

Typification of names published by Schultz “Bipontinus” in the *Andryala pinnatifida* complex (Cichorieae, Asteraceae), from the Canary Islands

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Abstract. Schultz “Bipontinus” (1805-1867) described, in the *Histoire Naturelle des Îles Canaries* published by Webb and Berthelot in 1849, several forms of the *Andryala pinnatifida* complex, endemic to the Canary Islands, based on plant material collected by E. Bourgeau and P. B. Webb. In order to facilitate a forthcoming taxonomic revision of this species complex, some of the names established by Schultz “Bipontinus” are here lectotypified based on protologue analysis and the examination of original material located at P and FI-W herbaria.

Keywords. *Andryala*, Canary Islands, Compositae, historic collections, Macaronesia, typification.

Resumen. Schultz “Bipontinus” (1805-1867) describió, en la *Histoire Naturelle des Îles Canaries*, publicada por Webb y Berthelot en 1849, varias formas del complejo de *Andryala pinnatifida*, endémico de las Islas Canarias, basadas en material recolectado por E. Bourgeau y P. B. Webb. Con el fin de facilitar una próxima revisión taxonómica de esta especie, algunos de los nombres establecidos por Schultz “Bipontinus” se tipifican aquí tras el análisis de los protólogos y del material original depositado en los herbarios P y FI-W.

Palabras clave. *Andryala*, Islas Canarias, Compositae, colecciones históricas, Macaronesia, tipificación.

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INTRODUCTION

Andryala L. (Asteraceae: Cichorieae) is a small genus comprising about 17 species distributed in the Mediterranean region, Southwest Europe, Northwest Africa, and Macaronesia (Sell 1976; Talavera 1987; Tohmé & Tohmé 2007; Blanca 2011; El Oualidi & al. 2012; Fennane 2014). Outside this area, only a rare endemic species, *A. levitomentosa* (Nyár.) P.D.Sell, is found in Romania (Nyárády 1965; Sell 1976). In Macaronesia, several endemic species are currently recognised, including *A. glandulosa* Lam. and *A. crithmifolia* Aiton from Madeira, as well as *A. pinnatifida* Aiton and *A. perezii* M.Z.Ferreira, R.Jardim, Alv.Fern. & M.Seq. from the Canary Islands (Press 1994; Ferreira & al. 2014a, 2014b; Ferreira & al. 2015). These species are relatively recent and their origin may be explained by single colonization events and subsequent insular speciation (Ferreira & al. 2015).

Andryala pinnatifida was validly published by Aiton (1789: 129) who recognised two varieties: *A. pinnatifida* var. α , from Madeira, and *A. pinnatifida* var. β , from the Canary Islands. Nonetheless, later authors (e.g. Sprengel 1826; De Candolle 1838; Schultz “Bipontinus” 1849) limited *A. pinnatifida* to the Canary Islands. Lowe (1868: 564) definitively placed *A. pinnatifida* var. α in *A. cheiranthifolia* L’Hér. (currently known as *A. glandulosa*). The distribution of *A. pinnatifida* was extended to North Africa by different authors (e.g., Ball 1878; Maire 1928). However, recent taxonomic and phylogenetic studies supported the restriction of *A. pinnatifida* to the Canary Islands (Ferreira & al. 2014c, 2015).

Andryala pinnatifida is a morphologically highly variable species and over time several infra-specific entities have been described by different authors (e.g. Schultz “Bipontinus” 1849; Christ 1888; Kunkel 1980). In the publication *Histoire naturelle des Îles Canaries*,

Schultz “Bipontinus” (1849) described *A. pinnatifida* in detail, based on plant material collected by E. Bourgeau in the Canary Islands between 1845 and 1846. Additionally, Schultz “Bipontinus” (1849) recognised several forms. Some of these were recently typified by Ferreira & al. (2014a, 2015), namely *A. pinnatifida* f. *cuneifolia* Sch. Bip., *A. pinnatifida* f. *buchiana* Sch. Bip., and *A. pinnatifida* f. *teydensis* Sch. Bip. The objective of this study is to typify the remaining names in order to facilitate a forthcoming taxonomic revision of the *A. pinnatifida* complex. Therefore, only a few names will be placed in the taxa presently recognised by the authors (*A. pinnatifida* subsp. *pinnatifida* and *Andryala pinnatifida* subsp. *cuneifolia*).

