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Typification of *Heliotropium* and *Tournefortia* (Heliotropiaceae) species described by Ruiz and Pavón

Federico Luebert[1,2,3*] & Hartmut H. Hilger[1]

[1]Institut für Biologie – Botanik, Freie Universität Berlin, Altensteinstr. 6, 14195 Berlin, Germany
[2]Departamento de Silvicultura, Facultad de Ciencias Forestales, Universidad de Chile, Santiago, Chile
[3]Present address: Nees-Institut für Biodiversität der Pflanzen, Universität Bonn, Meckenheimer Allee 170, 53115 Bonn, Germany. Tel.: +49-(0)228-737025, Fax: +49-(0)228-733120
fluebert@uni-bonn.de

Abstract

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Lectotypes are designated here for 14 names proposed by Ruiz and Pavón in "*Flora peruviana, et chilensis*" (1799) that were either described or are currently recognized as members of the genera *Heliotropium* or *Tournefortia* (Heliotropiaceae): *Heliotropium corymbosum*, *H. incanum*, *H. lanceolatum*, *H. microcalyx*, *H. microstachyum*, *H. oppositifolium*, *H. pilosum*, *H. synzystachyum*, *Lithospermum aggregatum*, *Tournefortia angustiflora*, *T. longifolia*, *T. polystachya*, *T. undulata*, *T. virgata*. Currently accepted names and comments on typifications and taxonomic affinities are also provided.

Keywords: Dombey, lectotype, nomenclature, Peru, taxonomy.

Resumen

Luebert, F. & Hilger, H.H. 2014. Tipificación de las especies de *Heliotropium* y *Tournefortia* (Heliotropiaceae) descritas por Ruiz y Pavón. Anales *Jard. Bot. Madrid* 71(2): e012

Se designan lectotipos de 14 nombres propuestos por Ruiz y Pavón en "*Flora peruviana et chilensis*" (1799) que son actualmente reconocidos, o fueron descritos, dentro de los géneros *Heliotropium* o *Tournefortia* (Heliotropiaceae): *Heliotropium corymbosum*, *H. incanum*, *H. lanceolatum*, *H. microcalyx*, *H. microstachyum*, *H. oppositifolium*, *H. pilosum*, *H. synzystachyum*, *Lithospermum aggregatum*, *Tournefortia angustiflora*, *T. longifolia*, *T. polystachya*, *T. undulata*, *T. virgata*. Se incluyen los nombres actualmente aceptados y comentarios sobre su tipificación y afinidades taxonómicas.

Palabras clave: Dombey, lectotipo, nomenclatura, Perú, taxonomía.

INTRODUCTION

The plant species described by Hipólito Ruiz López and José Antonio Pavón (Ruiz & Pavón) after their botanical expedition to Peru and Chile at the end of the 18th century are fundamental for the study of the flora of those territories. Several works describe the history of the expedition, its vicissitudes and relevant aspects for the study of collected plants (e.g., Ruiz, 1940; Steele, 1964; Muñoz Garmendia, 2003). The knowledge about the later destiny of the collected materials seems to be even more important, because it enables tracing the location of potential type specimens and their duplicates. This is particularly relevant because, with some exceptions (e.g., Knapp, 2008; Pupulin, 2012a, b), most of the species described by Ruiz and Pavón have not yet been typified. In the genus *Heliotropium* L., where most of the type materials were examined and typified by Förther (1998), there is no up-to-date and exhaustive study of the specimens collected by Ruiz and Pavón and held at Herbario del Real Jardín Botánico de Madrid (MA).

