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Andryala perezii (Asteraceae), a New Species from the Canary Islands

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ABSTRACT. *Andryala perezii* M. Z. Ferreira, R. Jardim, Alv. Fern. & M. Seq. (Asteraceae), a new species from the Canary Islands, is described and illustrated. Although formerly included in *A. glandulosa* Lam., the new species differs remarkably from Madeiran populations by its woolly stellate pubescence, scattered glandular pubescence restricted to the peduncles and involucre bracts, peduncles flattened and enlarged at the base of the capitula, and smaller cypselae. *Andryala perezii* has a habit similar to that of the Canarian *A. pinnatifida* Aiton but may be identified by its densely stellate pubescence on the stems; grayish white or glaucous, congested leaves with dense stellate pubescence on both surfaces and undulate-crispate margins; longer peduncles; and smaller cypselae with a ring of short teeth at the apex equivalent to the height of the prolongation of the ribs. Comments on the chromosome numbers, geographic distribution, habitat, and conservation status are also presented. The name *A. pinnatifida* Aiton f. *cuneifolia* Sch. Bip. is lectotypified and is transferred in rank as *A. pinnatifida* subsp. *cuneifolia* (Sch. Bip.) M. Z. Ferreira, R. Jardim, Alv. Fern. & M. Seq.; lectotypes are designated for its synonyms, *A. pinnatifida* f. *buchiana* Sch. Bip. and *A. pinnatifida* var. *latifolia* Borm. The name *A. pinnatifida* is also lectotypified. A key for Macaronesian *Andryala* L. taxa is provided.

Key words: *Andryala*, Asteraceae, IUCN Red List, Madeira, Spain.

Based on present taxonomic concepts, the genus *Andryala* L. comprises 13 species that are distributed across the Mediterranean Basin, being also present in

Macaronesia and Romania (Greuter, 2006+). In Macaronesia, *Andryala* is represented by *A. integrifolia* L. and *A. laxiflora* DC. and at least eight endemic taxa distributed in the Canary and Madeira archipelagos (Jardim & Menezes de Sequeira, 2008; Acebes Ginovés et al., 2010). The Madeira Archipelago hosts *A. integrifolia* (recently introduced), *A. crithmifolia* Aiton (a rare endemic), and *A. glandulosa* Lam. (Press, 1994; Ferreira et al., 2011), the latter including *A. glandulosa* subsp. *glandulosa* and *A. glandulosa* subsp. *cheiranthifolia* (L'Hér.) Greuter. For the Canary Islands, Acebes Ginovés et al. (2010) recognized *A. integrifolia* (as probably native), *A. laxiflora* (as introduced), and two endemic species: *A. webbii* (Sch. Bip. ex Christ) A. Santos and *A. pinnatifida* Aiton, the latter including four subspecies: *A. pinnatifida* subsp. *pinnatifida*, *A. pinnatifida* subsp. *preauxiana* (Sch. Bip.) G. Kunkel, *A. pinnatifida* subsp. *buchiana* (Sch. Bip.) Reyes-Bet. & A. Santos, and *A. pinnatifida* subsp. *teydensis* (Sch. Bip.) Rivas-Mart., Wildpret, del Arco, O. Rodr., Pérez de Pérez, García Gallo, Acebes, T. E. Díaz & Fern.-Gonz.

The *Andryala* populations on the eastern Canary Islands (Lanzarote and Fuerteventura) were originally included by Schultz Bipontinus (1849), together with populations from Tenerife, as the form *A. pinnatifida* f. *buchiana* Sch. Bip. of the polymorphic *A. pinnatifida* from the Canary Islands. Later Lid and Lid (1967) and Kunkel (1977, 1978, 1980) placed these populations in the Madeiran *A. glandulosa* (including *A. cheiranthifolia* L'Hér.), as did Hansen and Sunding (1993) and Acebes Ginovés et al.