MATERIALS AND METHODS

This study was based on protologue analysis of the typified names and the examination of original material during a visit to the P herbarium. Digital images provided by the staff from the FI-W herbarium were also studied.

TYPIIFICATION OF NAMES PUBLISHED BY SCHULTZ “BIPONTINUS”

1. *Andryala pinnatifida* f. *sprengeliana* Sch. Bip. in Webb & Berthel., Hist. Nat. Iles Canaries (Phytogr.) 3(2): 415. 1849 ≡ *Andryala pinnatifida* var. *sprengeliana* (Sch. Bip.) G. Kunkel in Vieraea 8(2): 344. 1980.

Ind. loc.: “Canaria, in collibus aridis argillosis Valsequillo, 25 Martio 1846: Bourgeau! n. 5 ... Canaria, Barranco de la Vierge, 30 Martio 1846: Bourgeau! n. 6 ... Canaria in humidiusculis et convalliuium umbrosis, Martio 1846: Bourgeau! n. 10 ... Canaria, Barranco de los Tiles, monte Doramas, 6 Apr. 1846: Bourgeau! n. 8 ... Teneriffa, Barranco de Ignoste [Igueste], reg. Pini, Junio 1846: Bourgeau! n. 2 ... Teneriffa ad Sylva? marginem prope San Diego del Monte 26 Febr. 1845. Bourgeau! sine n ...”.

TYPE: Spain, Canary Islands. Tenerife, Bco. de Igueste, Jun. 1846, *E. Bourgeau* 2 (lectotype, designated here, P 02462110!).

In the protologue of *A. pinnatifida* f. *sprengeliana*, Schultz “Bipontinus” (1849) mentioned several specimens collected by E. Bourgeau in different localities of Gran Canaria and Tenerife. According to the label on the herbarium sheet, the specimen P 02462110, under *A. pinnatifida* f. *sprengeliana*, is from the Schultz “Bipontinus” herbarium. An additional label shows that the collection locality, date and collector number match those in the protologue. Besides, this specimen fits perfectly the original description and is, therefore, designated here as lectotype. The remaining specimens listed in the protologue, with distinct collection dates and localities

(syntypes and isosyntypes), were located at the P and FI-W herbaria.

2. *Andryala pinnatifida* f. *fuerteventurensis* Sch. Bip. in Webb & Berthel., Hist. Nat. Iles Canaries (Phytogr.) 3(2): 415. 1849.

Ind. loc.: “Fuerteventura, el Risco de Valdebron, 19 Febr. 1846; Bourgeau! n. 13. Iconem tab. 135”.

TYPE: Spain, Canary Islands. Fuerteventura, en El Risco de Valdebron, 19 Feb. 1846, *E. Bourgeau* 13 (lectotype, designated here, P 02462161!).

The specimen P 02462161 from the Schultz “Bipontinus” collection was the only one found under *A. pinnatifida* f. *fuerteventurensis*, handwritten by Schultz “Bipontinus” himself. Given that the collection locality and date, as well as the collector number, coincide exactly with those in the protologue, this specimen is here selected as the lectotype.

Schultz “Bipontinus” (1849) emphasized the morphological similarity between *Andryala pinnatifida* f. *sprengeliana* and *A. pinnatifida* f. *fuerteventurensis* and presented a hand drawing to illustrate both these forms. The illustration shows a caption that says “*Andryala pinnatifida* Hort. Kew” and it resembles the lectotype of *A. pinnatifida* Aiton (designated by Ferreira & al. 2014a). Accordingly, the observation of original material from the Schultz Bipontinus collection showed that these forms are morphologically very similar to the lectotype of *A. pinnatifida* Aiton. In view of the foregoing, these forms should be included in *Andryala pinnatifida* subsp. *pinnatifida*.

3. *Andryala pinnatifida* f. *massoniana* Sch. Bip. in Webb & Berthel., Hist. Nat. Iles Canaries (Phytogr.) 3(2): 414. 1849.

Ind. loc.: “In rupestribus Teneriffæ vulgaris: Webb!”

TYPE: Spain, Canary Islands (lectotype, designated here, P 02462109!).

