

Reporting *Potentilla botschantzeviana* Adylov (Syn: *Potentilla butkovii* var. *botschantzeviana* (Adylov) Soják) (Rosaceae) as a new record species for the flora of Iran

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Abstract

Potentilla botschantzeviana (Syn: *P. butkovii* var *botschantzeviana* (Adylov) Soják is reported as a new record species from N Iran for the first time. This species is identified by petioles with suppressed erecto - patent hairs; deeply divided leaflets with sparse crispate, erect indumentum especially on underside and with flower diameter of 1.2 cm. The morphological characters of *Potentilla botschantzeviana* (especially long style thickened at the base) are similar to the species of section *Persicae* (Th. Wolf) Juz., the largest section of the genus in Iran, including 12 endemic species. The photographs of plant at the flowering stage, different parts, indumentum ultra structure and distribution map are presented.

Key words: *Potentilla*, Flora of Iran, *Persicae* (Th. Wolf) Juz.

Introduction

Potentilla L. (Rosaceae) is a genus comprising about 485 species (Soják, 2008) of mostly perennial herbs, growing in the open habitats of mountainous to alpine or arctic regions as well as xeric communities in the northern hemisphere (Dobeš and Paule, 2010). The genus is well distributed especially in north, northwest and west of Iran and forms important floristic elements of Alborz and Zagros mountains (Schiman-Czeika, 1969; Khatamsaz, 1993; Faghir, 2010).

Potentilla botschantzeviana T. A. Adylov was collected from north of Iran. This species has not been previously reported from Iran. Description of the species was compared with other species of the genus in Flora Iranica (Schiman-Czeika, 1969), Flora of URSS (Shishkin and Yuzepchuk, 1941), most recent papers of Soják (2008 and 2009) and Faghir (2010).

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Materials and Methods

The photographs of different parts were taken by digital microscope, Dino-Lite, AN-413T model. The indumentum ultra structure was studied using scanning electron microscopy (SEM) and distribution map was presented by means of dmapw software (Morton, 2004). The collected and examined specimens are deposited in the Tehran University Herbarium (TUH).

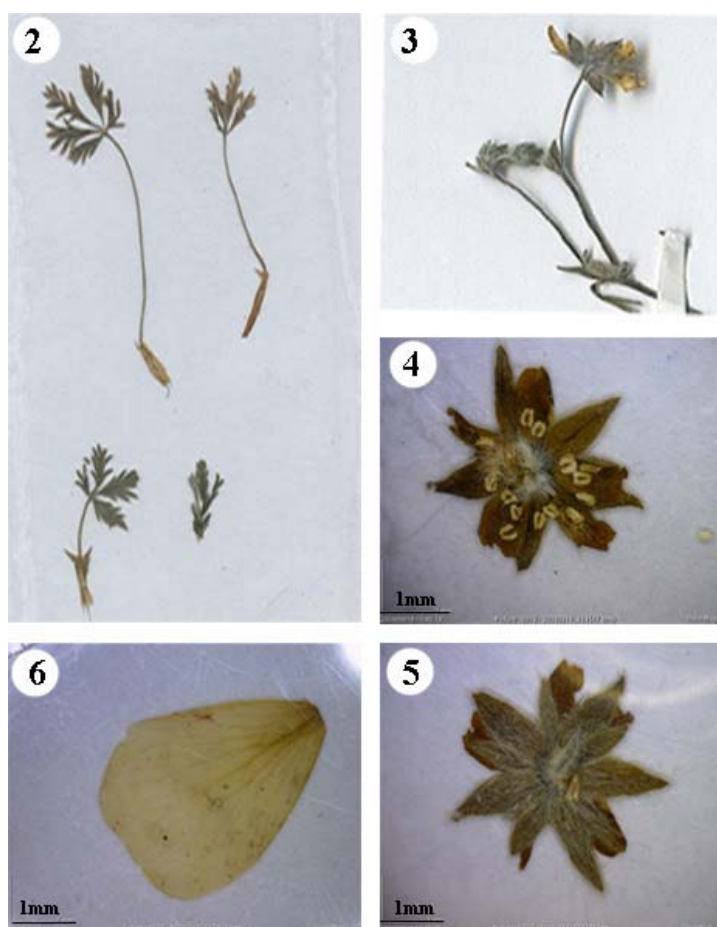
Results

Potentilla botschantzeviana (Syn: *P. butkovii* var *botschantzeviana* (Adylov) Soják (Figure 1)

