Noccaea cochleariformis* (DC.) Á. et D. Löve (*Thlaspi cochleariforme* DC.) has following diagnose and distribution: Plants up to 5-20 (35) cm high. Caudex usually well expressed. Stems relatively thin, always simple or more often many. Petals 6-8 x 3-4 mm. Styles (0.6) 1-1.8 (2.5) mm long.

*Distribution.* Russia (Ural, West and East Siberia, Far East), North, Northeast China, Mongolia (German 2008).

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Fig. 2. *Noccaea ferganensis* 2424 (TASH).

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