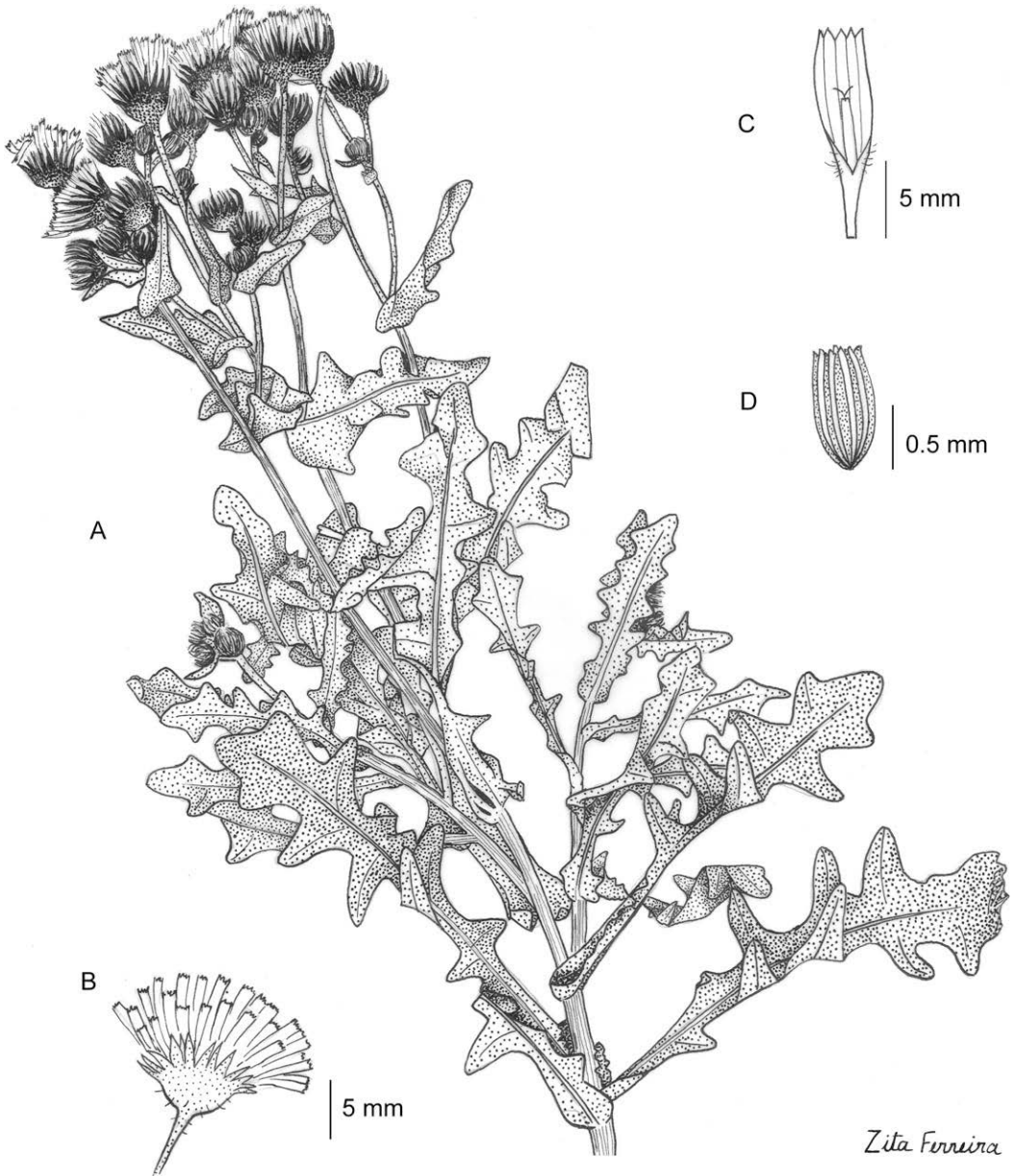


Figure 1. *Andryala perezii* M. Z. Ferreira, R. Jardim, Alv. Fern. & M. Seq. —A. Fertile habit. —B. Capitulum. —C. Floret. —D. Cypsel; note the characteristic apical ring of small teeth. Drawn from the paratype *J. A. Reyes-Betancort* (TFC-37826).

(2004). More recently, A. Santos Guerra and J. A. Reyes-Betancort (in Greuter & von Raab-Straube, 2009) excluded these populations from *A. glandulosa* and included them again in *A. pinnatifida* as *A. pinnatifida* subsp. *buchiana*.

The examination of herbarium specimens demonstrated the presence of a distinct taxon exclusively from Lanzarote and Fuerteventura, and accordingly a new species is described herein.

1. *Andryala perezii* M. Z. Ferreira, R. Jardim, Alv. Fern. & M. Seq., sp. nov. TYPE: Spain. Lanzarote: Haría, altos del Bco de Chafarís, 23 Feb. 1994, *J. A. Reyes-Betancort, W. W. de la Torre & P. L. Pérez de Paz s.n.* (holotype, TFC-39728). Figures 1, 2.

Andryala pinnatifida Aiton f. *buchiana* Sch. Bip. Hist. Nat. Iles Canaries (Phytogr.). 2: 415. 1849. p.p. quoad.

Andryala pinnatifida Aiton subsp. *buchiana* (Sch. Bip.)
Reyes-Bet. & A. Santos in *Willdenowia* 39: 328. 2010.
p.p. quoad.

Nova plantarum species quae ab *Andryala pinnatifida* Aiton caulibus indumentum densius ostendentibus, foliis congestioribus marginibus undulatis utrinque aequaliter tomentosus trichomatibus stellatis, pedunculis longioribus et cypselarum annuli apicalis dentibus costarum extensiones subaequantibus; ab *A. glandulosa* Lam. caulibus foliisque stellato-tomentosis sed trichomatibus glandulosis carentibus; ab *ambabus* pedunculis complanatis ad capitulorum basem ampliatis differt.

