

CONTRIBUCIONES A LA FLORA VASCULAR DE MARRUECOS (21-22)

21. NOTES ON NORTH AFRICAN *ANDRYALA* L. (ASTERACEAE): A NEW COMBINATION AND TYPIFICATIONS

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Notas sobre Andryala L. (Asteraceae) en el Norte de África: una nueva combinación y tipificaciones

Key words. *Andryala*, Cichorieae, Compositae, Morocco, nomenclature, taxonomy, typification.

Palabras clave. *Andryala*, Cichorieae, Compositae, Marruecos, nomenclatura, taxonomía, tipificación.

According to present knowledge and taxonomic concept, the genus *Andryala* comprises about 16 species distributed in the Mediterranean Basin and Macaronesia (one endemic species occurs in the Eastern Carpathians), which main centres of diversity are located in NW Africa, Iberian Peninsula, and in the Canary Islands. This genus includes both morphologically homogeneous species distributed in small geographical areas [glacial relicts; *A. agardhii* DC. and *A. laevitomentosa* (Nyár. ex Sennikov) P.D. Sell ex Greuter] and highly variable species (or species complexes if the more splitting approach is adopted) widely

distributed. The most remarkable representatives of the latter group are *A. integrifolia* (Western and Central part of Mediterranean Basin, introduced to Macaronesia) and NW Africa in hitherto accepted classification). Intraspecific classification of *A. pinnatifida* has been a matter of debate for a long time and several taxonomic concepts were proposed, the latest by Greuter (2003) and Arechavaleta *et al.* (2010). Greuter (2003) recognized four subspecies of *A. pinnatifida* in NW Africa, namely, *A. pinnatifida* subsp. *ducellieri* (Batt.) Greuter, *A. pinnatifida* subsp. *jahandiezii* (Maire) Greuter, *A. pinnatifida* subsp. *maroccana*

(Maire) Greuter and *A. pinnatifida* subsp. *mogadorensis* (Hook.f.) Greuter. Noteworthy is an additional NW African putative *A. pinnatifida*. Originally described as *A. antonii* Maire (Maire, 1927), this taxon was later combined as *A. canariensis* subsp. *antonii* (Maire) Maire in Jahandiez & Maire (1934) and, more recently, as *A. pinnatifida* subsp. *antonii* (Maire) Dobignard (Greuter & von Raab-Straube, 2007). Nonetheless, given the morphological differences (e.g. stems slender; leaves narrow ± dentate or slightly lobed, lower cauline leaves narrow lanceolate, attenuate at the base into a short petiole, upper ones linear and entire, cypselas with excurrent ribs at the apex and an inner ring of short teeth), it is herein excluded from *A. pinnatifida*. Being morphologically similar to *A. integrifolia* L., it should instead be included in this species. In the Canary Islands *Andryala pinnatifida* is a big complex, including about five subspecies which are more or less traditionally recognized (Kunkel, 1980; Arechavaleta *et al.*, 2010; Ferreira *et al.*, 2014).

The lack of agreement among various authors prompted us to re-examine the variation in *A. pinnatifida* s. lat. in detail, especially focused on Canarian and African plants. Consequently, here we propose a new taxonomic concept for *A. pinnatifida*, restricting it to the Canary Islands. Additionally, lectotypes for all synonyms of *Andryala mogadorensis* Coss. ex Hook.f. are designated.

1. *Andryala mogadorensis* Coss. ex Hook.f.

in Bot. Mag. 99: t. 6010. 1873 [January]

≡ *Andryala canariensis* Lowe subsp. *mogadorensis* (Coss. ex Hook.f.) Maire in Bull. Soc. Hist. Nat. Afrique N. 19: 59. 1928

≡ *Andryala pinnatifida* Aiton subsp. *mogadorensis* (Coss. ex Hook.f.) Greuter in Willdenowia 33(2): 232. 2003

Ind. loc.: "...on a little rocky islet in the bay of Mogadore, on the Western Morocco Coast, in lat. 31 10/2 N, and has hitherto

been found nowhere else. It was discovered by Balansa in 1868, and gathered by Messrs. Maw, Ball, and myself there in May, 1871. Mr. Maw was so fortunate as to transit a living plant to this garden at Benthal Hall, Broseley, which flowered in the following April, and is here figured."

