

A new genus, *Turanecio*, of the Asteraceae (tribe *Senecioneae*)

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Abstract: *Turanecio* Hamzaoğlu, a new genus of the Asteraceae, is described. Ten species are included, previously referred to *Senecio* L., *Cineraria* L., or *Iranecio* B.Nord. This genus belongs to the “Quadridentate Group” of the subtribe *Senecioninae*, because of the 4-lobed disc florets. The new genus closely resembles *Dolichorrhiza* (Pojark.) Galushko, but differs by the thickish rhizome, the short-sagittate anther bases, the style branches with papillate lower surface, and in possessing a persistent pappus. *Turanecio* is centred in Turkey, with species in the Caucasus, Iran, and Iraq.

Key words: Compositae, *Senecioninae*, taxonomy

Asteraceae familyasından yeni bir cins, *Turanecio* (*Senecioneae* oymağı)

Özet: *Turanecio* Hamzaoğlu, Asteraceae familyasının yeni bir cinsi olarak tanımlandı. Önceden *Senecio* L., *Cineraria* L. veya *Iranecio* B.Nord. cinsleri altında yer alan on tür, yeni cinse aktarıldı. Bu cins 4-loblu tüpsü çiçeklere sahip olduğu için *Senecioninae* altoymağının “Quadridentate Grubu” içinde yer alır. Yeni cins *Dolichorrhiza* (Pojark.) Galushko cinsine oldukça benzerdir, fakat rizomunun kalın, anter tabanının kısa-sagittat, sitilus dalları alt yüzeyinin papillat ve pappusunun kalıcı olmasıyla ondan farklıdır. Türkiye orijinli olan *Turanecio* Kafkasya, İran ve Irak’a kadar yayılış gösterir.

Anahtar sözcükler: Compositae, *Senecioninae*, taksonomi

Introduction

The *Senecioneae* is one of the largest tribes of the Asteraceae, comprising about 150 genera and 3000 species. *Senecio* L. is one of about 50 plant genera that contain over 500 species. The extent of the genus (about 1500 species) has made attempts at infrageneric classification of *Senecio* difficult, and

therefore the evolutionary history of this genus is still poorly known (Jeffrey et al., 1977; Bremer, 1994; Vincent, 1996; Mabberley, 1997).

The generic and infrageneric concepts of *Senecio* s.l. have been changed several times and it was divided into several genera, such as *Tephroseris* (Rchb.) Rchb., *Jacobaea* Mill., *Iranecio* B.Nord., and

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Caucasalia B.Nord. (Jeffrey et al., 1977; Nordenstam, 1978, 1997, 2006, 2007; Nordenstam & Rechinger, 1989; Jeffrey, 1992; Heller & Heyn, 1993; Pelser et al., 2002, 2003, 2004, 2006, 2007; Budak et al., 2007; Hamzaoglu et al., 2009).

Taxa in the *Senecioneae* are mainly characterised by 5-lobed disc corollas (pentamerous) and to some extent by 4-lobed disc corollas (tetramerous). *Senecio*, *Ischnea* F.Muell. and *Faujasiopsis* C.Jeffrey contain 4- or 5-lobed disc corollas, whereas *Abrotanella* Cass., *Adenostyles* Cass., *Pojarkovia* Askerova, *Caucasalia* B.Nord., *Dolichorrhiza* (Pojark.) Galushko, and *Iranecio* B.Nord. contain 4-lobed disc corollas (Nordenstam, 2007). Among these, *Adenostyles*, *Pojarkovia*, *Caucasalia*, *Dolichorrhiza*, and *Iranecio* contain many taxa that are distributed in Turkey, the Caucasus, Iran, and Iraq (Matthews, 1975; Nordenstam & Rechinger, 1989; Pojarkova, 1995; Shishkin, 1995; Nordenstam, 1997, 2007; Özhatay & Kültür, 2006; Özhatay et al., 2009). This distribution suggests that south-west Asia is one of the most important centres for the spread of the “Quadridentate Group” (Jeffrey, 1992).

Recently described genera, such as *Pojarkovia*, *Iranecio*, and *Caucasalia*, were based on some floral characters such as the capitulum type and number, involucre diameter, lobe length, and colour of disc corolla, anther bases, filament collar, apex, and the indumentum of the lower surface of the style branches, and pappus persistence (Askerova, 1984; Nordenstam & Rechinger, 1989; Nordenstam, 1997, 2007).

Materials and methods

This study is based on herbarium material in ANK, HUB, and GAZI (Ankara); ISTE, ISTF and ISTO (İstanbul); EGE (İzmir); KATO (Trabzon); KNYA (Konya); VANF (Van); AIBU (Bolu); GUL (Isparta); INU (Malatya); the Bozok University Herbarium (Yozgat); and the Erciyes University Herbarium (Kayseri). Some collections and type photos were provided by G, B, LD, E, BAK, and NY.

Images of the material were taken with an Olympus C-5060 digital camera, and Olympus SZ61 and Olympus BX51 microscopes (Figures 1-17).

Measurement of vegetative characters was made with a ruler accurate to 0.5 mm and floral characters were measured with an ocular micrometer. The involucre diameter was measured in fresh material. Measurements of the length of ray florets include the tube. The distribution maps of the taxa were generated by using Davis's grid system, where each square is marked at most 3 times (Davis, 1965).

Results and discussion

Turanecio belongs with *Dolichorrhiza*, *Iranecio*, *Caucasalia*, *Pojarkovia*, and *Adenostyles* in the “Quadridentate Group” of the subtribe *Senecioninae*. This group is characterised by 4-lobed disc corollas with 4 stamens (Jeffrey, 1992; Nordenstam, 1997). The Table summarises the comparison between *Turanecio* and the other genera of the “Quadridentate Group”.

Dolichorrhiza is the closest genus to *Turanecio* in terms of some vegetative and floral characters (Table). However, *Turanecio* differs from *Dolichorrhiza* by the thickish rhizome, the short-sagittate anther bases, and the style branches with papillate lower surface, and in possessing a persistent pappus (Pojarkova, 1995; Nordenstam, 1997, 2007).

The genus *Iranecio* contains 3 species—*Iranecio oligolepis* (Boiss.) B.Nord., *I. elbrusensis* (Boiss.) B.Nord. and *I. paucilobus* (DC.) B.Nord.—from Iran, Turkey, and Iraq (Nordenstam, 1989; Jeffrey, 1992). These species are rhizomatous perennial herbs with erect narrow inflorescences with clustered capitula, very short peduncles, discoid capitula, narrow involucre, few phyllaries, few disc florets, and caudate anther bases (Nordenstam, 1989).

Some species were later transferred to *Iranecio* by Jeffrey (1992) and Heller and Heyn (1993). During this transfer, the characters of the species mentioned above were not taken into consideration. In this study, most of the *Iranecio* species (excluding *I. massagetovii* (Schischk.) C.Jeffrey, and *I. kubensis* (Grossh.) C.Jeffrey) were transferred to *Turanecio*. Those species transferred have radiate capitula (excluding one variety), wider involucre, greater numbers of phyllaries and disc florets, and short-sagittate anther bases (Figures 1, 2, 17, Table).

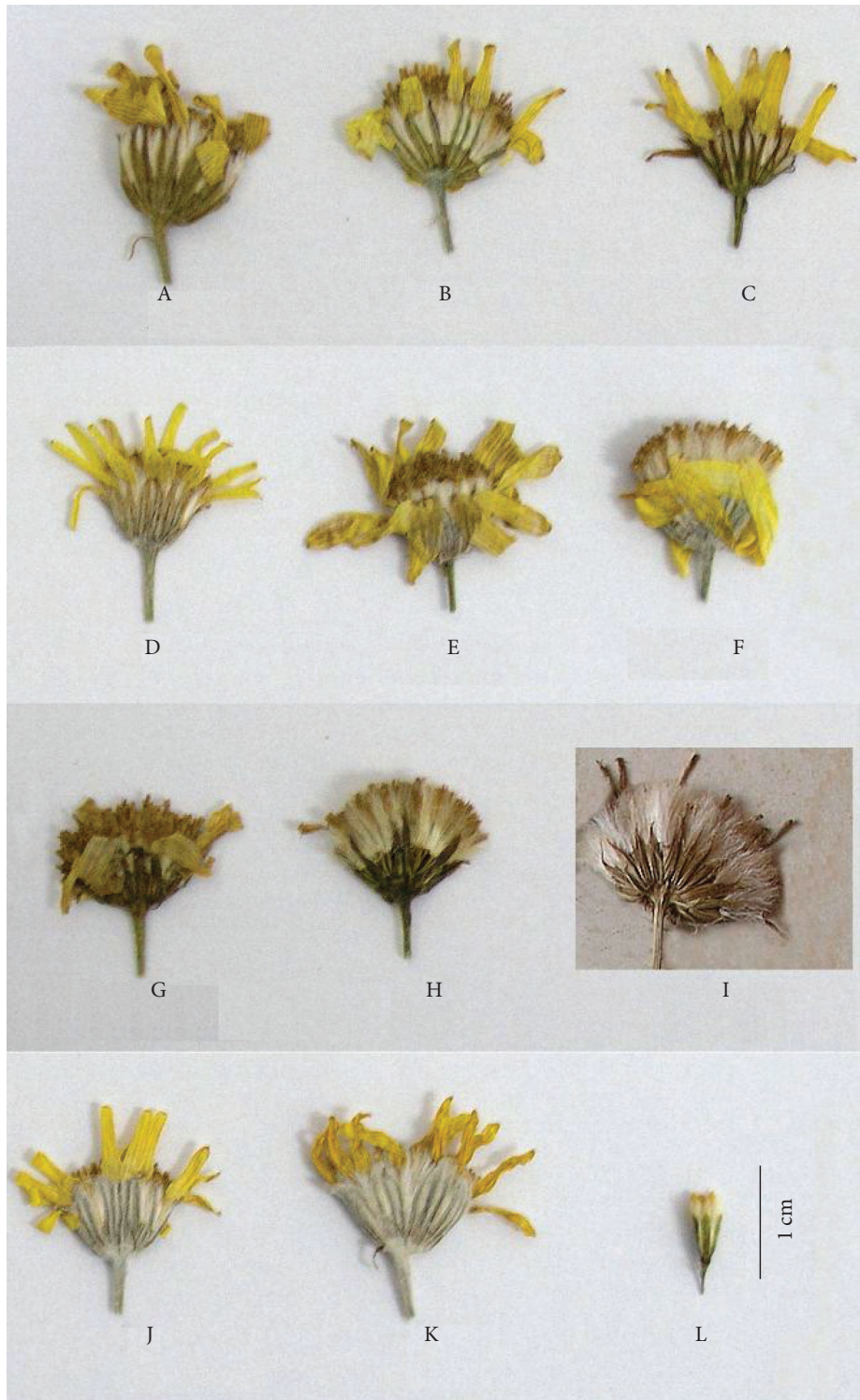


Figure 1. A comparison of the capitula of species of *Turanecio* and *Iranecio paucilobus*. A- *Turanecio cariensis*, B- *T. hypochionaeus*, C- *T. lazicus*, D- *T. pandurifolius*, E- *T. lorentii*, F- *T. eriospermus*, G- *T. taraxacifolius* var. *taraxacifolius*, H- *T. taraxacifolius* var. *discoideus*, I- *T. davisii* (from an image of an isotype of P.H.Davis 45832, ISTO), J- *T. bulghardaghensis*, K- *T. jurineifolius*, L- *Iranecio paucilobus*.

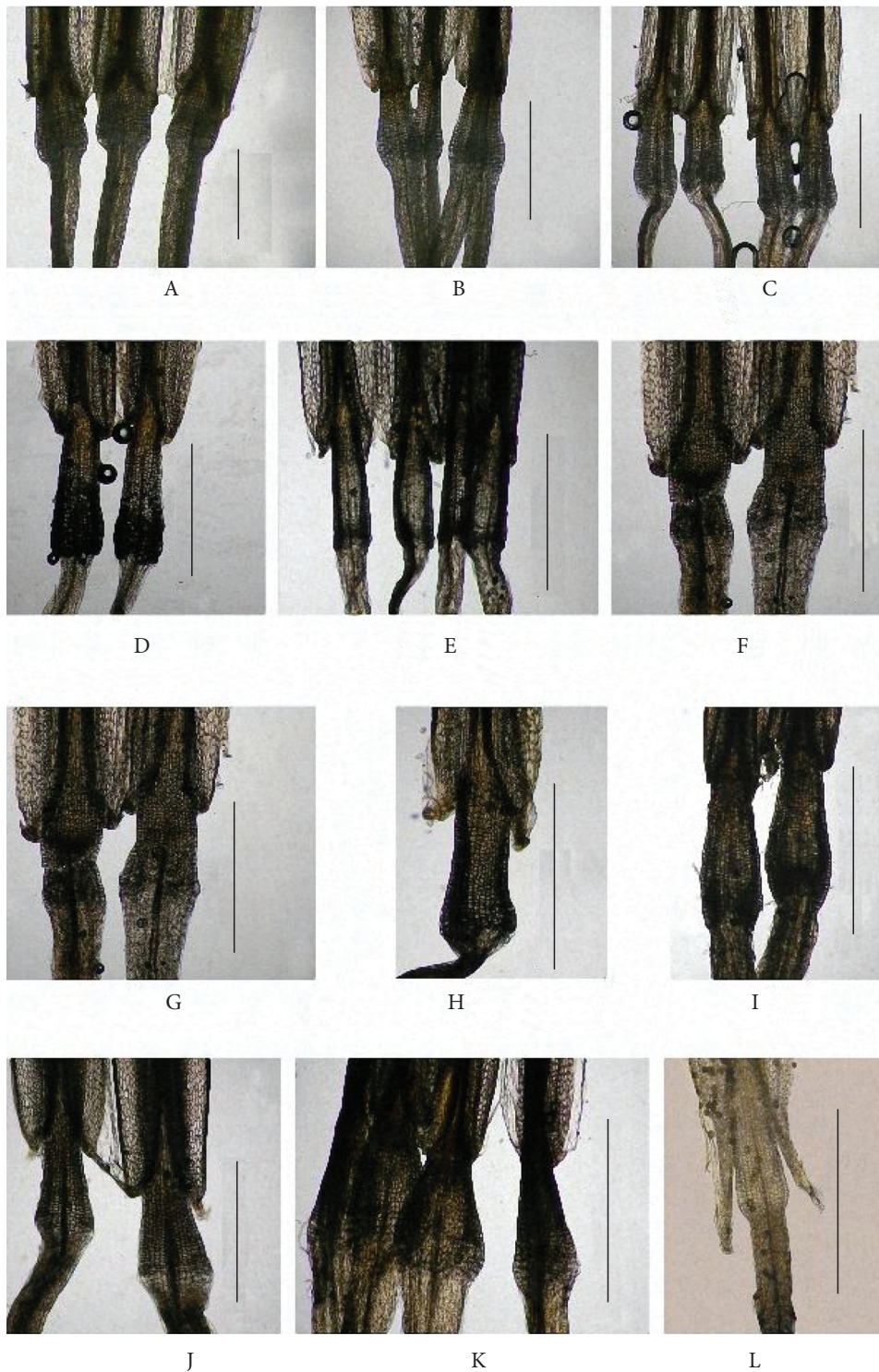


Figure 2. A comparison of the anther bases of species of *Turanecio* and *Iranecio paucilobus*. A- *Turanecio cariensis*, B- *T. hypochionaeus*, C- *T. lazicus*, D- *T. pandurifolius*, E- *T. lorentii*, F- *T. eriospermus*, G- *T. taraxacifolius* var. *taraxacifolius*, H- *T. taraxacifolius* var. *discoideus*, I- *T. davisii*, J- *T. bulghardaghensis*, K- *T. jurineifolius*, L- *Iranecio paucilobus*. Scale bars: 1 mm (A-L).

