

Two new species of *Taraxacum* from high mountains of the Iberian Peninsula

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Two species of *Taraxacum* new to science are reported from Spain. *Taraxacum ayllonense* A. Galán & Vicente Orell. was found in the Spanish Central System, and *T. cantabricum* A. Galán & Vicente Orell. was collected in the Cantabrian Mountains in northern Spain.

Key words: Spain, *Taraxacum*, taxonomy

A complete monograph of *Taraxacum* in the Iberian Peninsula and Balearic Islands has not been published since Handel-Mazzetti (1907). At the moment, there are some regional studies based on the morphological characters of the species (Van Soest 1948, 1951, 1954a, 1954b, 1956, Sahlin 1984a, 1984b, Richards 1992). On the other hand, the genus has been well studied for the European floras (Dudman & Richards 1997, Uhlemann 2003, Dudman *et al.* 2006), with a high number of species divided into 46 sections (Kirschner & Štěpánek 1997). The taxonomy is very difficult, because the genus includes plants with three types of reproduction: allogamy, autogamy (rare) and apomixis. Apomictic species can produce fertile pollen and thus may cross with sexual diploids or polyploids, producing new lineages of hybrid origin with plants of variable morphologies. In apomictic clones somatic mutations can play an important role in the origin of new species (Vašut 2003).

Although there are some genetic and molecu-

lar studies (Kirschner & Štěpánek 1996, Kirschner *et al.* 2003, Wittzell 1999) to circumscribe groups and species, new species have been described from Europe based on combinations of morphological characters (Vašut *et al.* 2005, Uhlemann 2007). Here we describe two new species from the Iberian Peninsula.

***Taraxacum ayllonense* A. Galán & Vicente Orell., *sp. nova* (Figs. 1 and 2)**

Planta parva, ca. 6 cm alta. Folia decumbentes sat obscure viridia interdum purpurascens late lanceolata 2.7–10.8 × 0.6–2.9 cm; lobi laterales 2–6, lati, acuti, saepe valde retroversi, interdum sine dentis; lobus terminalis subaequalis, triangularis ad hastatis; petiolus viridis vel purpureis ad basis exalatus. Scapis erecti folia excedentes in anthesis, pubescentis-araneosis brunneo-purpurei. Calathium croceum, radians, ca. 30 mm in diametro; ligulae extus stria violacea orna-



Fig. 1. Holotype of *Taraxacum ayllonense*.

tae; *styli stigmataque obscure virides*; *antherae pollen valde irregulare*; *squamae exteriores erectae adpressae involucri*, $3.7\text{--}7.8 \times 1.5\text{--}3.8$ mm, *atrovirides*, *laeves*, *late albo-marginatae*, *interdum callosis vel corniculatis*, *apicibus et marginibus ciliolatae*. *Achenium stramineum vel olivaceum*, *late fusiformis*, *papillosum vel spiculolum ad apice*, *ceterum laevis*, *corpore* $2.9\text{--}3.6$ mm, *pyramis* $0.7\text{--}1$ mm; *rostrum viridulum*, $5.8\text{--}8.1$ mm longum; *pappus albus*, $3.7\text{--}5$ mm.

TYPE: Spain. Segovia, Riofrío de Riaza, Puerto de la Quesera, en pastizal de *Poa bulbosa* L., 30TVL6563, 1750 m., 4.V.2007 A. Galán 1870 & Vicente Orell. (holotype MA; isotypes BC, PRA, USP).



Fig. 2. Achene of *Taraxacum ayllonense* (from the holotype).

A small plant to 6 cm high. Leaves $2.7\text{--}10.8 \times 0.6\text{--}2.9$ cm, lanceolate, pinnatifid to pinnatisect, not toothed; midrib green or purple coloured; lateral lobes 2–6, $2.2\text{--}16.5 \times 1.5\text{--}14.9$ cm, deltoid, recurved, with distal and proximal margins entire; terminal lobe $4.7\text{--}12.2 \times 6.3\text{--}17.4$ mm, triangular to hastate; petiole to 3.4 cm green, sometimes purplish to base, winged. Scapes to 14.5 cm, brown to purple erect exceeding leaves at flowering. Capitulum ca. 30 mm in diameter, involucre $6.6\text{--}16.8 \times 4.9\text{--}7.7$ mm; exterior phyllaries $3.7\text{--}7.8 \times 1.5\text{--}3.8$ mm erect, imbricate, ovate to ovate-lanceolate, sometimes callose or with a small hornlike, dark green often purple and

ciliate on margins and tip, and a conspicuous white border 0.4–0.7 mm; ligules ca. 13 mm, yellow, striped purple; stigma branches dark green, pollen present with irregular size. Achenes straw-yellow to olive-green; body 2.9–3.6 mm, with papillas and spikelets to tip, otherwise smooth; pyramid 0.7–1 mm, sometimes with spikelets; rostrum 5.8–8.1 mm and pappus 3.7–5 mm, white.