Plants from basal rosettes; stems 10–25 cm, woody at the base, branched from the base or from the middle upward, branches erect to patent (sometimes slightly ascending), with a dense tomentum of whitish stellate trichomes (Fig. 3A). Leaves congested at base of stem; leaf blades grayish white or glaucous, tomentose with dense stellate trichomes (Fig. 3B) on both surfaces, lower leaves 93–95 × 25–40 mm, narrowed at the base into a winged petiole 21–24 mm, oblong to lanceolate, lamina deeply lobed to pinnatisect, margin crispate-undulate, the apex acute; cauline leaves 31–66(–92) × 12–29 mm, cordate at the base, semiamplexicaul or amplexicaul, oblong, lamina pinnatifid or deeply lobed, margin crispate-undulate, the apex obtuse; upper leaves 8.3(–13)–21.7 × 2.3–8.6 mm, amplexicaul, ovate-oblong to ovate-lanceolate, entire, cordate at the base, the apex acute to acuminate. Inflorescences in corymbs of 3 to 8 heads; capitula 15–22 mm diam.; peduncles 26–43 mm, flattened and enlarged at the base of the capitulum, with dense stellate trichomes and few glandular trichomes (Fig. 3C); involucre 10–12 × 11–18 mm, ± hemispherical with involucre bracts in 2 or 3 rows; outer involucre bracts 7–7.5 × 1.2–1.6 mm, apex acuminate to subulate, involute enclosing a floret, the external surface with dense white or yellowish stellate trichomes and also abundant glandular trichomes 1.2–1.9 mm, especially along the middle nerve, the trichomes usually yellow or dark at the base; inner involucre bracts 6.5–8 × 1.5–2.3 mm, with narrow scarious margins; the receptacle convex, puberulous to tomentose, with long silky trichomes 3.3–4.2 mm (3 to 4 times longer than the cypselae). Florets ligulate, golden-yellow, tube 4–6.5 mm and ligule 7.4–10 × 1.9–3.1 mm, anther tube ca. 3 mm and style arms 1–2 mm. Cypselae 0.9–1.1 × 0.4–0.5 mm (Fig. 3D), oblong, dark brown with brownish red ribs; the apex with an inner ring of short teeth, as long as the outer (i.e., the prolongation of the ribs); pappus of white bristles 4.8–5.2 mm.

Distribution, habitat, and IUCN Red List category. *Andryala perezii* is found in Lanzarote

and Fuerteventura, where it is common on rocky slopes, growing also on roadsides and volcanic substrates, at elevations from 90 to 580 m. Kunkel (1977) considered the Canarian *A. glandulosa* (i.e., *A. perezii*, as treated here) locally common in both islands, despite grazing by rabbits and goats, and did not regard it as a threatened taxon. *Andryala perezii* was evaluated under the name *A. glandulosa* for the Canary Islands and was not included in the *Red Data Book of the Canarian Flora* (Beltrán Tejera et al., 1999), nor was it mentioned in “Memoria de Evaluación de Especies Amenazadas de Canarias 2009” (Servicio de Biodiversidad del Gobierno de Canarias, 2009). Although *A. perezii* has a restricted distribution in the Canary Archipelago, it is locally common in parts of its range and therefore should be listed as Least Concern (LC) according to IUCN Red List categories and criteria (IUCN, 2001).

Etymology. *Andryala perezii* is named in honor of the botanist Pedro Luís Pérez de Paz (1949–), University of La Laguna (Tenerife), who has greatly contributed to the knowledge of the Canary Islands flora and is a co-collector of the type specimen.

Karyology. Borgen (1970: 150) and Van Loon (1974: 155) counted 18 chromosomes in root tips of plants collected in Lanzarote, originally identified as *Andryala cheiranthifolia*. A careful observation of the herbarium voucher of the plant on which Borgen (1970) performed the chromosome counts made it clear that this specimen corresponds to the newly described species. These chromosome numbers correspond to all other counts known in the genus *Andryala* (e.g., Humphries et al., 1978; Moore, 1982; Goldblatt, 1988; Goldblatt & Johnson, 1990; Castroviejo & Valdés Bermejo, 1991; Pastor Díaz, 1992).

Taxonomic remarks. In the original description of *Andryala glandulosa*, Lamarck (1783) referred to its 3-foot stem height and the glandular pubescence observed on the branches, leaves, peduncles, and involucre bracts, as well as the sessile, lanceolate, and entire leaves. This morphology corresponds undoubtedly to the Madeiran populations of *A. glandulosa*, and the name was therefore misapplied to plants from the Canary Islands by several authors (e.g., Lid & Lid, 1967; Kunkel, 1980; Bramwell & Bramwell, 2001). Lamarck (1783: 154) was uncertain about the origin of this species (“Elle provient, je crois, de graines du voyage de Cook”). However, the likelihood of a Madeiran origin for material of *A. glandulosa* is quite high. James Cook, in his first voyage around the world, reached Madeira in September 1768. On board were the naturalists Sir



Figure 2. Holotype of *Andryala perezii* M. Z. Ferreira, R. Jardim, Alv. Fern. & M. Seq., collected by J. A. Reyes-Betancort, W. W. de la Torre & P. L. Pérez de Paz (TFC-39728).