Table. Generic characters in the "Quadridentate Group" of genera of the subtribe *Senecioninae* in south-western Asia.

Characters	<i>Turanecio</i>	<i>Dolichorrhiza</i>	<i>Iranecio</i>	<i>Caucasalia</i>	<i>Pojarkovia</i>	<i>Adenostyles</i>
Rhizome	thick	slender	thick	thick	thick	thick
Lower leaves	short- or long-petiolate	long-petiolate	short- or long-petiolate	long-petiolate	short-petiolate	long-petiolate
Leaf lamina	undivided to pinnatisect	undivided	undivided to pinnatisect	undivided	undivided	undivided
Inflorescence	mostly lax and broad	mostly lax and broad	strict and narrow	strict and narrow	strict and narrow	strict and narrow
Peduncle	mostly long, (1-)3-10(-30) cm	mostly long, 3-13 cm	very short, 0.5-2 cm	mostly short, 0.5-2(-5) cm	very short, 0.5-2 cm	very short, 0.5-2 cm
Capitula no.	solitary, few-many	solitary, few	clustered, few-many	clustered, many	clustered, many	clustered, many
Capitulum type	radiate or discoid	radiate or discoid	discoid	radiate or discoid	discoid	discoid
Involucre diam.	broad, 7-22 mm	broad, 8-23 mm	narrow, 3-9 mm	narrow, 2-4 mm	narrow, 2-2.5 mm	narrow, 2-3 mm
Phyllaries	many, 14-30	many, (7-)9-21	few, 5-15	few, 4-10	few, c. 5	few, 3-8(-10)
Disc florets	many, 30-75, shallowly lobed	many, 40-80, shallowly lobed	few, 8-30, shallowly lobed	few, 5-15(-17), shallowly to moderately lobed	few, 5-15, deeply lobed	few, 3-15(-32), shallowly to deeply lobed
Corolla	yellow to orange	yellow	yellow	yellow	whitish	purple
Anther bases	short-sagittate	ecaudate, obtuse	caudate	caudate-sagittate	ecaudate, auriculate	ecaudate, obtuse
Filament collar	senecioid	senecioid	senecioid	senecioid	dilated basally	rather slender
Style branches	linear, short	linear, short	linear, short	linear, short	linear, long	subulate, long
Lower surface of style branches	papillate	glabrous	papillate	papillate	puberulous	clavate-papillate
Pappus	persistent	caducous	persistent	persistent	persistent	persistent

Caucasalia, *Pojarkovia*, and *Adenostyles* share common characters in terms of their undivided basal leaves, capitula number, involucre diameter, and numbers of phyllaries and disc florets, differing from *Turanecio* in these characters (Table). *Caucasalia* also differs from *Turanecio* by the anther bases, while *Pojarkovia* and *Adenostyles* differ from *Turanecio* by the disc floret corollas, the filament collars, the length of the style branches, and the style branch indumentum (Table).

Turanecio is centred in Turkey where 5 species are endemic. The remaining species are to be found in the Caucasus, Iran, and Iraq (Matthews, 1975) as well as in Turkey. *Iranecio massagetovii* and *I. kubensis* from the Caucasus may also belong to *Turanecio* but are not transferred here. It is highly probable that these 2 species will also be found in Turkey.

***Turanecio* Hamzaoglu, gen. nov.**

= *Senecio* L., sect. *Velutini* Boiss., Fl. Orient. 3: 395 (1875) p.p.; sect. *Reniformes* Boiss., Fl. Orient. 3: 400 (1875) p.p.; sect. *Quadridentati* Boiss., Fl. Orient. 3: 413 (1875).

Type: *Turanecio hypochionaeus* (Boiss.) Hamzaoglu.

Diagnosis: Herbae perennes, rhizomatosae. Folia alterna, basalia et/vel caulina, petiolata vel sessilia, integra vel vario modo lobata vel dissecta. Capitula corymbosa vel solitaria, radiata vel discoidea, plerumque flaviflora; calyculi bractee paucae vel plures (1-9); involucrem latum, cupulatum vel hemisphaericum, (7-)11-18(-22) mm diametro; involucryphylla numerosa (14-)18-24(-30), uniseriata, libera vel basi breviter connata; receptaculum planum vel leviter convexum, glabrum, alveolatum. Flores radiantes (si praesentes) feminei (9-19). Flores disci numerosi, (30-)45-65(-75), hermaphroditi; corolla 4-loba; antherarum basis breviter sagittata; filamentorum collare senecioideum (=basi inflatum cellulis majoribus); styli rami lineares, apice truncati vel obtusi, extus papilloso. Achaenia costata, glabra vel pubescentia; pappi setae numerosae, barbellatae vel scabridae, persistentes.

Description: Rhizomatous perennial herbs. Stem leafy or scapiform, simple or branched towards

base, erect or sometimes ascending, 10-100 cm tall, completely floccose, stipitate glandular-hairy or pubescent or partly floccose and stipitate glandular-hairy, striate-ribbed. Leaves alternate. Basal and lower cauline leaves petiolate, petioles winged, lamina undivided or lyrate to pinnatisect, oblong-elliptic to ovate-triangular in outline, usually sparsely floccose above, densely floccose below, or completely stipitate glandular-hairy or pubescent on both surfaces, margins entire to toothed or lobed, apex obtuse to acute or acute-mucronate. Uppermost leaves similar, sessile or petiolate, base amplexicaul and/or auriculate or not. Inflorescences usually of a few- or many-headed corymb or sometimes of solitary capitula, supported by linear to linear-lanceolate leaves; peduncles short or long, floccose, pubescent or stipitate glandular-hairy. Capitula radiate or discoid; involucre usually cyathiform or hemispherical, (7-)11-18(-22) mm diameter; calycular bracts few or many, (1-)2-9, linear-filiform, shorter than involucre; phyllaries uniseriate, free or short-connate at base, (14-)18-24(-30), linear-lanceolate, subcoriaceous with scarious margins, apically acute to acuminate; receptacle flat or slightly convex, glabrous, alveolate. Ray florets (if present) female, 9-19, corolla tubular below, with an oblong-elliptic to linear-oblongate, 3-toothed limb, yellow; style branches linear. Disc florets numerous, (30-)45-65(-75), hermaphrodite, corollas 4-lobed, yellow to orange; stamens 4, anther base short-sagittate with obtuse to acuminate apex; filament collar Senecioid (=balusterform); style branches short, linear, apices truncate to obtuse with mainly lateral long sweeping-hairs, lower surface papillate towards apex. Achenes narrowly oblong-elliptic to oblong-cylindrical, ribbed, glabrous to partly or completely setuliferous, with a distinct carpodium; pappus bristles numerous, multiseriate, erect, barbellate or scabrous, white or dirty white, basally connate, persistent.

Distribution: A genus of 10 species found in Turkey, the Caucasus, Iran, and Iraq.

Etymology

The name *Turanecio* is dedicated to the founder of the Republic of Turkey (Türkiye Cumhuriyeti), Gazi Mustafa Kemal ATATÜRK.

Key to the species of the genus *Turanecio*

1. Lower leaves densely floccose and whitish below
 2. Achenes completely setuliferous on ribs **6. eriospermus**
 2. Achenes glabrous to rarely sparsely setuliferous towards apex
 3. Stem leafy; middle and upper cauline leaves developed, lamina ovate-lanceolate to linear-oblong or lyrate-pinnatisect, 1.5-19 × 0.3-8 cm, base amplexicaul and/or auriculate
 4. Basal and lower cauline leaves undivided
 5. Lower and middle cauline leaves oblong-elliptic to lanceolate with attenuate base, exauriculate; upper cauline leaves amplexicaul and exauriculate; involucre 13-17 mm diameter; achenes 6-8 mm long **1. cariensis**
 5. Lower and middle cauline leaves triangular-cordate to oblong-lanceolate or ovate to oblong with cordate base, usually conspicuously auriculate; upper cauline leaves auriculate; involucre 7-14 mm diameter; achenes 3.5-6 mm long
 6. Basal and lower cauline leaves triangular-cordate to oblong-lanceolate, petioles narrowly winged; inflorescence (3-)6-16(-27)-headed; calycular bracts 3-6 mm long; involucre 9-14 mm diameter; phyllaries 20-26; disc florets 40-70, 7-9 mm long **2. hypochionaeus**
 6. Basal and lower cauline leaves ovate to oblong, petioles usually broadly winged; inflorescence (9-)15-35(-42)-headed; calycular bracts 5-9 mm long; involucre 7-10 mm diameter; phyllaries 14-22; disc florets 30-45, 6-7.5 mm long **3. lazicus**
 4. Basal and lower cauline leaves lyrate to pinnatisect
 7. Basal and lower cauline leaves with 1-3 pairs of lateral segments, terminal segment much larger than lateral ones
 8. Basal and lower cauline leaves long petiolate, petioles 4-18(-23) cm long; inflorescence (9-)15-35(-42)-headed; calycular bracts and phyllaries glandular-hairy **3. lazicus**
 8. Basal and lower cauline leaves short petiolate, petioles 1-2.5(-4) cm long; inflorescence (2-)4-7(-14)-headed; calycular bracts and phyllaries floccose **4. pandurifolius**
 7. Basal and lower cauline leaves with 3-7 pairs of lateral segments, terminal segment smaller to slightly larger than lateral ones **5. lorentii**
 3. Stem scapiform; middle and upper cauline leaves much reduced, lamina linear, 0.7-3 × 0.1-0.2 cm, base not amplexicaul and/or auriculate
 9. Basal and lower cauline leaves undivided, lamina triangular-cordate to reniform; calycular bracts 3-7 mm long; ray florets 11-17 mm long **9. bulghardaghensis**
 9. Basal and lower cauline leaves lyrate to pinnatisect with 1-5 pairs of lateral segments, lamina broadly ovate to triangular-lanceolate in outline; calycular bracts 5-10 mm long; ray florets 14-20 mm long **10. jurineifolius**
1. Lower leaves pubescent or glandular-hairy and greenish below
 10. Plants completely glandular-hairy; stem 20-40(-60) cm tall; lamina of basal leaves lyrate-pinnatisect with 1-4 pairs of lateral segments, terminal segment distinct, larger than lateral ones, broadly ovate to oblong-lanceolate; phyllaries 14-22; ray florets (if present) 10-12 **7. taraxacifolius**
 10. Plants completely pubescent; stem 60-90 cm tall; lamina of basal leaves pinnatisect with 4-9 pairs of lateral segments, terminal segment indistinct, smaller than lateral ones, triangular to ovate-lanceolate; phyllaries 20-30; ray florets 14-19 **8. davisii**

1. *Turanecio cariensis* (Boiss.) Hamzaoglu, **comb. nov.** (Figures 3 & 6).

≡ *Senecio cariensis* Boiss., Fl. Orient. 3: 398 (1875);

Iranecio cariensis (Boiss.) C. Jeffrey, Kew Bull. 47(1): 102 (1992).

Lectotype (here designated): Turkey. C2 Denizli: In rupestribus regionis alpinae Cariae in monte Cadmo (Honaz Dağı) supra Colossam (Honaz, Çoraş), *Boissier* (3428)? (G-BOIS with barcode G00150288 - seen as photo!).

The photographs of the syntype specimens of the taxon are provided from G. In G, there are in total 5 sheets, but 2 of them are without barcodes. The Honaz (Colossam) specimen with a barcode is determined as a lectotype here for the first time.

Rhizomatous perennial herb. Stem leafy, simple, erect, 30-60(-80) cm tall, densely floccose to glandular-hairy in lower part, densely glandular-hairy in upper part. Basal and lower cauline leaves undivided, petiolate, petioles 2-7(-10) cm long, winged, lamina oblong-elliptic to lanceolate with attenuate base, exauriculate, 6-14(-20) × 3-5(-7) cm, sparsely floccose to glandular-hairy and greenish above, very densely floccose and whitish below, margins entire to distantly denticulate, apex acute to obtuse. Middle and upper cauline leaves similar but smaller and sessile, lamina linear-lanceolate to oblong-elliptic, 3-10(-15) × 1.2-3(-4.5) cm, base amplexicaul and exauriculate. Inflorescence laxly corymbose, (2-)5-9(-12)-headed, supported by linear-lanceolate leaves with entire margins; peduncles 2-8(-11) cm long, densely

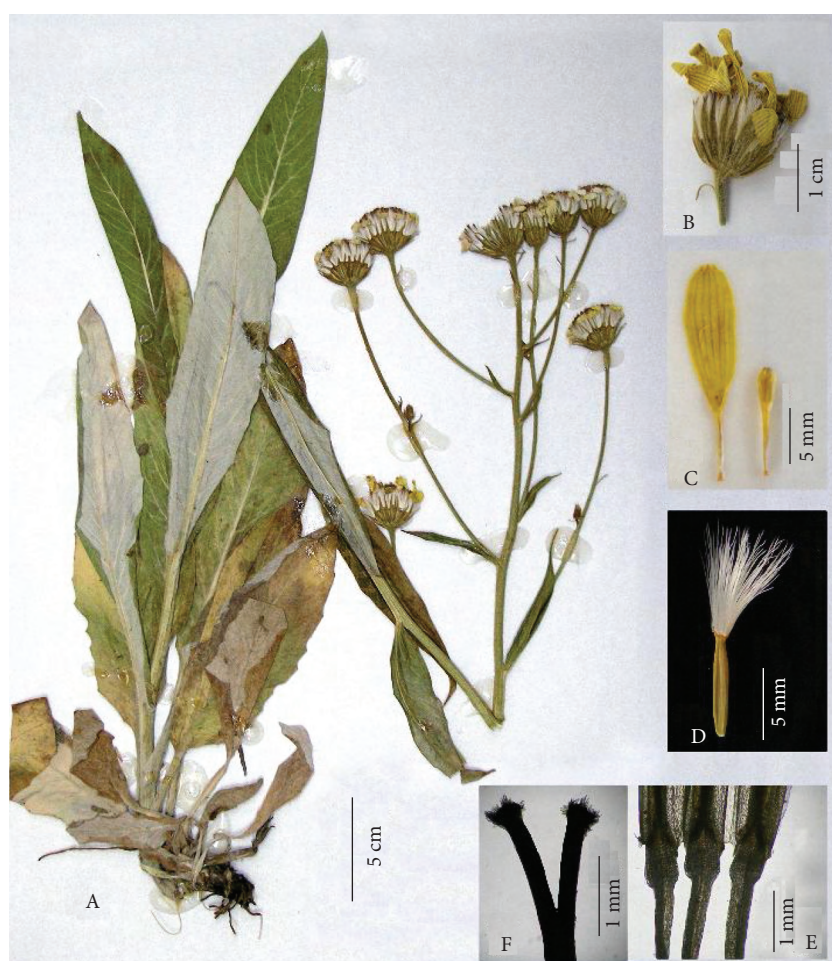


Figure 3. *Turanecio cariensis* (Budak 2070 et al.). A- habit, B- capitulum, C- ray and disc florets, D- achene and pappus, E- anther bases, F- style branches.

glandular-hairy. Capitula radiate; calycular bracts 5-8, 6-9 mm long, densely glandular-hairy, greenish; involucre cyathiform, 13-17 mm diameter; phyllaries 16-22, linear-lanceolate, 11-16 mm long, densely glandular-hairy, greenish, apex acute. Ray florets 12-14, 14-22 × 4-5 mm, limb oblong-ob lanceolate. Disc florets 50-65, corollas 4-lobed, 8-10 mm long, yellow; stamens 4, anther base short-sagittate with acute apex; filament collar senecioid; style branches linear, 1.3-1.4 mm long, apices subtruncate to slightly obtuse with mainly lateral long sweeping hairs, lower surface short papillate towards apex. Achenes narrowly oblong-elliptic, 6-8 mm long, glabrous to sparsely setuliferous towards apex; pappus 7-8 mm long, white.