Perennial; caudex sturdy, multicipital, covered with grayish brown relics of stipules; stems ascending or decumbent, 18-25 cm, thin, pale green, without branches, covered with erect and silky hairs; leaves digitate; petioles of radical leaves 5-8 cm; radical leaves 1.8×0.6 cm; leaflets $2-2.5 \times 0.8$ cm, with 6 teeth on each side; stipules lanceolate, 2 mm; cauline leaves with short petiole or sessile (Figure 2); inflorescence with 2-4 flowers; pedicels thin 6-8 mm (Figure 3); flowers 0.7-1.2 cm in diameter; outer sepals 3×1 mm; inner sepals lanceolate 5×1.5 cm (Figures 4 and 5); covered with erect and straight indumentums; petals yellow, emarginated (Figure 6); style thickened at the base, longer than mature achenes (Figure 12); stamens with short filaments and 20 small ovate white anthers arranged in two rows (Figure 4).



Figure 1: *Potentilla botschantzeviana*



Figures 2-6: 1. *P. botschantzeviana*; 2. Radical and cauline leaves; 3. Flowers; 4. Internal view of flowers showing stamens; 5. External view calyx and calyces; 6. Petal. Scale Bars: Figures 4-6 = 1 mm.

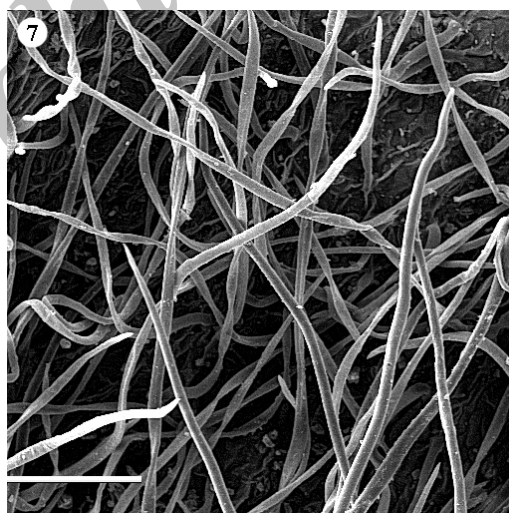
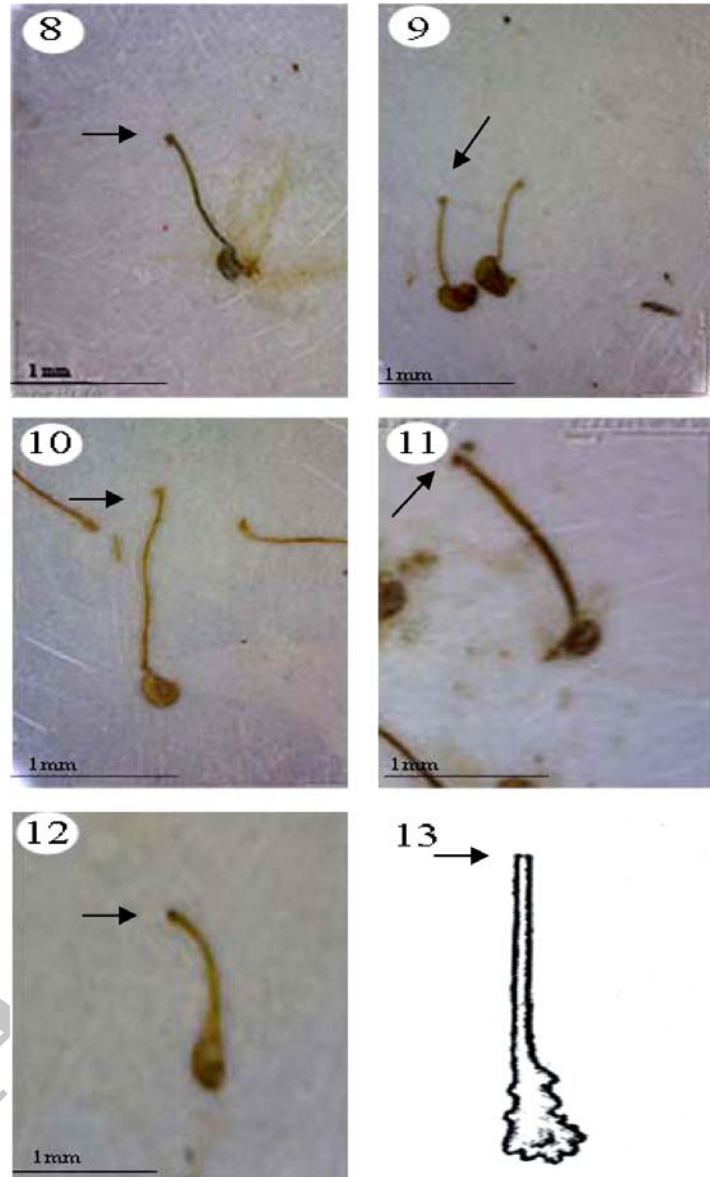


Figure 7: Scanning electron micrograph of crisped indumentum and sparse tomentum on underside of leaflets of *P. botschantzeviana*. Scale Bars = 100 μm.

