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Contributions to the taxonomy and distribution of the genus *Turanecio* (Asteraceae, Senecioneae)

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Abstract

Some specimens collected from Kars, Ardahan and Artvin were identified as *Senecio kubensis* Grossh and *S. massagetovii* Schischk which had been previously described in Azerbaijan and Georgia. As a result of examination of the type specimens and after evaluating of the literatures, *S. massagetovii* and *S. kubensis* were determined as identical specimens and *S. massagetovii* was reduced to as a synonym of *S. kubensis*. *S. kubensis* which is a new record for Turkey, *S. munzurdaglarensis* Yıld. which was recently described from Tunceli and *S. farfarifolius* Boiss. & Kotschy which had been formerly transferred as invalid was transferred to the genus *Turanecio* Hamzaoglu based on their taxonomic characters such as the thickish rhizome, the short-sagittate anther bases, and the style branches with papillate lower surface, and in possessing a persistent pappus.

Key words: Asteraceae, new combinations, new synonym, taxonomy, Turkey

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Turanecio cinsi taksonomisine ve yayılışına katkılar (Asteraceae, Senecioneae)

Özet

Kars, Ardahan ve Artvin'den toplanan bazı örneklerin, Azerbaycan ve Gürcistan'dan tanımlanan *Senecio kubensis* Grossh. ile *S. massagetovii* Schischk. olduğu tespit edildi. Tip örneklerin ve ilgili literatürün incelenmesi sonucu *S. massagetovii* ile *S. kubensis*'in aynı olduğu belirlendi ve *S. massagetovii*'nin *S. kubensis*'in sinonimi olduğu değerlendirildi. Türkiye için yeni kayıt olan *S. kubensis*, son zamanlarda Tunceli'den tanımlanan *S. munzurdaglarensis* Yıld. ve daha önce geçersiz bir şekilde aktarılmış olan *S. farfarifolius* Boiss. & Kotschy rizomlarının kalınlaşmış, anter tabanlarının kısa-sagittat, stilus dalları alt yüzeylerinin papillalı ve pappuslarının kalıcı olması gibi taksonomik karakterlere dayanılarak *Turanecio* Hamzaoglu cinsine aktarıldı.

Anahtar kelimeler: Asteraceae, yeni kombinasyonlar, yeni sinonim, taksonomi, Türkiye

1. Introduction

The generic and infrageneric concepts of *Senecio* s.l. have been changed several times and it was divided into several genera, such as *Tephrosieris* (Rchb.) Rchb., *Jacobaea* Mill., *Iranecio* B.Nord., *Caucasalia* B.Nord., and *Turanecio* Hamzaoglu (Jeffrey et al., 1977; Nordenstam, 1997, 2007; Nordenstam and Rechinger, 1989; Jeffrey, 1992; Heller and Heyn, 1993; Pelser et al., 2006, 2007; Hamzaoglu et al., 2011). *Turanecio* was constituted of *Senecio cariensis* Boiss., *S. hypochionaeus* Boiss., *S. lazicus* Boiss. & Balansa, *S. pandurifolius* K.Koch, *S. lorentii* Hochst., *S. eriospermus* DC., *S. taraxacifolius* (M.Bieb.) DC., *S. davisii* V.A.Matthews and *S. jurineifolius* Boiss. & Balansa. They are known formerly in the *Senecio* (Matthews, 1975; Hamzaoglu et al., 2011; Arslan et al., 2013). However, *Senecio farfarifolius* that is one of them, as invalid was transferred to the genus *Turanecio*.

Turanecio belongs with *Iranecio*, *Caucasalia*, *Pojarkovia*, *Adenostyles*, and *Dolichorrhiza* in the "Quadridentate Group" of the subtribe *Senecioninae*. This group is characterised by 4-lobed disc corollas with 4 stamens (Jeffrey, 1992; Nordenstam, 1997). *Dolichorrhiza* is the closest genus to *Turanecio* in terms of some vegetative and floral characters. However, *Turanecio* differs from *Dolichorrhiza* in that the thickish rhizome, the short-sagittate

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anther bases, and the style branches with papillate lower surface, and in possessing a persistent pappus (Schischkin, 1995; Nordenstam, 1997, 2007; Hamzaoglu et al., 2011).

