

## A New Species of *Senecio* (Asteraceae) from North Africa

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**ABSTRACT.** A new species of *Senecio* from the Anti Atlas of Morocco, *S. kerdousianus* (Asteraceae: Senecioneae), is described and illustrated. The new species can be distinguished from other species of *Senecio* growing in the Anti Atlas in their discoid capitula, subentire lower leaves with coarse sinuate dentate margins, and cauline and upper leaves with broad auriculate bases. A key to related species from SW Morocco, south of the High Atlas, is provided.

*Senecio* L. is a cosmopolitan genus comprising ca. 1,250 species of trees, shrubs, lianas, and herbs, of which ca. 350 occur in Africa (Mabberley 1997).

Six taxa of *Senecio* sect. *Senecio* are reported from the Anti Atlas: *S. vulgaris* L., *S. massaicus* (Maire) Maire, *S. flavus* (Decne.) Sch. Bip., *S. lividus* L. subsp. *foeniculaceus* (Ten.) Braun-Blanq. & Maire, *S. hesperidum* Jahan., Maire & Weiller, and *S. coronopifolius* Desf. The region can be characterized by the presence of Mediterranean, Saharan, and tropical floral elements, the mix of which depends upon climatic conditions (Msanda et al. 2002).

In ten years of botanical exploration of Morocco, we have produced a series of chorological investigations (Gómez 2002) and obtained much material from this area. Most specimens are deposited in the personal herbarium of F. Gómez. This herbarium offers no loans, but can be consulted in association with LEB Herbarium. During a 1996 expedition, we found a peculiar population of *Senecio* in the Anti Atlas (SW Morocco). New material, collected in 2004, confirmed that the specimens represent a new species of *Senecio* sect. *Senecio*. This section includes annual species that are glabrous or variously pubescent, with subentire to pinnatisect leaves, involucre usually with small calycular bracts, and subcylindrical, glabrous or setuliferous achenes (Chater and Walters 1976).

### TAXONOMIC TREATMENT

***Senecio kerdousianus*** Gómez & Llamas, sp. nov.—

TYPE: MOROCCO. Anti Atlas: Col du Kerdous, 29RMN6768, 1,050 m, al pie de roquedo silíceo húmedo y umbrío, 29° 33' N 9° 21' W, 2-IV-1996, Fco. Gómez (Holotype MA 712317! (Fig. 1A); ISO-TYPES: LEB 82419; herb. F. Gómez, FG 4711, 4712).

A *S. leucanthemifolius* capitulis homogamis prorsus et semper discoideus differt. A *S. coronopifolius*, primo obtutu recedit, capitulis homogamis discoideus, foliis subintegris vel inaequaliter sinuato-dentatis. A *S. mas-*

*saicus* capitulis paulo maioribus, foliis latioribus omnibus subintegris vel inaequaliter sinuato-dentatis (nec inferioribus interdum laciniis linearibus 1–2 versus medium utroque latere praeditis), superioribus basi valde late auriculato-amplexicaulis (nec superioribus basi non vel vix dilatatis auriculis brevibus rotundatis integerrimis semi-amplexicaulis) differt.

Annual with fibrous roots and erect stem, up to 30–40 cm high, branched from the lower half with suberect branches as long as the main stem. Plant green, subglabrous, with few simple, multicellular hairs, hairs more abundant in the upper part of the stem and branches, as well as on the mid-vein of the leaves. Basal leaves few and mostly withered at anthesis, lamina obovate, 2–3 × 0.8–1.2 cm, with sinuate margins, attenuate into a petiole as long as or slightly shorter than the lamina; middle cauline leaves auriculate, sessile, oblong to oblong-lanceolate, lamina 5–7 × 1.2–2 cm, margins irregularly sinuate-dentate; upper leaves similar to middle cauline leaves but smaller, with large semiamplexicaulous auricles twice as wide as the middle of the leaf. Inflorescences densely corymbose. Capitula homogamous, discoid, with a caliculus formed by 7–11 calycular bracts, apices black in upper 1/2–1/3; involucre 7–9 × 5–6 mm, glabrous; phyllaries uniseriate, 6–7 mm, oblong-lanceolate, with scarious margins, and pubescent blackish apex (Fig 1B). Florets 4.5–5 mm long (Fig 1C). Anthers small, 0.7–0.8 mm long including the narrowly-triangular acute appendage; filament collars c. 0.15 mm long (Fig 1D). Style arms linear, 0.6–0.7 mm long, apically truncate (Fig 1E). Achenes 10-ribbed 2.5–2.8 × 0.4–0.5 mm, subcylindrical to subfusiform, with glabrous brownish ribs and setuliferous intercostal spaces; setulae cylindrical with rounded apex, grey and appressed (Fig 1F). Pappus deciduous, c. 6 mm long, with white setae in two series, minutely barbellate.