Flowering time and habitat: 6-7, rocky slopes and forest openings, 1720-2100 m.

Specimens seen: Turkey. C2 Denizli: Honaz Dağı, Kayapınarı, 1720 m, 23.6.2006, *Budak* 2070, *Hamzaoğlu & Aksoy* (GAZI, Bozok Univ. Herb.); C3 Antalya: Çalbalı Dağı, 2000-2100 m, *P.H.Davis* 15273 (ANK); *ibid.*, 14.7.1949, *A.Attila* 8956 (ISTF).

Distribution: Endemic. S. & W. Turkey. East Mediterranean element.

It is closely related to *Turanecio hypochionaeus* in its undivided leaves, but differs substantially from it in its leaf shape, leaf base, involucre and achene features.

2. *Turanecio hypochionaeus* (Boiss.) Hamzaoğlu, **comb. nov.** (Figures 4 & 6).

= *Senecio hypochionaeus* Boiss., *Diagn. Ser.* 1(4): 14 (1844); *Iranecio hypochionaeus* (Boiss.) C.Jeffrey, *Kew Bull.* 47(1): 102 (1992).

Holotype: Turkey. A2 Bursa: In solo pingui ad cavos rupium partis superioris Olympi Bithyni (Uludağ) ad originem vallis Kirkbounar (Kirkpınar) ubi gregarie crescit, *Boissier s.n.* (G; iso: G, K, NY with barcode 00259558 - seen as photo!).

= *Senecio argaeus* Boiss. & Balansa, *Diagn. Ser.* 2(6): 100 (1859); *Senecio hypochionaeus* Boiss. var. *argaeus* (Boiss. & Balansa) V.A.Matthews, *Notes Roy Bot Gard Edinb* 33: 434 (1975); *Iranecio hypochionaeus* (Boiss.) C.Jeffrey var. *argaeus* (Boiss. & Balansa) D.Heller, *Consp. Fl. Orient.* 8: 171 (1993).

Lectotype (here designated): Turkey. B5 Kayseri: In regione alpina montis Argaei (Erciyes Dağı) Cappadociae, 2230 m, 15.7.1856, *Balansa* 885 (G with barcode G00096251 - seen as photo!).

The photographs of the type specimens of the taxon are provided from G. There are in total 6 sheets in G, but 2 of them are without barcodes. Lectotypification is performed by using the sheets with barcodes.

= *Senecio hypochionaeus* Boiss. var. *ilkasiensis* Freyn & Sint., *Öst. Bot. Zeitschr.* 44: 148 (1894); *Senecio ilkasiensis* (Freyn. & Sint.) Bornm., *Feddes Rep. Beih.* 89: 348 (1944); *Iranecio hypochionaeus* (Boiss.) C.Jeffrey var. *ilkasiensis* (Freyn. & Sint.) D.Heller, *Consp. Fl. Orient.* 8: 171 (1993).

Lectotype (here designated): Turkey. A4 Kastamonu/Çankırı: Paphlagoniae ad Tossia (Tosya): In sumo montis Böyük-Ilkas-Dagh (Büyük Ilgaz Dağı), 2710 m, 23.7.1892, *Sintenis* 4779 (LD with barcode 1215501 - seen as photo!).

The photographs of the type specimens of the taxon are provided from the websites of LD and B. Totally, there are 3 sheets with barcodes, 2 in LD and 1 in B. Lectotypification is performed by using these sheets.

= *Senecio cappadocicus* Boiss., *Fl. Orient.* 3: 398 (1875).

Holotype: Turkey. In Cappadocia ad Euphratem, *Aucher* 3428 (G).

= *Senecio argaeus* Boiss. & Balansa var. *sipikorensis* Bornm., *Feddes Rep. Beih.* 89: 347 (1944).

Holotype: Turkey. B7 Erzincan: Sipikor Dağı, 1525 m, 05.7.1938, *Sintenis* 1223 (B†, iso: B with barcode B100094742 - seen as photo!).

The photograph of the type specimen of the taxon is provided from the website of B. The photograph on the website is accepted as a possible isotype as the holotype in B was destroyed during WW2.

Rhizomatous perennial herb. Stem leafy, simple, erect, 20-50(-70) cm tall, densely floccose in lower part, sparsely to densely floccose or glandular-hairy in upper part. Basal leaves undivided, petiolate, petioles 4-14(-17) cm long, narrowly winged, lamina triangular-cordate to oblong-lanceolate with cordate base, 4-11(-20) × 3-8(-12) cm, sparsely to densely

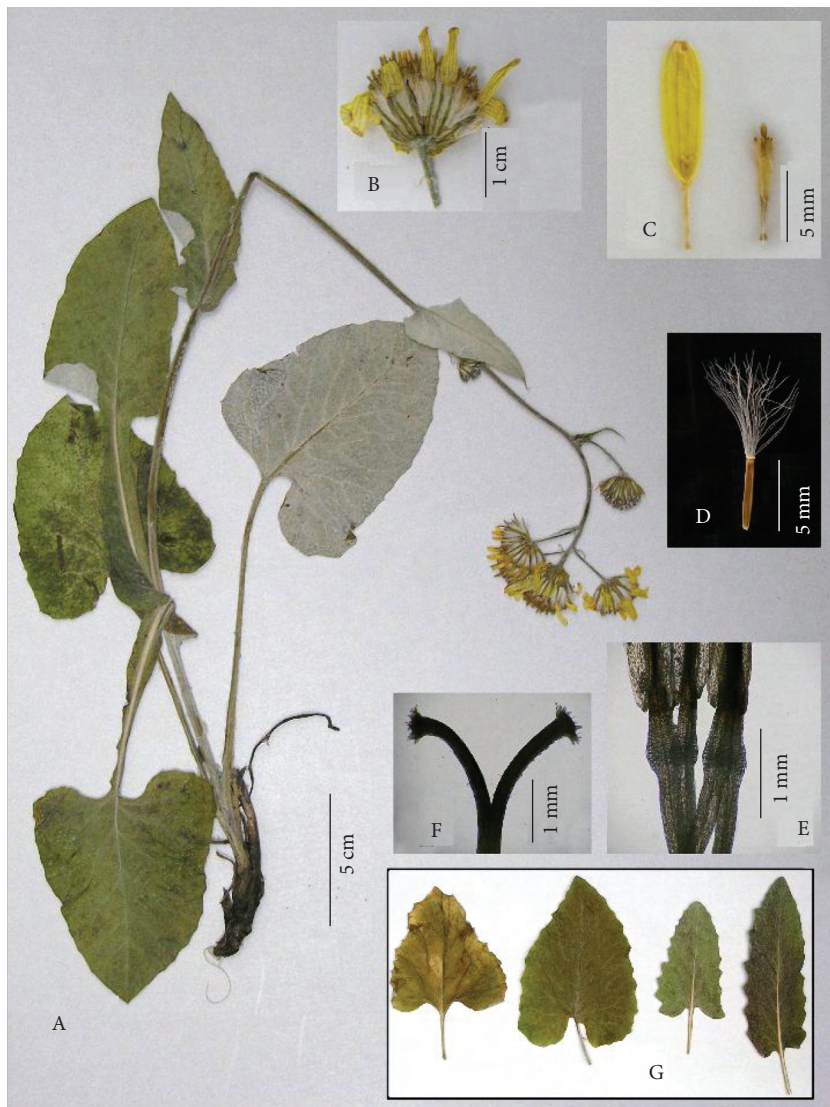


Figure 4. *Turanecio hypochionaeus* (Hamzaoglu 4391 et al.). A- habit, B- capitulum, C- ray and disc florets, D- achene and pappus, E- anther bases, F- style branches, G- variation of basal and lower cauline leaves (from different localities).

floccose and greenish above, very densely floccose and whitish below, margins subentire to coarsely dentate or repand, apex acute to obtuse. Lower cauline leaves similar, base amplexicaul and usually large auriculate. Middle cauline leaves similar but smaller, lamina 3-9(-16) × 0.9-4(-6.5) cm. Upper cauline leaves similar but smaller and sessile, lamina oblong-lanceolate to elliptic, 1.5-7(-11) × 0.3-2(-4) cm. Inflorescence densely or laxly corymbose, (3-)6-16(-27)-headed, supported by linear-lanceolate leaves with entire margins; peduncles 1-5(-8) cm

long, sparsely to densely floccose or glandular-hairy. Capitula radiate; calycular bracts 2-7, 3-6 mm long, sparsely to densely floccose or glandular-hairy, whitish to greenish; involucre cyathiform, 9-14 mm diameter; phyllaries 20-26, linear-lanceolate, 7-13 mm long, sparsely to densely floccose or glandular-hairy, whitish to greenish, apex acute to acuminate. Ray florets 10-18, 12-20 × 2-3.5 mm, limb oblong-elliptic. Disc florets 40-70, corollas 4-lobed, 7-9 mm long, yellow; stamens 4, anther base short-sagittate with obtuse to acute apex; filament collar

senecioid; style branches linear, 1.4-1.5 mm long, apices subtruncate to obtuse with mainly lateral long sweeping-hairs, lower surface short papillate towards apex. Achenes narrowly oblong-cylindrical, 4-6 mm long, glabrous; pappus 6-8 mm long, white.

Flowering time and habitat: 6-8, rocky or grassy slopes, wet places, forest openings and alpine meadows, 1390-3200 m.

Specimens seen: Turkey. **A2** Bursa: Uludağ, Kırkpınar, 2100-2200 m, 29.7.2006, *Hamzaoğlu* 4391, *Aksoy & Budak* (GAZI, Bozok Univ. Herb.); *ibid.*, c. 2300 m, 13.9.1947, *P.H.Davis* 14847 (ANK); *ibid.*, 2400 m, 29.07.1968, *Quézel* (ANK, HUB 28698); **A3** Bolu: Kale, Kırıkyayla, 1550 m, 24.6.1990, *Kılınç* 1129 (GAZI); between Bolu and Yedigöller, 21 km, 1390 m, 03.7.2005, *Budak* 1675 & *Hamzaoğlu* (GAZI, Bozok Univ. Herb.); between Yedigöller and Bolu, 23 km, around Sazaklı Suyu bridge, 1450 m, 06.7.1983, *N.Özhatay et al. s.n.* (ISTE); **A4** Karabük: Keltepe, c. 1700 m, 13.7.1984, *Demirörs* 1310 (ANK); Kastamonu: Ilgaz Dağı, Hacat Tepesi, 2200 m, 10.8.2006, *Hamzaoğlu* 4454 & *Budak* (GAZI, Bozok Univ. Herb.); *ibid.*, between Ilgaz Dağı pass and Geyikgediği, 2000 m, 29.7.1983, *N.Özhatay & E.Özhatay s.n.* (ISTE); Ilgaz Dağı, around transmitting station, c. 1700 m, 23.7.1981, *Akman* 11244, *Yurdakuol & Demirörs* (ANK); **A5** Amasya: Suluova, above Seyfe village, west of Akdağ, 1780 m, 30.7.2005, *Budak* 1879 & *Hamzaoğlu* (GAZI, Bozok Univ. Herb.); Yozgat: Çekerek, Deveci Dağı, Karlık Tepe, c. 1800-1900 m, 20.6.1980, *İlarslan* 1015 (ANK); **A6** Sivas: Koyulhisar, Kurşunlu village, Çakmak Yaylası, 1910 m, 13.7.2007, *Hamzaoğlu* 4797, *Aksoy & Budak* (Bozok Univ. Herb.); **A7** Gümüşhane: between Gümüşhane and Zigana pass, 1500 m, 12.6.2006, *Hamzaoğlu* 3861, *Aksoy & Budak* (GAZI, Bozok Univ. Herb.); ancient Gümüşhane, 1450 m, 05.6.1969, *A.Baytop & T.Baytop s.n.* (ISTE); between Yaydemir and Gözeler, c. 1500 m, 15.7.2007, *Hamzaoğlu* 4833 & *Aksoy* (GAZI, Bozok Univ. Herb.); Kelkit, Akdağ village, Kuzuçimeni Yaylası, 2300 m, 02.7.2006, *Budak* 2081 & *Hamzaoğlu* (GAZI, Bozok Univ. Herb.); Giresun: Dereli, from Aksu village to Karagöl, Kılıç Tepe, 2400-3000 m, 28.7.2007, *Hamzaoğlu* 4966, *Aksoy & Budak* (GAZI, Bozok Univ. Herb.); Alucra, around Armutlu village, 1600 m, 18.6.2007, *Hamzaoğlu* 4693 & *Aksoy* (GAZI, Bozok Univ. Herb.); Alucra, between Ardıç

and Tohumluk, 2100 m, 16.6.2007, *Hamzaoğlu* 4700 & *Aksoy* (Bozok Univ. Herb.); Balaban Dağları (Kılıç Tepe), above Tamdere, 07.8.1952, *P.H.Davis* 20597, *Dodds & Çetik* (ISTE, ANK, HUB); Karagöl, 2600 m, *Tobey* 1469 (ISTO); **A8** Gümüşhane: between Gümüşhane and Bayburt, 1690 m, 12.6.2006, *Hamzaoğlu* 3882, *Aksoy & Budak* (GAZI, Bozok Univ. Herb.); Bayburt: between Kocayokuş and Yenice, 1870 m, 13.6.2007, *Hamzaoğlu* 4592, *Aksoy & Budak* (GAZI, Bozok Univ. Herb.); **B5** Kayseri: Erciyes Dağı, from Sütdonduran to Erciyes peak, 2750-3200 m, 04.8.2006, *Hamzaoğlu* 4432, *Aksoy & Budak* (GAZI, Bozok Univ. Herb.); *ibid.*, 3030 m, 13.8.2007, *Budak* 2280, *Hamzaoğlu & Aksoy* (GAZI, Bozok Univ. Herb.); Erciyes Dağı, northeast of Perilikartın, 2245 m, 24.7.2005, *Budak* 1858 & *Aksoy* (Bozok Univ. Herb.); *ibid.*, above Perilikartın picnic area, 2245 m, 07.7.2006, *Aksoy* 2024 (GAZI, Bozok Univ. Herb., Erciyes Univ. Herb.); **B6** Sivas: Suşehri, Şarköy, Köse Dağı, Geminbeli, 1800-1900 m, 07.7.1986, *Yıldız* 7939 (INU); Divriği, south-west of Höbek village, 1860 m, 02.7.2008, *Hamzaoğlu* 5180 (Bozok Univ. Herb.); **B7** Erzincan: between Çayırılı and Yaylakent, Sipikor pass, 2370 m, 18.7.2007, *Hamzaoğlu* 4897, *Aksoy & Budak* (GAZI, Bozok Univ. Herb.); between Erzincan and Refahiye, Karadağ R/L transmitting station, 2550 m, 22.7.2008, *Hamzaoğlu* 5258 & *Aksoy* (Bozok Univ. Herb.); Keşiş Dağı, Cimin, c. 2800-2900 m, 28.7.1957, *P.H.Davis* 31786 & *Hedge* (ANK); *ibid.*, c. 2500-2600 m, 26.7.1957, *P.H.Davis* 31663 & *Hedge* (ANK); Sivas: Divriği, Mursal Mezrası, 1800-2100 m, 17.8.1996, *Dönmez* 4932 (HUB).

Distribution: Endemic. N. & C. Turkey.

The species is extremely variable in leaf shape and indumentum. The leaf shape and indumentum of the leaves and phyllaries vary in specimens collected from the type locality [Bursa: Uludağ (*Hamzaoğlu* 4391, *Aksoy & Budak*, GAZI and Bozok Univ. Herb.)]. A similar situation is also seen in *Senecio hypochionaeus* Boiss. var. *ilkasiensis* Feyn & Sint. and var. *argaeus* (Boiss. & Balansa) V.A. Matthews, which were previously accepted as varieties (Matthews, 1975). The leaf shape, hair type and leaf indumentum, peduncles and phyllaries shows variation in material of var. *ilkasiensis* collected from its type locality [Kastamonu: Ilgaz Mountain (*Hamzaoğlu* 4454 & *Budak*, GAZI and Bozok Univ. Herb.)] and in

material of var. *argaeus* collected from its type locality [Kayseri: Erciyes Mountain (*Hamzaoğlu* 4432, *Aksoy* & *Budak*, GAZI and Bozok Univ. Herb.)]. *Turanecio hypochionaeus* is here considered a somewhat variable species without discrete infraspecific taxa.