The original description of *A. pinnatifida* f. *massoniana* by Schultz “Bipontinus” (1849) matches the one on the label of the specimen P 02462109, designated here as the lectotype. Indeed, on the label Schultz “Bipontinus” wrote “*A. pinnatifida* DC. *A. fol. pinnatifida* a. *pinnis integris* – *genuina* 1. *involu. glanduloso* = *forma massoniana*”. Although the collector, collection locality and date were not mentioned, this specimen most likely corresponds to original material given that it is from the Schultz “Bipontinus” collection, according to the information on the herbarium sheet (“Herb. Car. Henr. Schultz, Bipont.”). Likewise, in the protologue no reference to the collection data was made. A plausible collector might be P. B. Webb seeing that Schultz “Bipontinus” highlighted that

this naturalist had seen the specimen. Another possible candidate for lectotypification would be a specimen from the Schultz “Bipontinus” collection found at P herbarium (P 02462108, on the left). Nonetheless, the only indication that it might correspond to *A. pinnatifida* f. *massoniana* is the label that reads “*involucrum hispidum*” handwritten by the author himself. Indeed, Schultz “Bipontinus” (1849: 414) considered *A. pinnatifida* f. *massoniana* and *A. pinnatifida* f. *preauxiana* as the typical forms (“*Folia pinnatifida, pinnis integris. = Forma genuina*”) which differ mainly by the hispid glandular hairs on the involucre, present on the first and absent on the second.

4. *Andryala pinnatifida* f. *preauxiana* Sch.Bip. in Webb & Berthel., Hist. Nat. Iles Canaries (Phytogr.) 3(2): 415. 1849.

Ind. loc.: “ α Capitula corymbosa. In rupibus Teneriffæ cum forma Massoniana. β Racemoso-corymbosa parva longe pedicellata, folia angustiora, caulis gracilior. Canaria Despréaux!”

TYPE: Spain, Canary Islands (lectotype, designated here, P 02462103!, specimen on the right).

Although there is no indication of the origin of the right-hand specimen on the herbarium sheet P 02462103, it is here designated as lectotype of *A. pinnatifida* f. *preauxiana* as it belongs to the Schultz “Bipontinus” collection. Indeed, it is labelled by the author as “*A. pinnatifida* DC. *A. fol. pinnatifida a. pinnis integris 2. invol. canum = f. preauxiana*”, matching the original description. As in the protologue no collector is indicated. It should be underlined that two specimens from the Schultz “Bipontinus” herbarium (P 00723579, both on the left) also correspond to *A. pinnatifida* f. *preauxiana*, deducing by the label that reads “*Involucrum canum*”. However, these are either not complete or well preserved and, therefore, they are not good candidates for lectotypification. The specimen from the Schultz “Bipontinus” collection (P 02462103, on the left), collected by Despréaux in the Canary Islands and under the name *Andryala coronopifolia* Link, may be regarded as a syntype. In fact, it is mentioned in the protologue in the following terms: “*Canaria: Despréaux! Andr. coronopifolia Link - Au A. pinnatifidæ var. ex Webb in Litt.*” Likewise, the specimens on the herbarium sheet FI-W109934 from the Webb collection are syntypes as these are indicated in the protologue.

5. *Andryala pinnatifida* f. *palmensis* Sch.Bip. in Webb & Berthel., Hist. Nat. Iles Canaries (Phytogr.) 3(2): 416. 1849.

Ind. loc.: “Palma, la Caldera, 2 Aug. 1845: Bourgeau n. 4”

TYPE: Spain, Canary Islands. La Palma, La Caldera, 2 Aug. 1845, *E. Bourgeau 4* (lectotype, designated here,

P 02462113! specimen on the right; isolectotypes, P 00723588! specimen on the left, FI-W109930 specimen on the left, FI-W109941 [digital images!]).

The specimens here considered as original material of *A. pinnatifida* f. *palmensis* were collected by Bourgeau, exactly in the locality and on the date mentioned in the protologue (“*Caldera de La Palma, 2 Aout. 1845*”). The specimen P 02462113 (on the right) is under the name *Andryala pinnatifida* f. *palmensis*, handwritten by Schultz “Bipontinus”, and was collected by Bourgeau according to the label “*E. Bourgeau, Plantæ Canariensis, n.º 4*”. As it clearly matches the information in the protologue and is the best preserved specimen, it is here selected as the lectotype. The specimen P 00723588 (on the left), also under the name *A. pinnatifida* f. *palmensis*, was collected by Bourgeau, but no collector number was indicated. However, an additional label reads “*Andryala coronopifolia* Link”, a name that figures in the protologue as unpublished (“*Andryala coronopifolia* C. H. Schultz Bip. olim.”). Although the specimen FI-W109930 (on the left) bears no collector number, it is considered as an isolectotype given that the collection locality and date as well as the collector match the ones in the protologue. The specimen FI-W1109941 is also under the name “*A. coronopifolia* C. H. Schultz Bip.”. However, the collection number does not coincide with the one in the protologue (“*E. Bourgeau, Plantæ Canariensis, n.º 1163*”). Nonetheless, in another label Schultz “Bipontinus” indicated the collection locality, collection date, and the collector. Seeing that the collection information matches the one in the protologue, this specimen is also listed as an isolectotype.