Joseph Banks and D. C. Solander, who investigated the natural history of Madeira during the few days spent on the island (Silva & Menezes, 1998), but their plant list was never published. The uncertainty

on the seed origin for Lamarck's *A. glandulosa* suggests another possibility: that the seeds correspond to later collections by Francis Masson (1741–1805). Between 1776 and 1779 Masson undertook

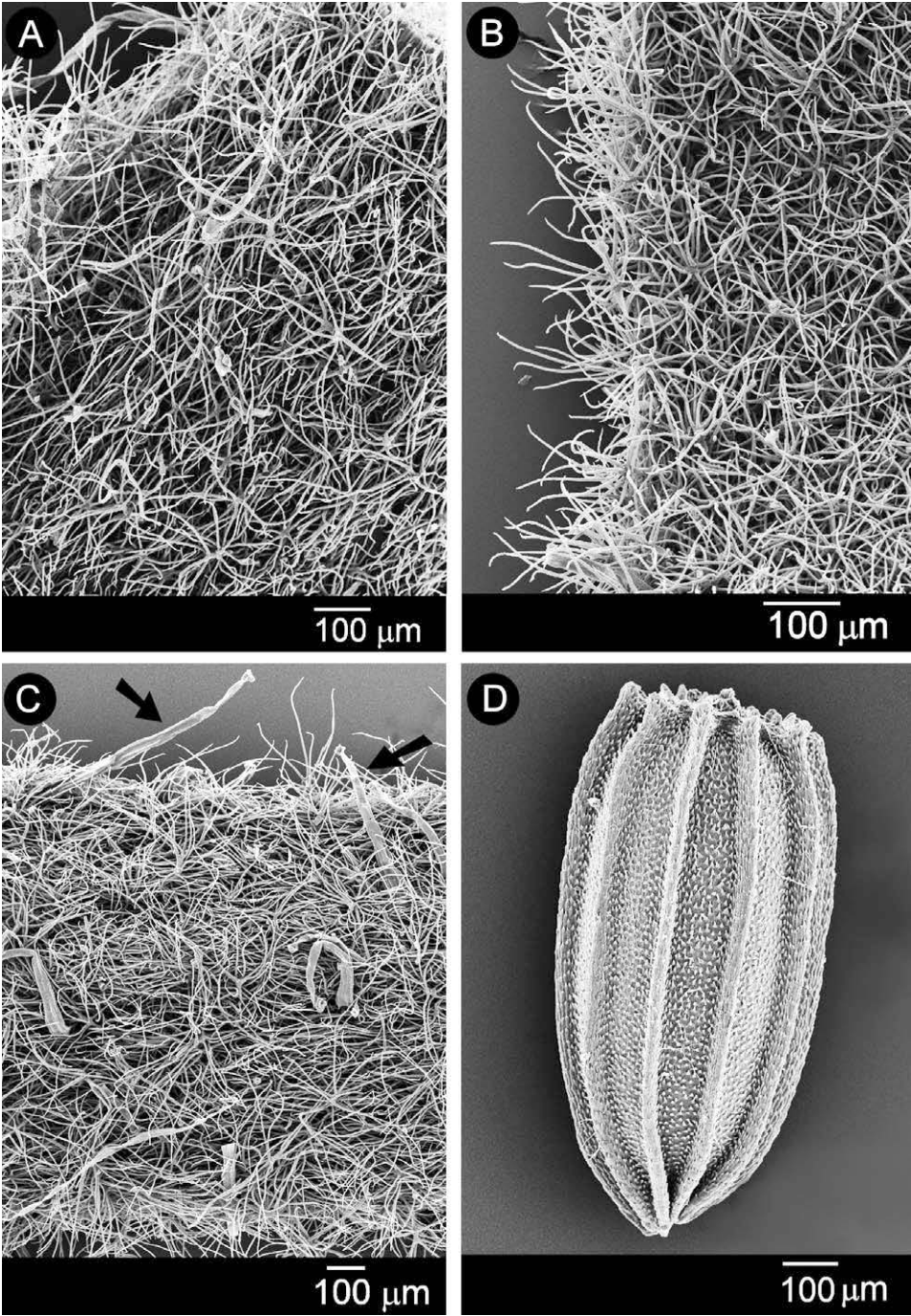


Figure 3. *Andryala perezii* M. Z. Ferreira, R. Jardim, Alv. Fern. & M. Seq. —A. Stem indumentum, tomentose with stellate trichomes. —B. Leaf indumentum, showing the abaxial blade surface as tomentose stellate. —C. Peduncle indumentum, densely stellate, with scattered glandular trichomes. —D. Longitudinal view of cypsela, showing the distinctive apical ring of teeth equivalent in height to the cypsela rib prolongations.