PARATYPES: MOROCCO. Anti Atlas: Col du Kerdous (Tiznit), 29RMN6768, 1,050 m, al pie de roquedo vertical y umbrío, 31-3-2004, F. Llamas & F. Gómez, BC 831896, LEB 82420, MGC 57534, SEV 211640. Western

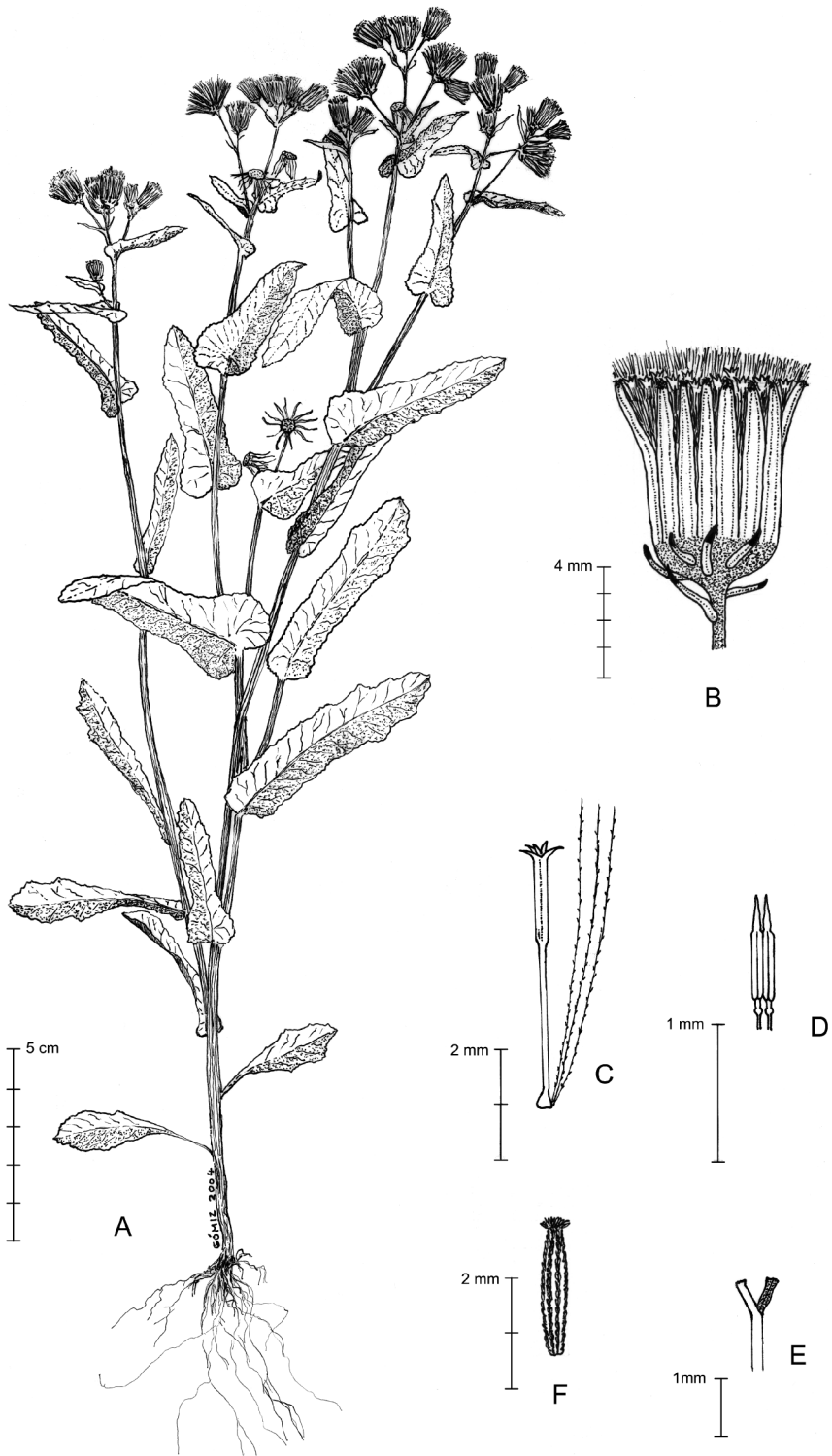


FIG. 1. *Senecio kerdousianus* Gómiz & Llamas. A. entire plant (holotype). B. capitulum. C. floret. D. anthers. E. style and style arms. F. achene (isotype).

Anti Atlas: Jbel Imzi, 29RMN7191, 1,250 m, bajo rocas húmedas y umbrías, 6-4-2004, F. Llamas & F. Gómiz, LEB 82418, MA 712318, herb. F. Gómiz, FG 6672, 6673.

**Relation to Other Taxa.** *Senecio kerdousianus* can be differentiated from other species of *Senecio* sect. *Senecio* growing in the western Anti Atlas or neighboring territories by the combination of discoid capitula, subentire leaves with coarsely sinuate dentate margins, and middle and upper cauline leaves with broadly auriculate bases (Table 1).

*Senecio massaicus* also has discoid capitula, but its leaves are divided into narrow segments and they have no large auricles. Furthermore, it grows at lower elevations in gravelly, dry riverbeds and it does not reach the Anti Atlas mountain range (Jahandiez and Maire 1931-1934; Fennane and Ibn Tattou 1998).

*Senecio flavus* and the cosmopolitan *S. vulgaris* can be distinguished as follows: *S. flavus* has broadly ovate and glaucous leaves that are purple-tinged on the lower surface, and corymbs that are open and lax with orange-reddish florets; *S. vulgaris* has more divided leaves with dentate lobes and without large auricles (in relation to the upper part of the lamina). Outside the Anti Atlas *S. vulgaris* has infraspecific taxa in which capitula are shortly radiate.

