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Typification of plant names referable to *Phagnalon* (Compositae) with some taxonomic notes

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ABSTRACT

As part of a taxonomic study in Gnaphalieae and other Compositae, 45 new lectotypes, 1 epitype and 3 neotypes are designated for names in *Phagnalon*, *Conyza* and *Pluchea*. Typifications are discussed, together with taxonomic notes on these taxa and references to previous lectotypifications. The accepted names for which we propose lectotypifications are: *Ph. acuminatum*, *Ph. barbeyanum*, *Ph. bicolor*, *Ph.* ×*caroli*, *Ph. carolipaui*, *Ph. harazianum*, *Ph. kotschyi*, *Ph.* ×*intermedium*, *Ph. latifolium*, *Ph. melanoleucum*, *Ph. phagnaloides*, *Ph. persicum*, *Ph. pygmaeum*, *Ph. quartinianum*, *Ph. rupestre* subsp. *rupestre, Ph. rupestre* subsp. *graecum*, *Ph. saxatile*, *Ph. schweinfurthii*, *Ph. sinaicum*, *Ph. stenolepis*, *Ph.* ×*telonense* and *Ph. viridifolium*.

Keywords: Asteraceae, Gnaphalieae, lectotypification, nomenclature, neotypification, taxonomy

INTRODUCTION

Phagnalon Cassini (1819: 173) is a genus distributed throughout North and East Africa, the Macaronesian region, the Mediterranean basin, the Irano-Turanian region and the Saharo-Arabian region, but its greatest diversity is found in the Arabian Peninsula (Montes-Moreno *et al.* 2010). Previous phylogenetic studies related to our present nomenclatural treatment showed unresolved relationships at generic and specific levels, as well as incongruences which suggested possible ancient hybridization events (Montes-Moreno *et al.* 2010). For these reasons, a subsequent phylogenetic and morphological study of *Aliella* Qaiser & Lack (1986a: 488) was carried out in Montes-Moreno *et al.* (2013). This study showed that *Aliella* was not monophyletic and that the morphological characters used to describe this genus were variable. Therefore, *Aliella* was merged into *Phagnalon.* The criteria used to delimit the taxa belonging to *Phagnalon* in this nomenclatural study were based on these previous phylogenetic and taxonomic investigations. The variability in their morphological characters and the identification of useful features to distinguish between species or groups of species were also considered, together with patterns of geographic distribution, intermediate specimens and phylogenetic relationships. Several lectotypifications and neotypifications are provided to fix the use of names and to define the delimitation of taxa accepted by us.

MATERIAL AND METHODS

The existing typifications for the names under consideration in this nomenclatural treatment were searched for in the relevant literature. Names that had never been typified and their protologues were examined and original specimens were searched for and studied. Lectotypes were chosen according to Art. 9.2 of the latest edition of the ICN (McNeill *et al.* 2012). In selecting lectotypes, the most complete specimen conforming to the description presented in the protologue was chosen from specimens and specific collections housed in the herbarium where the personal collection of each author is kept according to Stafleu & Cowan (1976–1988). If duplicates were found in other herbaria, these

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were indicated as isolectotypes. Neotypes were designated according to Art. 9.7 of ICN when all potential sources of original material had been checked but no original specimens found. In the case of certain taxa described by Sennen, examination of the printed labels revealed that the names had been effectively and validly published *in schedis* "Pl. Espagne 1926" and "Pl. Espagne 1928" with a diagnosis reproduced by indelible autograph. In some cases, labels were found in the specimens indicating that those specimens are syntypes, isotypes, isolectotypes or types. However, as no publication including the typification of the name was found, these labels cannot be considered as effective typification according to Art. 7.9 of ICN. We examined specimens deposited at the following herbaria (acronyms according to Thiers 2018): ARAN, B, BC, BCN, BM, C, COI, E, FI, HBG, JACA, K, LISU, M, MA, MGC, MPU, RAB, RNG, SALA, SANT, SEV, TFC, TSV, UPS, W and WU as well as other collections: Herbarium F. Sennen II (La Salle Bonanova, Barcelona) and J.X. Soler pers. herb. In addition, photographs of both type and non-type specimens from the following herbaria were also examined: AIX, BEI, BR, ETH, FI, FR, G, GDA, GOET, H, LE, LINN, LY, MA, MB, MO, NY, P, PAD, RAB, SAV, TLON, WAG and Z amongst others available in online databases (e.g., JSTOR Global Plants, http://plants.jstor.org/). Moreover, we studied microfilm images of type material kept in G-BOIS of *Phagnalon* species described by Boissier because, unfortunately, this material has been lost (Laurent Gautier, pers. comm.).

TYPIFICATION OF THE NAMES

Forty-nine type designations are listed in alphabetical order, firstly by species and then by intraspecific taxa. We applied the following format: the first name is the one being typified; the most relevant homotypic synonyms are chronologically ordered; the lectotype or neotype is designated and the accepted name shown in bold italic typeface, finally followed by taxonomical observations or nomenclatural remarks.

Blumea phagnaloides Richard (1847: 393)

≡ *Phagnalon scoparium* Sch. Bip. ex Oliver & Hiern in Oliver (1877: 338), *nom illeg.*

≡ ***Phagnalon phagnaloides*** (A.Rich.) Cufodontis (1966: 1105)

Type:—[ETHIOPIA.] In montibus elatis sterilibus ad montem Silke 9000 pedes supra mare et in ipso monte Silke, 9 February 1840, *Schimper 685* (lectotype: P barcode P033905 [digital image!], designated here; isolectotypes: B barcode B 10 0097164 [digital image!], BM!, BR barcodes BR000000836208 and BR0000008877024 [digital images!], FI barcode FI006327 [digital image!], G barcodes G00018238, G00018239 and G00018240 [digital images!], GOET barcode GOET001888 [digital image!], K barcodes K000274291! and K000274292!, LG barcode LG000009002415 [digital image!], M barcode M0105293 [digital image!], MO barcode MO684341 [digital image!], P barcodes P033906, P033907 and P04294926 [digital images!], S-G number S-G-4925 [digital image!], TUB barcode TUB005096 [digital image!], WAG barcode WAG0003704 [digital image!]).

(Image available at: https://science.mnhn.fr/institution/mnhn/collection/p/item/p033905).

Notes:—Richard (1847) validated the name *Pluchea phagnaloides* Sch. Bip. by adding a diagnosis and combining it under the genus *Blumea*. The locality and collector indicated in the original description read: "Crescit in montibus elatis et sterilibus versus montem *Selki*, altitudine circiter 9.000 pedum [sic] supra mare, in provincia *Semiène*, mense Februario florens (Schimper)". Qaiser & Lack (1986: 439) cited the specimen "*W. G. Schimper 685*" kept at P as holotype, but we found several specimens in this herbarium corresponding to the original gathering "Schimperi Iter Abyssinicum" collected by Schimper and numbered 685. Therefore, a lectotype had to be designated. These specimens numbered 685 are labelled as *Pluchea (Laggera) phagnaloides* Hochst. but this name was published on the labels without description. We chose the specimen P033905 because it is in a good state of preservation, has several mature capitula and morphologically agrees with the original description.

Conyza intermedia Lagasca (1816: 28)

≡ *Phagnalon lagascae* Cassini (1819: 174), *nom. illeg.*

≡ *Phagnalon saxatile* var. *intermedium* (Lag.) Candolle (1836: 396)

≡ *Phagnalon saxatile* f. *lagascae* Rouy (1903: 164)

≡ *Phagnalon saxatile* var. *lagascae* (Rouy) Merino (1906: 347), *comb. superfl.*

≡ *Phagnalon saxatile* subsp. *intermedium* (Lag.) Rivas Mart. in Rivas Martínez *et al.* (2002: 705)

≡ ***Phagnalon* ×*intermedium*** (Lag.) Pau (1931: 51) [*Ph. rupestre* (L.) DC. × *Ph. saxatile* (L.) Cass.]

Type:—[SPAIN.] Murcia, Portman, November 1972, *Calonge*, *Gómez* & *Valdés* (neotype: MA number MA441443!, designated here).

Notes:—The locality indicated in the original description was as follows: "Loca arida sterilia, et saxorum calcareorum rimas incolit, circa Orcelim, Murciam urbem, alibique in Hispania meridionali". Its intermediate morphology to *Ph. rupestre* and *Ph. saxatile* was indicated in the protologue. Following a detailed search, we failed to find any specimen from the original gathering in any institution. According to Stafleu & Cowan (1976–1988), the original herbarium of Lagasca was destroyed. Therefore, we selected as neotype another specimen corresponding morphologically with the protologue, and collected from the Murcia area. The selected neotype was morphologically intermediate between *Ph. rupestre* and *Ph. saxatile.* This intermediate specimen has linear to lanceolate leaves like those of *Ph*. *saxatile*, with the outermost and middle involucral bracts wider and obtuse, similar to those of *Ph*. *rupestre*, but frequently with undulate margins, like those of *Ph*. *saxatile*.

Conyza pumila Smith (1813: 173), *nom*. *illeg*. non Lam. ex Persoon (1807: 427)

≡ *Conyza pygmaea* Sieber (1823: 322)

≡ *Phagnalon pumilum* Candolle (1836: 397), *nom*. *illeg*.

≡ ***Phagnalon pygmaeum*** (Sieber) Greuter (1975: 23)

Type:—[GREECE.] *Sibthorp s.n.* (lectotype: Sib-2049, three upper plants [digital image!], designated here).

(Image available at: https://herbaria.plants.ox.ac.uk/bol/sibthorpherbarium/record/details/0e05d115-5e6d-4a48-a6a4-18dbf60b0f78).

Epitype:—[GREECE.] In summ. M. Spak, Creta, *s.d.*, *Sieber s.n.* (K barcode K001040207!, designated here; isoepitypes: K barcode K00910420!, BR barcode BR00005491223 [digital image!], M barcode M0029838 [digital image!], GOET barcode GOET001889 [digital image!], HAL barcode HAL0112808 [digital image!], P barcode P2829198 (left specimen) [digital image!]).

(Image available at: http://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.k001040207).