The destiny of the materials collected by Dombey, Ruiz and Pavón is a complex matter, primarily due to the fact that Pavón distributed a great portion of the material from the "Oficina de la Flora Americana" (hereafter OFA) without leaving any systematic record. Fortunately, Rodríguez Nozal (1993, 1994) has carried out a detailed study giving account of the dispersion of those specimens. According to this author, most of the materials can be found at the herbaria MA, FI, G and P, with secondary collections at AMES, B, BC, BM, BR, CGE, F, GH, HAL, K, LE, MAF, MO, NY, OXF, US and W. Therefore, no single herbarium holds a complete set of materials originally collected by Ruiz and Pavón. The largest collection, now deposited at MA, mostly comprises materials that remained in Spain after the dissolution of the OFA in 1835 (González Bueno & Rodríguez Nozal, 2003). Materials held at the Natural History Museum of Paris (Muséum National d'Histoire Naturelle, P) correspond primarily to ones that Joseph Dombey took with him in his return to France in 1784 (Steele, 1964). This collection is important because it contains specimens potentially absent in other herbaria. A significant part of the materials and manuscripts that stayed with Ruiz and Pavón after Dombey returned to France was either lost during a fire in 1784 in Huánuco (Peru) or was sent to Spain and shipwrecked near the coast of Portugal in February of 1786 (Steele, 1964; González Bueno & Rodríguez Nozal, 2003). Additionally, a part of the collections of B. Delessert and F. Klotzsch, which included some Ruiz and Pavón's materials originally acquired by A.B. Lambert (including more than 6400 plant specimens collected in Peru), ended at P (Rodríguez Nozal, 1993, 1994). The collection currently held at the herbarium of the Natural History Museum of the University of Florence (UniFI – Museo di Storia Naturale Firenze, FI) comes from collections directly transferred from the OFA to P.B. Webb

* Corresponding author.

(FI-W, incl. more than 2000 plant specimens from Peru), as well as other materials that P.B. Webb acquired from G. Gardner, who had acquired them from A.B. Lambert (Pichi-Sermolli, 1949; Steinberg, 1977). After the death of Pavón in 1840, E. Boissier purchased from his heirs around 8000 herbarium sheets (now at the Conservatoire et Jardin Botaniques de la Ville de Genève, G) including some materials from Peru (García Guillén & Muñoz Paz, 2003). The private collections of Ruiz and Pavón, which did not form part of the OFA, were acquired by different institutions, including BM and G (Rodríguez Nozal, 1993, 1994; González Bueno & Rodríguez Nozal, 2003). Materials distributed in other herbaria came primarily from those originally acquired by A.B. Lambert, as well as some materials probably purchased by M.E. Moricand (now at G) and J.C. Hoffmannsegg (now at B-WILLD and partially at W), and materials sold by Pavón to the Academy of Sciences and Arts of Barcelona (Academia de Ciencias y Artes de Barcelona, now at BC). The study of Rodríguez Nozal (1993, 1994) contains a detailed account of the dispersion of Ruiz and Pavón's materials into different herbaria. Exhaustive studies of the plants of Ruiz and Pavón currently held at B (Lack, 1979) and BC (Ibáñez, 2006; Ibáñez & al., 2006) include complete lists of the specimens deposited there.

The family Heliotropiaceae (Boraginaceae subfam. Heliotropoideae, Boraginales) was described by Schrader (1819) to include two genera described by Linnaeus (1753): *Heliotropium* L. and *Tournefortia* L. The delimitation of this family has remained relatively constant since Bentham (1876), but the generic limits within the family have fluctuated considerably (Förther, 1998; Luebert & al., 2011). In the times Ruiz & Pavón (1799) published the second volume of the *Flora peruviana et chilensis*, the authors followed Linnaeus' (1753) generic concepts, in which the family Heliotropiaceae was not yet well delimited. Recent studies have shown that these genera are not monophyletic (Diane & al., 2002; Hilger & Diane, 2003; Luebert & Wen, 2008; Luebert & al., 2011), leading to the recognition of four monophyletic genera in this family: *Heliotropium*, *Myriopus* Small, *Euploca* Nutt. and *Ixorhea* Fenzl. Species of *Tournefortia* should be partially included in *Heliotropium* (*T.* sect. *Tournefortia*) and would partially form the genus *Myriopus* (=*T.* sect. *Cyphocyema* I.M. Johnst.). *Euploca* is a genus segregated from *Heliotropium* (*H.* sect. *Orthostachys* (R. Br) G. Don), phylogenetically related to *Myriopus. Ixorhea* is a monotypic genus sister to the clade formed by *Euploca* and *Myriopus* (Weigend & al., 2014). Among the major works dealing with the taxonomy and nomenclature of *Heliotropium* in South America (Johnston, 1928, 1930, 1935; Förther, 1998), none has seriously taken into account the collections held at MA. The names of Ruiz and Pavón remain therefore untypified and the materials of *Heliotropium* have not yet been annotated by any specialist. E.P. Killip, well-known specialist in *Tournefortia*, spent several months in Madrid during 1932 also studying materials of Ruiz and Pavón (Blanco & Del Valle, 1991). Part of the materials of *Tournefortia* held at MA is annotated by Killip. Other part was probably on loan in Berlin (Lack, 1979). Several specimens currently at MA have revision labels of H. Melchior that bear a date 1932. Killip would not have had access to these materials.