3. *Turanecio lazicus* (Boiss. & Balansa) Hamzaoğlu, **comb. nov.** (Figures 5 & 6).

≡ *Senecio lazicus* Boiss. & Balansa, Fl. Orient. 3: 400 (1875); *Iranecio lazicus* (Boiss. & Balansa) C. Jeffrey, Kew Bull. 47(1): 103 (1992).

Holotype: Turkey. A8 Rize: In sylvis *Abetis orientalis* supra *Khabakhar* (İkizdere, Gölyayla), c. 1830 m, 03.9.1866, *Balansa* (546)? (G-BOIS with

barcode G00150293 - seen as photo!; iso: K, G with barcode G00096257 - seen as photo!).

Rhizomatous perennial herb. Stem leafy, simple, erect, 40-80(-100) cm tall, densely floccose in lower part, sparsely to densely glandular-hairy in upper part. Basal leaves petiolate, petioles 4-18(-23) cm long, usually broadly winged, lamina undivided with cordate to obtuse base or sometimes sublyrate with 1-2 pairs of triangular small lateral segments, ovate to oblong in outline, (4-)10-20(-28) × 4-8(-13) cm, usually sparsely floccose and greenish above, very densely floccose and whitish below, terminal segment (if present) distinct, much larger than lateral, ovate to oblong with cordate to obtuse base,

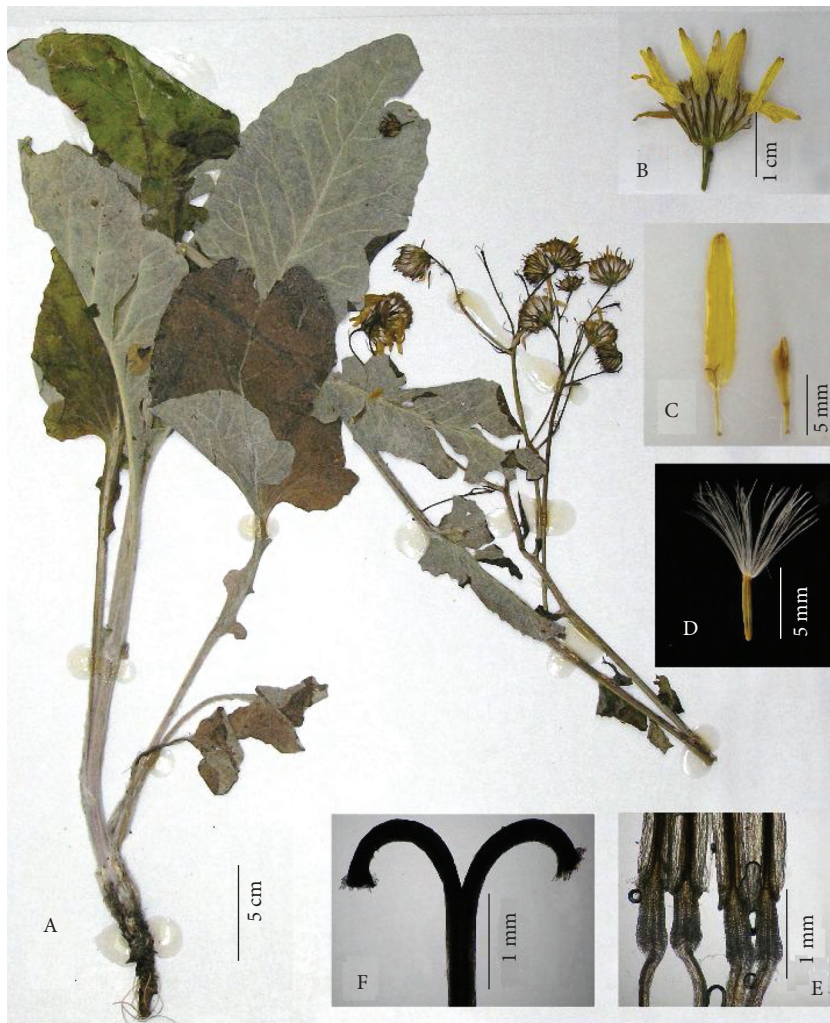


Figure 5. *Turanecio lazicus* (*Budak* 1945 et al.). A- habit, B- capitulum, C- ray and disc florets, D- achene and pappus, E- anther bases, F- style branches.

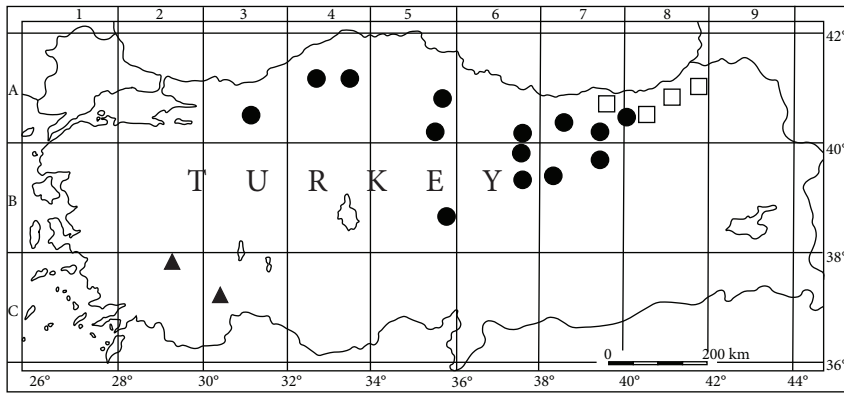


Figure 6. Distribution map of *Turanecio cariensis* (▲), *T. hypochionaeus* (●), and *T. lazicus* (□) in Turkey.

margins entire to distantly crenate-dentate, apex acute to obtuse. Lower cauline leaves similar, base amplexicaul and usually large auriculate. Middle cauline leaves similar but smaller, lamina 2.5-12(-19) × 1.5-5(-8) cm. Upper cauline leaves similar but smaller and sessile, lamina linear-lanceolate to elliptic, 1.5-8(-12) × 0.3-3(-4.6) cm. Inflorescence laxly corymbose, (9-)15-35(-42)-headed, supported by linear-lanceolate leaves with entire margins; peduncles 1-6(-9) cm long, sparsely to densely glandular-hairy. Capitula radiate; calycular bracts 3-7, 5-9 mm long, sparsely to densely glandular-hairy, greenish; involucre cyathiform, 7-10 mm diameter; phyllaries 14-22, linear-lanceolate, 6-11 mm long, sparsely to densely glandular-hairy, brownish-green, apex subulate-acuminate. Ray florets 10-18, 13-18 × 2.5-3.5 mm, limb oblong-lanceolate. Disc florets 30-45, corollas 4-lobed, 6-7.5 mm long, yellow; stamens 4, anther base short-sagittate with obtuse to acute apex; filament collar senecioid; style branches linear, 1.4-1.5 mm long, apices subtruncate to obtuse with mainly lateral long sweeping-hairs, lower surface short papillate towards apex. Achenes narrowly oblong-elliptic, 3.5-4.5 mm long, glabrous; pappus 6-8 mm long, white.

Flowering time and habitat: 6-8, rocky or grassy slopes, wet places, forest openings and alpine meadows, 1350-2670 m.

Specimens seen: Turkey. A7 Trabzon: Araklı, between Çankaya and Boğalı village, 24 km, 1400 m, 29.7.2002, *Hamzaoğlu* 3250 (Bozok Univ. Herb.);

ibid., around Boğalı village, 1700-2000 m, 29.7.2002, *Hamzaoğlu* 3270 (GAZI, Bozok Univ. Herb.); Çaykara, north of Soğanlı Dağı, c. 1700 m, 04.8.1957, *P.H.Davis* 32057 & *Hedge* (ANK); Uzungöl, Küçük Yayla, 2050 m, 24.7.1996, *Terzioğlu* (KATO 12765); ibid., Mağaralar, 1680 m, 18.7.2002, *Terzioğlu* (KATO 16088); A8 Rize: İkizdere, between Gölyayla and Cihantepe, 2450 m, 25.7.1985, *Güner* 6638 & *Vural* (GAZI, HUB); ibid., south-west of Gölyayla, 2665 m, 02.8.2005, *Budak* 1945, *Hamzaoğlu* & *Aksoy* (GAZI, Bozok Univ. Herb.); ibid., 2400-2500 m, 17.7.2006, *Budak* 2111, *Hamzaoğlu* & *Aksoy* (Bozok Univ. Herb.); between İkizdere and Anzer, 1350 m, 06.8.1983, *N.Özhatay*, *E.Özhatay* & *Sarıyar s.n.* (ISTE); İkizdere, around Ballıköy (Anzer), 2100-2200 m, 21.7.1984, *Güner* 5951 & *Vural* (AIBU); Çamlıhemşin, between Çat and Hisarcık, 1500 m, 08.8.1981, *Güner* 4065 & *Yıldız* (HUB); Artvin: Yusufeli, Öğdem village, from Kapreşet to Ziyaret hill, 1800-2400 m, 27.7.1982, *Demirkuş* 1575 (HUB).

Distribution: Endemic. N.E. Turkey. Euro-Siberian element.

It is closely related to *Turanecio hypochionaeus* due to its leaf shape, but it differs clearly from *T. hypochionaeus* in some sublyrate basal and lower cauline leaves, features of the involucre, length of calycular bracts, capitula and disc floret number. *T. hypochionaeus* has a continuous distribution from the north-west (Bursa, Uludağ) to the north-east (Gümüşhane, Zigana Dağı) of Turkey. It has spread on the southern slopes of the East Karadeniz

Mountains. *Turanecio lazicus*, whereas, has spread only on northern slopes or in alpine meadows in the same region.

4. *Turanecio pandurifolius* (K.Koch) Hamzaoğlu, **comb. nov.** (Figures 7 & 10).

= *Senecio pandurifolius* K.Koch, *Linnaea* 17: 48 (1843); *Iranecio pandurifolius* (K.Koch) C.Jeffrey, *Kew Bull.* 47(1): 103 (1992).

Holotype: Caucasia. In Mingrelia boreali, *K.Koch. s.n.* (B†).

= *Senecio conipes* Sommier & Levier, *Nuovo Giorn. Bot. Ital.* 2 (2): 88 (1895).

Lectotype (here designated): Georgia. Inter Adjari-Tzchali et Keda in regione silvarum inferiore Adjariae, *Sommier & Levier s.n.* (not traced, probably B†).

In the original paper of the taxon, no typification was made and 2 different addresses were given. These addresses are accepted as syntypes and lectotypification was performed. We could not determine in which herbarium are the specimens belonging to the taxon. We determined that some of the specimens collected from the same locality by Sommier and Levier are in B by the website. Because of this reason, we guess that some of the specimens of the taxon are in B but were destroyed during WW2.

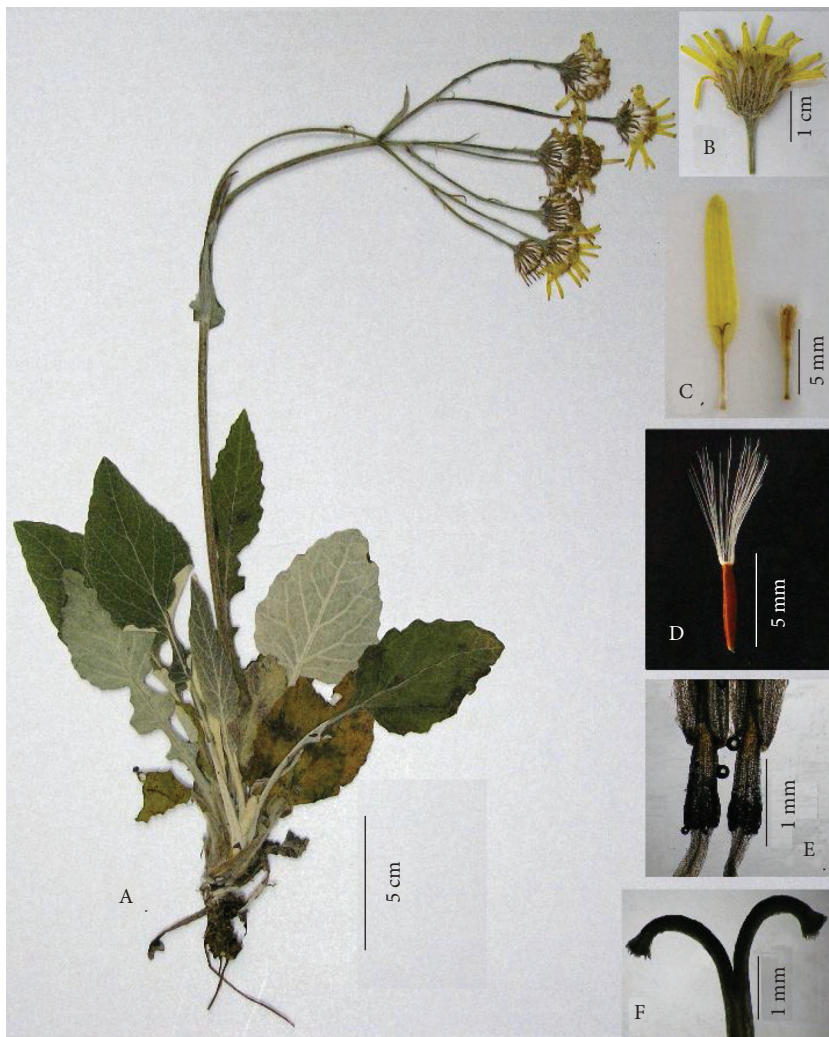


Figure 7. *Turanecio pandurifolius* (Aksoy 2021). A- habit, B- capitulum, C- ray and disc florets, D- achene and pappus, E- anther bases, F- style branches.

Rhizomatous perennial herb. Stem leafy, simple or sometimes branched towards base, ascending to erect, 25-40(-50) cm tall, sparsely to densely floccose. Basal leaves petiolate, petioles 1-2.5(-4) cm long, winged, lamina lyrate-panduriform to pinnatisect with 1-3 pairs of broadly triangular to oblong-suborbicular lateral segments, oblong-ovate to elliptic-lanceolate in outline, 4-17(-25) × 2.5-5(-8.5) cm, sparsely floccose and greenish above, very densely floccose and whitish below, terminal segment distinct, much larger than lateral ones, ovate to oblong-lanceolate with obtuse to cordate base, margins entire to slightly crenate-dentate, apex acute to obtuse. Lower cauline leaves similar, lamina with 1-2 pairs of lateral segments or sometimes undivided, base amplexicaul and auriculate. Middle and upper cauline leaves smaller and sessile, lamina usually undivided, lanceolate to linear-lanceolate, 1.5-5(-8) × 0.3-1(-2) cm, base amplexicaul and large auriculate. Inflorescence laxly corymbose, (2-)4-7(-14)-headed, supported by linear-lanceolate leaves with entire margins; peduncles 2-10(-14) cm long, sparsely floccose. Capitula radiate; calycular bracts 3-6, 4-6 mm long, floccose, greenish to whitish; involucre cyathiform, 8-11 mm diameter; phyllaries 18-22, linear-lanceolate, 8-9 mm long, floccose, greenish-white, apex acute to acuminate. Ray florets 11-13, 14-18 × 2-3.5 mm, limb oblong-lanceolate. Disc florets 40-50, corollas 4-lobed, 6-9 mm long, yellow; stamens 4, anther base short-sagittate with acute apex; filament collar senecioid; style branches linear, 1.3-1.4 mm long, apices subtruncate to obtuse with mainly lateral long sweeping hairs, lower surface short papillate towards apex. Achenes narrowly oblong-elliptic, 4-5 mm long, glabrous; pappus 6-8 mm long, white.