Potentilla botschantzeviana is reported for the first time from Iran based on the presence of some important characters especially crisped indumentum and sparse tomentum on underside of leaflets (Figure 7); styles thickened at the base, non broadened stigma (not

distinguishable from the top part of style) (Figure 12); long sepals (Figures 4 and 5) and whitish prominent anthers (Figure 4). This species was collected from Iran: Prov. Mazandaran, at 36° 27' North and 51°17' East, in Frozkouh. 2000-2500 mm altitude (36777-TUH).



Figures 8-13: 8. Style and stigma of section *Persicae* and sect. *Lipskyanae*: 8. *P. argea* Boiss. & Balansa; 9. *P. aucheriana* Th. Wolf; 10. *P. persica* Boiss. & Hausskn; 11. *Potentilla balansae* Soják; 12. *P. botschantzeviana*; 13. *P. mollissima* Lehm. (Soják, 2009). Scale Bars: Figures 8-12 = 1 mm, arrow indicates the broadened stigma in Figures 8-11 and non broadened.

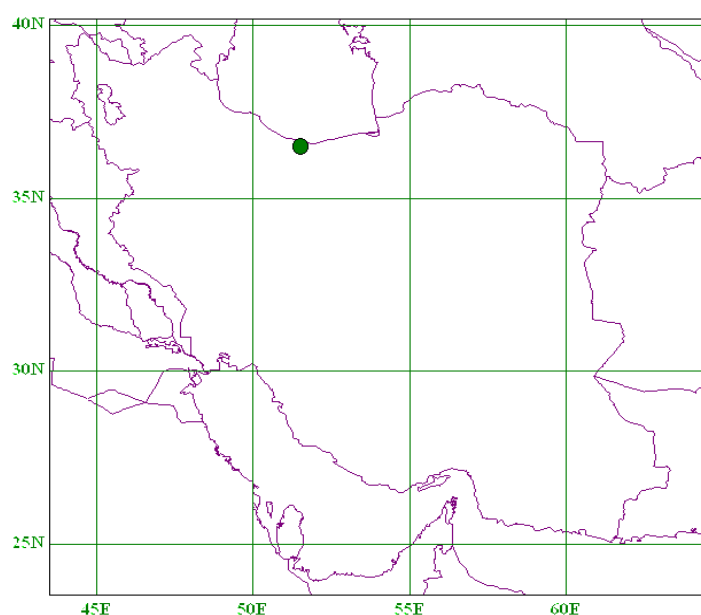


Figure 14: Distribution map of *P. botschantzeviana* (●) in Iran

Discussion

The morphological characters of *Potentilla botschantzeviana* (especially long style thickened at the base) are similar to species of section *Persicae* (Th. Wolf) Juz. Therefore authors of central Asian Flora assigned it with a group of very similar species ("*P. mollissima* Lehm group") to the section *Persicae*. This section is the largest section of the genus in Iran, including 14 species, and 12 endemic species, distributed in the north, northwest, centre and western parts of the country (Faghir *et al.*, 2010a). The species of "*P. mollissima* Lehm group" are distributed in Tajikistan and adjacent regions of Turkmenistan, Afghanistan and Iran (Mesicek and Soják, 1993). These species differed from the members of sect. *Persicae* in having straight indumentum (Faghir *et al.*, 2010b) and non broadened stigma (not differing morphologically from top of the style) (Figures 8-13). Based on this important differences *Potentilla botschantzeviana*, *P. mollissima* Lehm., (Syn: *P. komaroviana* Wolf., *P. lipskyana* Wolf.), *P. Butkovii* Botsch. and *P. rvazica* Juz. ex. Botsch. were referred in to section *Lipskyanae* Czevtajbva (Soják, 2009).