Notes:—In the protologue, the locality was indicated as: "In cacumine montium Sphacioticorum Cretae". The main collection of Sibthorp types is deposited at OXF herbarium according to Stafleu & Cowan (1976–1988) but the original material is a mixture of *Ph. pygmaeum* (three upper plants) and *Ph. rupestre* subsp. *rupestre* (lower plant). Therefore, we chose as the lectotype the three upper specimens that morphologically agree with the original description collected by the author. Moreover, as these three upper specimens do not have capitula, an epitype is here designated in order to avoid any ambiguity coming from the taxonomic interpretation of the lectotype, following Art. 9.8 of the ICN (McNeill *et al*. 2012).

Conyza tomentosa Forsskål (1775: 148), *nom*. *illeg*. non Miller (1768: without page number)

Type:—[EGYPT.] Alex[andria], April 1762, *Forsskål 1145* (lectotype: C barcode C10002069 [digital image!], designated here; isolectotypes: C barcodes C10002070, C10002072 and C10002071 [digital images!]).

(Image available at: https://plants.jstor.org/stable/10.5555/al.ap.specimen.c10002069).

= ***Phagnalon rupestre*** (L.) Candolle (1836: 396) subsp. ***rupestre***

Notes:—*Conyza tomentosa* was described from several localities: "Alexandria, & Hadie. Arab. Tom erneb vel Mottaj". The original material of *C. tomentosa* deposited at C herbarium is a mixture of *Ph. woodii* and *Ph. rupestre*. Nearly all syntypes collected by Forsskål and kept at C correspond to typical *Ph. rupestre*. Moreover, the specimen C10002068, included in the type database of the C herbarium, corresponds to *Ph. woodii* and was collected in Kusma (Yemen), but not in the original locality. We selected the specimen C10002069, which corresponds to *Ph. rupestre,* as the lectotype. It was collected by Forsskål and better agrees with the protologue, and bears a handwritten note "nova" on the label.

Conyza varthemioides Nábělek (1925: 7)

Type:—[TURKEY.] Valley Hawaspi, montibus Djelo, in rupibus calcareis alt. ca. 1000 m, 6 September 1910, *Nábělek 3515* (lectotype: SAV barcode SAV0002217 [digital image!], designated here; isolectotype: SAV barcode SAV0002218 [digital image!]).

(Image available at: https://plants.jstor.org/stable/10.5555/al.ap.specimen.sav0002217).

= ***Phagnalon kotschyi*** Sch. Bip. ex Boissier (1875: 221)

Notes:—The locality indicated in the original description is: "Crescit in Kurdistaniae Turcicae districtu Hakkiari, in montibus Ğelo dit. Ğulamerik, in valle Hawaspi, ad rupes calcareas inaccessas alt. ca 1600 m. Legi 6-IX-1910 (No. 3515)". We have selected the specimen that better agreed with the protologue, with a handwritten note "*Conyza varthemioides* sp. n." on the label.

Phagnalon acuminatum Boissier (1875: 222)

Type:—[AFGHANISTAN.] Beloochistan, 1851, *Stocks 1159* (lectotype: G-BOIS, lost, designated by Lack in Rechinger f., Fl. Iranica 145: 44. 1980; new lectotype: K barcode K00910403!, designated here; isolectotype: K barcode K00910402!).

(Image available at: http://specimens.kew.org/herbarium/K000910403).

Notes:—Boissier (1875) described *Ph. acuminatum* and indicated the locality and collector as: "Hab. in Belutschiâ (Stocks!)". Lack (1980: 44) selected as the lectotype the specimen collected by Stocks kept at G-BOIS herbarium. Unfortunately, all type specimens of *Phagnalon* species described by Boissier from G-BOIS were lost. Therefore, a new lectotype had to be designated. As there is no other isotype at G-BOIS, or indeed at G general herbarium, we selected the isotype kept at K as the new lectotype.

Phagnalon aegyptiacum Boissier (1888: 292)

Type:—[SAUDI ARABIA.] Al Jouf: 9 km S.W. of Umm, Nukaylah Camp (S.W. of Al Jouf), April 1987, 29° 33' N, 38° 20' E, *Collenette 6249* (neotype: E barcode E00541252 [digital image!], designated here).

(Image available at: http://data.rbge.org.uk/herb/E00541252).

= ***Phagnalon barbeyanum*** Ascherson & Schweinfurth (1887: 87)

Notes:—The locality, collector and collection date indicated in the original description are as follows: "Hab. in vallibus Ouadi Tin et Ouadi Mor deserti Aegyptiaco-Arabici (Schweinf. 35! et 249!). Fl. Aprili.". Qaiser & Lack (1985: 14) cited two syntypes 35 and 249 collected by Schweinfurth in 1876 and 1877 respectively, but no lectotype was designated. The original material kept in G-BOIS herbarium was lost and we were unable to find any isotypes in other herbaria that matched the locality indicated in the original description. Therefore, we selected as neotype another specimen that agreed morphologically with the protologue.

Phagnalon annoticum Jord. ex Burnat (1891: 56)

≡ *Phagnalon tenorei* f. *annoticum* (Jord. ex Burnat) Rouy (1903: 165)

≡ *Phagnalon rupestre* var. *annoticum* (Jord. ex Burnat) Briq. & Cavill. in Burnat (1915: 282)

≡ *Phagnalon rupestre* subsp. *annoticum* (Burnat) Pignatti (1969: 297)

Type:—[FRANCE.] Basses Alpes, Annot. – Rochers des Escarafêts, 3 July 1885, *Reverchon 34* (lectotype: S number S-G-4760 [digital image!], designated here; isolectotypes: MPU!; P barcodes P02829254, P03312909, P04034937, P04381110, P04401379 and P04405348 [digital images!]).

(Image available at: http://herbarium.nrm.se/specimens/S-G-4760).

= ***Phagnalon rupestre*** (L.) Candolle (1836: 396) subsp. ***rupestre***

Notes:—Burnat (1891) cited two syntypes from France in the protologue: "environs d'Annot (Basses Alpes), en 1874 […] et en 1885 (plantes de France, nº 34 […], rochers des Escarafets)", the first one from 1874 as *Conyza saxatilis* and the second from 1885 as *Ph. annoticum*. We selected as the lectotype the specimen S-G-4760 from 1885 cited under *Ph. annoticum* by the author with a handwritten label with the collection date, which agrees with the original description and has several well preserved capitula. We found another specimen in the BM herbarium from the original locality and with the same collector number, but this specimen was collected in 1888.

Phagnalon atlanticum var. ***rehamnarum*** Maire (1929: 25)

Type:—[MOROCCO.] In rupibus micaeschistaceis montium ditionis Rehamna, ad 130 Kil. ab Anfa, 500–600 m, 13 April 1926, *Maire s.n.* (lectotype: MPU barcode MPU002016!, designated here; isolectotype: P barcode P00084138 [digital image!]).

(Image available at: https://science.mnhn.fr/institution/um/collection/mpu/item/mpu002016).

= ***Phagnalon bicolor*** Ball (1873: 11)

Notes:—The locality indicated in the protologue is as follows: "Hab. in rupibus micaeschistaceis aridis in ditione Rehamna Imperii Maroccani, ad alt. 500-600 m. Aprili floret". We selected as the lectotype the specimen MPU002016 deposited at the herbarium that is the main source of original material of the names proposed by Maire. After studying the original material, we found that the diagnostic characters cited by Maire in the original description (short branched stems) do not represent any morphological discontinuity, and that this morphological variation falls within the range of the variability of *Ph. bicolor*.

Phagnalon bicolor Ball (1873: 364)

≡ *Phagnalon atlanticum* Ball (1878: 498), *nom. illeg.*

Type:—[MOROCCO.] Ex rupibus arenaceis Atlantis Majoris in convalle Ait Mesan, alt. 1400–2000 met., 13–16 May 1871, *Ball s.n.* (lectotype: K barcode K000274275!, designated here; isolectotype: P barcode P00390805 [digital image!]).

(Image available at: http://apps.kew.org/herbcat/getImage.do?imageBarcode=K000274275).

Notes:—The locality was indicated in the protologue as follows: "Hab. in regione media Atlantis Majoris. In convalle Aït Mesan! circa 1600 m". According to Stafleu & Cowan (1976–1988), the original materials of Ball are kept at E, GL, K, and OXF. We selected as the lectotype a specimen from the original locality kept at K since it agrees with the protologue.

Phagnalon calycinum subsp. ***ballsianum*** Maire (1937: 361)

Type:—[MOROCCO.] Grand Atlas: rochers calcaires sous le Tizi-n-Test (versant Sud), 1800 m, 25 June 1936, *Balls 2916* (lectotype: MPU barcode MPU003810!, designated here; isolectotypes: BM barcode BM000924064!, E barcode E00531201!, K!, P barcode P00084137 [digital image!], S number S-G-4761 [digital image!]).

(Image available at: https://science.mnhn.fr/institution/um/collection/mpu/item/mpu003810).

= ***Phagnalon carolipaui*** Font Quer (1928: 13)

Notes:—The locality indicated in the original description is: "Grand Atlas: rochers calcaires au dessous du Tizi-n-Test, sur le versant Sud, vers 1800 m (E. K. Balls)". These plants were recognized at subspecific rank under *Ph. calycinum* on the basis of glabrescent leaves, brown involucral bracts, the size of the involucral bracts, and the presence of five pappus bristles. We selected as the lectotype the specimen MPU003810 which belongs to the original gathering collected by Balls and is kept in the MPU herbarium, which holds the main part of the original material of names proposed by Maire. The specimens kept at MPU and P are labelled *Ph. ballsianum*, whereas those kept at BM, E, K and S are labelled *Ph. rupestre.* On the basis of diagnostic morphological characters, we found morphological differences between *Ph. calycinum* subsp. *ballsianum* and *Ph. calycinum s. str.* Firstly, *Ph. calycinum* subsp. *ballsianum* generally has fewer pappus bristles than *Ph. calycinum*, as occurs in *Ph. carolipaui*. Secondly, *Ph. calycinum s. str.* has lanceolate and broader leaves whereas *Ph. calycinum* subsp. *ballsianum* has linear and narrower leaves with entire margins and involucral bracts with papery, hyaline margins, like those of *Ph. carolipaui*. In addition, *Ph. calycinum* subsp. *ballsianum* has florets with waxy cushions on the corolla lobes like those of *Ph. carolipaui*, whereas *Ph. calycinum* s. str. has florets lacking waxy cushions on the outside of the corolla lobes. Therefore, we consider that there are significant morphological discontinuities between *Ph. calycinum* subsp. *ballsianum* and *Ph. calycinum s. str.*, and we consider *Ph. calycinum* subsp. *ballsianum* and *Ph. carolipaui* to be conspecific. Ferrer-Gallego & Guara (2011) also considered *Ph. carolipaui* an accepted taxon.