In 1979 Şınası Yıldırım visited Munzur Mountains (Tunceli) and he collected some *Senecio* specimens. These specimens were recently described by him as *Senecio munzurdaglarensis* (Yıldırım, 2010). Also, some specimens collected from Kars, Ardahan and Artvin were identified as *S. kubensis* Grossh and *S. massagetovii* Schischk which had been previously described in Azerbaijan and Georgia. All these specimens were evaluated with the help of type specimens and literatures.

2. Materials and methods

This study is based on herbarium material in GAZI, ANK and HUB (Ankara), ISTE, ISTF and ISTO (İstanbul), KATO (Trabzon), KNYA (Konya), AIBU (Bolu), OMUB (Samsun) and the Bozok University Herbarium (Yozgat). Some collections and type digital images were obtained from G, TBI, LE and BAK.

3. Results

3.1 *Turanecio kubensis* (Grossh.) Hamzaoglu, **comb. nov.** (“Kafkas Turanotu” in Turkish)

= *Senecio kubensis* Grossh., Trud. Azerb. Otdyel. Zakavk. Fil. Akad. Nauk SSSR, Sect. Bot. 1: 59 (1933); *Iranecio kubensis* (Grossh.) C.Jeffrey, Kew Bull. 47(1): 102 (1992). **Holotypus:** Azerbaijan. Kuba: Apmut stream, subalpine zone, rock crevices, 27.7.1930, M.Sachokiya s.n. (BAK with number 23606!, digital image).

= *Senecio massagetovii* Schischk., Fl. URSS 26: 722 & 882 (1961), **syn. nov.**; *Iranecio massagetovii* (Schischk.) C.Jeffrey, Kew Bull. 47(1): 103 (1992). **Holotypus:** Georgia. Grusinskaja SSR: In faucibus fluminis Borzhomka [Borjomi] prope stationem viae ferreae Sakoczavi [Sakochavi], in saxosis, 25.6.1934, P.Massagetov s.n. (LE!, digital image).

Specimens seen: TURKEY. A9 Artvin: Hatila Valley, Deliklitaş place, 1930 m, 07.6.2008, E.Hamzaoglu 5052, A.Aksoy & Ü.Budak (GAZI, Bozok Univ. Herb.); Melo place, c. 1840 m, 08.7.1978, A.Düzenli 598 (ANK); Tütüncüler, Avana upland, Civkariyet kayası, 2000 m, 19.7.1973, M.Koyuncu 4017 (GAZI); from Kozlu village to Tütüncüler upland, 2500 m, 27.7.2010, E.Hamzaoglu 6028, Ü.Budak & M.Koç (GAZI); South-east slope of Tiryal Dağı, road of Artvin-Hatila, Batı stream, c. 990 m, 29.5.1976, A.Düzenli 594 (ANK); Yusufeli, Yüksekoba village, 1965 m, 27.7.2008, E.Hamzaoglu 5299, A.Aksoy & Ü.Budak (GAZI, Bozok Univ. Herb.); between Şavşat and Artvin, 32. km, around Pırnallı village, 490 m, 23.4.1983, A.Güner 4718 & M.Vural (ANK, HUB, ISTE, ISTF); ibid., 535 m, 07.5.2007, Ü.Budak 2142, E.Hamzaoglu & A.Aksoy (GAZI, Bozok Univ. Herb.); between Şavşat and Ardahan, 18. km, 2000 m, 06.7.1984, N.Özhatay & E.Özhatay (ISTE 54740). **Ardahan:** Posof, between Alabalık village and Arsiyan Mountain, 1700-3000 m, 28.6.1986, N.Demirkuş 3620 (HUB); between Ardahan and Posof, above Ilgar Dağı pass, 2585 m, 03.8.2005, Ü.Budak 1963, E.Hamzaoglu & A.Aksoy (GAZI, Bozok Univ. Herb.). **Kars:** Arpaçay, Kısır Mountain, above Dağköyü village, 2430 m, 24.7.2000, M.Vural 8381, H.Ocakverdi, N.Adıgüzel & M.Kaya (GAZI); ibid., 2465 m, 25.7.2010, E.Hamzaoglu 5947, Ü.Budak & M.Koç (GAZI). **GEORGIA. Grusinskaja SSR:** In faucibus fluminis Borzhomka [Borjomi] prope stationem viae ferreae Sakoczavi [Sakochavi], in saxosis, 25.6.1934, P.Massagetov s.n. (holotype of *Senecio massagetovii*, LE!, digital image); **Samtskhe-Djavakheti:** calcareous slopes, 1800 m, 24.7.1967, Chinthibidze s.n. (TBI!, digital image); Racha-Lechkhumi region; calcareous slopes, 2000 m, 03.8.1966, Mikaledze s.n. (TBI!, digital image); **Svaneti region:** Chanis Tskali, rocks, 1300-1500 m, ???.7.1988, Mikaledze s.n. (TBI!, digital image). **AZERBAIJAN. Kuba:** Apmut stream, subalpine zone, rock crevices, 27.7.1930, M.Sachokiya s.n. (holotype of *Senecio kubensis*, BAK with number 23606!; isotype: LE!, digital image). **Intermediate forms between *Turanecio lorentii* & *T. kubensis* - TURKEY. A8 Erzurum:** West of Ağcakent village, 2070 m, 10.7.1976, A.Tatlı 4736 (KNYA); between İspir and Erzurum, 30. km, c. 2450 m, 03.7.1975, R.Çetik 5871 (KNYA); between Oltu and Tamrut, 19.6.1987, Gören s.n. (ISTE 58208); Erzurum: Olur, from fire tower to Olur, 1700-2500 m, 31.7.1984, N.Demirkuş 2253 (HUB); Oltu, from Eskidutlu village to top of Dutlu Dağı, 2200-2500 m, 19.7.1982, N.Demirkuş 1423 (HUB).

