

ФЛОРИСТИЧЕСКИЕ НАХОДКИ

УДК 581.9 (571) : 582.734

J. Soják¹
 J. Danihelka²
 M. Hájek²

Й. Соják
 Й. Данигелка
 М. Гайек

POTENTILLA TURKESTANICA, A RARE SPECIES NEW TO THE FLORA OF RUSSIA

POTENTILLA TURKESTANICA – РЕДКИЙ ВИД, НОВЫЙ ДЛЯ ФЛОРЫ РОССИИ

Summary. In August 2005, *Potentilla turkestanica* was collected in the south-eastern Altai Mts. in an alpine meadow in the Taldura River valley above the north-western margin of the Chuya steppe. Until recently, the species has been known only from north-western China and Mongolia; this is the first record from Russia. *Potentilla turkestanica* is a hybridogenous species of *P.* sect. *Niveae*. It is similar to *P. evestita*, but differs from it by 5-foliolate leaves. The morphological differences from two similar species, *P. alluvialis* and *P. anjuica*, are briefly described in the paper.

Key words: plant records, northern Asia, Altai Mountains, Rosaceae.

Аннотация. Сообщается о находке в Юго-Восточном Алтае *Potentilla turkestanica*, обнаруженной на альпийском лугу в долине р. Талдуры выше северо-западной границы Чуйской степи. Это первая находка в России данного вида, ранее известного только из Северо-Западного Китая и Монголии. *Potentilla turkestanica* – гибридогенный вид из секции *Niveae*, близкий к *P. evestita*, но отличающийся от последнего пятерными листьями. Кроме того, вид родственен *P. alluvialis* и *P. anjuica*, морфологические отличия от которых кратко обсуждены в сообщении.

Ключевые слова: флористические находки, Северная Азия, Алтай, Rosaceae.

Introduction

A team of botanists and zoologists based mainly at Masaryk University in Brno (Czech Republic), supported by specialists from the Central Siberian Botanical Garden in Novosibirsk (Russian Federation), visited in summer 2005 and 2006 numerous localities in the south-eastern, central and northern Altai. Altogether, 319 vegetation plots were recorded, including measurements of shading by topographic features, soil pH and soil conductivity (for a detailed description of study area and methods, see Chytrý et al., 2007 or Horsák et al., 2010). 2495 herbarium specimens of vascular plants, frequently members of critical genera, were collected from vegetation plots for later precise identification.

All specimens, now stored at BRNU (Herbarium of Masaryk University, Brno), are identified and labelled (a Microsoft Access database is available from the second author), and specialists were asked for the identification and revision of particular families and genera.

The genus *Potentilla* is represented by 103 specimens, which were revised by the first author. Among them, *P. turkestanica* Soják (in Bot. Jahrb. Syst. 109 : 26. 1987) was present by one gathering (BRNU 579455) from the slopes of the Tedaš Range above the north-western margin of the Chuya (Čuja) steppe in the south-eastern Altai Mts. A thorough search in the relevant literature (Kurbatsky, 1988, 1999; Czerepanov, 1995; Soják, 2004; Artemov, 2005; Baikov, 2005) has shown that this has been

¹Национальный музей, отделение ботаники, ул. Циркусова, 1740; 193 00, Прага 9-Горни Почернице, Чехия
²Кафедра ботаники и зоологии, университет им. Мазарика, ул. Котларжеска, 2, 611 37, Брно, Чехия; Ботанический институт Чешской АН, отделение экологии растительности, ул. Лидицка, 25/27, 602 00, Брно, Чехия
¹National Museum, Department of Botany, Cirkusová 1740; 193 00, Praha 9-Horní Počernice, Czech Republic
²Department of Botany and Zoology, Masaryk University, Kotlářská 2, CZ-611 37 Brno, and Institute of Botany, Department of Vegetation Ecology, Academy of Sciences of the Czech Republic, Lidická 25/27, CZ-602 00 Brno, both Czech Republic; e-mail (JD): danihel@sci.muni.cz

the first record ever of this rare species for the flora of Russia. The find was briefly mentioned by Soják (2009), and its circumstances are reported here in more detail, including some taxonomic considerations.

Locality description

Potentilla turkestanica was collected by M. Hájek and P. Hájková on 1 August 2005 in the Imele Brook valley (right-side tributary of the Tal-dura River) 12 km WSW of the Bel'tir village in an alpine meadow on the valley bottom (geographical coordinates: 49° 56' 40.3" N and 88° 00' 51.4" E, bias 11 m; measured with a GPS device) at an altitude of 2445 m a. s. l. The habitat in which the species was found is documented by a phytosociological relevé (cover values given following the new Braun-Blanquet scale; taxonomy and nomenclature of vascular plants follow Czerepanov, 1995, those of mosses Ignatov, Afonina, 1992).

PH107. Relevé area 100 m²; inclination and aspect 15° N; cover E₁ = 75%, E₀ = 10%, litter layer 10%, bare rock 4%; soil depth ca 15 cm; soil Ph 6.7; mean height of E₁ = 5 cm, max. height of E₁ = 20 cm.