The purpose of this contribution is to propose lectotypes for the names of *Heliotropium* and *Tournefortia* described by Ruiz & Pavón (1799) and to discuss their systematic position and synonymy according to the currently available knowledge. Because of the history of the dispersal of Ruiz and Pavón's materials outlined above, Knapp (2008) suggested that it is unlikely that any of the specimens currently held at MA are holotypes, even if there is only a single sheet there (but see Pupulin, 2012 a, b). Lectotypes were therefore selected for all names included in the present work. To this end, the main collection of plant specimens of Ruiz and Pavón was revised at MA, as well as those at the herbaria where most of the duplicates are housed (B, B-WILLD, BM, F, FI, G, G-DC, GH, HAL, K, M, P, W). The databases and the curators of the herbaria AMES, BR, CGE, L, LE, MO, MPU, NY, OXF, S, and US were consulted and their photographs were examined in case of availability of Ruiz and Pavón's materials. The catalogue published by Ibáñez (2006) indicates that no Ruiz and Pavón's specimen of *Heliotropium* or *Tournefortia* are held at BC. For lectotypifications, the criterion of Knapp (2008) was followed. When present, specimens from MA were selected as the lectotypes. If more than one specimen was available for typification, we chose the sheet that best fits the descriptions and illustrations of *Flora peruviana, et chilensis*. The name *Lithospermum aggregatum* Ruiz & Pav. is also included, because it was shown to be a *Heliotropium* (Förther, 1998). The remaining Ruiz and Pavón's names in *Lithospermum* L. (i.e., *L. dichotomum* Ruiz & Pav., *L. hispidum* Ruiz & Pav., *L. incanum* Ruiz & Pav., *L. muricatum* Ruiz & Pav., and *L. tinctorium* Ruiz & Pav.) are not treated here, because they belong to the genera *Amsinckia* Lehm., *Lithospermum*, *Plagiobothrys* Fisch. & C.A. Mey. or *Tiquilia* Pers. (see Johnston, 1927; Richardson, 1977; Weigend & al., 2010 for details), which lay beyond the scope of this paper.

TYPIFICATIONS

Heliotropium corymbosum Ruiz & Pav., Fl. Peruv. 2: 2, tab. 107a (1799).

Ind. Loc.: "Habitat *affatim in* Peruvia *per Provincias* Limae, Chancay, Cantae, Huarocherí, Icae, Camanae"

Lectotype, designated here: "*Heliotropium frutescens*", Lima (MA 814817); isotypes F 842503, FI-W (barcode FI-004994), MA (×4, MA 814813-MA 814816); possible isotypes: Lima, *Dombey* (BM barcode BM 000956344), *Dombey* (P[×4] barcodes P04035656, P04035661-P04035663) ex Herb Pavón (FI-W barcode FI005025 p.p.), *Pavón* (B-WILLD 3236); *Pavón* (P barcode P00610151); possible isosyntype: Canta, "ex Herb de R. et P." [K (Herb. Hook.)]

Current accepted name: *Heliotropium corymbosum* Ruiz & Pav.

The sheet selected as the lectotype is the only specimen bearing locality information. We consider the other specimens to be duplicates of this, although they lack indication of locality. The name *Heliotropium corymbosum* was placed under the synonymy of *H. arborescens* L. by Johnston (1928). The epitypification of the latter name made by Luebert & al. (2010) means that the name *H. corymbosum* should be re-established. This is in agreement with the typification proposed here and with the illustration of the flower by Ruiz and Pavón, where the style is clearly longer than the stigmatic

column, a fundamental character to differentiate *H. arborescens* (style shorter or equal to the stigmatic column) from *H. corymbosum* (Luebert & al., 2010). This species belongs to the section *Heliothamnus* I.M. Johnst., which is sister to all other sections of *Heliotropium* (Luebert & al., 2011).