Flowering time and habitat: 3-6, rocky places and forest openings, 250-2175 m.

Specimens seen: Turkey. **A7** Trabzon: Maçka, Altındere Vadisi, around Coşandere village, 620 m, 05.5.2002, *Uzun* (KATO 15129); **A8** Trabzon: Uzungöl, 1100 m, 14.5.2006, *Aksoy* 2021 (GAZI, Bozok Univ. Herb., Erciyes Univ. Herb.); *ibid.*, 11.6.2006, *Hamzaoğlu* 3846 (Bozok Univ. Herb.); Uzungöl, Yaylaönü mah., 1200 m, 21.5.1988, *Cevahir s.n.* (KATO); Rize: Çamlıhemşin, 250 m, 27.4.1981, *Güner* 3484 (HUB); Çamlıhemşin, between Meydan

and Çat, 1050-1200 m, 20.5.1981, *Güner* 3519 (ISTE, ANK, GAZI, HUB); *ibid.*, Tar Deresi, 850 m, 27.4.1981, *Güner* 3475 (ISTE, ANK, HUB); between Ayder and Çamlıhemşin, 13.5.2006, *Aksoy* 2020 (Bozok Univ. Herb., Erciyes Univ. Herb.); between Rize and İkizdere, around Hurmalık village, 400-430 m, 19.3.1984, *Güner* 5470 & *Vural* (GAZI, HUB, AIBU); between Rize and İkizdere, between Yerelma and Çifteköprü, 1100 m, 23.5.1985, *Güner* 6343 (AIBU); Artvin: Arhavi, around Ortacalar, 550 m, 24.4.1983, *Güner* 4750 & *Vural* (HUB); **A9** Artvin: Yusufeli, Tekkale Yaylası, 2175 m, 25.7.2008, *Hamzaoğlu* 5238 & *Aksoy* (GAZI, Bozok Univ. Herb.).

Distribution: Caucasia, W. Transcaucasia, N.E. Turkey. Euro-Siberian element.

It is similar to *Turanecio lorentii* (Hochst.) Hamzaoğlu in leaf dissection, but it is separated from this species due to shorter petiole of the basal and lower cauline leaves and larger terminal segment compared to lateral segments.

5. *Turanecio lorentii* (Hochst.) Hamzaoğlu, comb. nov. (Figures 8 & 10).

= *Senecio lorentii* Hochst., Wanderungen 330 (1845) & in Flora 28: 27 (1845); *Iranecio lorentii* (Hochst.) C. Jeffrey, Kew Bull. 47(1): 103 (1992).

Holotype: Turkey. B8 Erzurum: Erzurum, *Lorent s.n.* (not traced).

= *Senecio gundelius* K. Koch, Linnaea 24: 364 (1851).

Holotype: Als *Jacobaea armena incana et tomentosa*, *Acanthi folio* im Gundelsh. Herbar (not traced, probably B†).

We could not determine in which herbarium the type specimen is, but we guess that it is in B but were destroyed during WW2.

= *Senecio armenius* Jaub. & Spach, Ill. Pl. Orient. 4. 143 (1853).

Holotype: Armenia (?). Probably East Anatolia, *Bourgeau s.n.* (P).

= *Senecio pedunculatus* Trautv., Acta Horti Petrop. 3: 277 (1875).

Holotype: Turkey. B8 Erzurum: Palandöken Dağı, 1980 m, *Radde s.n.* (not traced).

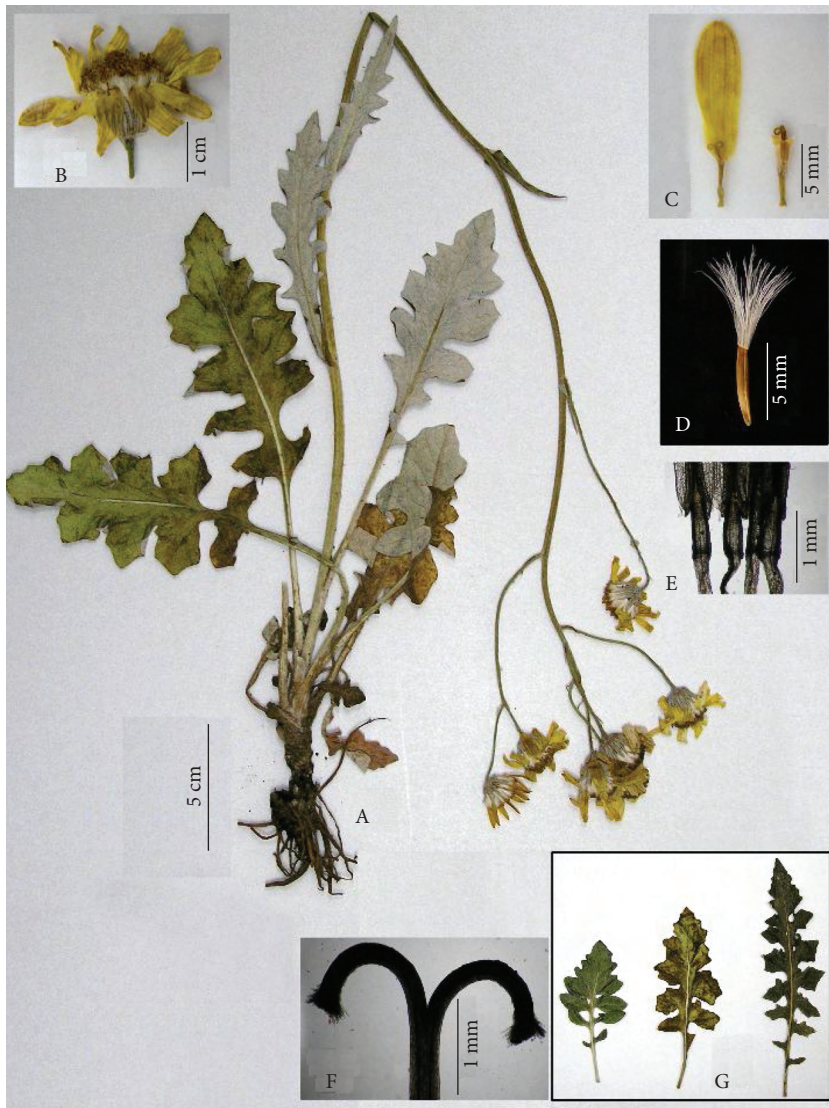


Figure 8. *Turanecio lorentii* (Hamzaoglu 4145 et al.). A- habit, B- capitulum, C- ray and disc florets, D- achene and pappus, E- anther bases, F- style branches, G- variation of basal and lower cauline leaves (different localities).

Rhizomatous perennial herb. Stem leafy, simple, erect, 30-50(-70) cm tall, sparsely to densely floccose. Basal leaves petiolate, petioles 4-12(-15) cm long, narrowly winged, lamina lyrate to pinnatisect with 3-7 pairs of triangular-lanceolate to oblong-rhombate lateral segments, oblong-lanceolate to elliptic-oblongate in outline, 4-10(-16) × 3-4(-6) cm, usually densely floccose and greyish above, very densely floccose and whitish below, terminal segment usually indistinct, smaller to slightly larger than lateral ones, triangular with truncate to attenuate

base, margins subentire to coarsely dentate or lobed, apex acute to obtuse. Lower cauline leaves similar, base usually amplexicaul and auriculate. Middle and upper cauline leaves smaller and sessile, lamina undivided to pinnatisect, oblong-lanceolate, 1.7-10(-16) × 0.3-3(-5.2) cm, base amplexicaul and auriculate. Inflorescence laxly corymbose, (3-)6-12(-16)-headed, supported by linear-lanceolate leaves with entire to lobed margins; peduncles 1-6(-9) cm long, sparsely to densely floccose. Capitula radiate; calycular bracts 4-7, 2-5 mm long, densely floccose, whitish; involucre

cyathiform, 9-13 mm diameter; phyllaries 14-20, linear-lanceolate, 6-8 mm long, floccose, greenish-white, apex acute to acuminate. Ray florets 13-17, 10-22 × 2.5-4.5 mm, limb oblong-ob lanceolate. Disc florets 40-75, corollas 4-lobed, 6-8 mm long, yellow; stamens 4, anther base short-sagittate with acute to acuminate apex; filament collar senecioid; style branches linear, 1-1.2 mm long, apices truncate to slightly obtuse with mainly lateral long sweeping hairs, lower surface long papillate towards apex. Achenes narrowly oblong-cylindrical, 3.5-4.5 mm long, glabrous or rarely sparsely pubescent towards apex; pappus 6-7 mm long, white.

Flowering time and habitat: 6-7, rocky slopes, steppe and scrub, 1500-2600 m.

Specimens seen: Turkey. **A8** Bayburt: Kop Dağı, 20.7.1934, *Balls* 1797 & *Gourlay* (ANK); *ibid.*, 20.7.1936, *Kuntay* & *Çelebioğlu* (ISTE); *ibid.*, around Şehitlik Anıtı, 2460 m, 18.7.2006, *Hamzaoğlu* 4331, *Aksoy* & *Budak* (GAZI, Bozok Univ. Herb.); around Çalidere village, 1775 m, 12.6.2006, *Hamzaoğlu* 3871, *Aksoy* & *Budak* (GAZI, Bozok Univ. Herb.); Soğanlı Dağları, c. 1500 m, 11.6.1975, *Akman* 9799 (ANK); south-west of Bayburt, 1500-1700 m, 23.6.2002, *Hamzaoğlu* 2895 (Bozok Univ. Herb.); **B8** Erzurum: west of Çamlıca village, 2050 m, 31.7.1976, *Tatlı* 5128 (HUB); between Erzurum and Erzincan, 30 km, 09.6.1970, *Karamanoğlu* 3107, *Güley*, *Tanker* & *Koyuncu* (GAZI); Palandöken Dağı, 2600 m, 02.7.2006, *Hamzaoğlu* 4145, *Aksoy* & *Budak* (GAZI, Bozok Univ. Herb.); between Aşkale and Çiftlik, near Yeni Yol village, 1880 m, 14.6.2007, *Hamzaoğlu* 4625 & *Aksoy* (Bozok Univ. Herb.); Erzurum: Çat, between Muratçayırı and Aşağıkumaşlı, 1700 m, 14.6.2007, *Hamzaoğlu* 4609 & *Aksoy* (Bozok Univ. Herb.); between Hınıs and Pasinler, 48 km, 1700 m, 12.7.1966, *P.H.Davis* 46435 (ISTO); **B9** Ağrı: between Hamur and Tutak, 5-10 km, 1650 m, 02.6.1966, *P.H.Davis* 44126 (ISTO).

Distribution: W. Transcaucasia, W. Iran, E. Turkey. Irano-Turanian element.

The species is extremely variable in leaf shape and indumentum. Its typical form grows on the steppe around Erzincan, Bayburt, Erzurum, and Ağrı. The terminal segment of the basal and lower cauline leaves are obvious and ovate-cordate in material

collected from Bayburt and Erzurum (*N.Özhatay* & *E.Özhatay*, ISTE 49440 & 54661; *Tatlı* 4736, KNYA; *N.Gören*, ISTE 58208; *Çetik* 5871, KNYA; *Demirkuş* 2253, HUB; *Demirkuş* 1423, HUB).

6. *Turanecio eriospermus* (DC.) Hamzaoğlu, comb. nov. (Figures 9 & 10).

= *Senecio eriospermus* DC., Prodr. 6: 358 (1838); *Iranecio eriospermus* (DC.) C.Jeffrey, Kew Bull. 47(1): 102 (1992).

Lectotype (here re-designated): Turkey. Ak Dağ, Cappadocia, *Aucher-Eloy* 3432 (G-DC with barcode G00204943 - seen as photo!).

The photographs of the type specimens of the taxon are provided from G. In G, there are 2 sheets with number *Aucher-Eloy* 3432, but 1 of them is without a barcode. These specimens were determined as lectotypes by Nordenstam and Rechinger (1989), but it is unknown which specimen was selected as a lectotype. Because of this reason, re-lectotypification was performed.

= *Senecio eriospermus* DC. var. *crambefolius* Boiss., Fl. Orient. 3: 393 (1875); *Iranecio eriospermus* (DC.) C.Jeffrey var. *crambefolius* (Boiss.) C.Jeffrey, Kew Bull. 47(1): 102 (1992).

Lectotype (here designated): Turkey. B8 Erzurum: In monte Kochapınar (Kocapınar) prope Erzurum, 2250 m, *Kotschy* 285 (G-BOIS with barcode G00150292 - seen as photo!).

The photographs of the syntype specimens of the taxon are provided from G. There are in total 3 sheets in G, but 1 of them is without a barcode. The Erzurum specimen with a barcode is determined as a lectotype for the first time here.

= *Senecio saxatilis* Lomakin, Trudy Tiflissk. Bot. Sada 2: 287 (1897), nom. illegit. non Wall. ex DC., Prodr. 6: 367 (1838).

= *Senecio lipskyi* Lomakin, Trav. Jard. Bot. Tiflis 3: 51 (1899). **syn. nov.**; *Iranecio lipskyi* (Lomakin) C.Jeffrey, Kew Bull. 47(1): 103 (1992).

Holotype: Caucasus. Distr. Erivan, prope Bitschenach in rupibus montis Takali, c. 2130 m, 10.7.1895, *Lipsky s.n.* (LE).

Rhizomatous perennial herb. Stem leafy, simple, erect, 35-65(-80) cm tall, sparsely to densely floccose.

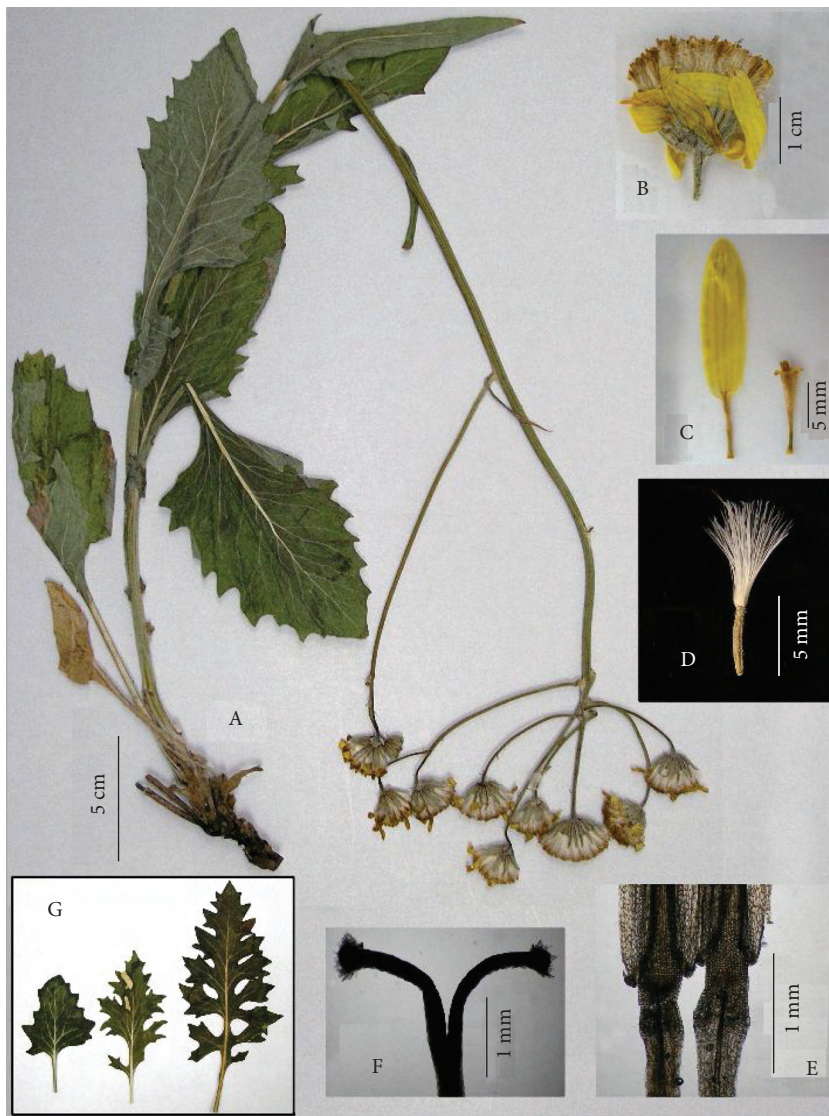


Figure 9. *Turanecio eriospermus* (Budak 2077 & Hamzaoglu). A- habit, B- capitulum, C- ray and disc florets, D- achene and pappus, E- anther bases, F- style branches, G- variation of basal and lower cauline leaves (same locality, Hamzaoglu 4747 et al.).