E₁: *Bistorta major* 2a, *Kobresia smirnovii* 2a, *Lagotis integrifolia* 2a, *Pulsatilla campanella* 2a, *Carex duriuscula* 2m, *Carex obtusata* 2m, *Artemisia phaeolepis* 1, *Carex melanantha* 1, *Festuca kryloviana* 1, *Galium verum* 1, *Helictotrichon hookeri* s. str. 1, *Pentaphylloides fruticosa* 1, *Poa glauca* 1, *Silene repens* 1, *Potentilla multifida* 1, *Saussurea alpina* 1, *Thalictrum alpinum* 1, *Arctopoa tibetica* +, *Aster alpinus* s. lat. +, *Astragalus austrosibiricus* +, *Bistorta vivipara* +, *Carex pseudofetida* +, *Dianthus superbus* +, *Elymus nevskii* +, *Elymus schrenkianus* +, *Eremogone formosa* +, *Hordeum brevisubulatum* +, *Koeleria altaica* +, *Myosotis imitata* +, *Oxytropis* sp. +, *Pachypleurum alpinum* +, *Papaver canescens* +, *Pedicularis compacta* +, *Polemonium boreale* +, *Potentilla gelida* +, ***Potentilla turkestanica*** +, *Primula algida* +, *Ranunculus pedatifidus* +, *Rumex alpestris* +, *Saussurea schanginiana* +, *Silene jenseensis* +, *Stellaria brachypetala* +, *Tephroses pratensis* +, *Trisetum mongolicum* +, *Trollius asiaticus* +.

E₀: *Entodon concinus* 1, *Rhytidium rugosum* 1, *Thuidium abietinum* 1, *Bryum* cf. *caespiticium* (ster.) +, *Distichium capillaceum* +, *Hypnum* sp. +, *Tortula ruralis* +.

Taxonomy of *Potentilla turkestanica*

Potentilla turkestanica is a member of the *Evestitae* group of *Potentilla* sect. *Niveae* (Rydb.)

Juz., which includes species with all or at least some leaves grey or greenish beneath from a rather loose tomentose indumentum consisting of crisped, flexuose or only strongly curved hairs. In the members of the other groups classified into this section all leaves are densely white-tomentose beneath (with crisped hairs).

All members of the *Evestitae* group have arisen via hybridisation between a species of *P.* sect. *Niveae*, whose leaflets are white-tomentose beneath, with a species from some other section of the genus *Potentilla* whose leaves are either ternate or 5-foliate and green and non-tomentose beneath. The putative sect. *Niveae* parent can usually be identified in hybrids without difficulties, whereas the other ancestral species often remains uncertain, and some degree of certainty can be reached only by experimental hybridisation.

Species of the *Evestitae* group can be divided into two main subgroups, one with individuals having only ternate leaves and the other with individuals having at least some digitate leaves (5-foliate). The majority, i.e. eight species, of the *Evestitae* group have only ternate leaves. Of those only three species have large distribution ranges and may occur rather frequently: they are *Potentilla macrantha* Ledeb. (*P. jacutica* Juz. of Russian authors), distributed from the Ural Mts. in the west to the Chukotka Peninsula in the east and southwards to Yakutiya; further, *P. evestita* Th. Wolf (incl. *P. regeliana* Th. Wolf), common in the mountains from southern Siberia to Tajikistan, from there reaching as far as Kashmir; and finally, *P. grisea* Juz., growing in the southern part of the former Soviet Central Asia, reaching Afghanistan and northern Pakistan. The five remaining species are local taxa with small distribution ranges.

Potentilla turkestanica belongs to the *Evestitae* subgroup with digitate leaves. Two other species also have similar leaves: *P. anjuica* V.V. Petrovsky, an endemic of western Chukotka, and *P. alluvialis* V.V. Petrovsky & Soják from Yakutiya. The growth habit and characters of *P. turkestanica* strongly resemble those of *P. anjuica* but this is probably only due to morphological convergence as these species completely differ in their putative parents. *Potentilla anjuica* possesses a distinct indumentum of petioles, consisting of a single type of straight hairs, and leaflets with acute teeth, whereas *P. turkestanica* has petioles with indumentum consisting of two types of hairs and leaflets with obtuse teeth. *Potentilla alluvialis* differs from *P. turkestanica* in having much narrower episepals, leaflets beneath with shorter



Fig. Scans of two specimens of *Potentilla turkestanica* from the Taldura River valley, Altai Mts., Russia (M. Hájek & P. Hájková, 2005, BRNU 579455).

indumentum and distinctive shape of their teeth. These characters clearly document the involvement of the northern *P. stipularis* as one hybrid parent in the origin of *P. alluvialis*. However, the distribution range of *P. stipularis* does not reach southern Siberia; therefore it could not participate in the formation of *P. turkestanica*.