Heliotropium incanum Ruiz & Pav., Fl. Peruv. 2: 2, tab. 108a (1799).

Ind. Loc.: "Habitat *in collibus aridis* Huanuci."
Lectotype, designated here: de Huanuco (MA 814823, Fig. 1a); isotypes B (destroyed, F neg. nr. 17326), F 844088, FI-W (barcode FI005023), G [Herb. Boissier], MA (×2, MA 814824, MA 814825), P barcode P02088521 not seen [digital photograph]; possible isotype: *Dombey* (P barcode P02088520 not seen [digital photograph]).
Curren accepted name: *Heliotropium incanum* Ruiz & Pav.

The most complete material at MA was selected as the lectotype. This is also the only specimen with locality indication matching both original description and illustration. This is a very characteristic species geographically distributed in south-central Peru. The material at B under *Heliotropium incanum* (B-WILLD 3235!) is a plant from Ecuador, possibly collected by J. Tafalla, and does not correspond to *H. incanum* in the sense the name has been historically applied, which is the sense of the present lectotypification. This confusion of materials was introduced by Kunth (1818), who applied this name to a different species from Ecuador, and was followed in the recent literature (Lack, 1979; Förther, 1998). This material (B-WILLD 3235) is a syntype of *Heliotropium submolle* Klotzsch. Authentic *Heliotropium incanum* was included in the phylogenetic analysis of Luebert & al. (2011), which confirms its position as member of section *Heliothamnus*.

Heliotropium lanceolatum Ruiz & Pav., Fl. Peruv. 2: 4, tab. 111a (1799), *non Heliotropium lanceolatum* Noronha, Verh. Batav. Genootsch. Kunst. 5(Art. 4): 18 (1790), *nomen nudum.*

Ind. loc.: "Habitat *in nemoribus* Pillao *et* Huanuci."
Lectotype, designated here: MA (MA 814827); isotypes: B(destroyed, F neg. nr. 17328), F 845246, F 843568 (fragm.), MA (MA 814828), P not seen (cited by Förther, 1998).
Current accepted name: *Heliotropium corymbosum* Ruiz & Pav.

The sheet selected as the lectotype is the most complete among the two sheets at MA, which are undoubtedly duplicates. The type material of *Heliotropium lanceolatum* falls clearly within the variability of *Heliotropium corymbosum*, from which it only differs in leaf size. The synonymy here proposed sets the priority on *Heliotropium corymbosum*, whenever these names are considered as synonyms.

Heliotropium microcalyx Ruiz & Pav., Fl. Peruv. 2: 3, tab. 109b (1799).

Ind. Loc.: "Habitat *in* Peruviae *collibus per* Huanuci *Provinciam.*"
Lectotype, designated here: MA (MA 814860); isotype B (destroyed, F neg. nr. 1051, photo MSB); possible isotype: F 843374 (fragm.).
Curren accepted name: *Tournefortia microcalyx* (Ruiz & Pav.) I.M. Johnst.

Only one specimen is currently found at MA. This species belongs to *Tournefortia* sect. *Tournefortia.* While the currently accepted name is under *Tournefortia*, phylogenetic analyses show that *Tournefortia* sect. *Tournefortia* is nested in *Heliotropium* ("*Tournefortia* clade", Luebert & al., 2011). Johnston (1956) indicated that the locality given in the protologue does not match the locality of materials examined by him. The materials revised by the authors of this work at BSB, K and W are in line with Johnston's claim that this is a species distributed at the coastal range of Peru. The locality of the protologue might be therefore wrong.

Heliotropium microstachyum Ruiz & Pav., Fl. Peruv. 2: 3, tab. 110 a (1799).