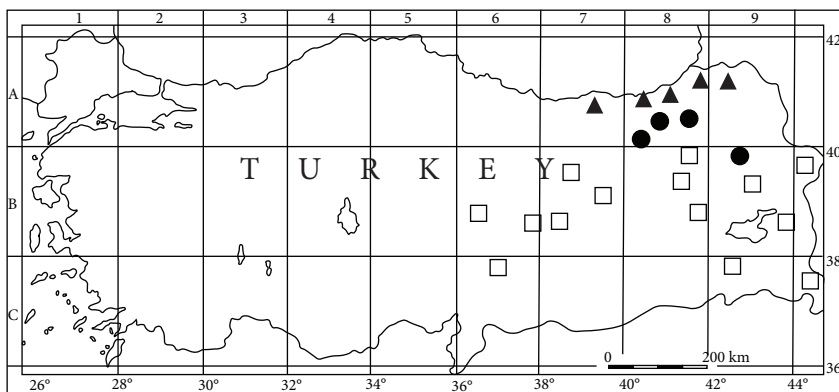


Figure 10. Distribution map of *Turanecio pandurifolius* (▲), *T. lorentii* (●), and *T. eriospermus* (□) in Turkey.

Basal leaves petiolate, petioles 4-14(-18) cm long, narrowly winged, lamina usually pinnatilobed or pinnatifid to pinnatisect with 1-5 pairs of triangular-ovate to broadly oblong-elliptic or rhombate lateral segments, triangular-rhombate to elliptic-oblong-lanceolate in outline, 4-14(-20) × 3-7(-11) cm, sparsely floccose and greenish above, very densely floccose and whitish below, terminal segment (if present) distinct or not, slightly larger than lateral ones, narrowly triangular to broadly ovate with attenuate to obtuse base, margins coarsely dentate to lobed, apex acute to obtuse. Lower cauline leaves similar, base usually amplexicaul and auriculate. Middle and upper cauline leaves smaller and sessile, lamina undivided to pinnatifid, narrowly rhombate to oblong-lanceolate, 1.7-11(-16) × 0.4-5(8.2) cm, base amplexicaul and auriculate. Inflorescence laxly corymbose, (4-)-7-18(-23)-headed, supported by linear-lanceolate leaves with entire to lobed margins; peduncles 1-5(-8) cm long, sparsely floccose or glandular-hairy. Capitula radiate; calycular bracts 4-9, 2-6 mm long, sparsely to densely floccose or glandular-hairy, whitish to greenish; involucre cyathiform, 8-12 mm diameter; phyllaries 16-28, linear-lanceolate, 7-9 mm long, floccose or glandular-hairy, whitish to greenish, apex acute. Ray florets 9-13, 12-24 × 3-4.5 mm, limb oblong-elliptic. Disc florets 40-65, corollas 4-lobed, 7-10 mm long, yellow; stamens 4; anther base short-sagittate with acute apices; filament collar senecioid; style branches linear, 1.4-1.5 mm long, apices obtuse with mainly lateral long sweeping hairs, lower surface long papillate towards apex. Achenes narrowly oblong-cylindrical, 4.5-6 mm long, completely setuliferous on ribs; pappus 7-9 mm long, dirty white.

Flowering time and habitat: 6-8, rocky slopes and scrub, 1500-3300 m.

Specimens seen: Turkey. **B6** Kayseri: Sarız, above Yalak (Yeşilkent), Binboğa Dağı, 1700-2000 m, 18.7.1992, *Aytaç* 5251 & *H.Duman* (GAZI); Sarız, Yeşilkent, above Karakoyunlu village, 1935 m, 29.7.2008, *Hamzaoğlu* 5303, *Aksoy & Budak* (GAZI, Bozok Univ. Herb.); Malatya: Doğanşehir, Dedeyazı village, Keşiş Dağı, 1800-2000 m, 28.7.1971, *Peşmen* 2311 (HUB); Doğanşehir, Eskiköy, between Çobanderesi and İhtiyar cave, 1600-1800 m, 25.7.1971, *Peşmen* 2644 (HUB); *ibid.*, c. 1900-2000

m, 14.7.1971, *Peşmen s.n.* (EGE); **B7** Elazığ: Baskil, Şahindere, Konak Mezrası, 1500-1750 m, 30.6.1996, *Behçet* 5398 (VANF); Masdar Dağı, Kuşkayası, c. 2000 m, 12.6.1984, *Evren* 1922 (ANK); Tunceli: Pülümür, Kuzdere Tepesi, 1700-2100 m, 14.6.1980, *Yıldırım* 3192 (HUB); Malatya: Venk village, Tavşan Tepesi, 1500-1600 m, 08.6.1996, *Yıldız* 13378 (INU); **B8** Erzurum: between Çat and Bingöl, around Kirişli pass, 2320 m, 16.7.2007, *Hamzaoğlu* 4860 & *Aksoy* (Bozok Univ. Herb.); Erzurum: Aşkale, above Yumruveren village, 2130 m, 17.7.2007, *Hamzaoğlu* 4882 & *Aksoy* (GAZI, Bozok Univ. Herb.); Muş: Üçevler village, Ziyarettepe, 2850 m, 03.8.1996, *Dönmez* 5403 (HUB); **B9** Muş: Malazgirt, south-east of Karıncalı village, 1760 m, 23.6.2006, *Behçet, Özgökçe & Ünal s.n.* (VANF); Bitlis: Tatvan, Nemrut Dağı, in crater, 2250-2400 m, 06.7.2006, *Hamzaoğlu* 4747, *Aksoy & Budak* (GAZI, Bozok Univ. Herb.); *ibid.*, 1900-2900 m, 18.6.1972, *Peşmen* 2882 (HUB); *ibid.*, 2250 m, 05.7.1986, *Seçmen* (EGE 18593); *ibid.*, c. 2180 m, 13.7.1956, *Birand* 260 & *Karamanoğlu* (ANK); Döşkaya village, 1500 m, 18.6.2002, *Altıok* 2615 (VANF); Hizan, Karbastı village, 1600 m, 26.6.1990, *Behçet* 3289 (VANF); Kotum, Karz Dağı, above Kamer, c. 2300 m, 24.8.1954, *P.H.Davis* 24600 & *Polunin* (ANK); *ibid.*, 28.6.1954, *P.H.Davis* 22224 & *Polunin* (ANK); Kambos Dağı, above Hürmüz, c. 1830 m, 31.6.1954, *P.H.Davis* 23443 (ANK); Başhan village, c. 1800-1900 m, 23.6.1983, *Ekim* 7576 (ANK, GAZI); Bitlis/Van: 10 km south-east of Pelli, 2590 m, *P.H.Davis* 22592 (ISTE); Van: Özalp road, 1800 m, 19.9.1993, *Özçelik* 6548 (GUL); Özalp, Pirreşit Dağı, above Gündüzlü village, Çobantaşı, 2350 m, 26.6.1997, *Özgökçe* 3386 (VANF); above Kevenli village, 2300 m, 06.7.1986, *Özçelik* 504 (GUL); east of Küçük Erek Dağı, 2400 m, 19.7.1986, *Özçelik* 795 (GUL); Gürpınar, between Sarıyaprak and Güleçler village, 2300 m, 18.7.2001, *Ünal* 6138 (VANF); Gürpınar, south-east of Koçgüden village, 2500 m, 23.7.2001, *Ünal* 5972 (VANF); Gürpınar, Sarıyaprak, 2800 m, 01.8.2002, *Ünal* 7971 (VANF); between Van and Tatvan, 10 km, c. 1800-2000 m, 24.6.1983, *Ekim* 7656 (ANK, GAZI); Başkale, İspiriz Dağı, c. 3300 m, 31.7.1954, *P.H.Davis* 23759 & *Polunin* (ANK); Gevaş, Artos Dağı, c. 3050 m, 16.7.1954, *P.H.Davis* 22747 & *Polunin* (ANK); Çatak, Bahçesaray road, Aşağınarlıca village, 2100 m, 30.6.1983, *Koyuncu* 6189 & *Coşkun* (GAZI); Hoşap, Güzeldere pass, 2800

m, 18.8.1993, *Altan* 5549 (GAZI); Muş: Malazgirt, east of Aktuzla, 1600 m, 03.6.2000, *Almaner* 1550 (VANF); Ağrı: between Horasan and Eleşkirt, about Tahir (Saçdağı) pass, 1990 m, 05.7.2007, *Hamzaoğlu* 4731, *Aksoy & Budak* (GAZI, Bozok Univ. Herb.); *ibid.*, 24.7.2008, c. 1800-1900 m, *Budak* 2326 & *Aksoy* (GAZI, Bozok Univ. Herb.); **B10** Ağrı: Doğubayazıt, Tendürek pass, 2590 m, 29.7.2007, *Budak* 2207, *Hamzaoğlu & Aksoy* (GAZI, Bozok Univ. Herb.); **C6** Kahramanmaraş: Engizek Dağı, north of Gici Tepesi, 2000 m, 22.7.1987, *H.Duman* 3655 (GAZI); **C9** Siirt: Eruh, Yassıdağ (Serikur Dağı), above Meşindağ pass, 2100 m, 18.7.1981, *Tuzlacı s.n.* (ISTE); **C10** Hakkari: Cilo Dağı, Cilo Yayla, Diz Deresi, c. 2438 m, 10.8.1954, *P.H.Davis* 24254 & *Polunin* (ANK); between Yüksekova and Dağlıca, 1830 m, 30.6.2006, *Budak* 2077 & *Hamzaoğlu* (GAZI, Bozok Univ. Herb.); between Yüksekova and Vargöz, Sat Dağı, 1900-2000 m, 27.6.1966, *P.H.Davis* 45565 (ISTO); Sat Dağı, between Vargöz and Sat Lake, 2600 m, 27.7.1966, *P.H.Davis* 45679 (ISTO); **Azerbaijan**. Nahcivan: Aznabyurt village, around Almalıbulak Dağı, 28.7.1976, *D.Halilov* (BAK 23571); **Armenia**. Daralgez region, 8.8.1931, *I.Qarjagin* (BAK 28589).

Distribution: Transcaucasia, N. Iran, N. Iraq, E. & C. Turkey. Irano-Turanian element.

The species is extremely variable in leaf dissection, hair type, and indumentum. The typical form of this species grows on the steppe of Van and Hakkari provinces. The specimens collected in these provinces have lobed leaves. *Senecio lipskyi* Lomakin, based mainly on this character, was separated in *Flora Iranica* (Nordenstam & Rechinger, 1989). This species exhibits leaf dissection in mid- and northern regions of east Anatolia. It is possible to see leaf dissection of any type in the same population of these regions. Specimens collected in Bitlis: Tatvan, Nemrut Mountain crater (*Hamzaoğlu* 4747, *Aksoy & Budak*, GAZI and Bozok Univ. Herb.) and Ağrı: Tahir (Saçdağı) pass (*Budak* 2326 & *Aksoy* and *Hamzaoğlu* 4731, *Aksoy & Budak*, GAZI and Bozok Univ. Herb.) and Tendürek pass (*Budak* 2207, *Hamzaoğlu & Aksoy*, GAZI and Bozok Univ. Herb.) that showed variation in these characters. According to these findings, and based on phyllary hair type and leaf dissection, *Senecio eriospermus* DC. var. *crambefolius* Boiss. and *Senecio lipskyi* are considered synonymous (c.f. Matthews, 1975; Shishkin, 1995).

7. *Turanecio taraxacifolius* (M.Bieb.) Hamzaoğlu, comb. nov.

Rhizomatous perennial herb. Stem leafy, simple or branched below middle, ascending to erect, 20-40(-60) cm tall, glandular-hairy. Basal leaves petiolate, petioles 3-11(-15) cm long, narrowly winged, lamina lyrate-pinnatisect with 1-4 pairs of broadly triangular to oblong-suborbicular lateral segments, elliptic-oblongate in outline, 5-12(-18.5) × 3-6(-8) cm, glandular-hairy on both surfaces, greenish, terminal segment distinct, larger than lateral ones, broadly ovate to oblong-lanceolate with attenuate to obtuse base; margins irregularly dentate, apex almost obtuse. Lower cauline leaves similar, lamina with 1-3 pairs of lateral segments or sometimes undivided, base amplexicaul and auriculate. Middle and upper cauline leaves smaller and sessile, lamina undivided to deeply pinnatilobed, ovate-lanceolate, 1.2-7(-9.5) × 0.4-1.5(-2.5) cm, base amplexicaul and usually conspicuously auriculate. Inflorescence a lax, 2-15-headed corymb or sometimes of solitary capitula, supported by linear leaves with entire to coarsely dentate margins; peduncles 1-8(-13) cm long, glandular-hairy. Capitula radiate or discoid; calycular bracts 1-9, 4-9 mm long, glandular-hairy, greenish; involucre cyathiform, 13-19 mm diameter; phyllaries 14-22, linear to lanceolate, 7-11 mm long, sparsely glandular-hairy, greenish to brownish, apex acute to acuminate. Ray florets (if present) 10-12, 12-17 × 3-4 mm, elliptic. Disc florets 45-75, corollas 4-lobed, 7-10 mm long, yellow to orange; stamens 4, anther base short-sagittate with obtuse apex; filament collar senecioid; style branches linear, 1.4-1.8 mm long, apices subtruncate to obtuse with mainly lateral long sweeping hairs, lower surface short papillate towards apex. Achenes narrowly oblong-elliptic, 5-8 mm long, glabrous; pappus 5-9 mm long, dirty white.

1. Capitula radiate, borne in a lax (2-)4-7(-15)-headed corymb var. *taraxacifolius*
1. Capitula discoid, solitary or borne in a lax 2-5(-9)-headed corymb var. *discoideus* var. *taraxacifolius* (Figures 11 & 16).



Figure 11. *Turanecio taraxacifolius* var. *taraxacifolius* (Budak 2107 & Hamzaoğlu).
A- habit, B- capitulum, C- ray and disc florets, D- achene and pappus,
E- anther bases, F- style branches.

≡ *Cineraria taraxacifolia* M.Bieb., Fl. Taur.-Cauc. 2: 313 (1808); *Senecio taraxacifolius* (M.Bieb.) DC., Prodr. (DC.) 6: 348 (1838); *Iranecio taraxacifolius* (M.Bieb.) C.Jeffrey, Kew Bull. 47(1): 103 (1992).

Holotype: Georgia. In Iberia, *Steven s.n.* (LE).
= *Ligularia aucheri* DC., Prodr. 7: 300 (1838).

Type: In Persia australis prov. Laristan in montibus legitel, *Aucher-Eloy* 3431 (holotype: not traced).

Flowering time and habitat: 7-9, alpine meadows, rocky slopes, screes and streamsides, 2250-3050 m.