According to the Flora of the U.S.S.R; *Turanecio kubensis* differs from *Senecio massagetovii* based on the characters such as shape of lower leaves base, terminal lobes, involucre length and number of ray flowers (Schischkin, 1995). As a result of specimens examination which were collected from Turkey and found in LE, BAK, TBI herbaria, it is established that these characters are not stable and reveal variations (Figures 1, 2 and 3). Based on the examined specimens, it was decided that these two taxa are identical and *S. massagetovii* is synonym of *S. kubensis* (i.e. *T. kubensis*). Distribution areas of *T. kubensis* and *T. lorentii* (Hochst.) Hamzaoglu species are overlapped at north-east Turkey (Figure 4). The lower leaves are smaller, multipartite and have uncertain terminal lobes in *T. lorentii* which was adapted to xeric habitats in Erzurum, Ağrı, Bayburt, Yerevan (Armenia) and Iran (Hamzaoglu et al., 2011).

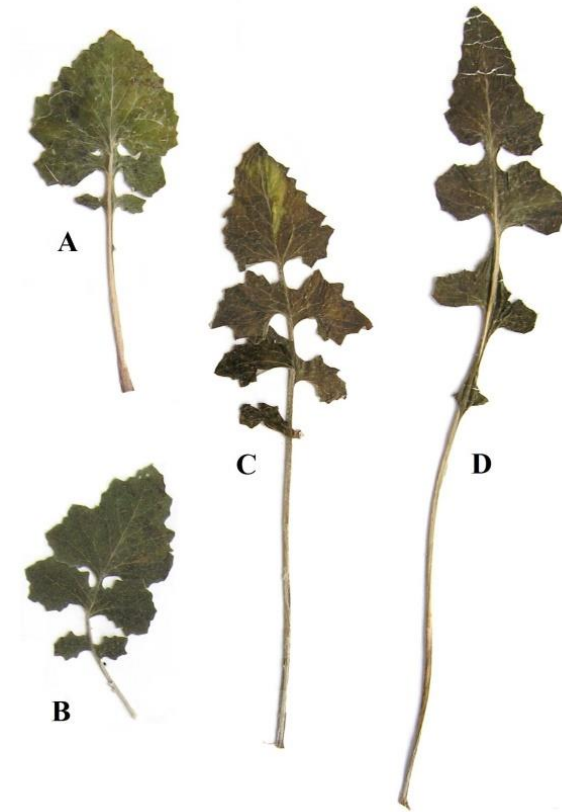


Figure 1. Lower cauline leaves in *Turanecio kubensis* (A- Artvin, Hamzaoğlu 6028 et al.; B- Artvin, Ü.Budak 2142 et al.; C- Kars, Hamzaoğlu 5947 et al.; D- Ardahan, Ü.Budak 1963 et al.).