Taraxacum ayllonense, a plant of the grasslands of the high mountains with *Poa bulbosa* and *Festuca rubra* communities above 1700 m, belongs to the sect. *Alpina* due to the following characters: achenes straw-yellow to olive-green with spikelets to the tip of the body, cone conspicuous, pappus white, and exterior phyllaries sometimes callose or with a small hornlike (Van Soest 1959, Sahlin 1984a). It also produces irregular-sized pollen grains, with apomictical reproduction, and presents a punctual distribution.

Three other principal species of the sect. *Alpina* can be recognized in the Iberian Peninsula, presenting the following differences as compared with *T. ayllonense*:

- T. pyrenaicum*: stigma branches yellow, leaf lateral lobes not recurved and with the distal margin often toothed, exterior phyllaries with an inconspicuous white border, achenes with body 3.2–3.9 mm and pyramid 0.3–0.6 mm, plants from the Pyrenees (France and Spain);
- T. panalpinum*: stigma branches dark-green, lateral lobes unrecurved, exterior phyllaries with an inconspicuous white border, plants distributed from Romania to the Pyrenees;
- T. aragonicum*: stigma branches green-yellowish, exterior phyllaries unciliate but with a conspicuous white border 0.3–0.4 mm, pollen absent, achene pyramid 0.2–0.4 mm, endemic of the Iberian slopes in the Pyrenees.

Taraxacum ayllonense is an endemic to the oriental part of the Spanish Central System (Ayllon Mountains).

***Taraxacum cantabricum* A. Galán & Vicente Orell., sp. nova** (Figs. 3 and 4)

Planta parva, ca. 13 cm alta. Folia decumbentes sat obscure viridia interdum purpurascens

late lanceolata 2–14.2 × 0.5–3.5 cm; *lobi laterales* 2–6, *lati, obtusi, saepe valde retroversi, interdum infradentati; lobus terminalis subbrevis, sagittatis ad hastatis; petiolus viridis brevis exalatus. Scapi erecti folia subaequantes in anthesis, glabri brunneo-purpurei. Calathium luteum, radians, ca. 30 mm in diametro; ligulae extus stria cana ornatae; styli stigmataque obscure virides; antherae pollen valde regulare; squamae exteriores erectae subadpressae involucri, 3.2–9.7 × 1–2.3 mm, atrovirides, laeves, angustissimae albo-marginatae, marginibus ciliolatae. Achenium stramineo-brunneum, late fusiformis, squamulosum-spiculosum ad apice, ceterum laevis, corpore 2.3–4.1 mm, pyramis brevissimis vel abiens; rostrum crassum brunneum vel viridulum, 2.8–5.9 mm longum; pappus discolori, 3.1–6.4 mm.*

TYPE: Spain. Asturias, Ponga, Les Colladielles, en prado al borde de un camino, 30TUN2587, 1200 m, 2.III.2007 A. Galán 1855 (holotype MA; isotypes BC, PRA, USP).

A small plant to 13 cm high. Leaves 2–14.2 × 0.5–3.5 cm, lanceolate, pinnatifid to pinnatisect, sometimes toothed; midrib green but purple coloured to base; lateral lobes 2–6, 1.2–20.5 × 1.7–18 mm, deltoid, recurved, with distal and proximal margins entire, sometimes toothed; terminal lobe 3.2–19.2 × 5.5–17.9 mm, sagittate to hastate; petiole to 5 cm green to purple, lightly winged. Scapes to 11 cm, brown to purple, erect equalling leaves at flowering. Capitulum c. 30 mm in diameter, involucre 9.6–17.1 × 3.9–7.7 mm; exterior phyllaries 3.2–9.7 × 1–2.3 mm erect, imbricate, ovate to ovate-lanceolate, dark green often purple and ciliate on margins and tip, uncorbiculated, and with an inconspicuous white border; ligules 9.9–19.5 mm, yellow, striped purple; stigma branches dark green, pollen present with regular size. Achenes straw-yellow to brownish; body 2.3–4.1 mm, with erose small scales and spikelets to tip, pyramid 0.2–0.3 mm or absent; rostrum 2.8–5.9 mm and pappus 3.1–6.4 mm, discoloured.