Phagnalon carolipaui Font Quer (1928: 13)

≡ *Phagnalon calycinum* subsp. *caroli-paui* (Font Quer) Emberger & Maire (1930: 37)

Type:—[MOROCCO.] pr. Asib de Ketama, 1 July 1929, *Font Quer 434* (neotype: BC barcode BC98238!, designated here; isoneotypes: BC barcode BC810468 [digital image!], Z barcode Z000003778 [digital image!]).

Notes:—Ferrer-Gallego & Guara (2011) cited the specimen Z000003778 as type material, but no lectotype was designated. The specimen cited was collected in "Asib de Ktama" but this does not correspond with the original locality indicated in the protologue: "Badú (Atlante rhiphaeo)". Following a detailed search, no specimen from the original gathering could be found in any institution. The main collection from Font Quer is deposited at BC. Therefore, we selected as neotype another specimen kept at this institution that shows the diagnostic characters of the taxon, mature capitula, morphologically agrees with the original description and was also collected in "Asib de Ktama" in the Riphean Atlas, as stated in the original description.

Phagnalon* ×*dertosense Sennen (1929: 42)

Type:—[SPAIN.] Tarragone: Tortose, rochers calcaires, 13 April 1922, *Sennen 4428* (lectotype: BC-SENNEN barcode BC945734!, designated here; isolectotypes: BC-SENNEN barcode BC945736!, BC barcode BC31379!, BM barcode BM001025794!, MA number MA124769!, Herb. F. Sennen II number 12601!, P barcodes P02829260 and P04034925 [digital images!], W number W1926-23065!).

(Image available at: http://www.ibb.csic.es/herbari/JPEG/BC945734.jpg).

= ***Phagnalon* ×*caroli*** Pau ex Vicioso (1916: 144) [*Ph. rupestre* (L.) DC. × *Ph. sordidum* (L.) Rchb.]

Notes:—The locality and *exsiccata* number indicated in the original description are: "Hab.- Tarragone: Tortose, rochers à conglomérats des coteaux Nº 4428". We selected the specimen BC-SENNEN 945734 as the lectotype because of its good preservation status. Moreover, it is kept in Sennen's personal collection at BC and matches the original description. The type material appears to be morphologically intermediate between *Ph*. *sordidum* and *Ph*. *rupestre*. This may be attributed to recent hybridization events. These intermediate specimens have linear leaves, like those of *Ph*. *sordidum,* and solitary capitula like those of *Ph*. *rupestre*. In some specimens, the peduncle is branched and bears two capitula, whereupon they may also be more or less arranged but not forming glomerules. The outermost and middle involucral bracts are ovate with flat margins, similar to *Ph*. *sordidum* and *Ph. rupestre*.

Phagnalon glabrifolium Rechinger (1955: 34)

Type:—[AFGHANISTAN.] Nozi, El. 10,000 ft: Lime rocks; 21 June 1937, *Koelz 11983* (lectotype: W number W1980-05000!, designated here; isolectotypes: E barcode E00239169!, US barcode US00129509 [digital image!], MSB barcode MSB002200 [digital image!]).

(Image available at: http://herbarium.univie.ac.at/database/detail.php?ID=300320).

= ***Phagnalon acuminatum*** Boissier (1875: 222)

Notes:—The locality is indicated in the protologue as follows: "E: Nozi, 10000 ft., lime rocks, in clumps, fl. yellow, 21.VI.1937 (Koelz 11983, Typus hb. W., BPI)". We selected as the lectotype the specimen W1980-05000 deposited at the herbarium which is the main source of original material for the names proposed by this author.

Phagnalon graecum Boiss. & Heldr. in Boissier (1849: 6)

≡ *Conyza graeca* (Boiss. & Heldr.) Nyman (1855: 16)

≡ *Phagnalon rupestre* var. *graecum* (Boiss. & Heldr.) Fiori in Fiori, Béguinot & Paoletti (1903–1904: 284)

≡ ***Phagnalon rupestre*** subsp. ***graecum*** (Boiss. & Heldr.) Batt. in Battandier & Trabut (1889: 444)

Type:—[GREECE.] Ad rupes circa Pylos, May 1844, *Heldreich s.n.* (lectotype: G barcode G00300631 [digital image!], designated here; isolectotypes: BM!, G barcode G00300630 [digital image!], P barcode P02829201 [digital image!], W number W0025366!, W number W0025367!).

(Image available at: http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=225124).

Notes:—Boissier (1849) cited several syntypes in the protologue, all of them from Greece: "Hab. in rupestribus regionis calidae totius Graeciae ad Patras, Nauplia (Boiss.), Atticâ ad Acropolim (Sprun.), Messeniâ ad Pylos (Heldr.) Cretâ (Sieb. sub Con. saxatili ["sexatili"]), Zacyntho (Marg.)". We also considered as a potential lectotype the specimen W0025369 because morphologically it agrees better than the G specimen with the taxonomic concept of subsp. *graecum* (see explanations below). However, the W specimen has no data locality and collection date in the labels and the only information about its origin comes from indirect sources [L. Anton, pers. comm.; Stafleu & Cowan (1976–1988)]. Therefore, we selected as the lectotype the specimen deposited at the G general herbarium that morphologically agrees with the original description and has data about locality and collection date. Specimens from the center and east of the Mediterranean basin have capitula with a greater number of rows of involucral bracts, the wider outermost bracts being triangular and acute, and a greater number of hermaphrodite florets per capitulum. These specimens were recognized by Boissier (1849) and Battandier & Trabut (1889) at specific or subspecific levels [*Ph. graecum* Boiss. & Heldr., *Ph. rupestre* subsp. *graecum* (Boiss. & Heldr.) Batt.]. The study of specimens from the whole distribution area of *Ph. rupestre* reveals that these morphological discontinuities are constant and restricted to a delimited geographic area. Moreover, according to molecular data, *Ph*. *graecum* and *Ph*. *rupestre* form a highly supported monophyletic group (Montes-Moreno *et al.* 2010). Therefore, we conclude that this combination of morphological traits allows to distinguish *Ph. graecum* as a subspecies of *Ph. rupestre*.

Phagnalon harazianum Deflers (1889: 150)

Type:—[YEMEN.] Ad fauces montis Schibâm (Haràz), prope Menâkhâ, Alt. 2600 m, 10 May 1887, *Deflers 274* (lectotype: P barcode P01816434 [digital image!], designated here).

(Image available at: https://science.mnhn.fr/institution/mnhn/collection/p/item/p01816434).

Notes:—Deflers (1889) described *Ph. harazianum* from western Yemen: "Hab. ad fauces montis Schibâm (Haràz) prope Menâkhah; alt. 2200-2600 m. (Exs. n^{os} 274 et 441)" and cited two syntypes in the protologue (Deflers 274 and 441). We selected the specimen Deflers 274 as the lectotype because it is deposited at the herbarium which

preserves the main type collection of the author, morphologically agrees with the original description, and has several well preserved capitula. This specimen exhibited the characteristic diagnostic features and agreed with the original description. At MPU, there are two other specimens from the original collections, but their locality does not completely agree with the protologue.

Phagnalon ×hybridum Albert (1902: 132)

Type:—[FRANCE.] Var: La Farlède, vieux murs avec les parents, 28 June 1902, *Albert 4891* (lectotype: TLON [digital image!], designated here; isolectotypes: BC-SENNEN barcode BC990146!, P barcodes P03312908 and P04124701 [digital images!].)

= ***Phagnalon ×telonense*** Jordan & Fourreau (1868: 61) [*Ph. saxatile* × *Ph. sordidum*]

Notes:—The locality indicated in the protologue reads: "dans les environs de Toulon, de voir, sur les vieux murs, les rochers [...] 27 de juin […] près de la Farlède". *Phagnalon ×hybridum* was indicated in the original description as a hybrid between *Ph. telonense* × *Ph. sordidum.* We selected as the lectotype the specimen that morphologically agrees with the original description as well as the original locality, and is kept at the institution which preserves the main part of original material on which the names proposed by this author are based. The type material is morphologically intermediate between *Ph. saxatile* and *Ph. sordidum*. This may be attributed to hybridization. These intermediate specimens have more oblong to linear leaves, like those of *Ph. sordidum*, but are wider and longer, like those of *Ph. saxatile*. The bracts are ovate to oblong, similar to those of *Ph. sordidum*, whereas the peduncle is branched and the apex of the bracts is usually acute but does not form glomerules like that of *Ph. saxatile*.

Phagnalon kotschyi Sch. Bip. ex Boissier (1875: 221)

Type:—[IRAQ.] In rupestribus subhumidis m. Gara Kurdist., 24 July 1841, *Kotschy 313* (lectotype: G-BOIS, lost, designated by Lack 1980: 43; new lectotype: G barcode G00300633 [digital image!], designated here; isolectotypes: BM barcode BM000945889 [digital image!], FI barcode FI006328 [digital image!], G barcodes G00300632, G00300634 and G00300635 [digital images!], GH barcodes GH00011220 and GH00011222 [digital images!], GOET barcode GOET001886 [digital image!], HAL barcode HAL0112820 [digital image!], K barcodes K000910394! and K000910396!, LE barcodes LE00017948 and LE00017947 [digital images!], P barcodes P01816435, P01816436, P01816437 and P01816438 [digital images!], W number W1889-278834!, W1889-29549!, W004691! and W0040692!, WAG barcode WAG0000625 [digital image!]).

(Image available at: http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=225132).

Notes:—Boissier (1875) cited several syntypes in the protologue: "Hab. in fissuris rupium Libani ad Hadet (Ehrenb!), Mar Simam supra Dimam et Ain el Karn supra Eden (Bl!), Danie supra Eden alt. 5000' (Ky. 338!), mons Gara Kurdistaniae Assyriacae (Ky. 313!), inter Chana Putkie et Mukus 7000' (Ky. Suppl 598!). Fl. Jul.". Lack (1980: 43) designated as the lectotype the syntype 313 collected by Kotschyi kept at G-BOIS. Unfortunately, the specimen was lost and a new lectotype must now be designated. Therefore, we chose the isosyntype 313 from the G general herbarium as the new lectotype.