Ind. Loc.: "Habitat *in aridis* Tarmae *et* Cheuchin."
Lectotype, designated here: Tarma 1780, januario (MA 814829, Fig. 1b); isotypes: B (destroyed, F neg. nr. 17333), FI-W (barcode FI 004998), MA (×2, MA 814831, MA 814832); possible isotypes: B-WILLD 3237, F 842502, G [Herb. Boissier], M (barcode M0188668), MPU (barcode MPU019717 not seen [digital photograph]), P (barcode P00610207), S (S-R-2846 not seen [digital photograph]), *Dombey s.n.* (P barcode P00610206), *Dombey 366* (G-DC barcode G00148000, L barcode L0004005 not seen [digital photograph], M barcode M0188054, P barcode P03877800).
Current accepted name: *Heliotropium microstachyum* Ruiz & Pav.

The selected lectotype is the most complete sheet, it contains a label with the description of the species identical to the protologue, includes locality and collection year, and is similar to the original illustration. Two of the sheets at MA and P indicated as isotypes (MA814831 and barcode P00610207) could be a different gathering (syntype), because the leaves are smaller, narrower and apically more acute. The specimen at F could be a duplicate of the latter. The materials collected by *Dombey 366* (G-DC, L, M, P), possibly isotypes, are also isotypes of *Heliophytum brachystachyum* DC., Prodr. 9: 554 (1845) [*Heliotropium brachystachyum* (DC.) Griseb. in Abh. Königl. Ges. Wiss. Göttingen 24: 271 (1879)] which is therefore a synonym of this species.

As it has already been observed by other authors (De Candolle, 1845; Johnston, 1928; Förther, 1998), the reference to plate 110b in the protologue ("*Icon. CX Fig. b*"), as well as the legend of plate 110 are erroneous: plate 110a corresponds to the present species, while plate 110b corresponds to *Heliotropium pilosum*, the opposite of what is indicated in the plate legend.

Luebert & al. (2011) confirmed the close relationships between this species and *H. abbreviatum* Rusby previously suggested by Johnston (1928). *Heliotropium microstachyum* and *H. abbreviatum* form the section *Hypsogenia* I.M. Johnst. within the "*Tournefortia* clade".

Fig. 1. Selected lectotypes in. **a**, (MA 814823); **b**, (MA 814829); **c**, (MA 814835) (=); **d**, (MA 814811) (=).

Heliotropium oppositifolium Ruiz & Pav., Fl. Peruv. 2: 2, tab. 108b (1799).

Ind. Loc.: "Habitat *in* Muña *aridis, versus* Cormilla *tractum.*"
Lectotype, designated here: MA (MA 814833); isotypes: B (destroyed, F neg. nr. 1052), F 609302 (fragm.), GH (barcode GH00097725 [fragm.]), MA (MA 814834).
Current accepted name: *Heliotropium oppositifolium* Ruiz & Pav.

The sheet selected as the lectotype is the most complete and better conserved among the two sheets currently housed at MA. This name has been cited as synonym of *Tournefortia polystachya* by Macbride (1960), Brako & Zarucchi (1993) and Förther (1998). Killip (mscr.) indicates, however, that they are distinct species of *Tournefortia*, differentiated primarily by the ratio between length of style and stigmatic head, which is in agreement with the description and illustration of Ruiz & Pavón (1799). The combination of this species under *Tournefortia* was not validly published by Killip, and the name is no longer available (cf. *T. oppositifolia* Riedl). Possibly, this will not be necessary, because this species probably belongs to section *Tournefortia*, which is a synonym of *Heliotropium*.

Heliotropium pilosum Ruiz & Pav., Fl. Peruv. 2: 3, tab. 110b (1799).

Ind. Loc.: "Habitat *in collibus aridis* Limae *ad* Amancaes *tractus.*"
Lectotype, designated here: Lima... en los Amancayes (MA 814835, Fig. 1c); isotypes: B (destroyed, F neg. nr. 17339), B-WILLD 3238, F 844085, F 845276, FI-W, G [Herb. Boissier], GH (barcode GH00097731), HAL (barcode HAL0113289), MA (×2, MA 814836, MA 814837), P [Herb. Drake] not seen (cited by Förther, 1998); possible isotypes: MPU (barcode MPU019708 not seen [digital photograph]), *Dombey 363* (P[×2] barcodes P00610216, P00610217, M barcode M0188034).
Current accepted name: *Euploca pilosa* (Ruiz & Pav.) Luebert

The sheet selected as the lectotype is the most complete and the only one with indication of locality, which is also in agreement with the protologue and the illustration. The reference to plate 110a both in the protologue and in the legend of plate 110 is erroneous (see comment under *Heliotropium microstachyum* above). This species belongs to section *Orthostachys* (= *Euploca* Nutt.), which was confirmed in phylogenetic studies (Hilger & Diane, 2003; Luebert & al., 2011).