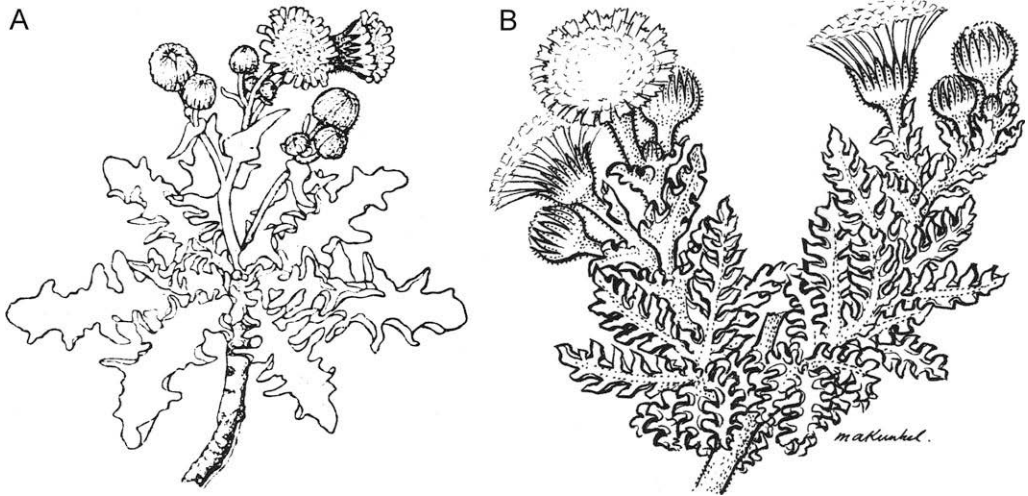


Figure 4. —A. Illustration of *Andryala cheiranthifolia* L'Hér. from the Canary Islands by Dagny Tande Lid, *Contributions to the Flora of the Canary Islands*, 1967. © Dagny Tande Lid/BONO 2013. —B. Illustration of *A. glandulosa* Lam. from Kunkel (1978). Reprinted with permission from Organismo Autónomo Parques Nacionales.

extensive plant collecting in Macaronesia, and Madeira was the main hub for his collecting activities (Francisco-Ortega et al., 2008). These plants were the basis for the description of many new species, including several by L'Héritier, but not *A. cheiranthifolia* (Francisco-Ortega et al., 2008).

The illustration of *Andryala glandulosa* in Poirlet's *Tableau Encyclopedique* (1823: pl. 567) does not correspond to the protologue published in 1783 by Lamarck. The specimen illustrated better resembles, by its lanceolate and deeply divided lower leaves, *A. cheiranthifolia* [\equiv *A. glandulosa* subsp. *cheiranthifolia*]. When L'Héritier described *A. cheiranthifolia* in 1784, he explicitly assigned it to Madeira, although he was referring to a plant grown in what he noted was the "Hortus regius Parisiensis" (L'Héritier, 1784). Lid and Lid (1967) later accepted *A. cheiranthifolia* for the Canary flora, and the illustration presented by these authors corresponds taxonomically to the newly described *A. perezii* (Fig. 4A). Kunkel (1978) described the Canarian *A. glandulosa* as an herb, 10–25 cm tall, woody at the base, with smooth, whitish, and velvety, pinnapartite or pinnatisect leaves, as well as yellow and rather large capitula. This description was accompanied by an illustration (Fig. 4B), and both fit the new species perfectly.

Schultz Bipontinus (1849: 416) described *Andryala pinnatifida* f. *buchiana* and comprehensively discussed its morphology and distribution, assigning it to the Canary Islands of Tenerife ("in campis villa Orotava usque ad summitatem Cumbre Lagunæ")

and Lanzarote ("in summo monte Chache et ad oppidulum Haría"). In respect to the plants from Lanzarote, Schultz Bipontinus (1849: 416) expressed some doubt about their taxonomic position: "*Andr. pinnatifida* var. *major*? an *Andr. cheiranthifolia* var.?" For this island (specifically at "la Mancha Blanca") the author described a unique specimen that matches *A. perezii* given its description ("caule abbreviato, palmari, robusto, foliis profundius pinnatifidis, valde undulatis, lobis triangularibus, obtusis, subintegris, capitulos majoribus, corymbosis, floribus aureis, involucri, pilis glanduliferis, flavo-virentibus, praecipue basi hispidissimo"). However, included in *A. pinnatifida* f. *buchiana*, this author also considered a specimen from Tenerife ("ad rupes atlas, de las Mercedes") that, by its description ("folia subcuneata, paulo angustiora, sinuato-dentata, dentibus non tam obtusis, supra glabrescentia, capitula corymboso-racemosa, minor, involucri cum pedunculis hispida, flores pallide aurei"), corresponds, together with *A. pinnatifida* f. *cuneifolia* Sch. Bip., to the much later described *A. pinnatifida* var. *latifolia* Bornm., assigned by Bornmüller (1904) to Tenerife and El Hierro and usually not accepted by authors of the Canarian flora (e.g., Acebes Ginovés et al., 2010). This taxon was later combined by Kunkel (1980) as *A. pinnatifida* subsp. *latifolia* (Bornm.) G. Kunkel. Not surprisingly, Schultz Bipontinus (1849) stressed that *A. pinnatifida* f. *cuneifolia*, from El Hierro, is close to *A. pinnatifida* f. *buchiana*, particularly to the specimen from Tenerife. It is obvious that the

Table 1. Diagnostic characters of *Andryala perezii* compared with *A. glandulosa* and *A. pinnatifida*.