According to the authors of the name, *P. junatovii* Rudaya & A.L. Ebel, described recently from western Mongolia (Rudaya, Ebel, 2002), belongs to the affinity of *P. turkestanica*. Its leaves, however, have only straight hairs (tomentum is missing completely), and its plants have large flowers and a carpet-like growth habit. Two hybrid species, which have pinnate leaves and do not belong to the *Evestitae* group, occur in western Mongolia and in neighbouring areas of southern Siberia. These species can also produce forms with digitate leaves, which may resemble *P. turkestanica*. One of them is *P. chionea* Soják, which differs from *P. turkestanica* mainly in having a long petiolar indumentum and leaflets of all leaves densely white-tomentose beneath. The other species is *P. chamaeleo* Soják, which is eglandular, unlike *P. turkestanica*, which has numerous glands that are well visible under a magnifier.

Most discriminate characters of *P. turkestanica*, including indumentum of leaves, stems and calyces, are very similar to those of *P. evestita*. The latter, however, always has ternate leaves, and 5-foliate leaves can never occur, which is corroborated

by numerous gatherings in Saint Petersburg (LE) and by field observations by the first author at numerous localities in Mongolia and in Central Asian republics of the former USSR (see also Juzepczuk, 1941; Li et al., 2003).

Potentilla turkestanica was described from the Eastern Tian Shan in north-western China (province Xinjiang, formerly Sinkiang). Apart from two type specimens from China, another three gatherings from western Mongolia have been known; they were made in the Mongolian Altai in 1947 and 1983. The locality above the Chuya steppe is situated ca 220 km and 770 km from the sites known until recently. Therefore we assume that *P. turkestanica* is a rare species over its whole distribution range, well explored by Russian botanists.

Acknowledgements

We thank the local staff of our expeditions for their support during the fieldwork. The mosses were identified by S. Kubešová (Moravian Museum, Brno). Dana Michalcová (Brno) helped us to improve the scan of herbarium specimens. This research was funded by the Czech Science Foundation (P504/11/0454), the Ministry of Education of the Czech Republic (MSM0021622416) and by the Academy of Sciences of the Czech Republic (AVOZ60050516).

LITERATURE

- Artemov I.A.** New species of *Potentilla* L. from Western Tuva // Turczaninowia, 2005. – Vol. 8, № 1. – P. 5–10.
- Baikov K.S.** (ed.). Conspectus florum Sibiriae. Plantae vasculares. – Novosibirsk: Nauka, 2005. – 362 p.
- Czerepanov S.K.** Vascular plants of Russia and adjacent states (the former USSR). – St. Petersburg: Mir i semya-95, 1995. – 992 p.
- Chytrý M., Danihelka J., Ermakov N., Hájek M., Hájková P., Kočí M., Kubešová S., Lustyk P., Otýpková Z., Popov D., Roleček J., Řezníčková M., Šmarda P., Valachovič M.** Plant species richness in continental southern Siberia: effects of pH and climate in the context of the species pool hypothesis // Global Ecol. Biogeogr., 2007. – Vol. 16. – P. 668–678.
- Horsák M., Chytrý M., Pokryszko B.M., Danihelka J., Ermakov N., Hájek M., Hájková P., Kintrová K., Kočí M., Kubešová S., Lustyk P., Otýpková Z., Pelánková B., Valachovič M.** Habitats of relict terrestrial snails in southern Siberia: lessons for the reconstruction of palaeoenvironments of full-glacial Europe // J. Biogeogr., 2010. – Vol. 37. – P. 1450–1462.
- Ignatov M.S., Afonina O.M.** (eds). Check-list of mosses of the former USSR // Arctoa, 1992. – Vol. 1. – P. 1–58.
- Juzepczuk S.V.** *Potentilla* L. // Shishkin B.K., Juzepczuk S.V. (eds), Flora of USSR. – Leningrad: Nauka, 1941. – Vol. 10. – P. 78–223.
- Kurbatsky V.I.** *Potentilla* L. // Polozhij A.V., Malyshev A.V. (eds), Flora Sibiri. Rosaceae. – Novosibirsk: Nauka, divisio sibirica, 1988. – Vol. [8]. – P. 38–83.
- Kurbatsky V.I.** Notes about genus *Potentilla* L. in the flora of Siberia // Turczaninowia, 1999. – Vol. 2, № 3. – P. 10–18.

Li C.-L., Ikeda H., Ohba H. *Potentilla* Linnaeus // Wu Z.Y., Raven P.H., Hong D.Y. (eds), Flora of China. – Beijing: Science Press, St. Louis: Missouri Botanical Garden Press, 2003. – Vol. 9. – P. 291–328.

Rudaya N.A., Ebel A.L. New species of *Potentilla* L. and *Anoplocaryum* Ledeb. from alpine zone of Mongolian Altai // Turczaninowia, 2002. – Vol. 5, № 2. – P. 5–10.

Soják J. *Potentilla* L. (Rosaceae) and related genera in the former USSR (identification key, checklist and figures). Notes on *Potentilla* XVI // Bot. Jahrb. Syst., 2004. – Vol. 125. – P. 253–340.

Soják J. *Potentilla* L. (Rosaceae) in the former USSR; second part: comments. Notes on *Potentilla* XXIV // Feddes Repert., 2009. – Vol. 120 – P. 185–217.