*Senecio coronopifolius* and *S. hesperidum* have radiate capitula and more divided leaves: *S. coronopifolius* is one of the most common species in the region. Its leaves are divided into narrow segments. *S. hesperidum*, known only from one locality NW of Tiznit (Fennane and Ibn Tattou 1998) near the border between the western Anti Atlas and the Souss, has fleshy leaves. Some of the lower and middle cauline leaves are bipinnatifid.

*Senecio lividus* subsp. *foeniculaceus* has been reported from the western Anti Atlas (Adrar M' Korn) (Dobignard et al. 1992). This taxon has glandular hairs in the inflorescence and shortly radiate capitula.

Finally, *S. leucanthemifolius* (*sensu lato*) is a variable species not reported from the Anti Atlas region. An ambiguous report of this species from the littoral of SW Morocco, probably from coastal Essaouira (formerly Mogador) was published by Ball (1878). Furthermore, this species usually has radiate capitula with a single discoid variety outside North Africa. Only Sauvage (1949 annotation 521), reported it from the lower Drâa as "*une forme étiolée de ce seneçon qui paraît dépourvue de ligules*" (a weak form of this *Senecio* appearing without ligules). *Senecio leucanthemifolius* var. *casablancae* lives along the Moroccan west coast on sand dunes, rocky calcareous slopes, and sea-facing cliffs up to 50 m high. It has triangular upper cauline leaves that are long, narrow, and serrate, occasionally lobed at the base, and yellow rays 6-10 × 1.5-3 mm.

**Geographic Distribution and Ecology.** The species is distributed in the western Anti Atlas of SW Moroc-

TABLE 1. Morphological comparison of annual species of *Senecio* from the Anti Atlas region. Phyllary and bract lengths are in millimeters. (\*) The colored apex is minute and it is not present in every calycular bract.