Characters	<i>A. perezii</i>	<i>A. glandulosa</i>	<i>A. pinnatifida</i>
Stems	10–25 cm; woolly stellate, without glandular trichomes	21–112 cm; stellate tomentose, with glandular trichomes at least in the upper part	14–81 cm; stellate pubescent or tomentose with glandular trichomes or not
Leaf blades	not pale to dark green, but grayish white or glaucous; all densely stellate tomentose on both surfaces, without glandular trichomes; margins undulate-crispate	pale to dark green, not glaucous; uppermost leaves stellate and glandular pubescent; cauline and basal leaves sometimes glandular pubescent; margins not undulate-crispate	grayish white, pale, or dark green, not glaucous; stellate pubescent more so abaxially; uppermost leaves sometimes glandular pubescent; margins not undulate-crispate
Peduncles	26–43 mm; flattened and enlarged at bases of capitula; densely stellate tomentose, with a few glandular trichomes	19.2–80 mm; cylindrical and not enlarged at bases of capitula; stellate and densely glandular pubescent	7.6–26 mm; ± cylindrical and not enlarged at bases of capitula; stellate pubescent, with ± abundant glandular trichomes or without
Involucres	outer involucre bracts enclosing the florets	outer involucre bracts enclosing the florets	outer involucre bracts rarely enclosing the florets
Cypselae	0.9–1.1 × 0.4–0.5 mm; reddish brown ribs; apex with an inner ring of short teeth, as long as the outer (i.e., the prolongation of the ribs)	1.1–1.7 × 0.4–0.6 mm; usually whitish ribs; apex with an inner ring of short teeth ± equal to or slightly exceeding the outer (i.e., the prolongation of the ribs)	0.9–1.6 × 0.4–0.5 mm; reddish brown ribs; apex with an inner ring of teeth much shorter than the outer (i.e., the prolongation of the ribs, very pronounced)

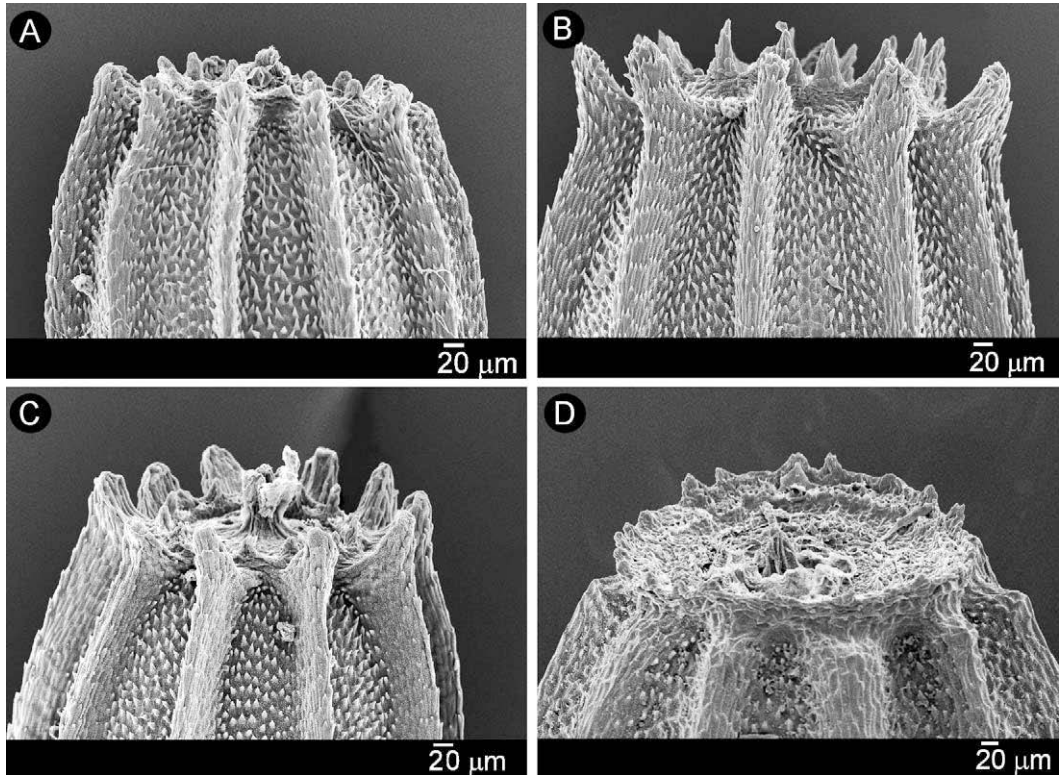


Figure 5. Apex of cypselae. —A. *Andryala perezii* M. Z. Ferreira, R. Jardim, Alv. Fern. & M. Seq., taken from J. A. Reyes-Betancort (TFC-37826). —B. *Andryala glandulosa* Lam., from Z. Ferreira, M. Sequeira & A. Pupo Correia MA-801899. —C. *Andryala pinnatifida* Aiton subsp. *preauxiana* (Sch. Bip.) G. Kunkel from the Canary Islands, taken from C. Suárez & G. Rodríguez (TFC-31801). —D. *Andryala pinnatifida* Aiton subsp. *mogadorensis* (Hook. f.) Greuter from North Africa, taken from Z. Ferreira & I. Á. Fernández (MA-870318).