Typus: Morocco, "Isle de Mogador", B. Balansa, 25-04-1867 [**lectotype, designated here**, K000251901!; syntypes: P02462215! (specimen on the right), P02462221!, BM000949980!]

1a. *Andryala mogadorensis* Coss. ex Hook.f. subsp. *mogadorensis*

= *Andryala mogadorensis* Coss. et Bal. ex Cosson in Bull. Soc. Bot. France. 20: 252. 1873 [November]

Ind. loc.: "In maritimis insulae Mogador detexit cl. Balansa. 25 April. 1867 florifera et fructifera lecta."

Typus: *Andryala mogadorensis* sp. nov. (Coss.). Ile de Mogador. 25 avril. B. Balansa, pl. du Maroc, 1867 [**lectotype, designated here**, P02462219! ex herb. Cosson; isolectotypes: P02462218! ex herb. Cosson, P02462215! (specimen on the left) ex herb. Cosson]

= *Andryala ducellieri* Batt. in Bull. Soc. Hist. Nat. Afrique N. 9: 120. 1918. basion.

Andryala canariensis Lowe subsp. *ducellieri* (Batt.) Maire in Jahandiez & Maire, Cat. Pl. Maroc. 3: 840. 1934

Andryala pinnatifida Aiton subsp. *ducellieri* (Batt.) Greuter in Willdenowia 33(2): 232. 2003

Ind. loc.: "... sur les falaises de Safi par M. Ducellier" [Battandier, 1918]

Typus: [Morocco], Falaises de Safi, Ducellier [**lectotype, designated here**, MPU020221 (specimen on the left); isolectotype MPU020221 (specimen on the right); syntype MPU020220]

= *Andryala canariensis* Lowe subsp. *maroccana* Maire in Bull. Soc. Hist. Nat. Afrique N. 19: 58. 1928.

Andryala pinnatifida Aiton subsp.

maroccana Maire in Mém. Soc. Sci. Nat. Maroc. 8 (1): 239. 1924, nom. nud.

Andryala pinnatifida Aiton subsp. *maroccana* (Maire) Greuter in Willdenowia 33: 232. 2003

Ind. loc.: “Hab. in arenosis litoris nec non in collibus aridis Imperii Marroccani austro-occidentalis, ubi a martio usque ad aestatem floret: in arenis prope Mogador copiosissime crescit.” [Maire, 1928]

Typus: [Morocco], Dunes de Mogador, Jahandiez E., n° 368, 6-4-1920 (**lectotype, designated here**, MPU001913; syntypes MPU001906, MPU001907, MPU001909, MPU001910, MPU001911, MPU001912)

= *Andryala mogadorensis* Coss. et Bal. ex Cosson. f. *sinuatifolia* H. Lindb., Itin. Mediterr. (Act. Soc. Sc. Fenn. n. s. B, i. No. 2) 152. 1932

Andryala canariensis Lowe subsp. *mogadorensis* Coss. et Bal. ex Cosson f. *sinuatifolia* (H. Lindb.) Maire in Jahandiez & Maire, Cat. Pl. Maroc. 3: 840. 1934

Ind. loc.: “Mogador loco sterili in Insula Magna”

Typus: Morocco, occ., prope opp. Mogador, in sterilibus in Insula Magna, Harald Lindberg 2012, 11 May 1926 (H-1451919), designated by Väre in Phytotaxa 47: 15. 2012.

Andryala mogadorensis Coss. ex Hook. f. was validly published by Joseph Dalton Hooker in January of 1873. In the protologue several types were mentioned, including specimens from Balansa (1867). This material was found at the K, P and GOET herbaria and corresponds to specimens gathered in 25 April 1867 and labeled by Balansa himself as “*Andryala Mogadorensis* sp. nov. (Coss.)”. Apparently, the name is of Cosson’s authority, but in fact it was Hooker who first described the species. Hooker was one of the Directors of the Royal Botanic Gardens, Kew, hence it is more likely that the original description was based on Balansa’s specimen at K herbarium than the ones deposited in P herbarium. Thus, the specimen