6. *Andryala pinnatifida* f. *multidentata* Sch.Bip. in Webb & Berthel., Hist. Nat. Iles Canaries (Phytogr.) 3(2): 416. 1849.

Ind. loc.: “Teneriffa, ad pedem cataractæ in Barranco Tomodoya Arico, 29 Junio 1846: Bourgeau!”

TYPE: Spain, Canary Islands. Tenerife, Barranco de Tomadoya, Arico, 29 Jun. 1846, *E. Bourgeau s.n.* (lectotype, designated here, FI 000182; isolectotype: P 02462170!).

Both specimens under the name *A. pinnatifida* f. *multidentata* are accompanied by collection data that correspond exactly the one in the protologue (“*Teneriffa, ad pedem cataractæ; in Barranco de Tomadoya Arico, 29 Junio 1846: Bourgeau!*”). The specimen FI 000182, from the Webb collection, is here designated as the lectotype considering that it fits the original description quite well and is more complete.

7. *Andryala pinnatifida* f. *cheiranthoides* Sch.Bip. in Webb & Berthel., Hist. Nat. Iles Canaries (Phytogr.) 3(2): 417. 1849.

Ind. loc.: “Teneriffa, Barranco de Anavigo, Arafa, 17 Maio 1845: Bourgeau!”

TYPE: Spain, Canary Islands. Tenerife, Bco. de Anavigo, Arafa, 17 May 1845, *E. Bourgeau s.n.* (lectotype, designated here, FI-W109930, specimen on the right ([digital image!]); isolectotype, P 02462164!).

Two herbarium specimens under the name *Andryala pinnatifida* f. *cheiranthoides*, handwritten by Schultz “Bipontinus”, with collection information (locality, date and collector) that matches the one in the protologue, were found. However, the best developed specimen is from the Webb collection and it is here designated as the lectotype.

8. *Andryala pinnatifida* f. *gomeraea* Sch.Bip. in Webb & Berthel., Hist. Nat. Iles Canaries (Phytogr.) 3(2): 417. 1849.

Ind. loc.: “Gomera, valle Hermoso, locis siccis, 16 Apr. 1845 Bourgeau!”

TYPE: Spain, Canary Islands. La Gomera, Valle Hermoso, 16 Apr. 1845, *E. Bourgeau s.n.* (lectotype, designated here, FI-000183 [digital image!]; isolectotype: P 02462165!).

The specimen FI-000183 from the Webb collection is here designated as the lectotype of *Andryala pinnatifida* f. *gomeraea* as it is more complete, conversely to another specimen from P herbarium (P 02462165) consisting of a single leaf. Indeed, both specimens correspond to original material as the collector, collection locality and date, all coincide exactly with the information in the protologue.

9. *Andryala pinnatifida* f. *bourgaeana* Sch.Bip. in Webb & Berthel., Hist. Nat. Iles Canaries (Phytogr.) 3(2): 417. 1849.

Ind. loc.: “Gomera, Barranco Seco de Valhermoso, 16 Apr. 1845, Bourgeau!”

TYPE: Spain, Canary Islands. La Gomera, Bco. Seco de Valhermoso, 16 Apr. 1845, *E. Bourgeau s.n.* (lectotype, designated here, FI-W109950 [digital image!]; isolectotypes, P 02462100!, FI-W109928, bottom specimen [digital image!]).