Phagnalon latifolium Maire (1929: 134)

Type:—[MOROCCO.] In Atlantis Majoris ditione Mesfioua: in rupibus graniticis mont. Aouljdid, 2700 m., 12 July 1924, *Maire s.n.* (lectotype: MPU-MAIRE barcode MPU001948!, designated here).

(Image available at: https://science.mnhn.fr/institution/um/collection/mpu/item/mpu001948).

Notes:—The locality is indicated in the original description as follows: "Hab in rupibus subalpinis Atlantis Majoris: in monte Aouljdid supra Ouinimsen, in fissuris rupium graniticarum septentrionem spectantium, ad alt. 2.700 m, hucusque tantum notum. Junio floret - Typus in Herb. Univers. Algeriensis et in Herb. Inst. Imper. Scient. Rabatensis". According to El Oualidi *et al.* (2012) there is no type material at RAB herbarium. We selected as the lectotype the specimen MPU001948 deposited in the author's herbarium of MPU, which is more accessible to scientific community and is in better agreement with the protologue.

Phagnalon lepidotum Pomel (1874: 34)

Type:—[ALGERIA.] O. [Oran] St. Louis, *s.d.*, *Pomel s.n.* (lectotype: MPU-MAIRE barcode MPU004736!, designated here).

(Image available at: https://science.mnhn.fr/institution/um/collection/mpu/item/mpu004736).

= ***Phagnalon ×intermedium*** (Lag.) Pau (1931: 51) [*Ph. rupestre* (L.) DC. × *Ph. saxatile* (L.) Cass.]

Notes:—The locality indicated in the protologue is in northern Algeria: "Lieux broussailleux du Tell: environs d'Oran". We selected as the lectotype the specimen that is morphologically in accordance with the original description, bearing Pomel's handwritten label. This specimen is deposited at the herbarium where the author was working, according to Stafleu & Cowan (1976–1988). There are other specimens in MPU that agree with the protologue, but none of them bears an original label. Athough Pomel indicated that *Phagnalon lepidotum* was close to *Ph. saxatile,* we studied the original gathering deposited at MPU, and the specimens showed intermediate characters attributed to hybridization events between *Ph*. *rupestre* and *Ph*. *saxatile*. Also, Faure (1923) indicated that the description by Pomel matched the hybrid character of these plants (see taxonomic notes on *Conyza ×intermedia*).

Phagnalon linifolium Post (1891: 12)

Type:—[SYRIA.] Qaldûn, 4 April 1881, *Post s.n.* (lectotype: BEI number BEI10328 [digital image!], designated here; isolectotype: G barcode G00300639 [digital image!]).

= ***Phagnalon rupestre*** (L.) Candolle (1836: 396) subsp. ***rupestre***

Notes:—The locality indicated in the original description reads: "Habitat in rupestribus prope Quldûn (Antilibani). Floret Aprili". We selected as the lectotype the specimen that morphologically agrees with the protologue and bears several well-preserved capitula. This specimen shows the diagnostic characters of the taxon and is deposited at BEI. According to Stafleu & Cowan (1976–1988), the Post types are housed in different herbaria. The specimen found in G was not chosen as the lectotype because it is in a bad state of preservation.

Phagnalon luridum Webb in Hooker (1849: 136)

Type:—[CAPE VERDE.] In Monte Verede, ins. S. Vicentii, ultra alt. 1000 ped., *s.d*., *Vogel 51* (lectotype: FI barcode FI012361 [digital image!], designated here; isolectotype: K barcode K000274285!).

(Image available at: https://plants.jstor.org/stable/10.5555/al.ap.specimen.fi012361).

= ***Phagnalon melanoleucum*** Webb in Hooker (1849: 135)

Notes:—The locality indicated in the original description is on Saint Vincent island: "HAB. In *Monte Verede*, ins. *S. Vicentii*, ultra alt. 1000 ped. (*Vogel*, n. 51. Junio 1841, spec. fructifera et quodam florida)". However, a detailed study of a representative number of herbarium specimens from several localities on the different islands shows that there are no morphological discontinuities between *Ph. luridum* and *Ph. melanolecum*. Therefore, we conclude that this variability reflects phenotypic plasticity and does not merit taxonomic recognition.

Phagnalon melanoleucum Webb in Hooker (1849: 135)

Type:—[CAPE VERDE.] In Monte Verede, ins. S. Vicentii, ultra alt. 1000 ped., *s.d*., *Vogel 37* (lectotype: FI barcode FI012362 [digital image!], designated here; isolectotype: K barcode K000274286!).

(Image available at: https://plants.jstor.org/stable/10.5555/al.ap.specimen.fi012362).

Notes:—*Phagnalon melanoleucum* was described from Saint Vincent island: "In *Monte Verede*, ins. *S. Vicentii*, ultra alt. 1000 ped. usque ad apicem, (*Th. Vogel*, n. 37. Junio 1841, spec. florida et fructifera)". We chose as the lectotype the specimen FI012362 deposited in the author's herbarium, as it better agrees with the protologue.

Phagnalon methanaeum Haussknecht (1887: 85)

Type:—[GREECE.] Methana, 25 May 1885, *Haussknecht s.n.* (lectotype: JE barcode JE00017037 [digital image!], designated here; isolectotypes: BM barcode BM001025787!, K barcode K000910410!).

(Image available at: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017037).

= ***Phagnalon ×intermedium*** (Lag.) Pau (1931: 51)

Notes:—The locality indicated in the original description of *Ph. methanaeum* is: "Das in Griechenland sehr häufige Ph. graecum B. weicht durch schmale und spitze Hüllschuppen sehr ab. an Kalkfelsen der Halbinsel Methana bei Vromolimni". We found two specimens corresponding to the original material at JE, where Haussknecht deposited his main collection, as well as other herbaria (BM and K). We selected the specimen that better agrees with the protologue. It bears a note "n. sp." and a handwritten label with the collection date. We also found specimens of the original gathering collected in the exact original locality at K and BM, but we did not choose any of them as the lectotype because the note "n. sp." was not written on the label. Similarly, other specimens collected from the original locality

and labelled as type material are deposited at BR, C, K, LD and M. However, these specimens were collected after the protologue was published and they should not be considered as part of the original material. The protologue indicated that *Ph. methanaeum* is close to *Ph. rupestre,* but our study of the original material deposited at JE revealed that these specimens show intermediate characters attributed to hybridization between *Ph*. *rupestre* and *Ph*. *saxatile*. They also have linear to lanceolate leaves, like those of *Ph*. *saxatile,* the outermost and middle involucral bracts being wider and obtuse, like those of *Ph*. *rupestre,* but frequently with undulate margins, like those of *Ph*. *saxatile*.

Phagnalon ×montserratense Sennen (1929: 41)

Type:—[SPAIN.] Catalogne: Monistrol, rochers calcaires près la Station de la Crémaillère de Monserrat, 19 April 1916, *Sennen 2697* (lectotype: BC-SENNEN barcode BC945733!, designated here; isolectotypes: BC barcode BC31382!, BM barcode BM001025779!, MA number MA124751!, Herb. F. Sennen II number 12597!, W number W1922-15041!).

(Image available at: http://www.ibb.csic.es/herbari/JPEG/BC945733.jpg).

= ***Phagnalon ×caroli*** Pau ex Vicioso (1916: 144) [*Ph*. *rupestre* (L.) DC.. × *Ph*. *sordidum* (L.) Cass.]

Notes:—*Phagnalon ×montserratense* was described from northeastern Spain: "Hab.-Barcelone: Monistrol, rochers calcaires près de la gare du Funicular de Ntra. Sra. de Montserrat Nº 2697" and treated as a hybrid between *Ph. sordidum* [sub *Ph. linneanum*] and *Ph. rupestre* [sub *Ph. tenorii*]. According to Nuet & Panareda (1992: 224), the type specimen corresponds to *Ph. saxatile*, although they pointed out that the margins of the involucral bracts were not obviously undulate. We studied the original gathering deposited at BC and other herbaria (BM, Herb. F. Sennen II, MA and W), and the specimens show intermediate characters attributed to hybridization and agree with the protologue (see taxonomic notes regarding *Phagnalon ×dertosense*).

Phagnalon ×murbeckii Faure (1923: 256)

Type:—[ALGERIA.] Les Lauriers-Roses, May 1915, *Faure s.n.* (lectotype: MPU barcode MPU009769 [digital image!], designated here).

(Image available at: https://science.mnhn.fr/institution/um/collection/mpu/item/mpu009769).

= ***Phagnalon ×caroli*** Pau ex Vicioso (1916: 144) [*Ph. rupestre* (L.) DC.× *Ph. sordidum* (L.) Rchb.]

Notes:—Faure (1923) described *Phagnalon ×murbeckii* and mentioned this locality: "à cette même localité des Lauriers-Roses" and indicated it as a hybrid between *Ph. sordidum* and *Ph. rupestre.* We found several specimens collected from 1913 to 1923 between "Lauriers-Roses" and "Oued Imbert" considered as part of the original material deposited at BC, JE, K, M, MPU, P and Z. We selected as the lectotype the specimen conserved at MPU because the exact original locality was handwritten on the label and it agrees with the diagnostic characters cited in the protologue (see taxonomic notes regarding *Ph. ×dertosense*).

Phagnalon ×paschale Sennen (1929: 43)

Type:—[SPAIN.] Tarragone: Tortose, rochers calcaires, 13 April 1922, *Sennen 4429* (lectotype: BC-SENNEN barcode BC945732!, designated here; isolectotypes: BC barcode BC31430!, BC-SENNEN barcode BC945735!, BM barcode BM001025778 [digital image!], GZU barcode GZU000273000 [digital image!], Herb. F. Sennen II number 12602!, MA number MA124748!, P barcodes P02829258, P04401424 [digital images!], W number W1926-23064!).

(Image available at: http://www.ibb.csic.es/herbari/JPEG/BC945732.jpg).

= ***Phagnalon ×telonense*** Jordan & Fourreau (1868: 61) [*Ph*. *saxatile* (L.) Cass. × *Ph*. *sordidum* (L.) Rchb.]