Specimens seen: Turkey. A8 Gümüşhane: Maden Dağı, c. 3050 m, 02.8.1933, *Balls* 553 & *Gourlay* (ANK);

Trabzon: Çaykara, Haldizan, Uzungöl, Demirkapı village, 2750 m, 26.8.1995, *Terzioğlu s.n.* (KATO); Rize: İkizdere, Gölyayla, 2665 m, 02.8.2005, *Budak 1947*, *Hamzaoğlu & Aksoy* (Bozok Univ. Herb.); *ibid.*, 2580 m, 17.7.2006, *Budak 2110*, *Hamzaoğlu & Aksoy* (GAZI, Bozok Univ. Herb.); between İkizdere and İspir, Ovıt Dağı, 2630 m, 01.8.2005, *Budak 1937 & Hamzaoğlu* (GAZI, Bozok Univ. Herb.); *ibid.*, 2650 m, 17.7.2006, *Budak 2107 & Hamzaoğlu* (GAZI, Bozok Univ. Herb.); *ibid.*, 2450 m, 07.8.1983, *N.Özhatay*, *E.Özhatay & Sarıyar s.n.* (ISTE); İkizdere, Anzer, 2550 m, 06.8.1983, *N.Özhatay*, *E.Özhatay & Sarıyar s.n.* (ISTE); İkizdere, between Anzer Yaylası and Bayburt, 2950 m, 21.7.1984, *Güner 5978 & Vural* (GAZI, HUB); Çamlıhemşin, Yukarıkavrun Yaylası, Kaçkar Dağı, 2350-3450 m, 09.8.2002, *Hamzaoğlu 3347* (Bozok Univ. Herb.); *ibid.*, around Mezevit, 2250-2800 m, 02.9.1979, *Güner 2136* (HUB); Çamlıhemşin, Hisarcık village, between Ortasirt Yaylası and Lamalı, 2400-2600 m, 20.8.1981, *Güner 4202* (ANK, HUB); Çamlıhemşin, Ortayayla village, Verçembek Dağı, around Atmeydanı Gölü, 3000 m, 20.8.1982, *Güner 4498* (HUB); Bayburt: around Yoncalı Yaylası, 2975 m, 18.8.2006, *Hamzaoğlu 4500*, *Aksoy & Budak* (Bozok Univ. Herb.); between Yoncalı and Anzer (Ballıköy), 2600-3000 m, 18.8.2006, *Hamzaoğlu 4462*, *Aksoy & Budak* (Bozok Univ. Herb.); **A9** Ardahan: Çıldır, Sabaholdu village, Sabaholdu Yaylası, Kel Dağ, 2600-3040 m, 01.8.2007, *Budak 2246*, *Hamzaoğlu & Aksoy* (GAZI, Bozok Univ. Herb.); Posof, north of Ilgar Dağı, 2545 m, 04.8.2005, *Budak 1966 & Hamzaoğlu* (GAZI, Bozok Univ. Herb.); Posof, between Alabalık Yaylası and Kaleönü, 1800-2500 m, 30.8.1986, *Demirkuş 3778* (HUB); Kars: Kağızman, Aladağ, 2800-3100 m, 23.7.1980, *Güneş 1719* (HUB); Artvin: from Pırnallı village to Kaçkal Dağı, 1600-3100 m, 12.8.1984, *Demirkuş 2599b* (HUB); Ardanuç, from Lahşet to Kurdevan Dağı, 1900-2900 m, 29.7.1982, *Demirkuş 1620* (HUB); *ibid.*, 1500-3000 m, 08.8.1984, *Demirkuş 2497b* (HUB).

Distribution: Caucasia, N.W. Iran, N.E. & E. Turkey.

var. *discoideus* (V.A.Matthews) Hamzaoğlu, **comb. nov.** (Figures 12 & 16).

= *Senecio taraxacifolius* (M.Bieb.) DC. var. *discoideus* V.A.Matthews, Notes Roy Bot Gard Edinb 33: 257 (1974); *Iranecio taraxacifolius* (M.Bieb.) C.Jeffrey var. *discoideus* (V.A.Matthews) D.Heller, Consp. Fl. Orient. 8: 171 (1993).

Holotype: Turkey. B9 Bitlis: Süphan Dağı, above Adilcevaz, 3350-3660 m, *P.H.Davis 24645 & Polunin* (E - seen as photo!, iso: ANK!).

Flowering time and habitat: 7-9, alpine meadows, volcanic rocky slopes, screes and streamsides, 2500-3700 m.

Specimens seen: Turkey. **B5** Kayseri: Kayseri, 7.1941, *Aulich* (ISTF 1065); **B8** Muş: Bingöl Dağları, around Dağkale Tepe, 3190 m, 07.8.1989, *Alpınar & Hart s.n.* (ISTE); Bingöl: Bingöl Dağı, Beritan Yaylası, 2500-2800 m, 22.8.1983, *Ekim 7895a* (ANK, GAZI); **B9** Bitlis: west of Süphan Dağı, 3700 m, 21.8.1987, *Behçet 1044* (VANF); *ibid.*, c. 2300-3650 m, 13.8.1987, *Behçet s.n.* (EGE); Süphan Dağı, Adilcevaz, c. 3350-3660 m, 26.8.1954, *P.H.Davis 24645 & Polunin* (ANK, isotype); Adilcevaz, from Çanakayayla village to Süphan Dağı peak, 3150 m, 20.8.2006, *Hamzaoğlu 4528*, *Aksoy & Budak* (GAZI, Bozok Univ. Herb.); **B10** Van: Özalp, Bakışık village, 2500 m, 05.10.1997, *Özgökçe 1436* (VANF).

Distribution: Endemic. E. & C. Turkey. Irano-Turanian element.

This species is similar to *Turanecio davisii* (V.A.Matthews) Hamzaoğlu in terms of its habitat preference and leaf dissection. It differs from *T. davisii* in hair type, stem length, shape of terminal segment, the number of pairs of lateral segments, and phyllary number.

8. *Turanecio davisii* (V.A.Matthews) Hamzaoğlu, **comb. nov.** (Figures 13 & 16).

= *Senecio davisii* V.A.Matthews, Notes Roy Bot Gard Edinb 33: 256 (1974); *Iranecio davisii* (V.A.Matthews) C.Jeffrey, Kew Bull. 47(1): 102 (1992).

Holotype: Turkey. C10 Hakkâri: Sat Dağı, between Yüksekova and Vargöz, 2000 m, 30.6.1966, *P.H.Davis 45832* (E photo!, iso: K, ISTO!).

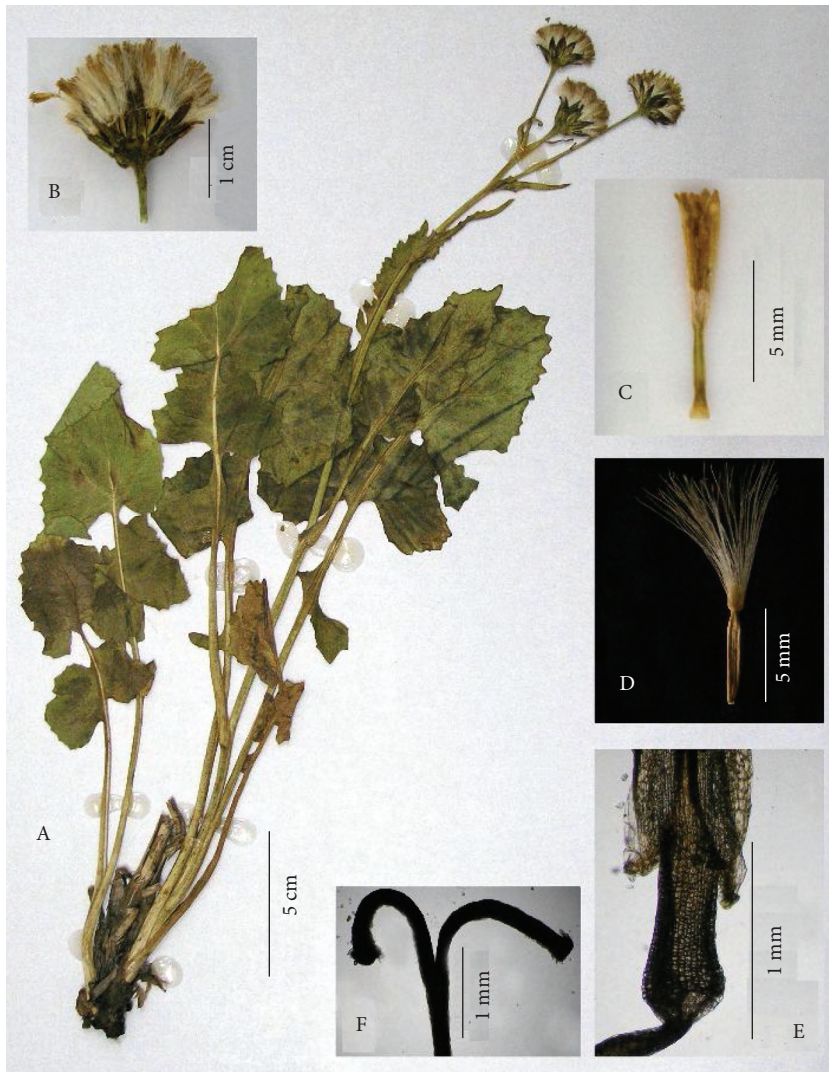


Figure 12. *Turanecio taraxacifolius* var. *discoideus* (Hamzaoglu 4528 et al.). A- habit, B- capitulum, C- disc floret, D- achene and pappus, E- anther bases, F- style branches.

Rhizomatous perennial herb. Stem leafy, simple, erect, 60-90 cm tall, sparsely pubescent. Basal leaves petiolate, petioles 10-12 cm long, narrowly winged, lamina pinnatisect with 4-9 pairs of ovate-lanceolate to oblong-suborbicular lateral segments, elliptic to linear-lanceolate in outline, 12-24 × 4-13 cm, subglabrous to sparsely pubescent on both surfaces especially on veins, greenish, terminal segment indistinct, smaller than lateral ones, triangular margins coarsely and irregularly sinuate-dentate,

apex acute. Lower cauline leaves similar, base semi-amplexicaul and auriculate. Middle and upper cauline leaves smaller and sessile, lamina pinnatifid to pinnatisect, linear-lanceolate, 5-14 × 2.5-7.5 cm, base amplexicaul and auriculate. Inflorescence laxly corymbose, 5-10-headed, supported by linear-lanceolate leaves with entire to coarsely dentate margins; peduncles 2-6(-9) cm long, sparsely pubescent. Capitula radiate; calycular bracts 5-12, 4-8 mm long, pubescent, greenish; involucre hemispherical to cyathiform, 14-22 mm diameter;



Figure 13. *Turanecio davisii* (P.H.Davis 45832, ISTO, isotype). A- habit, B- capitulum, C- ray and disc florets, D- achene and pappus, E- anther bases, F- style branches.

phyllaries 20-30, linear to lanceolate, 10-14 mm long, sparsely pubescent, greenish, apex acute to acuminate. Ray florets 14-19, 14-22 × 4-6 mm, limb elliptic-oblong to oblanceolate. Disc florets 40-50, corollas 4-lobed, 9-11 mm long, yellow; stamens 4, anther base short-sagittate with obtuse apex; filament collar senecioid; style branches linear, 1.5-1.9 mm long, apices lower surface of branches short papillate towards apex. Achenes narrowly oblong-cylindrical, 6-8 mm long, glabrous; pappus 7-10 mm long, white.

Flowering time and habitat: 6-7, shaly rocky slopes, c. 2000 m.

Specimens seen: Turkey. C10 Hakkâri: Sat Dağı, between Yüksekova and Vargözü, 2000 m, 30.6.1966, P.H.Davis 45832 (ISTO, isotype).

Distribution: S.E. Turkey, N.E. Iran. Irano-Turanian element.

9. *Turanecio bulghardaghensis* (Soldano) Hamzaoglu, **comb. nov.** (Figures 14 & 16).

≡ *Senecio farfarifolius* Boiss. & Kotschy, Fl. Orient. 3: 400 (1875), non Maxim. (1874) [*Senecio farfarifolius* Maxim.]; *Iranecio farfarifolius* (Boiss. & Kotschy) C.Jeffrey, Kew Bull. 47(1): 102 (1992);

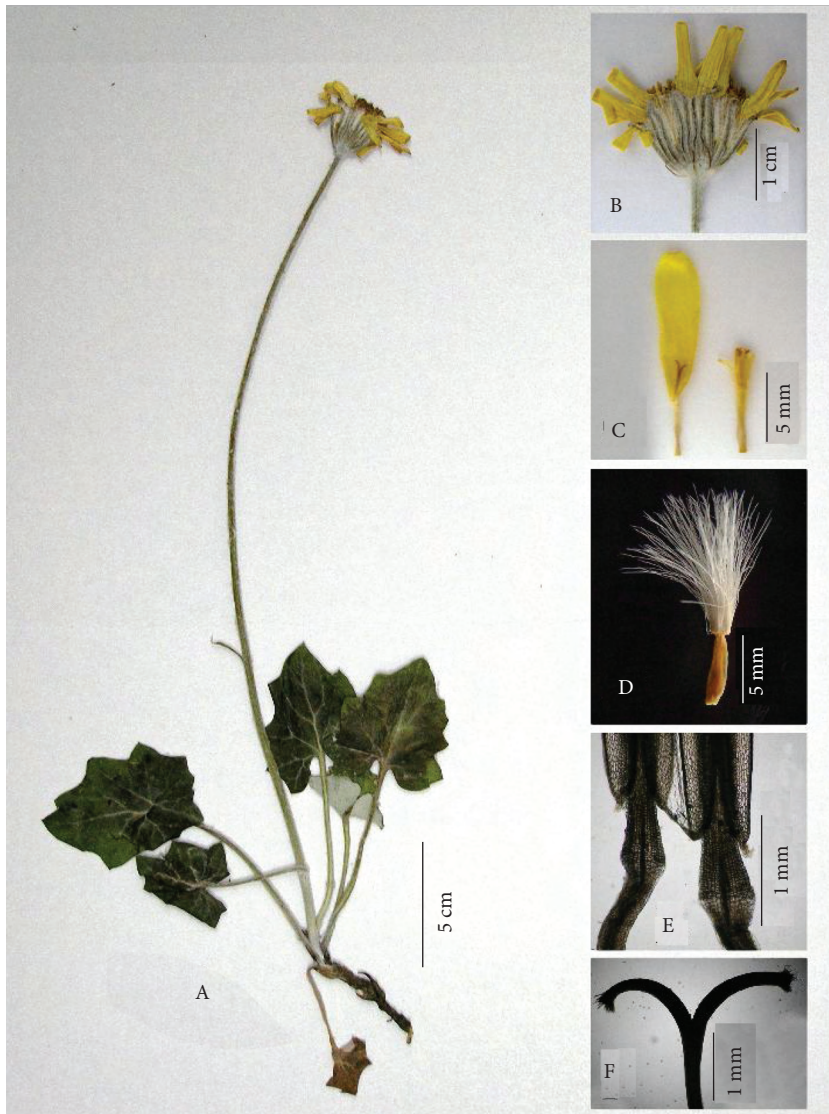


Figure 14. *Turanecio bulghardaghensis* (Budak 1759 et al.). A- habit, B- capitulum, C- ray and disc florets, D- achene and pappus, E- anther bases, F- style branches.

Senecio bulghardaghensis Soldano, Comp. Newsl. 20/21: 7 (1992), nom. nov. pro *S. farfarifolius* Boiss. & Kotschy; *Iranecio bulghardaghensis* (Soldano) D.Heller, Consp. Fl. Or. 8: 68 (1993).

Lectotype (here designated): Turkey. C5 Niğde/ Mersin: In rupestribus frigidis Tauri Cilicici montis Bulghardagh (Bolkar Dağı), 1370-2130 m, *Kotschy* 96 (G-BOIS with barcode G00150309 - seen as photo!).