Heliotropium synzystachyum Ruiz & Pav., Fl. Peruv. 2: 3, tab. 109a (1799).

Ind. Loc.: "Habitat *in segetibus et campis aridis* Limae *et* Chancay."
Lectotype, designated here: MA (MA 814811, Fig. 1d); isotypes: F 844086 (fragm.), MA (MA 814812), *Dombey* (P [×2] barcodes P04035771, P04035779), Lima, *Dombey* (P barcode P04035780); possible isotypes: G [Herb. Boissier], *Dombey* (P [×2] barcodes P04035770, P04035773).
Current accepted name: *Heliotropium angiospermum* Murray

Among the two sheets currently held at MA, both without indication of locality, we have chosen the more complete one as the lectotype. Because of the degree of development of its inflorescences, this sheet matches better the illustration. The pubescence of the fruits in both specimens clearly indicates that this is a synonym of *Heliotropium angiospermum*. Recent phylogenetic analyses confirm the position of this species in the "*Tournefortia* clade" (Luebert & al., 2011).

Lithospermum aggregatum Ruiz & Pav., Fl. Peruv. 2: 4 (1799).

Ind. Loc.: "Habitat *in collibus aridis* Tarmae *et* Huanuci."
Lectotype, designated here: "*Helyotropium agregatum*" Cheuchín et Tarma in naridis (MA 814830); possible isotype: P (barcode P00610208).
Current accepted name: *Heliotropium microstachyum* Ruiz & Pav.

The only assignable material to this species at MA is a specimen designated by Ruiz as "*Helyotropium agregatum*". This name was never published as such. Some of the duplicates of *Lithospermum aggregatum* housed in other herbaria (e.g., P) may have been assigned to *H. microstachyum*. However, we have not found any evidence of that.

Tournefortia angustiflora Tafalla in Ruiz & Pav., Fl. Peruv. 2: 25, tab. 151a (1799).

Ind. Loc.: "Habitat *in* Peruviae *nemoribus ad* Chicoplaya *et* Pueblo nuevo, *ubi Joannes Tafalla delineavit et descripsit*."
Lectotype, designated here: MA (MA 814849, Fig. 2a); isotypes B (destroyed, F neg. nr. 1038), F 845245, K (barcode K000583524).
Current accepted name: *Tournefortia angustiflora* Tafalla in Ruiz & Pav.

Only one sheet has been found at MA. According to the description, this name has to be attributed to Juan José Tafalla. This is a very distinct taxon and the only Peruvian species having flowers with elongated corolla tube more than six times longer than the calyx. Morphologically, this species belongs to *Tournefortia* sect. *Tournefortia*.

Tournefortia longifolia Ruiz & Pav., Fl. Peruv. 2: 25, tab. 150b (1799).

Ind. Loc.: "Habitat *in* Peruviae *nemoribus ad* Pozuzo *sepes*."
Lectotype, designated here: MA (MA 814859, F neg. nr. 12943, photo MSB, Fig. 2b).
Current accepted name: *Tournefortia longifolia* Ruiz & Pav.

A single sheet was found at MA. The negative of The Field Museum of Natural History of Chicago is labelled as taken in B, probably when the material was there on loan. The photograph is identical to the material currently at MA. This species belongs to *Tournefortia* sect. *Tournefortia*.

Fig. 2. Selected lectotypes in. **a**, (MA 814849); **b**, (MA 814859); **c**, (MA 814868); **d**, (MA 814878).

Tournefortia polystachya Ruiz & Pav., Fl. Peruv. 2: 24, tab. 149a (1799).