Notes:—Sennen (1929) described *Phagnalon ×paschale* from northeastern Spain: "Hab.- Tarragone: Tortose, mêmes station et localités des précédents Nº 4429" and pointed out that it was a hybrid between *Ph. caroli* [which was thought to be a hybrid between *Ph. rupestre* × *Ph*. *sordidum*] and *Ph. saxatile,* but the type material studied only showed intermediate morphology between *Ph*. *saxatile* and *Ph*. *sordidum*. This may be attributed to hybridization events. These intermediate specimens have more oblong to linear leaves, their bracts are ovate to oblong like those of *Ph. sordidum* but the peduncle is branched and the mature capitula are campanulate with some reflexed external bracts like that of *Ph. saxatile*, whereas no glomerules are formed. However, involucral bracts are more or less appressed and the apex is more or less obtuse in some specimens. We selected as the lectotype the specimen from the institution where the author was working that morphologically agrees best with the original description and locality.

Phagnalon persicum Boissier (1846: 74)

Type:—[IRAN.] In fissuris rupium in alpe Kuh-Delu, 20 June 1842, *Kotschy 493* (lectotype: G-BOIS, lost, designated by Lack in Rechinger f., Fl. Iranica 145: 44. 1980; new lectotype G barcode G00300637 [digital image!], designated here; isolectotypes: BM barcodes BM000945963! and BM000945887!, C barcodes C10007763 and C10007764 [digital images!], G barcodes G00300636, G00300638 and G00300640 [digital images!], GOET number GOET001887 [digital image!], K barcodes K000910399! and K000910400!, L barcode L0002231 [digital image!], LE barcodes LE00017950 and LE00017949 [digital images!], MO barcode MO5254535 [digital image!], P barcodes P01816445, P01816447, P01816449, P01816451, P01816452, P01816454, P01816456 [digital images!], W numbers W29550!, W78160! and W0042878!).

(Image available at: http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=225147).

Notes:—The locality indicated in the protologue reads: "Hab. in fissuris rupium alpis Kuh-Daëna Persiae australis (Ky. 493!) Fl. Jun." Lack (1980: 44) designated as the lectotype a specimen collected by Kotschy and kept at G-BOIS. Unfortunately, this specimen was lost, and therefore a new lectotype had to be designated. Since there were other isotypes kept at the G general herbarium, we chose as the lectotype the specimen that morphologically agrees best with the protologue and bears mature capitula.

Phagnalon persicum var. ***latifolium*** Boissier (1846: 74)

Type:—[IRAN.] In monte Küh-Daëna, Alt. 10,000', July 1842, *Kotschy 904* (lectotype: G barcode G00300641 [digital image!], designated here; isolectotypes: BM barcode BM00094586!, LE barcode LE00017951 [digital image!], P barcodes P01816446, P01816450 and P01816458 [digital images!], K [digital image!], W barcode W0042877 [digital image!]).

(Image available at: http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=225165).

= ***Phagnalon persicum*** Boissier (1846: 74)

Notes:—Boissier (1846: 74) described *Ph. persicum* var. *latifolium* from this locality: "In Persia australi loco non notato Kotschy No. 904". Unfortunately, the original material kept in G-BOIS was lost. Therefore, we chose as the lectotype the specimen G00300641 that morphologically agreed with the protologue.

Phagnalon* ×*pomelii Faure (1923: 257)

Type:—[ALGERIA.] Entre les Lauriers-Roses et O.-Imbert, 31 May 1923, *Faure s.n.* (lectotype: MPU barcode MPU009763 [digital image!], designated here; isolectotypes: M barcode M0104642 [digital image!], MPU barcode MPU009760 [digital image!]).

(Image available at: https://science.mnhn.fr/institution/um/collection/mpu/item/mpu009763).

= ***Phagnalon* ×*intermedium*** (Lag.) Pau (1931: 51) [*Ph. rupestre* (L.) DC. × *Ph. saxatile* (L.) Cass.]

Notes:—Faure (1923: 257) described *Ph.* ×*pomelii* from: "toujours à la localité des Lauriers-Roses" and pointed out in the protologue that this hybrid showed the habit of *Ph. saxatile* and the morphology of the involucral bracts of *Ph. rupestre.* We found different specimens corresponding to the original gathering in MPU, but we selected the specimen MPU009763 because it has mature capitula and matches quite well the original description.

Phagnalon pumilum var. ***glabrum*** Boissier (1875: 222)

≡ *Phagnalon pumilum* subsp. *glabrum* (Boiss.) Hayek (1931: 601)

Type:—[GREECE.] Crete, Sphakia in fissuris rupium, montis Hagio Pneuma et Stavropodia ["Stravopodia"], 7000', July 1846, *von Heldreich s.n.* (lectotype: G barcode G00300645 [digital image!], designated here; isolectotypes: BM barcodes BM001025792! and BM001025793!, G barcodes G00300643 and G00300644 [digital images!], GOET barcode GOET001890 [digital image!], K barcode K001040206!, P barcodes P2829197 [digital image!] and P2829198 [upper specimen-digital image!], W!]).

(Image available at: http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=225168).

= ***Phagnalon pygmaeum*** (Sieber) Greuter (1975: 23)

Notes:—Boissier (1875: 222) described *Ph. pumilum* var. *glabrum* based on specimens collected at several localities on Crete ("Hab. in fissuris rupium montium Sphacioticorum Hagion Pneuma, Volakia, Stavropodia ["Stravopodia"] 6000–7000' (Heldr!) [GREECE]") which we consider syntypes. The original gathering kept at G-BOIS was lost. We found three specimens corresponding to the original material deposited at the G general herbarium, and we chose as the lectotype the specimen G00300645 because it is in a good state of preservation and matches quite well the original description.

Phagnalon pumilum var. ***tomentosum*** Halácsy (1902: 29)

≡ *Phagnalon pumilum* subsp. *tomentosum* (Halácsy) Hayek (1931: 601)

Type:—[GREECE.] In montibus Spathioticis summo jugo Mavrous Lakous, July 1882, *Spreitzenhofer s.n.* (lectotype: WU-Halácsy-Graecum [digital image!], designated here).

= ***Phagnalon pygmaeum*** (Sieber) Greuter (1975: 23)

Notes:—In the original description, Halácsy (1902) referred to two authors, Raulin ("Raul. cret. p. 778") and Spreitzenhofer ("Spreitz. In z.b. G. 1890"), indicated two gatherings ("Heldr. pl. cret. n. 1620; Spreitz. it. cret. a. 1882") and validated the name with a short diagnosis "Totum cano-tomentosum". Both earlier authors accepted this name without descriptions (Raulin 1869; Ostermeyer 1890). We chose as the lectotype the specimen stored at WU-Halácsy-Graecum, which is kept in the author's own collection and matches the original description.

Phagnalon quartinianum Richard (1847: 396)

Type:—[ETHIOPIA.] Abyssinie Vallée du Mareub, *s.d*., *Quartin-Dillon* & *Petit s.n.* (lectotype: P barcode P033897 [digital image!], designated here; isolectotypes: P barcodes P033898 and P033899 [digital images!]).

(Image available at: https://science.mnhn.fr/institution/mnhn/collection/p/item/p033897).

Notes:—The locality indicated in the original description is as follows: "Crescit in rupibus convallis fluvii Mareub, mense Octobre florens (Quartin Dillon)". Qaiser & Lack (1986b: 446) cited a specimen kept at P as the holotype without indicating a herbarium number. We found three specimens corresponding to the original gathering at P and collected at the original locality by Quartin Dillon; one of these bears a label indicating "holotype", but the herbarium number of this specimen was not indicated in Qaiser & Lack (1986b). Therefore, a second-step lectotype has to be designated. We selected the specimen P033897 because it is in a good state of preservation, has well-developed capitula, and morphologically agrees with the original description.

Phagnalon rupestre var. ***illyricum*** Lindberg (1906: 107)

≡ *Phagnalon rupestre* subsp. *illyricum* (H.Lindb.) Ginzberger (1921: 198)

Type:—[CROATIA.] Dalmatia, montis Marian ditione Spalatensis, in rupestribus et ad muros vetustos, *s.d*., *Pichler s.n.* (lectotype: H barcode H1644534 [digital image!], designated here; isolectotypes: BM!, C barcode C0007765 [digital image!], E barcode E00433309 [digital image!], GOET number GOET1415 [digital image!], K barcode K000910416!, M barcode M0029839 [digital image!], W number W1887-4049!, WU!).

= ***Phagnalon rupestre*** (L.) Candolle (1836: 396) subsp. ***rupestre***

Notes:—The locality is indicated in the original description as follows: "Dalm., Spalato, Monte Marian, in rupestribus calc. apricis". The author stated clearly in the protologue that the original material was distributed as part of the "Flora Austro-Hungarica Exsiccata, num. 250". We found different specimens with the note "var. *illyricum*" handwritten on the label and corresponding to original material at H. We selected the specimen H1644534 as the lectotype because it belongs to the syntype gathering collected in Monte Marian and morphologically agrees with the protologue. One of the specimens kept at H does not belong to the original material as it was collected in Ragusa but not in the original locality. The original description was based on the following combination of morphological characters: size of the capitula, number of florets per capitulum, width of involucral bracts and outermost and involucral bracts with acute margins. However, after performing a biometric study of specimens from Croatia and from the entire geographical distribution of *Ph*. *rupestre* subsp. *rupestre*, we found that the apex of the outermost and middle involucral bracts was variable, ranging from acute to obtuse. Moreover, the size of the capitulum, the number of florets and the size of involucral bracts of specimens from the Central Mediterranean basin (from Croatia to East France) strongly overlap with the ranges of those for *Ph*. *rupestre* subsp. *rupestre*. Therefore, we conclude that the range of the size of the capitula, the width of the outermost and middle involucral bracts, and the number of florets per capitulum fall within the range of the variability of *Ph*. *rupestre* subsp. *rupestre*, and therefore, these specimens do not merit taxonomic recognition.

Phagnalon saxatile var. ***fulvosquamatum*** Sennen (1926–1927: *in schedis*) ["*fulvosquamata"*]

Type:—[SPAIN.] Murcie: Sierra de Espuña, 5 May 1926, *Jerónimo 5972* (lectotype: BC-SENNEN barcode BC949577!, designated here; isolectotypes: BC barcode BC31390!, MA number MA435556!).

(Image available at: http://www.ibb.csic.es/herbari/JPEG/BC949577.jpg).

