



Typification of names in the genus *Duranta* (Duranteae, Verbenaceae)

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Abstract

During the taxonomic revision of the genus *Duranta*, seventeen names were identified to need typification. All related herbaria and different literature concerning each name were studied. As a result twelve lectotypes, one epitype and four neotypes are designated here, which will contribute to stabilize the nomenclatural framework of the genus. Notes about typifications are provided.

Introduction

Duranta Linnaeus (1753: 637) is an American genus of shrubs and small trees distributed from southern United States of America to northern Argentina and in the Caribbean islands. The genus is characterized by its fruits being a drupe with four or five 2-seeded pyrenes, enclosed by the adherent, accrescent fruiting calyx which is usually connivent.

Duranta has only been studied regionally in floras of different countries around the world (MacBride 1960, Lopez-Palacios 1977, Moldenke 1983, Múlgura *et al.* 2012); the only comprehensive review of the genus is the taxonomic treatment done by Roger Sanders (1984), who estimated the genus comprises *ca.* 17 species. However, this revision lacks descriptions, illustrations and resolution of nomenclatural and typification matters. So far, only two names have been typified in *Duranta*: *D. erecta* Linnaeus (1753: 637) by Caro (1956) and *D. repens* Linnaeus (1753: 637) by Sanders (1989).

During the taxonomic revision of *Duranta*, several names were found to require typification, mostly since many authors have not designated a type or have designated unsuitable specimens, or the type specimen was lost. Although many authors have contributed to the description of *Duranta* species, it is necessary to highlight the contribution of Briquet, Hayek, Moldenke and Todaro.

Materials and Methods

In order to resolve these typifications all the protologues of the published taxa were studied. We examined type specimens from BM, BR, E, F, G, GH, K, MO, MPU, NY, P, S, SI and US at the website of JSTOR (<http://plants.jstor.org>) and through digital images obtained by personal communication with herbaria curators from BM, G, MOL, PAL and W (acronyms according to Thiers 2016).

Taxonomic treatment

A) Species described by August von Hayek

Hayek described four species of *Duranta* (Hayek 1906, 1909). Hayek's type specimens and his personal herbarium are mainly housed in GB although he has also worked upon material housed in other herbaria (Stafleu & Cowan 1979). In the case of the following species there is no type material housed in GB (Claes Gustafsson, pers. comm.), so the lectotypes were selected among duplicates housed in other herbaria. In order to determine if any of the labels was written by Hayek the handwriting was studied following Widder & Teppner (1974).

A1) Species described in the year 1906

Several duplicates housed in different herbaria were found (BM, COL, G, K, P, W); the specimens kept in W have labels that seem to be original because the handwriting on them matches with Hayek's calligraphy. So a lectotype was selected among duplicates housed in W.

Duranta coriacea Hayek (1906: 88)

Type (lectotype, designated here):—COLOMBIA. Cauca, *s.d.*, *H. Karsten s.n.* (W No. 0061992 [digital image!], right-hand specimen; image of the lectotype is available at <http://herbarium.univie.ac.at/database/detail.php?ID=628410>).

Protologue citation:—“Nouvelle Grenade, Prov. de Cauca: Vellée de Cauca, 1000 m (Triana 2074).—Cauca (Karsten).—Andes Quitensis: Pallatanga (Spruce 5574).”

Notes:—Hayek (1906) mentioned three collections in the protologue that can be considered as syntypes (Arts. 9.3, 9.5 of the ICN, McNeill *et al.* 2012). One of these collections was done by Richard Spruce near Pallatanga (Ecuador) in 1858, numbered 5574 (K barcode 000202297 [digital image!], W No. 1889-0294722 [digital image!], W No. 1889-0166962 [digital image!]). The second was collected in Cauca (Nouvelle Grenade, Colombia today) by J. J. Triana, numbered 2074 (BM barcode 001191075 [digital image!], BM barcode 00119076 [digital image!], G barcode 00382618 [digital image!], P barcode 02886094 [digital image!], W No. 0061990 [digital image!]), and finally the third one was collected in Cauca by H. Karsten, without any collection number (W No. 0061992 [digital image!]).

The specimen collected by H. Karsten is here selected as lectotype because it matches the original description and it is the most complete material (it has flowers and fruits).

Duranta tomentosa Hayek (1906: 88)

Type (lectotype, designated here):—[COLOMBIA]. Nouvelle-Grenade, Prov. De Pasto, 2600 met., 1853, *J. J. Triana 2073* (W No. 0061991 [digital image!], image of the lectotype is available at <http://herbarium.univie.ac.at/database/detail.php?ID=628366>; isolectotypes COL barcode 000369341 [digital image!], BM barcode 001191068 [digital image!], BM barcode 001191069 [digital image!], G barcode 00382638 [digital image!], P barcode 02886093 [digital image!]).

Protologue citation:—“Nouvelle-Grenade: Prov. de Pasto, 2600 m (Triana 2073).”

Notes:—In the protologue Hayek (1906) mentions only the collection of J. J. Triana. Six duplicates of this collection were found in BM, G, P, and W. According to McNeill (2014) a lectotype has to be designated among these. The specimen housed in W is in a good state of preservation and it matches the protologue, and, as stated before, the handwriting belongs to Hayek. So it is here selected as lectotype.