The specimen FI-W109950 from the Webb collection is here designated as the lectotype of *A. pinnatifida* f. *bourgaeana*. It is the best developed specimen, fitting the original description, and it was originally labelled as “*Andryala bourgaei* C. H. Schultz Bip.” Indeed, in the protologue Schultz “Bipontinus” indicated an unpublished name from the Webb collection (“*A. bourgeauii* C. H. Schultz Bip.”) as original material. Schultz “Bipontinus” (1849) mentioned plant material collected by Bourgeau in La Gomera in 16 April 1845 and, in fact, the lectotype is labelled with this information. Two other specimens with the same collection information are kept at the P and FI

ex Webb herbaria and are, therefore, considered as isolectotypes (P 02462100 and FI-W109928).

Both *Andryala pinnatifida* f. *gomeraea* and *A. pinnatifida* f. *bourgaeana* are here included in *A. pinnatifida* subsp. *cuneifolia* (Sch.Bip.) M.Z.Ferreira, R.Jardim, Alv.Fern. & M.Seq. Likewise, *A. pinnatifida* f. *cuneifolia* Sch.Bip. and *A. pinnatifida* f. *buchiana* (including only the plants from Tenerife) were placed in this subspecies (Ferreira & al. 2014a). All four forms are morphologically similar (leaves frequently broad, dentate-lobate, with abaxial face stellate-lanate, lower leaves attenuate at base, cauline and upper leaves semiamplexicaul, base subcuneate to cuneate, and inflorescences corymbose-racemose).

10. *Andryala pinnatifida* f. *webbiana* Sch.Bip. in Webb & Berthel., Hist. Nat. Iles Canaries (Phytogr.) 3(2): 417. 1849.

Ind. loc.: “Ins. Hierro, Intra de Inama, die 8 Junii, Bourgeau!”

TYPE: Spain, Canary Islands. Hierro, Intra de Inama, 8 Jun. 1845, *E. Bourgeau s.n.* (lectotype, designated here, P 02462116!).

Schultz “Bipontinus” (1849) mentioned material collected by Bourgeau, on the 8th of June, in a locality named “Intra de Inama” (El Hierro). A specimen with these references was located at the P herbarium (P 02462116) and it fits perfectly the description of *Andryala pinnatifida* f. *webbiana*. Thus, it is designated here as the lectotype. In the protologue Schultz “Bipontinus” also indicated an unpublished name from the Webb collection, “*Andryala webbii* C. H. Schultz Bip.”. Indeed, a specimen found at FI herbarium ex Webb (FI-W109925, on the right) is under the name *A. webbii* C. H. Schultz Bip., however, it is from La Palma and was collected in 17 July 1845. On the same herbarium sheet, on the left, there is a morphologically identical specimen under *A. webbiana* Schultz Bip., collected by Bourgeau also in La Palma in July 1845. Several other specimens deposited at the P herbarium are under this name, but they are also from La Palma. As none of these specimens were collected in El Hierro, as expected from the collection information in the protologue, they cannot be regarded as original material. However, as they all fit the original description this could mean that perhaps *A. pinnatifida* f. *webbiana* Sch.Bip. is present on both islands.

11. *Andryala pinnatifida* f. *glabrescens* Sch.Bip. in Webb & Berthel. Hist. Nat. Iles Canaries (Phytogr.) 3(2): 417. 1849.

Ind. loc.: “Palma in rupestribus et in sylvis circa Los Saucos, die 17 Julii 1845 Bourgeau! n. 13”.

TYPE: Spain, Canary Islands. La Palma, circa Los Saucos, 17 Jul. 1845, *E. Bourgeau 13* (lectotype, designated here, P 02462163 [digital image!]).

The specimen P 02462163 under *A. pinnatifida* f. *glabrescens*, originally from the Schultz “Bipontinus” herbarium, has exactly the same information as the one in the protologue (collection date and locality, as well as collector and collector number). Although this specimen was initially under “*Andryala Webbii* var. α ”, Schultz “Bipontinus” renamed it as “*Andryala pinnatifida* forma 13 *glabrescens* C. H. Sch.Bip.” Indeed, it fits the original description of this form and is, therefore, designated here as the lectotype. Although the specimen FI-W109925 (on the right), mentioned above, has exactly the same collection information, it was not selected for typification because it is morphologically closer to *A. pinnatifida* f. *webbiana*. Similarly to *A. pinnatifida* f. *webbiana*, this specimen exhibits obovate leaves, with broad-triangular teeth at the margin, while in *A. pinnatifida* f. *glabrescens* the leaves are elliptic, acuminate, with an acute-dentate margin.

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