specimens from Lanzarote and Tenerife referred by Schultz Bipontinus belong to two different taxa. The specimens corresponding to the Schultz Bipontinus publication were located at the Paris (P) and Florence (FI) herbaria. They are FI-W109935, FI-W109928, and P-02462105, and their observation supports the recognition of two distinct taxonomic entities. The specimens FI-W109928 and FI-W109935, both from Lanzarote, were identified originally as “*Andryala cheiranthifolia* var.?” and only the first includes a note by Schultz Bipontinus: “*A. pinnatifida* f. *buchiana* C. H. Schultz. Bip.” In 2005, Santos-Guerra annotated on the herbarium sheet FI-W109935 “*Andryala pinnatifida* Ait. f. *buchiana* typus.” Apparently he ignored the existence of P-02462105, the specimen from Tenerife that was clearly identified as *A. pinnatifida* f. *buchiana* by Schultz Bipontinus himself. Furthermore, all information on the herbarium label is in conformity with the one in the protologue, including the collector number, which means that P-02462105, having no other name associated with it, is to be considered the lectotype of *A. pinnatifida* f. *buchiana*. Thus, herbarium material (FI-W109928 and FI-W109935), as well as earlier literature, support specimens from Lanzarote as taxonomically concordant with *A. perezii*, here excluded from *A. pinnatifida* f. *buchiana*. Later the plants from Lanzarote, corresponding to the application of the name *A. glandulosa* to the east Canarian plants, were recognized as *A. pinnatifida* subsp. *buchiana* (Greuter & von Raab-Straube, 2009), but no lectotype was designated. Moreover, Santos-Guerra and Reyes-Betancort, when publishing *A. pinnatifida* subsp. *buchiana* as a transfer in rank from form to subspecies, did not mention that the taxon originally included elements from both Tenerife and Lanzarote. Given the confusion attached to the name *A. pinnatifida* f. *buchiana* and to the respective protologue (indeed, three descriptions in total), and taking into account the morphological differences between the specimens from Tenerife and Lanzarote, we have chosen to recognize the eastern Canary species (from Lanzarote and Fuerteventura) as a new species with a new type, *A. perezii* M. Z. Ferreira, R. Jardim, Alv. Fern. & M. Seq.

The description of the Tenerife plants by Schultz Bipontinus and the specimen (P-02462105) better match *Andryala pinnatifida* f. *cuneifolia*. The later described *A. pinnatifida* var. *latifolia* clearly corre-

sponds to the previously described taxon, hereby recognized at the rank of subspecies.

2. *Andryala pinnatifida* Aiton, Hort. Kew. [W. Aiton] 3:129. 1789. TYPE: Spain. Canary Islands, Tenerife, 1778, *Fr. Masson* (lectotype, designated here, BM000753022).

2a. *Andryala pinnatifida* Aiton subsp. ***cuneifolia*** (Sch. Bip.) M. Z. Ferreira, R. Jardim, Alv. Fern. & M. Seq. stat. nov. Basionym: *Andryala pinnatifida* Aiton f. *cuneifolia* Sch. Bip., Hist. Nat. Iles Canaries (Phytogr.). 2: 417. 1849. TYPE: Spain. El Hierro, Monte Savinosa, 18 June 1845, *Bourgeau* n°. 9 (lectotype, designated here, P02462115).

Andryala pinnatifida Aiton f. *buchiana* Sch. Bip. Hist. Nat. Iles Canaries (Phytogr.). 2: 415. 1849. TYPE: Spain, Canary Islands, Tenerife: contre les rochers élevés de las Mercedes, 9 June 1846, *Bourgeau*, n° 7 (lectotype, designated here, P02462105).

Andryala pinnatifida Aiton subsp. *latifolia* (Bornm.) G. Kunkel in Vieraea 8: 344. 1980, syn. nov. Basionym: *Andryala pinnatifida* Aiton var. *latifolia* Bornm., Bot. Jahrb. Syst. 33: 489. 1904. TYPE: Spain. Canary Islands, Tenerife: Cumbre de Anaga, 27 June 1901, *Bornmüller*, n°. 863 (lectotype, designated here, P02462137; isolectotype, JE00013921).

Further, the publication of a new species name is strongly supported by the fact that *Andryala perezii* differs remarkably from the Madeiran *A. glandulosa* (e.g., indumentum, leaf margins, peduncle shape, and cypsela size), as well as from the Canarian *A. pinnatifida* taxa (e.g., indumentum, leaf margins, involucre shape, and cypsela apex). Table 1 summarizes the diagnostic characters of *A. perezii* versus *A. glandulosa* and the Canarian *A. pinnatifida*. The new species is also notably distinct from the North African *A. pinnatifida* taxa, namely with regard to leaf margin, involucre indumentum, involucre bract margin, and apex of cypsela, the latter being an important diagnostic feature within the genus *Andryala*. In all North African *A. pinnatifida* subspecies, the cypsela apex is quite distinct compared to that in *A. perezii*, *A. glandulosa*, and *A. pinnatifida* from the Canary Islands. *Andryala pinnatifida* subsp. *mogadorensis* (Hook. f.) Greuter is presented as an example: the ribs at the apex of the cypsela are not extended, and the inner ring of teeth is larger in diameter (Fig. 5).