from K herbarium was selected as the lectotype. Hooker (1873) restricted *A. mogadorensis* to the rocky islet in the bay of Mogador (city on the western coast of Morocco which is currently known as Essaouira). Therefore, all the type specimens selected were collected on this Moroccan island. The specimen P02462215, collected by Ball in April 1871, might be a syntype, although the collection date (27 April 1871) does not exactly match with the one in the protologue (May, 1871). Months later, in November of 1873 Ernest Cosson published several new species for Morocco, including “*Andryala mogadorensis* Coss. et Bal.”. It appears that Cosson (1873) described this species based on specimens of *A. mogadorensis* also from Balansa, according to the indication given in the protologue “Bal. pl. Mar. (1867)” and the authority of the name. The description was based on specimens deposited in the Paris herbarium ex Cosson and labeled “B. Balansa, Pl. du Maroc, 1867” [P02462219, P02462218 and P02462215]. The specimen P02462219 was chosen as lectotype since it is the one that best fits the original description. However, *A. mogadorensis* Coss. et Bal. is an illegitimate name, because it is a later homonym. Maire (1928) considered *A. mogadorensis* at a subspecies level, designating it as *Andryala canariensis* subsp. *mogadorensis* (Coss. ex Hook. f.) Maire. Thus, Maire (1928) adopted the name *Andryala canariensis* suggested by Lowe (1872: 564) for the Canarian *Andryala pinnatifida* Aiton. More recently, Greuter (2003) presented a new combination, *Andryala pinnatifida* subsp. *mogadorensis* (Coss. ex Hook. f.) Greuter, in order to restore the earliest validly published name, but no typification was proposed.

Battandier (1918) described *Andryala ducellieri* Batt. as a Moroccan botanical novelty, underlining that this *Andryala* was collected at the cliffs of Safi by M. Ducellier. Indeed three specimens collected by Ducellier in Safi were located at MPU herbarium, all of them

including a printed version of the protologue. Although all bear original labels with the name *Andryala mogadorensis*, these specimens were later identified as *Andryala ducellieri* Batt. On the label of the herbarium sheet MPU020221 we can read “*Andryala Ducellieri species nova, Safi*” and since there are two specimens on the same sheet, the one on the left which is the best conserved, is here designated as lectotype. The labels on the specimens MPU020221 and MPU020220 by P. A. Schäfer, indicate the first as the holotype and the second as an isotype, but since no type designation was included in the protologue, a lectotype must be designated. In the protologue, Battandier (1918) noted the resemblance of the new species to *A. mogadorensis* (“*Par ses ligules et ses achaines, il se rapproche de l’A. Mogadorensis Cosson.*”) and emphasized the morphological characters which differentiate it from *A. mogadorensis* (“*Il s’en distingue par sa couleur blanchâtre, par ses feuilles moins larges et non arrondies, obtuses au sommet, par ses inflorescences longuement hispides ainsi que les pédicelles et les capitules hérissés de poils blancs ou un peu jaunâtres, jamais noirs.*”). Actually, these morphological differences are observable on the lectotype here designated. Several years before, Ball (1878) referred to *A. mogadorensis* plants growing along the coastline from the city Safi southwards, and distinguished them from the ones found on the Island of Mogador by their narrower, oblong and subsinuate leaves. A specimen collected by Ball in 1871 on the coastline near Safi is kept at Kew herbarium (K000251902). It was originally identified as *Andryala mogadorensis* Coss. var. *intermedia*, name that was never published, and indeed it corresponds to *A. ducellieri* Batt., herein included in *A. mogadorensis* Coss. ex Hook.f. In the publication by Jahandiez & Maire (1934), Maire transferred *A. ducellieri* to a subspecies rank under the name *A. canariensis* subsp. *ducellieri* (Batt.) Maire, and later Greuter (2003) made a new combination:

A. pinnatifida subsp. *ducellieri* (Batt.) Greuter, but no typifications were suggested. *Andryala pinnatifida* subsp. *ducellieri* is herein synonymized to *A. mogadorensis* subsp. *mogadorensis* since both are perennials exhibiting robust stems, covered with a dense whitish-lanate stellate indumentum, with long glandular hairs, especially in the upper part and inflorescence; crowded leaves, the lower ones petiolate, cauline semi-amplexicaul to amplexicaule, cordate or auriculate at the base, rounded or acute-obtuse at the apex; leafy inflorescences; densely glandular-hairy involucre, and receptacle bearing long setose hairs.