	Capitula	Phyllary length	Calycular bract		Rays	Pubescence	Middle cauline leaves	Auricles	Leaf color	Leaf texture		
			number	length								
<i>S. coronopifolius</i>	radiate	4.5-8	1-12	1-4	black	>3 mm	glandular	eglandular	pinnatisect with narrow segments	little	green	fleshy/not fleshy
<i>S. flavus</i>	usually discoid	6-9	0-5	2-2.5	black	absent or <3 mm	glabrous	glabrous	subentire to dentate	very large	glaucous, purple beneath	fleshy/not fleshy
<i>S. hesperidum</i>	radiate	6.5-7.5	14-46	1.5-2.5	(*)	>3 mm	eglandular	eglandular	pinnatisect, some bipinnatisect	little	green	fleshy
<i>S. kerdousianus</i>	discoid	6-7	7-11	c. 1.5	black	absent	eglandular	eglandular	subentire or sinuate-dentate	very large	green	not fleshy
<i>S. leucanthemifolius</i>	usually radiate	4-8	4-20	0.5-3	black	present	eglandular	eglandular	dentate to pinnatisect	little/large	green	fleshy/not fleshy
<i>S. lividus</i> subsp. <i>foeniculaceus</i>	radiate	8-10	4-5	2.5-3	green	<3 mm	glandular at least in the inflorescence	glandular	very variable	little/large	green	not fleshy
<i>S. massaicus</i>	discoid	4.5-5.5	4-10	1.5-2.5	brown	absent	eglandular	eglandular	pinnatisect with narrow segments	little	green	not fleshy
<i>S. vulgaris</i>	usually discoid	6-8	10-20	1.5-2	black	absent or <3 mm	eglandular	eglandular	pinnatifid to pinnatisect	little/large	green	not fleshy