A2) Species described in the year 1909

In the next two cases Hayek's species are based on material collected by A. Weberbauer in Peru. Most of the specimens collected by Weberbauer were housed in B and have been destroyed during the bombing of Berlin in 1943. Original material was found in MOL where duplicates of Weberbauer's collections are also kept.

Duranta lineata Hayek (1909: 170)

Type (lectotype, designated here):—PERU. Departamento de Ancash, *s. d.*, *A. Weberbauer 3286* (MOL barcode 26305 [digital image!]).

Protologue citation:—“Peru: unterhalb der Yanganucho-Seen bei Yungay (Dep. Ancash), üppiges Gesträuch in einer Bachschlucht, 3300—3400 m, sehr häufig (A. Weberbauer, Flora von Peru, n. 3286).”

Notes:—The only reference to the holotype housed in B and now destroyed is a photo taken by F. MacBride (photo neg. F barcode 0BN017570 [digital image!]).

Duranta rupestris Hayek (1909: 170)

Type (lectotype, designated here):—PERU. Departamento de Junín, Tarma, *s. d.*, *A. Weberbauer 1759* (MOL barcode 26304 [digital image!]).

Protologue citation:—“Peru: unterhalb Palca (Dep. Junin, prov. Tarma), Felsen, 2600 m (A. Weberbauer, Flora von Peru, n. 1759).”

Notes:—The only reference to the holotype housed in B and now destroyed is a photo taken by F. MacBride (photo neg. F barcode 0BN017572 [digital image!]).

B) Species described by John Isaac Briquet

Briquet described two species of *Duranta* (Briquet 1896). Although the author clearly designated type specimens currently housed in G, more than one sheet of each type material was found. Thus, the specimen showing the best quality of preservation of the important diagnostic features of the taxon was chosen as a lectotype (Art. 9.17 of the ICN, McNeill *et al.* 2012, McNeill 2014).

***Duranta benthamii* Briquet (1896: 343)**

Type (lectotype, designated here):—BOLIVIA. Larejaca, viciniis Sorata, Queliquaya in nemoribus, alt. 2600 m. 1858, *G. Mandon 534* (G barcode 00366379 [digital image!], isolectotypes BR barcode 5506118 [digital image!], BR barcode 5505463 [digital image!], F barcode 74354F [digital image!], G barcode 00366374 [digital image!], G barcode 00366376 [digital image!], GH barcode 286877 [digital image!], MPU barcode 12689 [digital image!], MPU barcode 12688 [digital image!], NY barcode 137496 [digital image!], S No. 04-2569 [digital image!]).

Protologue citation:—“Bolivia: Provincia Larejaca, viciniis Sorata, Queliquaya in nemoribus, alt. 2600 m. (Mandon n° 534 in h. Delessert).”

***Duranta sprucei* Briquet (1896: 344)**

Type (lectotype, designated here):—ECUADOR. “In Andibus Ecuadorensibus”, 1861, *R. Spruce 5526* (G barcode 00366342! [digital image], isolectotypes BM barcode 000992775! [digital image], E barcode 00373269! [digital image], F barcode 0074359F! [digital image], G barcode 00366357! [digital image], G barcode 00366377! [digital image], GH barcode 00094759! [digital image], K barcode 000202284! [digital image], MPU barcode 012690! [digital image], NY barcode 00137517! [digital image], P barcode 02886082! [digital image], S No. 04-2573! [digital image], S No. 04-2572! [digital image]).

Protologue citation:—“In Andibus Ecuadorensibus (Spruce n° 5526 in h. Delessert).”

C) Species described from plants grown in botanical gardens

C1) «Orto Botanico di Palermo», Italy

Agostino Todaro described four species in *Duranta* (Todaro 1860) based on cultivated plants from the Real Orto Botanico di Palermo, Italy. Subsequent authors mentioned Todaro’s species (Sanders 1984, Munir 1995) mostly as synonyms of other taxa, but none has referred to the original type material studied by Todaro.

Todaro did not cite any type in the protologues. However, he mentioned the name under which the plants were cultivated in the botanical garden. His personal herbarium is currently housed in PAL (Stafleu & Cowan 1986); a few of these specimens have labels while the remaining material is not labeled (Gianniantonio Domina, pers. comm.). The labels on the sheets show at least two different handwritings. In order to determine if any of the labels was written by Todaro the handwriting was studied following Burdet (1978). Even though these specimens have been studied by Todaro there is no evidence concerning the date of herborization, therefore this material cannot be considered as original. For this reason, neotypes are proposed for all the names published by Todaro which are based on specimens that match the morphological features described in the protologues.

***Duranta integrifolia* Todaro (1860: 27)**

Type (neotype, designated here):—[LOCATION UNKNOWN]. “Da lungo tempo è stata coltivata nel Real Orto Botanico come una varietà della *Duranta inermis*, dalla quale sembra diversa.”, *A. Todaro s.n.* (PAL No. 102.475 [digital image!]), Fig. 1.