Braun-Blanquet & Maire (1924) cited *A. pinnatifida* subsp. *maroccana* Maire for the first time, confining it to “*Dunes de Mogador dans le Retametum*”, but no description was provided, which makes it an invalid name. Maire (1928) validly published the new taxon under the name *A. canariensis* subsp. *maroccana* Maire, stressing that it is found abundantly on dunes near Mogador. In the protologue Maire indicated where the type specimens were deposited: “*Typus in Herb. Univers. Algerensis*”. Since all specimens from this herbarium were transferred to the P and MPU herbaria and Maire (op.cit.) did not mention a specific specimen as holotype, a lectotype was designated among the original material located in MPU. All the type specimens mentioned above belonged initially to the herbarium of the University of Algiers and most are labelled “*Andryala pinnatifida* Ait. ssp. *maroccana* Maire” and accompanied by a printed copy of the protologue. Furthermore, all were collected from the dunes of Mogador (Essaouira), except for the specimen MPU001907 which is from the dunes near Diabet (town to the south of Essaouira). Maire (1928) distinguished *A. canariensis* subsp. *maroccana* Maire from *A. canariensis* subsp. *mogadorensis* based on leaf characters (“*foliis plus minusve pinnatifidis apice acutiusculis*”) and further stated that *A.*

canariensis subsp. *maroccana* corresponds to a plant incorrectly cited by Ball (1878) as *A. ragusina* L. var. *lyrata* (Pourr.) DC. Indeed, Ball (1878) identified a specimen collected in the vicinity of Mogador based on leaf characters (“*Folia in spec. nostris pinnatifida lobis oblongis obtusis.*”) as *A. ragusina* var. *lyrata*. Since this plant was not yet in anthesis, Ball (1878) revealed some uncertainty about its true identity and stressed that it could eventually correspond to the very polymorphic Macaronesian species, *A. pinnatifida* Aiton. Ball (op. cit.) highlighted that the specimen in question was deposited at Kew herbarium, but unfortunately it was not found. However, there is no current evidence of the presence of *A. ragusina* near Mogador and the specimen could indeed correspond to *A. mogadorensis* subsp. *maroccana* taking into account the geographic distribution. Later, Greuter (2003) combined *A. canariensis* subsp. *maroccana* as *A. pinnatifida* subsp. *maroccana* (Maire) Greuter, here synonymized to *A. mogadorensis* subsp. *mogadorensis* since it resembles this taxon in all morphological features, except for the leaf margin (the lower and cauline leaves are more or less pinnatifid, instead of entire or sinuate-dentate).

1b. *Andryala mogadorensis* Coss. ex Hook.f. subsp. *jahandiezii* (Maire) M.Z.Ferreira, Álv.Fern. & M.Seq., comb. nov.

≡ *Andryala jahandiezii* Maire in Mem. Soc. Sc. Nat. Maroc, 15: 46. 1927. basion.

≡ *Andryala canariensis* Lowe subsp. *jahandiezii* (Maire) Maire in Jahandiez & Maire, Cat. Pl. Maroc, 3: 840. 1934

≡ *Andryala pinnatifida* Aiton subsp. *jahandiezii* (Maire) Greuter in Willdenowia 33: 232. 2003

Ind. loc.: “In planitiebus arenosis inter flumina Sous et Massa (Maire, 1922).”

Typus: [Morocco], Sous, plaines sabloneuses entre l’Oued Sous et l’Oued Massa, Maire, 02-04-1922 (**lectotype, designated**

here, P00710614!; isolectotypes RAB078016; MPU001815; syntypes MPU001816, MPU001817, P04277958!)

= *Andryala jahandiezii* Maire var. *microcarpa* Maire in Mem. Soc. Sc. Nat. Maroc, 15: 47. 1927

Ind. loc.: “In arenosis maritimis ad meridiem urbis Agadir-n-Ighir (Jahandiez, 1923; Maire, 1926).”

Typus: [Morocco], Agadir-n-Ighir, dunes, Jahandiez, n° 203, 28-04-1923 (**lectotype, designated here**, MPU001818; isolectotypes P02462208!, P04308378!).