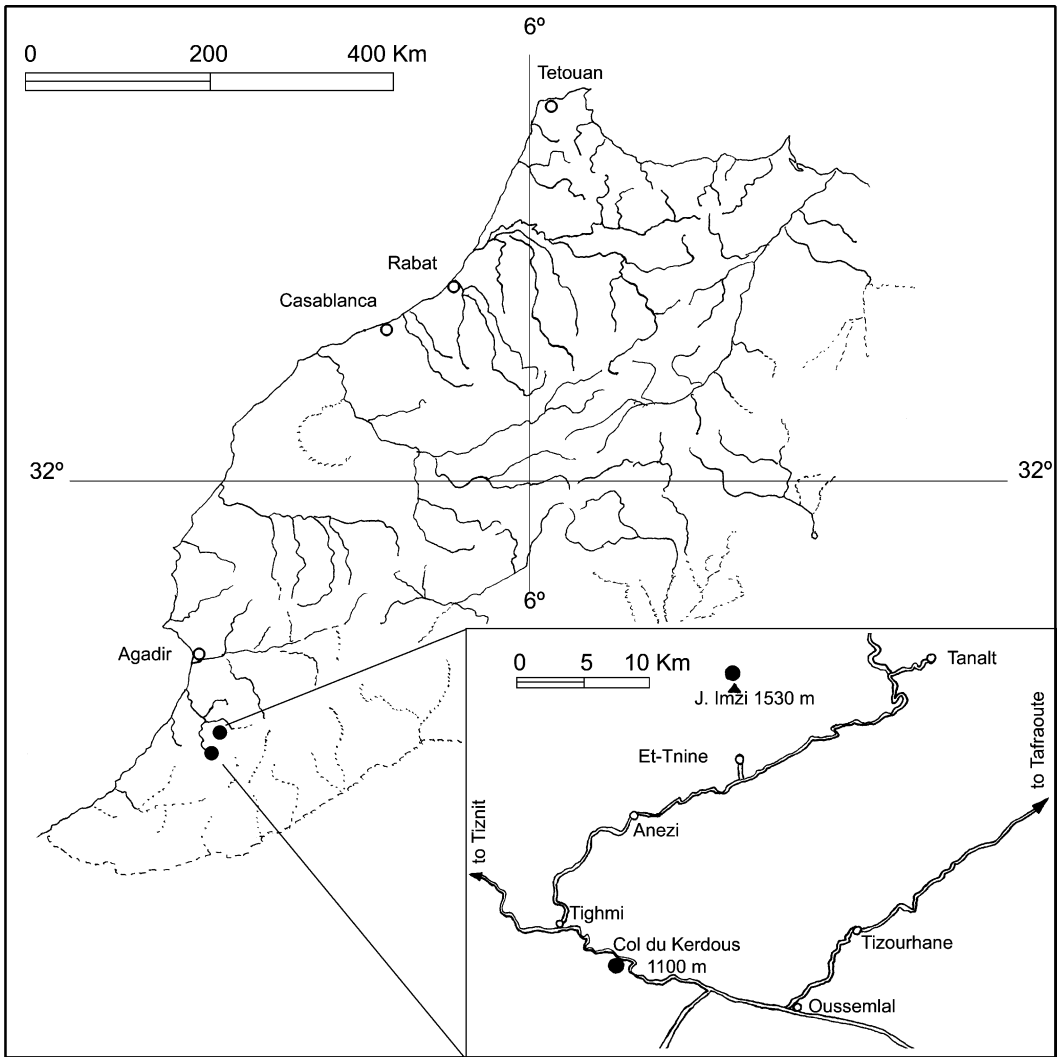


FIG. 2. Geographical distribution of *Senecio kerdousianus* Gómiz & Llamas.

co, and is known from only two localities (Fig. 2). One is the Col du Kerdous, between Tiznit and Tafrout, where it was found growing in the shadiest and wettest parts of a road-side ditch, and on terraces above the road at 1,050–1,100 m elevation. In April 2004, we counted some 200 poorly developed specimens along a distance of two kilometers at this locality. The other locality is on the North-facing slope of Jbel Imzi, 1,200–1,250 m elevation, growing in the wettest and shadiest areas below fallen rocks and at the base of vertical rocks. This is a very isolated place and is near the only

population of *Dracaena draco* L. subsp. *ajgal* Benabid & Couzin, discovered in 1997. The wet and shady habitat is quite different from that of other *Senecio* species. We have not noticed the new species in sunny habitats, so we do not know the extent of leaf shape plasticity. To determine if this taxon has the degree of phenotypic plasticity in leaf shape that characterizes other annual *Senecio* taxa, we intend to grow plants in different light conditions, but our achenes have not yet germinated.

**Etymology.** Found for the first time in the Kerdous region.

#### KEY TO THE SPECIES

The species of *Senecio* sect. *Senecio* known from SW Morocco, south of the High Atlas, can be identified with the following key adapted from Alexander (1979) and modified to include *S. kerdousianus*:

1. Ray florets absent
2. Leaves pinnatifid or pinnatipartite

3. Phyllaries 6–8 mm long; calycular bracts 10–20, black-tipped . . . . . *S. vulgaris*
3. Phyllaries less than 6 mm long; calycular bracts 4–10, brown-tipped . . . . . *S. massaicus*
2. Leaves entire or shallowly lobed
  4. Plant glandular; basal leaves broadly ovate, often cordate, crenate or shallowly lobed . . . . . *S. flavus*
  4. Plant green; basal leaves gradually attenuate into the petiole, never cordate.
    5. Basal leaves linear, remotely toothed or lobed; phyllaries less than 6 mm long; calycular bracts 4–10, brown-tipped . . . . . *S. massaicus*
    5. Basal leaves obovate-elliptic, shallowly lobed; phyllaries 6–7 mm long; calycular bracts 7–11, black-tipped . . . . . *S. kerdousianus*
1. Ray florets present
  6. Rays less than 3 mm long
    7. Plant glandular, at least in the inflorescence . . . . . *S. lividus*
    7. Plant eglandular throughout . . . . . *S. vulgaris*
  6. Rays more than 3 mm long
    8. Rays more than 4 mm wide; leaf lobes rounded . . . . . *S. hesperidum*
    8. Rays less than 4 mm wide; leaf lobes dentate and acute . . . . . *S. coronopifolius*

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