The photographs 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 a barcode. Lectotypification is performed using the specimens with barcodes.

Rhizomatous perennial herb. Stem scapiform, simple or sometimes few-branched towards base, ascending to erect, 10-40(-60) cm tall, densely

floccose. Basal and lower cauline leaves undivided, petiolate, petioles 2-15(-19) cm long, narrowly winged, lamina triangular-cordate to reniform with cordate base, 3-8(-13) × 2-7(-12) cm, sparsely floccose and dark greenish above, very densely floccose and whitish below, margins coarsely dentate, apex acute-mucronate. Middle and upper cauline leaves much reduced, lamina linear, 0.9-1.5(-3) × 0.1-0.2 cm. Inflorescence of solitary capitula or of a lax 2-5(-13)-headed corymb, supported by linear leaves with entire margins; peduncles 3-15(-30) cm long, densely floccose. Capitula radiate; calycular bracts 4-14, 3-7 mm long, densely floccose, whitish; involucre cyathiform, 10-18 mm diameter; phyllaries 22-26, linear-lanceolate, 8-14 mm long, densely floccose, whitish, apex acute to acuminate. Ray florets 12-16, 11-17 × 2.5-5.5 mm, limb oblong-ob lanceolate. Disc florets 40-75, corollas 4-lobed, 7-11 mm long, yellow; stamens 4, anther base short-sagittate with acute apex; filament collar senecioid; style branches linear, 1.3-1.4 mm long, apices truncate to slightly obtuse with mainly lateral long sweeping hairs, lower surface short papillate towards apex. Achenes oblong-elliptic, 4-6 mm long, glabrous; pappus 7-11 mm long, white.

Flowering time and habitat: 6-8, rocky slopes, shrubs and forest openings, 1275-2700 m.

Specimens seen: Turkey. **C3** Antalya: Alanya, south of Gökbel Yaylası, 1800 m, 18.7.1998, *Güner* 12648 (GAZI); Gündoğmuş, Geyik Dağı, Söbüçimen Yaylası, 1980 m, 14.7.1998, *Başer* et al. 1482 (GAZI); **C4** Antalya: Gazipaşa, Macarköyü Yaylası, Srainler, 1800-2000 m, 21.7.1981, *Sümbül* 1216 (ANK, HUB, AIBU); *ibid.*, Sarımaçalanı, c. 2000 m, 13.7.1982, *Sümbül* 1325 (ANK, HUB); Mersin (İçel): between Ermenek and Anamur, Çamurluyayla, c. 2100 m, 15.8.1949, *P.H.Davis* 16263 (ANK); **C5** Niğde: Ulukışla, Maden, Bolkar Dağı, north-east of Karagöl, 2660 m, 19.7.2005, *Budak* 1759, *Hamzaoğlu & Aksoy* (GAZI, Bozok Univ. Herb.); *ibid.*, 2700 m, 03.8.1992, *Hein s.n.* (ISTE); Mersin (İçel): Arslanköy, Bolkar Dağı, Küçük yıldız Tepesi, 2300 m, 10.8.1976, *Alpınar s.n.* (ISTE); Tarsus, Cocak Deresi, c. 1700 m, 12.7.1988, *Gemici* (EGE 37837); Cocak Vadisi, c. 1900 m, 6/7.1970, *Quézel* 85 (ANK); Adana: Karaisalı, Karsantı (=Aladağ), 24.6.1970, *Pamukçuoğlu s.n.* (AIBU, HUB); *ibid.*, Şamadan Gediği, Sulukeler,

1275 m, 20.6.2006, *Budak* 2062, *Hamzaoğlu & Aksoy* (GAZI, Bozok Univ. Herb.); *ibid.*, Şamadan region, Karapınar road, c. 1500 m, 31.5.1973, *Yurdakuol* 76 (ANK); Konya: Ereğli, Aydos Dağı, Delimahmutlu, Otlak Tepe, 2200 m, 19.8.1978, *Erik* 3041 (HUB).

Distribution: Endemic. S. Turkey. East Mediterranean element.

It is closely related *Turanecio jurineifolius* (Boiss. & Balansa) *Hamzaoğlu* based on the scapiform stem, but differs clearly from *T. jurineifolius* in terms of basal and lower cauline leaf shape and the length of the calycular bracts. The specimens of Adana: Karsantı (=Aladağ) were referred to as *Senecio bornmuellerianus* Quézel & Pamukç. nom. nud. by Quézel and Pamukçuoğlu (Quézel & Pamukçuoğlu, 1973). Some of these specimens are taller and have a branched lower stem and larger leaves, and have many capitula when compared to specimens collected from other localities. The Karsantı (=Aladağ) population prefers humid forest or openings at around 1275-1500 m. It is thought that the differences observed in some individuals are caused by the habitat. This species was previously referred to as *Senecio farfarifolius* Boiss. & Kotschy in the *Flora of Turkey*, but renamed as *Senecio bulghardaghensis* by Soldano (Boissier, 1875; Matthews, 1975; Soldano, 1992). Unfortunately, these observations were not taken into consideration later and this species was transferred separately to the genus *Iranecio* as both *I. farfarifolius* and *I. bulghardaghensis* (Jeffrey, 1992; Heller & Heyn, 1993).

10. *Turanecio jurineifolius* (Boiss. & Balansa) *Hamzaoğlu*, **comb. nov.** (Figures 15 & 16).

= *Senecio jurineifolius* Boiss. & Balansa, *Diagn. Ser.* 2(6): 99 (1859); *Iranecio jurineifolius* (Boiss. & Balansa) C. Jeffrey, *Kew Bull.* 47(1): 102 (1992).

Lectotype (here designated): Turkey. B5 Kayseri: In regione alpina montis Aslan dach (Tomarza, Aslantaş village) Antitauri in Cappadocica, *Balansa* 733 (G-BOIS with barcode G00150307 - seen as photo!).

The photographs of the type specimens of the taxon are provided from G. There are 2 sheets in G, but 1 of them is without a barcode. The specimen with a barcode is determined as a lectotype for the first time here.



Figure 15. *Turanecio jurineifolius* (Hamzaoğlu 4372 et al.). A- habit, B- capitulum, C- ray and disc florets, D- achene and pappus, E- anther bases, F- style branches.

Rhizomatous perennial herb. Stem scapiform, simple or sometimes few-branched towards base, ascending to erect, 10-30(-45) cm tall, densely floccose. Basal and lower cauline leaves petiolate, petioles 2-6(-9) cm long, narrowly winged, lamina lyrate to pinnatisect with 1-5 pairs of oblong-ovate to triangular-lanceolate lateral segments, broadly ovate to triangular-lanceolate in outline, 4-8(-11) × 2-4(-7) cm, sparsely floccose and dark greenish above, very densely floccose and whitish below, terminal segment

distinct, larger than lateral ones, triangular-ovate to elliptic-lanceolate with attenuate to cordate base, margins coarsely dentate, apex acute-mucronate. Middle and upper cauline leaves much reduced, lamina linear, 0.7-2.5 × 0.1-0.2 cm. Inflorescence of solitary capitula or of a lax 2-3(-5)-headed corymb, supported by linear leaves with entire margins; peduncles 3-16(-26) cm long, densely floccose. Capitula radiate; calycular bracts 4-9, 5-10 mm long, densely floccose, whitish; involucre cyathiform, 12-

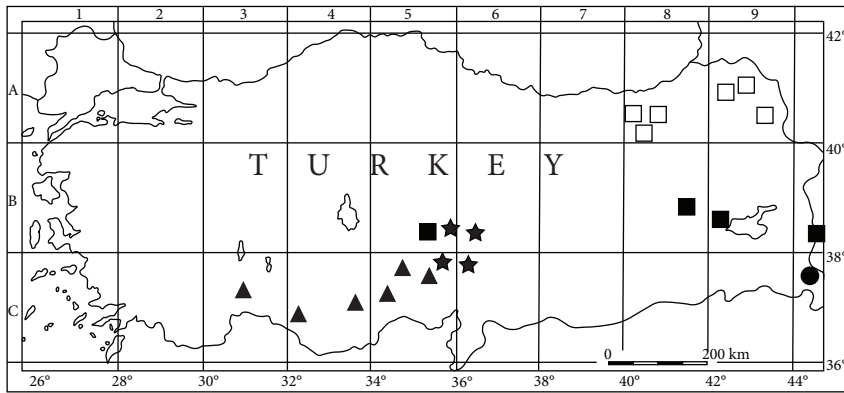


Figure 16. Distribution map of *Turanecio taraxacifolius* var. *taraxacifolius* (□), *T. taraxacifolius* var. *discoideus* (■), *T. davisii* (●), *T. bulghardaghensis* (▲), and *T. jurineifolius* (★) in Turkey.

19 mm wide; phyllaries 20-28, linear-lanceolate, 9-13 mm long, densely floccose, whitish, apex acute to acuminate. Ray florets 12-14, 14-20 × 3.5-4.5 mm, limb oblong-elliptic. Disc florets 50-65, corollas 4-lobed, 9-11 mm long, yellow; stamens 4, anther base short-sagittate with acute apex; filament collar senecioid; style branches linear, 1.6-1.7 mm long, apices truncate to slightly obtuse with mainly lateral long sweeping-hairs, lower surface short papillate towards apex. Achenes narrowly oblong-elliptic, 5.5-8.5 mm long, glabrous; pappus 7-9.5 mm long, white.

Flowering time and habitat: 7-8, rocky places, 1350-2900 m.

Specimens seen: Turkey. **B5** Kayseri: Tomarza, Aslantaş village, north of Karagöl Dağı, 2405 m, 05.8.2005, *Budak* 1976, *Hamzaoğlu & Aksoy* (GAZI, Bozok Univ. Herb.); *ibid.*, 2050-2250 m, 20.7.2006, *Hamzaoğlu* 4372, *Aksoy & Budak* (GAZI, Bozok Univ. Herb.); **B6** Kahramanmaraş: Göksun, Binboğa Dağı, above Keklikoluk village, 2530 m, 20.7.2005, *Budak* 1815, *Hamzaoğlu & Aksoy* (GAZI, Bozok Univ. Herb.); *ibid.*, 2630 m, 20.7.2005, *Budak* 1843, *Hamzaoğlu & Aksoy* (GAZI, Bozok Univ. Herb.); **B7** Kahramanmaraş: Göksun, Binboğa Dağı, Keklikoluk Kayası, Işık Dağı (Binboğa Dağı), 2400-2600 m, 11.9.1991, *Aytaç* 4435 & *H.Duman* (GAZI); Findık village, north of Kandil Dağı, 1600-1800 m, 27.7.1981, *Yıldız* 3113 (HUB); north of Berit Dağı,

2800 m, 25.8.1977, *Yıldız* 1612 (HUB); Çardak, Berit Dağı, Arpaçukuru Yaylası, c. 2800 m, *P.H.Davis* 20330 (ANK); Kayseri: Sarız, Yeşilkent (Yalak), Binboğa Dağı, around Körkuyu Tepe, 2400-2600 m, 20.7.1992, *Aytaç* 5404 & *H.Duman* (HUB); Binboğa Dağı, Tekkekayası, 2000-2400 m, 18.7.1992, *Aytaç* 5298 & *H.Duman* (GAZI, AIBU); *ibid.*, 2400-2550 m, 23.7.1992, *Aytaç* 5497 & *H.Duman* (GAZI); **C5** Adana: Karsantı, Söğüt region, c. 1350 m, 26.5.1973, *Yurdakuol* 79 (ANK); **C6** Kahramanmaraş: Süleymanlı, Berit Dağı, between Yedigardaş and Çimen Yaylası, 2700-2900 m, 29.7.1981, *Yıldız* 3209 (HUB).

Distribution: Endemic. S. Turkey (Anti-Taurus). East Mediterranean element.

It shows similarity to *Turanecio bulghardaghensis* with its scapiform stems. Some specimens of *T. jurineifolius* may have a few undivided basal leaves. However, these specimens clearly differ from *T. bulghardaghensis* in leaf shape, calycular bracts, and the length of the ray florets.

Additional specimens seen: *Iranecio paucilobus* (DC.) B.Nord. (Figure 17). Turkey. **B9** Van: between Van and Çatak, Işınlı (Arganis) village, Yukarımahalle, 1890 m, 01.7.2006, *Hamzaoğlu* 4112, *Aksoy & Budak* (Bozok Univ. Herb.); *ibid.*, 22.7.2008, *Budak* 2298, *Hamzaoğlu & Aksoy* (Bozok Univ. Herb.); 15 km

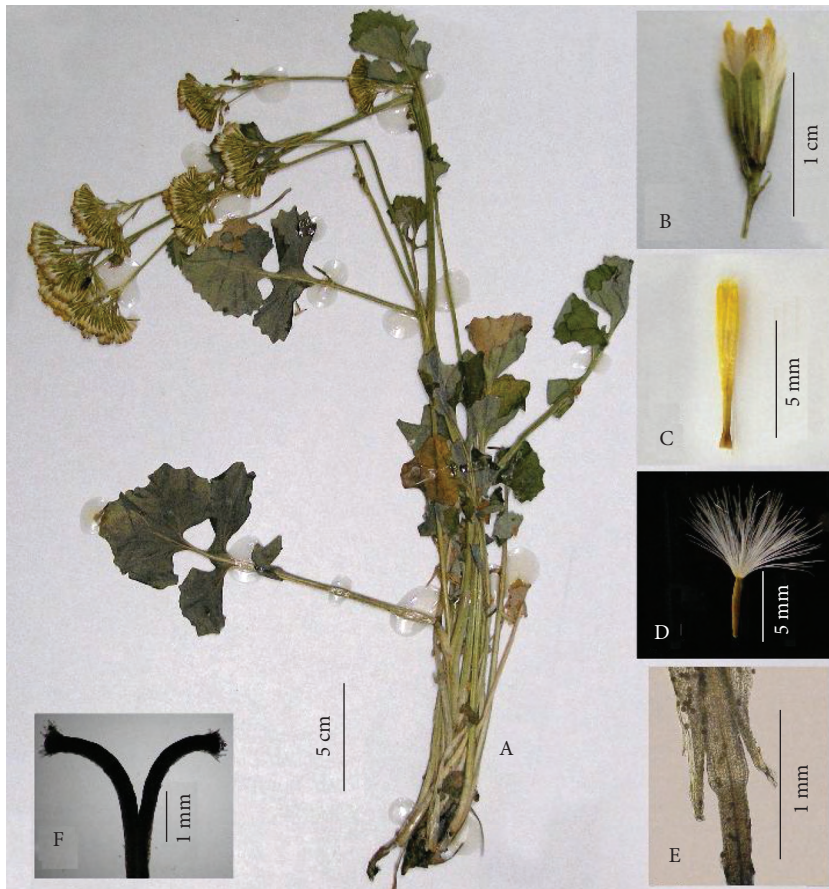


Figure 17. *Iranecio paucilobus* (Hamzaoglu 4112 & Budak). A- habit, B- capitulum, C- disc floret, D- achene and pappus, E- anther bases, F- style branches.

North of Çatak, 25.7.1954, *P.H.Davis* 23152 & *Polunin* (ANK); west of Küçük Erek Dağı, 2600 m, 19.7.1986, Özçelik 1012 (GUL); *ibid.*, 2500 m, 06.7.1986, Özçelik 512 (GUL); **C10** Van: around Çatak, Çatak Deresi, c. 1500 m, 12.7.1972, *Koyuncu* 3765 (GAZI); between Hoşap and Başkale, Güzeldere pass, 2600 m, 02.9.2001, *Armağan* (VANF 4481); Hakkâri: after 126 km from Hakkâri, Çuh Dağı (Çuh Gediği), 2600 m, 19.0.1956, *Birand* 484 & *Karamanoğlu* (ANK).

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