In 1927 Maire described a species from the province of Sous in Morocco, *Andryala jahandiezii* Maire. The protologue includes information on the location of the type specimens: “*Typi in Herb. Univers. Algeriensis et in Herb. Inst. Imper. Scient. Rabatensis*”. The specimens from the University of Algiers were incorporated in the P and MPU herbaria, where indeed some type specimens of *A. jahandiezii* Maire were found. The author recognized two varieties based upon the size of the cypselae: *A. jahandiezii* var. *typica* Maire, occurring on sandy shores between the rivers Sous and Massa, and *A. jahandiezii* var. *microcarpa* Maire, found on sandy maritime shores near the city of Agadir-n-Ighir. According to the protologue, specimens representing the typical variety were collected by Maire in 1922. Three herbarium sheets from different herbaria (MPU, P and RAB) with the same collection date and collector (Maire, 2-4-1922) were found. The specimen MPU001815 was labelled by Muriel Durand and Caroline Loupe as the holotype, but Maire (op. cit.) made no reference to a particular specimen in the protologue and there are two type specimens (MPU001814 and MPU001815) labelled as “*Andryala jahandiezii* n.sp.”. Thus, the best conserved specimen (P00710614) is herein designated as the lectotype and the specimens MPU001815 and RAB078016 are considered as isolectotypes. In the protologue,

Maire (1927) made reference to specimens of *A. jahandiezii* var. *microcarpa* collected by Jahandiez in 1923. Actually, the specimen MPU001818 is labeled “*Andryala jahandiezii* var. *microcarpa* n.sp.” and was collected by Jahandiez on 24 April 1923, and therefore it was chosen as the lectotype. There are additional specimens (P02462208 and P04308378) collected by Jahandiez on the same day and locality, labeled “*Andryala mogadorensis* Cossou”, for which reason these are herein considered as isolectotypes. In the protologue, Maire referred to specimens of *A. jahandiezii* var. *microcarpa* Maire collected by himself in 1926. These were located in the herbaria MPU and P (MPU001816, MPU001817 and P04277958) under the name *Andryala jahandiezii* Maire, but since they were collected in a different locality from the one mentioned in the protologue (“*In arenosis ad ostium fluminis Sous*”, where the typical variety is found), they could be considered as syntypes of *A. jahandiezii* Maire. In the original description, Maire (1927) considered *A. jahandiezii* Maire morphologically close to *A. pinnatifida* subsp. *maroccana* (Maire) Greuter, differing in the habit, leaf margin and indumentum (“*habitu magis virgato, foliis integris nec lobatis, pilis glanduliferis parcissimis*”). Jahandiez & Maire (1934) transferred *A. jahandiezii* Maire to a subspecies rank under the name *A. canariensis* subsp. *jahandiezii* (Maire) Maire and later, Greuter (2003) presented a new combination: *A. pinnatifida* subsp. *jahandiezii* (Maire) Greuter. Indeed, this taxon is worthy of distinction at a subspecies level considering its morphological differences compared to *A. mogadorensis* subsp. *mogadorensis*. Besides, it is found in the Region of Souss-Massa-Drâa while the typical subspecies can be found northwards along the western coast of Morocco.

The Moroccan taxa herein included in *A. mogadorensis* Coss. ex Hook.f. were formerly recognized as North African subspecies of *A. pinnatifida* Aiton. However, these are