= ***Phagnalon saxatile*** (L.) Cassini (1819: 174)

Notes:—*Phagnalon saxatile* var. *fulvosquamatum* was described on a printed label in Sennen's *exsiccata* "1926 - PLANTES D'ESPAGNE – SENNEN" and the locality indicated was: "Murcie: Sierra de Espuña". We selected the specimen BC-SENNEN 949577 as the lectotype because it matches the original description, is in a good state of preservation, and is preserved in the personal collection of the author. At MA we found other specimens belonging to the same *exsiccata* number 5972, but they are not isolectotypes because their year of collection does not match that of the lectotype.

Phagnalon saxatile var. ***fuscosquamatum*** Sennen (1926–1927: *in schedis*) ["*fuscosquamata*"]

Type:—[SPAIN.] Murcie: Sierra de Espuña, 5 May 1926, *Jerónimo 5971* (lectotype: BC-SENNEN barcode 949579!, designated here; isolectotypes: BC barcode BC31391!, MA number MA124602!).

(Image available at: http://www.ibb.csic.es/herbari/JPEG/BC949579.jpg).

= ***Phagnalon saxatile*** (L.) Cassini (1819: 174)

Notes:—*Phagnalon saxatile* var. *fuscosquamatum* was described from sourthern Spain: "Murcie: Sierra de Espuña" on the printed labels of specimens collected by H. Jerónimo bearing the collector number 5971. These specimens belong to the *exsiccata* "1926 - PLANTES D'ESPAGNE – SENNEN". We selected the specimen BC-SENNEN 949579 as the lectotype because of its good state of preservation. This specimen is kept in the author's own collection and matches the original description.

Phagnalon saxatile var. ***longepedunculatum*** Sennen (1929: 44)

Type:—[SPAIN.] Catalogne: Massif du Tibidabo près Horta, 27 Mai 1915, *Sennen 2505* (lectotype: Herb. F. Sennen II number 12594!, designated here; isolectotype: W number W1922-16503!).

= ***Phagnalon saxatile*** (L.) Cassini (1819: 174)

Notes:—Sennen (1929) indicated the collector number "2505" in the original description, but did not refer to any specific locality. We designated as the lectotype the specimen kept at the herbarium where the author was working, corresponding to Herb. F. Sennen II 12594. This specimen was selected because it morphologically agrees with the original description, and has only one label and collection date, and its collector number matches that in the protologue. At BM we found two more specimens corresponding to the collector number 2505, but we did not accept them as isolectotypes because they have different collection dates handwritten on the label.

Phagnalon saxatile var. ***perezmendezii*** Pau (1924: 43)

Type:—[SPAIN.] Tapias viejas de Santiago, *s.d*., *J . Planellas s.n.* (lectotype: MA number MA124597!, designated here; isolectotype: BCN number BCN82431 [digital image!]).

= ***Phagnalon saxatile*** (L.) Cassini (1819: 174)

Notes:—*Phagnalon saxatile* var. *perezmendezii* was described from northwestern Spain: "Tapias viejas de Santiago". We selected the specimen that better agrees with the protologue and is included in the personal collection of Pau.

Phagnalon saxatile var. ***semiviridifolium*** Sennen (1926–1927: *in schedis*) ["*semiviridifolia"*]

Type:—[SPAIN.] Murcie: Sierra de Espuña, March/May 1926, *Jerónimo 5970* (lectotype: BC-SENNEN barcode BC949578!, designated here; isolectotypes: BC barcode BC31389!, MA number MA124603!).

(Image available at: http://www.ibb.csic.es/herbari/JPEG/BC949578.jpg).

= ***Phagnalon saxatile*** (L.) Cassini (1819: 174)

Notes:—*Phagnalon saxatile* var. *semiviridifolium* was described from southern Spain: "Murcie: Sierra de Espuña" on the printed label of specimens collected by H. Jerónimo bearing the collector number 5970. These specimens belong to his *exsiccata* "1926 - PLANTES D'ESPAGNE – SENNEN". We selected as the lectotype the specimen BC-SENNEN 949578 that morphologically agrees with the original description and is included in the personal collection of Sennen of the BC herbarium.

Phagnalon saxatile var. ***tenuifolium*** Sennen (1936: 265)

Type:—[SPAIN.] Almeria: Sierra Alhamilla, Bco. del Infierno, 12 April 1935, *H. Jerónimo 9826* (lectotype: BC-SENNEN barcode BC949580!, designated here; isolectotypes: BC barcode BC88812!, BC-SENNEN barcode BC949581!).

(Image available at: http://www.ibb.csic.es/herbari/JPEG/BC949580.jpg).

= ***Phagnalon saxatile*** (L.) Cassini (1819: 174)

Notes:—The locality and collector number indicated in the protologue are: "Almeria: Sierra Alhamilla, Bco. del Infierno" and "Nº 9826". We selected as the lectotype the specimen BC-SENNEN 949580, which agrees morphologically with the protologue and is kept in the personal collection of Sennen. Moreover, this specimen is in a good state of preservation.

Phagnalon* ×*saxatiliforme Sennen (1929: 44)

Type:—[SPAIN.] Barcelona, massif du Tibidabo vers Belesguart [Belesguard], 7 May 1922, *Sennen 4432* (lectotype: BC-SENNEN barcode BC945731!, designated here; isolectotypes: BC barcode BC31426!, BM!, Herb. F. Sennen II number 12605!, MA numbers MA124763! and MA124764!).

(Image available at: http://www.ibb.csic.es/herbari/JPEG/BC945731.jpg).

= ***Phagnalon* ×*intermedium*** (Lag.) Pau (1931: 51) [*Ph. rupestre* (L.) DC. × *Ph. saxatile* (L.) Cass.]

Notes:—The locality and collector number indicated in the original description refer to northeastern Spain: "Hab. - Barcelone, massif du Tibidabo vers Belesguart [Belesguard]" and "4432". Sennen indicated that this was a hybrid between *Phagnalon saxatile* × *Ph. rupestre* [sub *Ph. tenorii*]. We selected as the lectotype the specimen BC-SENNEN 945731 that matches quite well the original description, is kept in Sennen's personal collection and is in a good state of preservation. We studied the original gathering deposited at BC and verified that the specimens show intermediate characters attributed to hybridization between *Ph. rupestre* and *Ph. saxatile*: the outermost and middle involucral bracts wider and obtuse, similar to those of *Ph. rupestre*, but frequently with undulate margins, like those of *Ph. saxatile* (see taxonomic notes under *C.* ×*intermedia*). However, we observed that the outermost and intermediate bracts were acute in some capitula.

Phagnalon schweinfurthii Sch.Bip. ex Schweinfurth (1868: 685)

Type:—[SUDAN.] Ssortuba-Gerbirge an der Nubischen Küste, 22º n. B. am Castle Hill, 6 August 1865, *Schweinfurth 364* (lectotype: G barcode G00018234 [digital image!], designated here; isolectotype: P barcodes P033884 and P033885 [digital images!]).

(Image available at: http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=95004).

Notes:—Schweinfurth (1868) described the species and attributed the name to Schultz Bipontinus, as well as mentioned the following localities: "im Soturba-Gebirge an der Nubischen Küste (22º n. Br.), an den Bergen Castle Hill und Gebel Schellāl gesammelt und unter Nr. 365 und 364 seiner Sammlung vertheilt" and cited two syntypes: 364 and 365. Qaiser studied the original gathering kept at P and G and added a label indicating that that these specimens are syntypes. However, even though he cited these two specimens later on (Qaiser & Lack 1985: 13, 1986: 448), no lectotype was designated. We chose the specimen G00018234 because it is in a good state of preservation, matches the original description quite well and bears several well-preserved capitula.

Phagnalon sinaicum Bornm. & Kneuck. in Bornmüller (1906: 69)

Type:—[EGYPT.] Pass Lethi, südostl. Sinai Halbinsel, 3 May 1904, *Kneucker s.n.* (lectotype: B barcode B 10 0097160 [digital image!], designated here; isolectotype: B barcode B 10 0097161 [digital image!]).

(Image available at: http://ww2.bgbm.org/Herbarium/specimen.cfm?Barcode=B100097160).

Notes:—Bornmüller (1906) described this taxon from mountains of the Sinai Peninsula: "Peninsulae montis Sinai in faucibus vallis "Wadi Lethi" 3.V.1904 in consortio *Ph. nitidi* Fres. leg. cl. A. Kneucker" based on a combination of morphological characters: stipitate glandular trichomes on the surface of branches and leaves; leaves with basal auricules and entire margin; and hyaline margins of involucral bracts. Qaiser & Lack (1985: 8) pointed out that the holotype was deposited at B. However, we found two specimens collected by Kneucker from the locality "Pass Lethi", which we considered equivalent to "Wadi Lethi". Therefore, a lectotype had to be designated. We chose the specimen B 10 0097160 because it is in a good state of preservation and matches the original description quite well.

Phagnalon tarraconense Sennen (1929: 43), *pro. hybr.*

Type:—[SPAIN.] Catalogne: Tarragona, coteaux calcaires, 3 April 1917, *Sennen 3097* (lectotype: BC-SENNEN barcode BC945730!, designated here; isolectotypes: BC barcode BC31383!, BM barcodes BM001025798 and BM001025799 [digital image!], Herb. F.

Sennen II number 12598!, P barcode P04401236 [digital image!], W number W1922-0015200!).

(Image available at: http://www.ibb.csic.es/herbari/JPEG/BC945730.jpg).

= ***Phagnalon rupestre*** (L.) Candolle (1836: 396) subsp. ***rupestre***

Notes:—Sennen (1929) described *Ph. tarraconense* from eastern Spain: "Hab.- Tarragone: coteaux calcaires et vieux murs dans la garrigue" and suggested its hybrid origin between *Ph. tomentosum* and *Ph. saxatile,* citing only one specimen in the original description, "Num. 3097". However, we found no information about morphological characters intermediate between the parental species in the original description. Moreover, on the labels of the original gathering, it was stated that it could possibly be a hybrid between other different taxa: *Ph. tomentosum* and *Ph. sordidum*. We chose the specimen BC-SENNEN 945730 as the lectotype because it is in a good state of preservation and agrees morphologically with the original description. We found no evidence of intermediate morphology between the Iberian species *Ph. rupestre, Ph. saxatile* and *Ph. sordidum* in the original material. We conclude that the morphology of leaves, involucral bracts and peduncles fall within the morphological variation found in *Ph*. *rupestre* subsp. *rupestre*.