Ind. Loc.: "Habitat *in* Peruviae *praeruptis ad* Huassahuassi *et* Cheuchin *vicos*."
Lectotype, designated here: Cheuchin, Mayo 1779 (MA 814868 [photo MSB], Fig. 2c); isotypes: B (destroyed, F neg. nr. 1056), B-WILLD 3440, MA (×3, MA 814869–MA 814871 [photos MSB]), US (barcode 00110818); possible isotypes: *Dombey 358* (P [×2], barcodes P030436, P030437), *Dombey s.n.* (P barcode P030435 [photo MSB]).
Current accepted name: *Tournefortia polystachya* Ruiz & Pav.

The sheet selected as the lectotype is not only the most complete, but also includes locality indication and a full diagnosis. The diagnosis is coincident but different from the protologue. The date of the material, 1779, allows assuming that the P specimens collected by Dombey are actual isotypes, because this date is earlier than his return to Europe in 1784. This species was included in the phylogenetic analyses of Luebert & al. (2011), which confirm its placement in the "*Tournefortia* clade".

Tournefortia undulata Tafalla ex Ruiz & Pav., Fl. Peruv. 2: 25, tab. 149b (1799).

Ind. Loc.: "Habitat in Provinciae Camanae *collibus ad* Lomas de Atiquipa, *undè Tafalla iconem et descriptionem nobiscum communicavit*."
Lectotype, designated here: de Atiquipa y Pillao, 1788 (MA 814875 [photo MSB]); isotypes: B (destroyed, F neg. nr. 1064), F 842495, HAL (barcode HAL0113292), MA (×4, MA 814873, MA 814874, MA 814876, MA 814877 [photos MSB]).
Current accepted name: *Tournefortia undulata* Tafalla ex Ruiz & Pav.

The sheet selected as the lectotype matches the description and includes indication of locality. It was collected at Lomas de Atiquipa, in the coastal range of south-central Peru. Because of its fruit morphology, it clearly belongs to section *Tournefortia*. However, the limits of this species are still poorly understood. For example, De Candolle (1845) includes in this species the material of *Hartweg 810* (BM!, K!) from Loja, Ecuador, with which Killip (mscr.) agrees. Johnston (1928) indicates with doubts that the latter specimens fall into the variability of *Heliotropium arborescens* (sect. *Heliothamnus*), with which we agree. *Tournefortia undulata* is a species from coastal environments of central Peru, as described by Macbride (1960). The material *Weigend & Förther 97/880* (BSB!, F!) from the coastal region of Mollendo clearly belongs to *Tournefortia undulata.* It was included in the phylogenetic analysis of Hilger & Diane (2003) and retrieved in a clade with other South American *Heliotropium*.

Tournefortia virgata Ruiz & Pav., Fl. Peruv. 2: 25, tab. 150a (1799).

Ind. Loc.: "Habitat *in* Peruviae *nemoribus in* Huassahuassi *circuitu*."
Lectotype, designated here: de Huasahuasi (MA 814878, F neg. nr. 12942, Fig. 2d); isotypes: F 844089, MA MA 814879).
Current accepted name: *Tournefortia virgata* Ruiz & Pav.

The two specimens held at MA have indication of locality ("Huassahuassi"), but that determined by Melchior is more similar to the original illustration and therefore was selected here as the lectotype. This species seems to be rare in its distribution area on the mid-elevation slopes of the Andes of central Peru. Material assigned to this species was included in the phylogenetic analysis of Hilger & Diane (2003), which resolved its position together with other South American sections of *Heliotropium*.

EXCLUDED NAMES

"***Tournefortia volubilis*** Ruiz & Pav."

This name is cited in Index Kewensis (available at www.ipni.org). However, *Tournefortia volubils* L. (≡*Myriopus volubilis* (L.) Small) is explicitly cited in Ruiz & Pavón (1799) under the description of this species. Therefore, Ruiz & Pavón (1799) did not attempt at describing a new species here but only indicate that this species is present in Peru. The material assigned by Ruiz and Pavón to *Tournefortia volubilis* corresponds, however, to *Myriopus maculatus* (Jacq.) Feuillet.

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