Figure 2. Type of *Turanecio kubensis* (as basionym *Senecio kubensis*, herbarium BAK 23606).



Figure 3. Type of *Senecio massagetovii* (Herbarium LE, unnumbered).

Turanecio kubensis grows in humid habitats in Artvin, Ardahan, Kars, Borjomi (Georgia) and Kuba (Azerbaijan) and its lower leaves are big, few partitate and have certain terminal lobes. Some specimens which were collected from the northern Erzurum were found to be similar to *T. kubensis* due to their big base leaves and certain terminal lobes and similar to *T. lorentii* due to their multipartite lower leaves (A.Tatlı 4736, R.Çetik 5871, Gören s.n., N.Demirkuş 1423 and 2253). These specimens were considered as intermediate forms between two species. Also, *T. kubensis* which was transferred to genus *Turanecio* is a new record for the flora of Turkey (Matthews, 1975; Schischkin, 1995).



Figure 4. Distribution map of *Turanecio kubensis* (O), *T. lorentii* (●) and intermediate forms between *T. kubensis* and *T. lorentii* (⊙). Type localities; SK – *Senecio kubensis*, SM – *Senecio massagetovii*.

3.2 *Turanecio farfarifolius* (Boiss. & Kotschy) Hamzaoglu, **comb. nov.** (“**Turanotu**” in Turkish)

≡ *Senecio farfarifolius* Boiss. & Kotschy, Diagn. Pl. Orient. ser. 2(3): 33 (1856) [as “*farfaraefolius*”, published later (isonym) by authors (Fl. Orient. 3: 400, 1875), ICBN Art. 33.7(a), Melbourne Code], non (Siebold & Zucc.) Sch.Bip. ex K.Koch, Wochenschr. Gärtnerei Pflanzenk. 1: 212 (1858) [nom. illeg., later homonym, basionym: *Cacalia farfarifolia* Siebold & Zucc., Abh. Akad. Muench. 4(3): 190 (1846)], nec (Siebold & Zucc.) Maxim., Bull. Acad. Imp. Sci. Saint-Petersbourg 19: 483 (1874) [nom. illeg., later homonym]; *Iranecio farfarifolius* (Boiss. & Kotschy) C.Jeffrey, Kew Bull. 47(1): 102 (1992); *Senecio bulghardaghensis* Soldano, Comp. Newsl. 20/21: 7 (1992) [nom. illeg., nom. superfl., ICBN Art. 11.4, Melbourne Code]; *Iranecio bulghardaghensis* (Soldano) D.Heller, Consp. Fl. Orient. 8: 68 (1993) [nom. illeg., nom. superfl., ICBN Art. 11.4, Melbourne Code]; *Turanecio bulghardaghensis* (Soldano) Hamzaoglu, Turk J Bot 35(5): 502 (2011) [nom. illeg., nom. superfl., ICBN Art. 11.4, Melbourne Code]. **Lectotypus (hoc loco designates)**: [Turkey. C5 Niğde/Mersin]: İter Cilicicum in Tauri alpes Bulgar Dagħ [Bolkar Dağı], crescit in schistosis aquiloni oppositis ad Bulgar Magara fodinas argentiferas alt. 7000. ped. (c. 2130 m), Mense Jul. Aug. 1853 (July/August 1853), Kotschy 96b. 18. 235. (G-BOIS with barcode G00150309!, digital image; **isolectotypus**: G-BOIS with barcode G00150310!, digital image).

The digital images of the type specimens of the taxon are provided from G . There are in total 3 sheets in G, but 1 of them is without flower (barcode G00150308). Lectotypification was performed using the specimens containing barcodes.

Cacalia farfarifolia Siebold & Zucc. was reported in 1846 as a new taxon from Japan (Siebold & Zuccarini, 1846). This taxon was transferred to genus *Senecio* twice as *Senecio farfarifolius* (Siebold & Zucc.) Sch.Bip. ex K.Koch in 1858 and *Senecio farfarifolius* (Siebold & Zucc.) Maxim. in 1874 (Koch & Fintelmann, 1858; Maximowicz, 1874). *Senecio farfarifolius* Boiss. & Kotschy which is endemic to Turkey was published in “Diagnoses Plantarum Orientalium novarum” in 1856 for the first time (Boissier, 1856). This taxon was re-reported in 1875 as isonym and this literature was given as the original publication in “Flora of Turkey and the East Aegean Islands” (Boissier, 1875; Matthews, 1975).