Phagnalon ×telonense Jordan & Fourreau (1868: 61), *pro sp.* [*Ph*. *saxatile* (L.) Cass.× *Ph*. *sordidum* (L.) Rchb.]

≡ *Phagnalon saxatile* f. *telonense* (Jord. & Fourr.) Rouy (1903:164)

≡ *Phagnalon saxatile* var. *telonense* (Jord. & Fourr.) Font Quer (1950: 138)

Type:—[FRANCE.] Hyères, May 1843, *Jordan s.n.* (lectotype: LY!, designated here).

Notes:—The locality indicated in the original description reads: "Hab. in rupibus Galliae australioris: circa Olbias et Telonem". We have studied the original gathering deposited in Jordan's herbarium at LY. On the label of the specimen selected as the lectotype, the locality indicated is "Hyères" that is very close to Toulon, where there was an old area called Olbias. The specimen shows intermediate characters attributed to hybridization between *Ph*. *sordidum* and *Ph*. *saxatile*. These intermediate specimens have linear to lanceolate leaves and solitary capitula like those of *Ph*. *saxatile*, the outermost and middle involucral bracts being wider and ovate, similar to those of *Ph*. *sordidum*.

Phagnalon tenorei var. ***minor*** Sennen (1928–1929: *in schedis*)

Type:—[SPAIN.] Murcie: Sierra de Espuña, 18 June 1926, *Jerónimo 6726* (lectotype: BC-SENNEN barcode BC949576!, designated here; isolectotypes: BC barcode BC31462!, MA number MA124681!).

(Image available at: http://www.ibb.csic.es/herbari/JPEG/BC949576.jpg).

= ***Phagnalon rupestre*** (L.) Candolle (1836: 396) subsp. ***rupestre***

Notes:—*Phagnalon tenorei* var. *minor* was described on a printed label in Sennen's *exsiccata* "1928 - PLANTES D'ESPAGNE – SENNEN" and the locality indicated reads: "Murcie: Sierra de Espuña". We selected as the lectotype the specimen BC-SENNEN 949576, which matches quite well the original description and is kept in the personal collection of the author.

Phagnalon tibesticum subsp. ***meridionale*** Quézel (1958: 185)

≡ *Phagnalon scalarum* var. *meridionale* (Quézel) Wickens (1972: 564)

= ***Phagnalon stenolepis*** Chiovenda (1911: 71)

Type:—[CHAD.] Emi Koussi, Kondou, 2600 m, Sept.-Nov. 1956, *Quézel s.n.* (lectotype: AIX barcode AIX000059 [digital image!], designated here; isolectotype: AIX barcode AIX000060 [digital image!]).

(Image available at: https://plants.jstor.org/stable/10.5555/al.ap.specimen.aix000059).

Notes:—The locality, collection date and collector indicated in the original description read: "Emi Koussi, thalwegs encaissés, surtout entre 2300 et 2700 mètres; peut cependant s'élever à plus de 3000 mètres par pieds isolés, 1956, Quézel s. n.". We found at AIX two specimens corresponding to the original gathering, and we designated as the lectotype the specimen AIX000059. The selected specimen matches the original description, is quite well preserved and shows well-developed capitula.

Phagnalon viridifolium Decne. ex Boissier (1875: 220)

Type:—[OMAN.] Regn. de Mascate, *s.d., Aucher-Éloy 4774* (lectotype: G-BOIS, lost, designated by Qaiser & Lack 1985: 12; new lectotype: G barcode G00300769 [digital image!], designated here; isolectotypes: G barcode G00300642 [digital image!], K barcode K000910407!, LE barcodes LE00017954 and LE00017955! [digital images!], P barcodes P01816448, P01816459 and P01816460

[digital images!], W numbers W34638! and W0040688!).
(Image available at: http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=225264).

Notes:—Boissier (1875) described *Ph. viridifolium* from Oman: "Hab. in montibus regni Mascate Arabiae (Auch. 4774!)" and cited as type the specimen collected by Aucher-Eloy 4774. Unfortunately, the original material kept in G-BOIS herbarium was lost. Therefore, a new lectotype had to be designated. We found two specimens corresponding to the original gathering kept at the G general herbarium, and we selected as the lectotype the specimen G00300769 because it is in a good state of preservation and morphologically agrees with the protologue. We found different isolectotypes in other institutions, nearly all of them having a printed label corresponding to the original gathering "Aucher-Eloy Herbier d'Orient Nº 4774", and some with handwritten details of collection locality "Regn. Mascate". However, specimens corresponding to the original gathering are slightly different: for example, the specimen P01816448 had a handwritten label bearing the same information about collection locality and collector "In regno Mascatensi Aucher Eloy n. 4774". Similarly, the specimen P01816460 bears two labels: the same printed label "Aucher-Eloy Herbier d'Orient Nº 4774" with the handwritten annotation "Djebel Akadar" as well as another handwritten label that reads "Arabie (Mascat)".

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LITERATURE CITED

Albert, A. (1902) Simple note sur un *Phagnalon* hybride. *Bulletin de l'Académie Internationale de Géographie Botanique* 11: 132.

Ascherson, P. & Schweinfurth, G. (1887) Illustration de la flore d'Égypte. *Mémoires de l'Institut Égyptien* [preprint] 2: 25–259.

Ball, J. (1873) Descriptions of some new species, subspecies, and varieties of plants collected in Morocco by J.D. Hooker, G. Maw, and J. Ball. *Journal of Botany, British and Foreign* 11: 364–374.

Ball, J. (1878) Spicilegium Florae Maroccanae. Part II. *The Journal of the Linnean Society. Botany* 16: 377–772. https://doi.org/10.1111/j.1095-8339.1878.tb00103.x

Battandier, J.A. & Trabut, L.C. (1889) *Flore de l'Algérie*. Typographie Adolphe Jourdan, Alger, 885 pp. https://doi.org/10.5962/bhl.title.10917

Boissier, P.E. (1846) *Diagnoses plantarum orientalium novarum*, ser. 1, vol. 1, part 6. M. Ducloux, Paris, 136 pp.

Boissier, P.E. (1849) *Diagnoses plantarum orientalium novarum*, ser. 1, vol. 2, part 11. M. Ducloux, Paris, 136 pp.

Boissier, P.E. (1875) *Flora Orientalis sive enumeratio plantarum in Oriente a Graecia et Aegypto ad Indiae fines hucusque observatarum*, vol. 3. H. Georg, Geneva, Basel, 1033 pp.

Boissier, P.E. (1888) *Flora Orientalis sive enumeratio plantarum in Oriente a Graecia et Aegypto ad Indiae fines hucusque observatarum*, Supplementum. H. Georg, Geneva, Basel, 466 pp.

Bornmüller, J. (1906) *Phagnalon sinaicum* Bornmüller & Kneucker spec. nov. *Allgemeine Botanische Zeitschrift für Systematik* 12: 69–71.

Burnat, E. (1891) Notes sur quelques espèces distribuées cette année (1891). *Bulletin de la Société Dauphinoise pour l'Échange des Plantes* 2(2): 53–61.

Burnat, E. (1915) *Flore des Alpes maritimes*, vol. 5. H. Georg, Geneva, Basel, 375 pp.

https://doi.org/10.5962/bhl.title.11537
Candolle, A.P. de (1836) *Prodromus systematis naturalis regni vegetabilis, sive, Enumeratio contracta ordinum generum specierumque plantarum huc usque cognitarium, juxta methodi naturalis, normas digesta*, vol. 5. Sumptibus Sociorum Treuttel et Wϋrtz, Paris, 706 pp.
https://doi.org/10.5962/bhl.title.286
Cassini, H. (1819) Description des nouveaux genres *Garuleum* et *Phagnalon*. *Bulletin des Sciences par la Société Philomatique de Paris* 1819: 172–174.
Cavanilles, J. (1801) Fasciculo II de las plantas que el ciudadano Augusto Broussonet colectó en las costas septentrionales de la Africa y en las Islas Canarias. *Anales de Ciencias Naturales* 4: 52–109.
Chiovenda, E. (1911) Plantae novae vel minus notae e regione aethiopica. *Annali di Botanica* 9: 51–85.
Cufodontis, G. (1966) Enumeratio plantarum Aethiopiae spermatophyta (Sequentia). *Bulletin du Jardin Botanique de l'État à Bruxelles* 36 (Suppl.): 1059–1114.
https://doi.org/10.2307/3667195
Deflers, A. (1889) *Voyage au Yemen*. P. Klincksieck, Paris, 246 pp.
El Oualidi, J., Khamar, H., Fennane, M., Ibn Tattou, M., Chauvet, S. & Sghir Taleb, M. (2012) Checklist des endémiques et spécimens types de la flore vasculaire de l'Afrique du Nord. *Documents de L'Institut Scientifique, Université Mohamed V* 25: 1–189.
Emberger, L. & Maire, R. (1930) Matériaux pour la flore marocaine. Fascicule 1. *Mémoires de la Société des Sciences Naturelles du Maroc* 21–22: 21–53.
Faure, A. (1923) Notes sur mes herborisations dans le département d'Oran. *Bulletin de la Société d'Histoire Naturelle de l'Afrique du Nord* 14: 233–264, 293–300.
Ferrer-Gallego, P.P. & Guara, M. (2011) Táxones descritos para el lugar de interés comunitario "Muela de Cortes y Caroche" y territorios limítrofes (Valencia, España), Parte I. *Flora Montiberica* 47: 71–93.
Fiori, A., Béguinot, A. & Paoletti, G. (1903–1904) *Flora Analitica d'Italia; ossia descrizione delle piante vascolari indigene inselvatichite e largamente coltivate in Italia disposte per quadri analitici*, vol. 3. Tipografia del Seminario, Padova, 527 pp.
Font Quer, P. (1928) *Index seminum qua Hortus Botanicus Musei Barcinonensis Scientiae Naturae mutua commutatione olatffert*. Ajuntament de Barcelona, Barcelona, 14 pp.
Font Quer, P. (1950) *Flórula de Cardó. Consideraciones generales sobre las plantas que se crían en su valle en relación con la temperatura, sequedad y pobreza polínica del aire, seguidas del catálogo de dicha flórula*. Ajuntament de Barcelona, Barcelona, 165 pp.
Forsskål, P. (1775) *Flora Aegyptiaco-Arabica: sive descriptiones plantarum quas per Aegyptum inferiorem et Arabiam Felicem detexit, illustravit Petrus Forsskål*. Mölleri, Hauniæ [Copenhagen], 221 pp.
https://doi.org/10.5962/bhl.title.41
Ginzberger, A. (1921) Zur Kenntnis des Formenkreises von *Phagnalon rupestre* (L.) DC. und *Phagnalon graecum* Boiss. et Heldr. *Oesterreichische Botanische Zeitschrift* 70: 197–204.
https://doi.org/10.1007/BF01637456
Greuter, W. (1975) *Premier Colloque OPTIMA en Crète – septembre 1975. Guide aux excursions*. Genève, 34 pp.
Halácsy, E. (1902). *Conspectus Florae Graecae*, vol. 2. Sumptibus Guilelmi Engelmann, Leipzig, 612 pp.
https://doi.org/10.5962/bhl.title.9919
Haussknecht, H.C. (1887) Kurze Mitteilungen über neue Pflanzen-Arten der griechischen Flora. *Mitteilungen der Basler Botanischen Gesellschaft* 5: 85–88.
Hayek, A. (1931) Prodromus florae peninsulae balcanica. *Repertorium Novarum Specierum Regni Vegetabilis* 30: 577–768.
Hooker, W.J. (1849) *Niger Flora*. Hippolyte Bailliere, London, 587 pp.
https://doi.org/10.5962/bhl.title.594
Jordan, A. & Fourreau, J. (1868) *Breviarum plantarum novarum sive specierum in horto plerumque cultura recognitarum descriptio contracta ulterius amplianda auctoribus, fasciculus II*. Savy, Paris, 137 pp.
Lack, H.W. (1980) *Phagnalon*. In: Rechinger, K.H. (Ed.), *Flora Iranica*, vol. 145. Akademische Druck- und Verlagsanstalt, Graz, pp. 39–45.
Lagasca, M. (1816) *Genera et species plantarum*. Typographia Regia, Madrid, 35 pp.
Lindberg, H. (1906) Iter Austro-hungaricum: Verzeichnis der auf einer Reise in Österreich-Ungarn im Mai und Juni 1905 gesammelten Gefässpflanzen. *Öfversigt af Finska Vetenskaps-Societetens Förhandlingar* 48(13): 1–128.
Maire, R. (1929) Contributions à l'étude de la flore de l'Afrique du Nord. Fascicule 14. *Bulletin de la Société d'Histoire Naturelle de l'Afrique du Nord* 20: 12–42.
Maire, R. (1937) Contributions à l'étude de la flore de l'Afrique du Nord. Fascicule 25. *Bulletin de la Société d'Histoire Naturelle de l'Afrique du Nord* 28: 332–388.
McNeill, J., Barrie, F.R., Buck, W.R., Demoulin, V., Greuter, W., Hawksworth, D.L., Herendeen, P.S., Knapp, S., Marhold, K., Prado, J.,