Further morphological survey of section *Lipskyanae* revealed that these species are so close to each other that they could be considered as varieties. According to Soják (2009) *Potentilla botschantzeviana* is referred to as *P. butkovii* var. *botschantzeviana* (Adylov) Soják. This species is the closest relative to *P. butkovii* Botsch (Syn: *P. butkovii* Botsch var. *butkovii*) so that both species possesses non broadened stigma and petioles with suppressed or erecto-patent hairs). However presence of important difference especially deeply divided leaflets, crispate indumentum and sparse tomentum on underside of leaflets; flowers diameter (1.2 cm) separates it from *P. butkovii* Botsch var. *butkovii* (Soják, 2004 and 2009).

References

- Dobeš, C. and Paule, J. (2010) A comprehensive chloroplast DNA-based phylogeny of the genus *Potentilla* (Rosaceae): Implications for its geographic origin, phylogeography and generic circumscription. *Molecular Phylogenetics and Evolution* 56: 156-175.

- Faghir, M. B. (2010) Biosystematical studies on the genus *Potentilla* L. In Iran. Ph.D. Thesis. University of Tehran, Iran.
- Faghir, M. B., Attar, F. and Soják, J. (2010b) *Potentilla radiata* Lehm. and *Potentilla balansae* Pesmen two new record species for the Flora of Iran. *Taxonomy and Biosystematics* 2(2)3: 39-46.
- Faghir, M. B., Attar, F., Farazmand, A., Ertter, B. and Eriksen, B. (2010a) Leaf indumentum types in *Potentilla* (Rosaceae) and related genera in Iran. *Acta Societatis Botanicorum Poloniae* 79 (2): 139-145.
- Khatamsaz, M. (1993) Flora of Iran. Rosaceae. Research Institute of Forests and Rangeland 6: 88-140.
- Mesicek, J. and Soják, J. (1993) Annotated chromosome numbers of Asiatic *Potentilla* species. *Folia Geobotanica Phytotaxonomica* 28: 437-447.
- Morton, A. (2004) DMAP, Distribution mapping software. Retrieved from <http://www.dmap.co.uk>. On: 20 June 2011.
- Schiman-Czeika, H. (1969) *Potentilla* (Rosaceae) Flora Iranica (ed. Rechinger, K. H.). 66(30) 4: 78-114.
- Shishkin, B. K. and Yuzepchuk, S. V. (1941) Flora of USSR. Vol. 10. Chief editor Academician. Komorov.
- Soják, J. (2004) *Potentilla* L. (Rosaceae) and related genera in the former USSR (identification key. Checklist and figures). Notes on *Potentilla* XVI. *Botanische Jahrbücher für Systematik*. 125: 253-340.
- Soják, J. (2008) Notes on *Potentilla* XXI. A new division of the tribe Potentilleae (Rosaceae) and notes on generic delimitations. *Botanische Jahrbücher für Systematik* 127: 349-358.
- Soják, J. (2009) *Potentilla* L. (Rosaceae) in the former USSR: Second part: Comments Note on *Potentilla* XXIV. *Feddes Repertorium*. Weinheim 3-4:185-217.

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گزارش گونه *Potentilla botschantzeviana* Adylov
(Syn: *Potentilla butkovii* var. *botschantzeviana* (Adylov) Soják)
از تیره گل سرخ به عنوان گونه جدید برای فلور ایران

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چکیده

گونه *Potentilla botschantzeviana* ((Syn: *P. butkovii* var. *botschantzeviana* (Adylov) Soják) به عنوان گزارشی جدید از شمال ایران ارایه می‌شود. این گونه با دارا بودن دمیرگ‌هایی پوشیده از گُرک‌های راست-خوابیده یا گسترده؛ برگ‌هایی با تقسیم‌های عمیق و برگچه‌هایی با گُرک‌های تُتک، افراشته - فر دار و نیز گل‌هایی به قطر ۱/۲ سانتی‌متر قابل شناسایی است. *P. botschantzeviana* دارای صفات ریخت‌شناسی (به‌ویژه خامه بلند در قاعده ضخیم) مشابهی با گونه‌های بخشه *Persicae* (Th. Wolf) Juz، بزرگترین بخشه این جنس در ایران و شامل ۱۲ گونه بومی است. تصویر گیاه در مرحله گل‌دهی، تصاویر قطعات مختلف، تصویر گُرک سطح تحتانی برگ و نیز نقشه پراکنش این گونه ارایه می‌گردد.

واژه‌های کلیدی: *Potentilla*، فلور ایران، *Persicae* (Th. Wolf) Juz.