Soldano (1992) has taken into consideration the date 1858 for the naming of *Senecio*. He re-named *Senecio farfarifolius* Boiss. & Kotschy which was reported as isonym in 1875 as *Senecio bulghardaghensis* Soldano in order to remove the homonym. But this re-naming was found as invalid according to the International Code of Botanical Nomenclature (ICBN) due to the original publication date of *Senecio farfarifolius* which was 1856 (McNeill et al., 2012).

Similar mistakes were made during the transfer of *Senecio farfarifolius* Boiss. & Kotschy to the genera *Iranecio* and *Turanecio*. According to the ICBN, the taxon was transferred with “*bulghardaghensis*” epithet instead of “*farfarifolius*” epithet incorrectly (Heller & Heyn, 1993; Hamzaoglu et al., 2011; McNeill et al., 2012). In the current study, *Senecio farfarifolius* Boiss. & Kotschy which was reported in 1856 was considered as basionym and was transferred to the genus *Turanecio* in accordance with ICBN.

3.3 *Turanecio munzurdaglarensis* (Yıld.) Hamzaoglu, **comb. nov.** (“**Munzur Turanotu**” in Turkish)

≡ *Senecio munzurdaglarensis* Yıld., Ot Sist. Bot. Dergisi 17(2): 36 (2010); *Iranecio munzurdaglarensis* (Yıld.) Raab-Straube & Greuter, Willdenowia 41: 315 (2011). **Holotypus**: Turkey. B7 Tunceli: Ovacık, Munzur Mountains, Kepir Hill, Bellihasan Çukurluğu ridges, 2500-2700 m, 29.7.1979, Ş.Yıldırım 2300! (Yıldırım Herb.; **isotypus**: HUB!, Bozok Univ. Herb.).

Senecio munzurdaglarensis which has been described in the Munzur Mountains, Tunceli in recent years was transferred to the genus *Turanecio* based on the examined type specimens and its taxonomic characters (Yıldırım, 2010; Hamzaoglu et al., 2011; Greuter & Raus, 2011). Similar to *T. pandurifolius* (K.Koch) Hamzaoglu but basal leaves 0-1 pairs (not 1-3 pairs), glabrous above, sparsely floccose below (sparsely floccose and greenish above, very densely floccose and whitish below), phyllaries 5-6 mm long (not 8-9 mm long), pappus 5 mm long (not 6-8 mm long) and *T. lorentii* but basal leaves 0-1 pairs (not 3-7 pairs), glabrous above, sparsely floccose below (not usually densely floccose and greyish above, very densely floccose and whitish below), phyllaries 5-6 mm long (not 6-8 mm long), pappus 5 mm long (not 6-7 mm long).

4. Discussion

In the current study, it was determined that *Senecio kubensis* Grossh. (i.e. *Turanecio kubensis*) and *S. massagetovii* Schischk grow in Turkey which was known from Azerbaijan and Georgia (Schischkin, 1995). Total taxa number of the genus *Turanecio* increased to 13 with the transfer of *T. kubensis*, *T. munzurdaglarensis* and *T. farfarifolius* (12 species and 1 variety). All taxa of the genus also including *Senecio lipskyi* Lomakin and *S. massagetovii* which were decided to be synonym grow in Turkey. Seven of *Turanecio* taxa are endemic to Turkey and the endemism rate of the genus is approximately 55%. *T. pandurifolius*, *T. lorentii*, *T. eriospermus* (DC.) Hamzaoglu, *T. taraxacifolius* (M.Bieb.) Hamzaoglu, *T. davisii* (V.A.Matthews) Hamzaoglu and *T. kubensis* are distributing in Turkey

as well as Georgia, Azerbaijan, Iran and Iraq (Matthews, 1975; Nordenstam & Rechinger, 1989; Schischkin, 1995; Hamzaoglu et al., 2011). The chorological data of the taxa showed that the gene source of the genus is Turkey and Transcaucasia.

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