Prud'homme van Reine, W.F., Smith, G.F., Wiersema, J.H. & Turland, N.J. (eds.) (2012) *International Code of Nomenclature for algae, fungi, and plants (Melbourne Code). Adopted by the Eighteenth International Botanical Congress Melbourne, Australia, July 2011*. [Regnum Vegetabile 154]. Koeltz Scientific Books, Königstein, 240 pp.

Merino, B. (1906) *Flora descriptiva é ilustrada de Galicia*, vol. 2, Fanerógamas: Monopétalas y Estamíneas. Tipografía Galaica, Santiago de Compostela, 634 pp.
https://doi.org/10.5962/bhl.title.10911

Miller, P. (1768) *The gardeners dictionary*, ed. 8. John and Francis Rivington, London, without pagination.
https://doi.org/10.5962/bhl.title.541

Montes-Moreno, N., Sáez, L., Benedí, C., Susanna, A. & Garcia-Jacas, N. (2010) Generic delineation, phylogeny and subtribal affinities of *Phagnalon* and *Aliella* (Compositae, Gnaphalieae) based on nuclear and chloroplast sequences. *Taxon* 59: 1654–1670.

Montes-Moreno, N., Garcia-Jacas, N., Benedí, C. & Sáez, L. (2013) Evaluation of the taxonomic status of the genus *Aliella* (Compositae, Gnaphalieae): a recircumscription of the genus *Phagnalon*. *Phytotaxa* 148: 1–31.
https://doi.org/10.11646/phytotaxa.148.1.1

Nábělek, F. (1925) Iter Turcico-Persicum pars II. Plantarum collectarum enumeratio (Compositae). *Spisy Vydávané Přírodovědeckou Fakultou Masarykovy University* 52: 1–58.

Nuet, J. & Panareda, J.M. (1992) *Flora de Montserrat*, vol. 2. Publicacions de l'Abadia de Montserrat, Barcelona, 311 pp.

Nyman, C.F. (1855) *Sylloge Florae Europaeae*. Sumptu et Typis N. M. Lindh, Oerebroae, 442 pp.

Oliver, D. (1877) *Flora of tropical Africa*, vol. 3. J.E. Taylor and Co., London, 544 pp.
https://doi.org/10.5962/bhl.title.42

Ostermeyer, F. (1890) Beitrag zur Flora von Kreta. *Verhandlungen der Zoologisch-Botanischen Gesellschaft in Österreich* 40: 291–300.

Pau, C. (1924) El herbario de Planellas III. *Brotéria, Série Botânica* 21: 43–82.

Pau, C. (1931) Plantas de Andalucía. *Cavanillesia* 4: 49–57.

Persoon, C.H. (1807) *Synopsis plantarum seu enchiridium botanicum complectens enumerationem systematicam specierum hucusque cognitarum*, vol. 2. Treuttel et Wurtz, Paris and J.G. Cottam, Tübingen, 657 pp.
https://doi.org/10.5962/bhl.title.638

Pignatti, S. (1969) *Phagnalon metlesicsii* nova sp. aus Westsizilien, mit einem Überblick über die Gruppe von *Phagnalon rupestre* im Mittelmeerraum. *Giornale Botanico Italiano* 103(4): 291–299.
https://doi.org/10.1080/11263506909426507

Pomel, A.N. (1874) *Nouveaux matériaux pour la flore atlantique*. Savy, Paris, 399 pp.

Post, G.E. (1891) *Plantae Postianae* II. Imprimerie Georges Bridel, Lausanne, 23 pp.
https://doi.org/10.5962/bhl.title.10982

Qaiser, M. & Lack, H.W. (1985) The genus *Phagnalon* (Asteraceae, Inuleae) in Arabia. *Willdenowia* 15: 3–21.

Qaiser, M. & Lack, H.W. (1986a) *Aliella*, a new genus of Asteraceae (Inuleae) from Morocco. *Botanische Jahrbücher fur Systematik* 106: 487−498.

Qaiser, M. & Lack, H.W. (1986b) The genus *Phagnalon* (Asteraceae, Inuleae) in Tropical Africa. *Willdenowia* 15: 437–450.

Quézel, P. (1958) Mission Botanique au Tibesti. Contribution à l'étude de la flore et de la végétation du Borkou et du Tibesti. *Mémoires, Institut de Recherches Sahariennes* 4: 99–357.

Raulin, V. (1869) *Description physique et naturelle de l'île de Crète,* vol. 2. A. Bertrand, Libraire de la Société de Géographie, Paris.

Rechinger, K.H. (1955) II. Compositae. In: Køie, M. & Rechinger, K.H. Symbolae Afghanicae. Enumerations and descriptions of the plants collected by L. Edelberg and M. Køie on The 3rd Danish Expedition to Central Asia and by W. Koelz, H.F. Neubauer, O.H. Volk, and others in Afghanistan. *Det Kongelige Danske Videnskabernes Selskab Biologiske Skrifter* (2): 1–215.

Richard, A. (1847) *Tentamen florae Abyssinicae*, vol. 1. Arthus Bertrand, Paris, 472 pp.
https://doi.org/10.5962/bhl.title.334

Rivas Martínez, S., Díaz, T.E., Fernández González, F., Izco, J., Loidi, J., Lousa, M. & Penas, A. (2002) Vascular plant communities of Spain and Portugal. Addenda to the syntaxonomical checklist of 2001: part 2. *Itinera Geobotanica* 15(2): 433–922.

Rouy, G.C.C. (1903) *Flore de France*, vol. 8. Asnières, Paris & Rochefort, 406 pp.

Schweinfurth, G. (1868) *Novae Species aethiopicae*. Eine Anzahl neuer und unbeschriebener Pflanzen-Arten, welche von Dr. Steudner 1862 und Dr. Schweinfurth 1864-1866 in Nubien und Abyssinien gesammelt wurden. *Verhandlungen der Zoologisch-Botanischen Gesellschaft* 18: 351–688.

Sennen, F. (1929) Breves excursiones botánicas por D. Carlos Pau. *Boletín de la Sociedad Ibérica de Ciencias Naturales* 28: 40–44.

Sennen, F. (1936) *Diagnoses des nouveautés parues dans les exsiccata Plantes d'Espagne et du Maroc de 1928 à 1935*. Imprenta Anglada, Vic, 308 pp.

Sieber, F.W. (1823) *Reise nach der Insel Kreta im griechischen Archipelagus im Jahr 1817 2*. F. Fleischer, Leipzig & Sorau, 328 pp.

Sibthorp, J. & Smith, J.E. (1813) *Florae Graecae Prodromus*, vol. 2. R. Taylor & Soc., London, 422 pp.

https://doi.org/10.5962/bhl.title.6653
Stafleu, F.A. & Cowan, R.S. (1976–1988) *Taxonomic literature: A selective guide to botanical publications and collections with dates, commentaries and types*, ed. 2, vol. 1-7. Bohn, Scheltema & Holkema, Utrecht.
https://doi.org/10.5962/bhl.title.48631
Thiers, B. (2018) [continuously updated] *Index Herbariorum: a global directory of public herbaria and associated staff*. New York Botanical Garden's Virtual Herbarium. Available from: http://sweetgum.nybg.org/science/ih/ (accessed 20 February 2018)
Vicioso, C. (1916) Plantas de Bicorp (Valencia). *Boletín de la Real Sociedad Española de Historia Natural* 16: 135–145.
Wickens, G.E. (1972) Compositae. In: Hepper, F.N. (Ed.), Tropical African Plants: XXXI. *Kew Bulletin* 26(3): 563–564.
https://doi.org/10.2307/4120319