KEY TO THE MACARONESIAN SPECIES OF *ANDRYALA*

- 1a. Cauline leaves crowded, deeply pinnatisect; all flowers with ligule teeth stellate pubescent *A. crithmifolia*
 1b. Cauline leaves entire to pinnatisect (if pinnatisect, never crowded); ligule teeth not stellate pubescent, seldom a few flowers scarcely so. 2.

- 2a. Leaves usually more stellate pubescent abaxially, cypsela apical ring with teeth much shorter than the prolongation of the ribs *A. pinnatifida*
- 2b. Leaves equally stellate pubescent on both faces, cypsela apical ring with teeth \pm equaling or exceeding the prolongation of the ribs. 3.
- 3a. Involucral bracts subulate, receptacular trichomes not longer than the cypsela, cypsela apical ring with teeth largely exceeding the prolongation of the ribs *A. laxiflora*
- 3b. Involucral bracts acute to acuminate or seldom subulate, receptacular trichomes longer than the cypsela, cypsela apical ring with teeth \pm equaling or slightly exceeding the prolongation of the ribs. . . 4.
- 4a. Therophyte to hemicryptophyte plants; involucral bracts flat, not enfolding a floret . . . *A. integrifolia*
- 4b. Chamaephyte or seldom hemicryptophyte plants; external involucral bracts involute, enfolding a floret. 5.
- 5a. Stems stellate tomentose and glandular pubescent at least in the upper part, uppermost leaves glandular pubescent and sometimes stellate tomentose; peduncles cylindrical and not enlarged at the base of the capitula, densely glandular pubescent *A. glandulosa*
- 5b. Stems densely stellate tomentose but not glandular pubescent, all leaves stellate tomentose but not glandular pubescent; peduncles somewhat flattened and enlarged at the base of the capitula, with a few glandular trichomes *A. perezi*

KEY TO THE MACARONESIAN *ANDRYALA PINNATIFIDA* SUBSPECIES

- 1a. Plants without glandular trichomes; stems up to 90 cm; cauline leaves pinnatisect (with linear segments) to linear pinnatifid-dentate; capitula arranged in racemes *A. pinnatifida* subsp. *teydensis*
- 1b. Plants usually with glandular trichomes; stems up to 75 cm; cauline leaves pinnatipartite to dentate with broader, never linear segments; capitula arranged in racemes or corymbs 2.
- 2a. Stems stellate tomentose to densely stellate tomentose below; leaves lanceolate to elliptic-lanceolate; inflorescence usually corymbose-racemose, sometimes racemose; peduncles without glandular trichomes or with glandular trichomes 0.3–1.5 mm long 3.
- 2b. Stems usually stellate puberulous to finely stellate tomentose below; leaves obovate, obovate-cuneate to subcuneate, or elliptic; inflorescence corymbose; peduncles always with glandular trichomes 1–2.8 mm long 4.
- 3a. Lower leaves narrow (2–3 cm wide), lanceolate, pinnatifid with entire lobes; peduncles 0.5–2 cm long *A. pinnatifida* subsp. *pinnatifida*
- 3b. Lower leaves broad (3–6 cm wide), lanceolate or elliptic-lanceolate, pinnatifid to pinnatipartite with divided lobes; peduncles 0.8–3 cm long *A. pinnatifida* subsp. *preauxiana*
- 4a. Stems sometimes purplish; leaves not crowded, obovate or elliptic, dentate, abaxial surface stellate tomentose *A. pinnatifida* Aiton subsp. *webbii* (Sch. Bip. ex Christ) G. Kunkel
- 4b. Stems never purplish; leaves crowded, obovate-cuneate to subcuneate, sinuate to sinuate-dentate, abaxial surface stellate lanate *A. pinnatifida* subsp. *cuneifolia*

Paratypes. SPAIN [CANARY ISLANDS]. **Fuerteventura:** Pico del Fraile, 24 July 1979, *A. Banãres* (TFC-21147). **Lanzarote:** Risco de Famara, 25 Mar. 1975, *J. R. Acebes & P. L. Pérez de Paz* (TFMC-1770); Risco de las Nieves, 19 Jan. 1983, *M. del Arco Aguilar, P. L. Pérez de Paz & W. Wildpret de la Torre* (TFC-28870); Teguisse, casas de Famara, 4 Apr. 2006, *C. Aedo, L. Medina & A. Quintanar*, CA12532 (MA-750660); Haría, riscos de Famara, penas de Chache, 3 Apr. 2006, *C. Aedo, L. Medina & A. Quintanar*, CA12417 (MA-751304); San Bartolomé, Monte Medina, 7 Apr. 2006, *C. Aedo, L. Medina & A. Quintanar*, AQ1846 (MA-750866); Montaña Blanca, 31 Mar. 1994, *J. A. Reyes-Betancort* (TFC-37826).

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