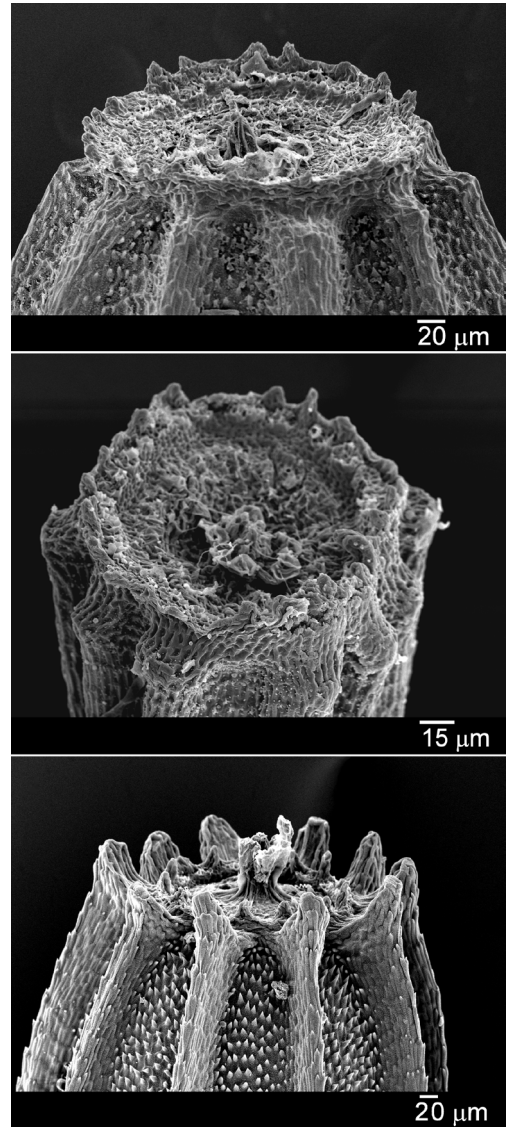


Figure 1. Apex of cypselas: A - *A. mogadorensis* subsp. *mogadorensis* (MA870318); B - *A. mogadorensis* subsp. *jahandiezii* (Maire) M.Z. Ferreira, Alv. Fern. & M. Seq. (P04308378, left specimen), © Muséum National d'Histoire Naturelle (MNHN) - Paris Herbarium (P); C - *A. pinnatifida* Aiton (TFC31801).
Apice de la cipsela: A - *A. mogadorensis* subsp. *mogadorensis* (MA870318); B - *A. mogadorensis* subsp. *jahandiezii* (Maire) M.Z. Ferreira, Alv. Fern. & M. Seq. (P04308378, espécimen de la izquierda), © Muséum National d'Histoire Naturelle (MNHN) - Paris Herbarium (P); C - *A. pinnatifida* Aiton (TFC31801).

morphologically distinct compared to *A. pinnatifida* Aiton from the Canary Islands (involucre indumentum, leaf shape, cypselae apex). The cypselae morphology is very important in Asteraceae classification, mainly at the generic and specific level (Bremer, 1994). In effect, *A. mogadorensis* Coss. ex Hook.f. exhibits cypselae ribs scarcely excurrent at the apex, not exceeding the inner ring of teeth, while in the Canarian *A. pinnatifida* Aiton the cypselae ribs are very prominent at the apex, largely exceeding the inner ring of teeth (Fig. 1). Confusion arose when Ball (1878) cited *A. ragusina* var. *lyrata* (Pourr.) DC. for western Morocco, not discarding, however, a possible correspondence of this taxon to *A. pinnatifida* Aiton. This view was adopted by later authors and the error persisted until now since no effective morphological comparison with *A. pinnatifida* Aiton from the Canary Islands was ever made. For instance, in Jahandiez & Maire (1934), Maire included *A. mogadorensis* Coss. ex Hook.f., *A. pinnatifida* subsp. *maroccana* Maire (nom. nudum., as stated by the author), *A. jahandiezii* Maire and *A. ducellieri* Batt. in *A. canariensis* as subspecies, but did not justify this taxonomic placement based on morphological features. A similar situation occurred with the *Andryala* taxa from Madeira. Aiton (1789) erroneously considered a variety of *A. pinnatifida* Aiton for Madeira. Lowe (1872), a naturalist who extensively studied the Madeiran flora, stressed that so much confusion is attached to the name *A. pinnatifida* that the adoption of a new name for the Canarian taxa (*Andryala canariensis*) would be warrantable.

In view of the foregoing, *A. pinnatifida* Aiton should be restricted to the Canary Islands and the North African taxa addressed in this paper [except for *A. pinnatifida* subsp. *antonii* (Maire) Dobignard] should be included in *A. mogadorensis* Coss. ex Hook.f.

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22. NUEVO NOMBRE EN *RHODANTHEMUM* (COMPOSITAE, ANTHEMIDEAE).

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New name in Rhodanthemum (Compositae, Anthemideae).

Palabras clave. *Rhodanthemum redieri* subsp. *soriae*, *Leucanthemum redieri* var. *cuneatum*, Flora, Taxonomía, Marruecos, Norte de África

Key words. *Rhodanthemum redieri* subsp. *soriae*, *Leucanthemum redieri* var. *cuneatum*, Flora, Taxonomy, Morocco, North Africa.

Rhodanthemum (Vogt) Wilcox, Bremer & Humphries, es un género perteneciente a la tribu *Anthemideae*, subtribu *Leucanthemeinae*, (*Compositae*), cuyo área de distribución se extiende por el norte de África (Argelia y Marruecos) y el sudoeste de Europa (España)

(Bremer & Humphries, 1993) (Oberprieler, Himmelreich & Vogt, 2007).

En Marruecos está representado por una docena de especies endémicas, más otras dos de distribución argelino-marroquí y una más hispano-marroquí (Ibn Tattou & Fennane,