This species is endemic to the Cantabrian Mountains, growing in alpine grasslands and pastures in beechwoods. It is included in the sect. *Arctica* (Dahlstedt 1921) because of the small or absent cone and the discoloured pappus, being quite similar to *T. andorriense* (Sahlin



Fig. 3. Holotype of *Taraxacum cantabricum*.

1984a, 1984b) and *T. teres* (Sonck 1983). *Taraxacum cantabricum* differs from *T. andorriense* in the green leaves without purple spots and in the upright segment of the terminal lobe of leaves being longer than the lateral ones, and from *T. teres* in the scapes green to brown and green exterior phyllaries (1–3.5 mm), sometimes with a white border.

The pollen presents regular size and the plants have a sexual reproduction mostly outcrossing (Wittzell 1999, Vašut 2003). So, there is no reproductive isolation between individuals, and consequently this species is widely extended along the Cantabrian Mountains.



Fig. 4. Achene of *Taraxacum cantabricum* (from the holotype).

ADDITIONAL SPECIMENS EXAMINED (paratypes): — **Spain.** Asturias, Cabrales, Hoyo Trasllambrión, 30TUN4892, 2390 m, 3.IX.1993 J.L. Díaz Alonso, J. Delgado, J. Torio, M. Lainz & Moreno Moral (herb. Sánchez Pedraja). Asturias, Sobrefoz, antes de entrar al bosque de Peloño, 30TUN2584, 2.III.2007 A. Galán 1852 (USP), A. Galán 1856 (MA); Asturias, San Juan de Beleño, Campreneu, 30TUN2685, en claros de hayedo, 2.III.2007 A. Galán 1853 (USP); Asturias, Los Bedules, 30TUN2683, 900 m, prado en claro de hayedo, 2.III.2007 A. Galán 1854 (USP); Asturias, Viego, 30TUN2785, 550 m, en un prado nitrificado, 2.III.2007 A. Galán 1857 (USP). Burgos, Espinosa de los Monteros, Las Motas, 30TUN4781, 1640 m, pastizal de la cumbre, sobre calizas, 3.IX.1992, Moreno, J., Navarro, S.P. & Valdeolivas, G. (herb. Sánchez Pedraja). León, Boca de Huérfano, cabecera del arroyo de Hoyo Empedrao, 30TUN5764, 2170 m, margen de regato, húmedo, 7.VII.1992, Moreno

(herb. Sánchez Pedraja). Palencia, Cervera de Pisuerga, Cola del Curavacas, 30TUN6360, 2000 m, sobre roca musgosa muy húmeda, 25.VI.1993, *Moreno Moral* (herb. Sánchez Pedraja). Santander, Camaleño, Pico Tesorero, 30TUN5082, 2400 m, ladera sur, 3.IX.1993 *J.L. Díaz Alonso, J. Delgado, J. Torio, M. Lafínz & Moreno Moral* (herb. Sánchez Pedraja). Santander, Camaleño, cuenca de Salborón sobre Pido, 30TUN5374, 1380 m, borde de pista forestal en un hayedo, 15.III.1997 *Moreno Moral 0015/97* (herb. Sánchez Pedraja). Santander, Camaleño, Fuente la Planá Cortés-Áliva, macizo central o los Urrieles, 30TUN5882, 2250 m, pasto fresco junto a la fuente, sobre calizas, 2.VII.2000 *G. Gómez Casares & Moreno Moral 0189/2000* (herb. Sánchez Pedraja). Santander, Vega de Liébana, sobre el pozo cimero de Peña Prieta, 30TUN5865, 2310 m, pasto fresco, en zona pedregosa, 23.VIII.1995, *Moreno Moral 1167* (herb. Sánchez Pedraja). Zamora, carrapas cercanas al refugio de Trevinca, 1750 m, 27.V.1983 *S. Ortiz* (SANT 033985).

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