Protologue citation:—“Da lungo tempo è stata coltivata nel Real Orto Botanico come una varietà della *Duranta inermis*, dalla quale sembra diversa.”

Notes:—In PAL there is only a specimen with a label that reads “*Duranta integrifolia*”. This label matches the calligraphy of the author, however we cannot ascertain when was this label placed. This specimen shares the morphological features described in the protologue of the species, so it is here selected as a neotype.



FIGURE 1. Neotype of *Duranta integrifolia* Todaro kept in PAL.

Duranta brachypoda Todaro (1860: 24)

Type (neotype, designated here):—[LOCATION UNKNOWN]. Orto Botanico di Palermo, A. Todaro s.n. (PAL No. 102.452 [digital image!]), Fig. 2.

Protologue citation:—“Stazione ignota. Coltivasi da lungo tempo nel Roal Orto Botanico col nome di *Duranta Mutisii*, dalla quale è diversa.”

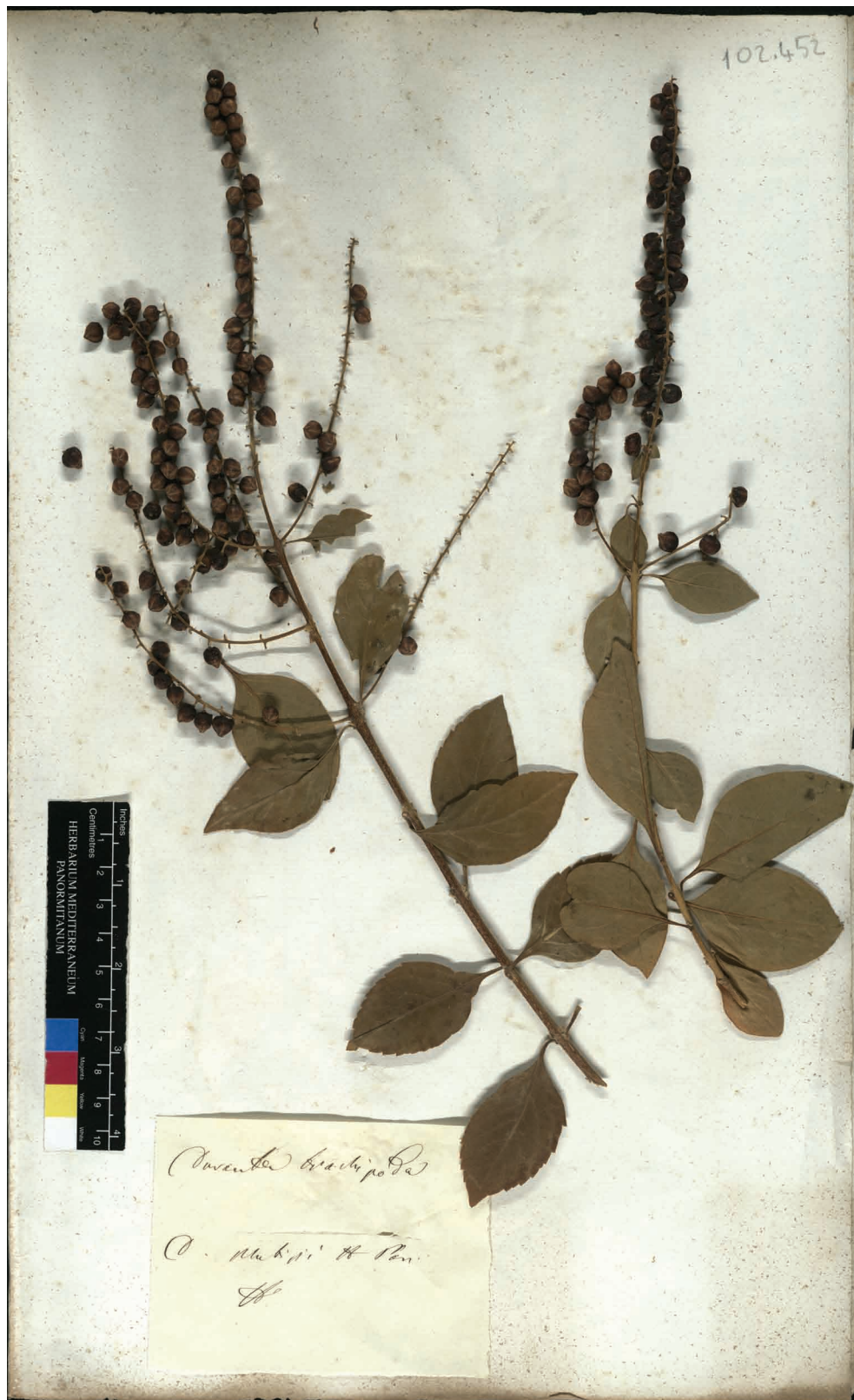


FIGURE 2. Neotype of *Duranta brachypoda* Todaro kept in PAL.

Notes:—In PAL there is a specimen with a label that reads “D. Mutisii H. Parm.” This matches the name under which Todaro’s species *D. brachypoda* was cultivated in the botanical garden, as stated in the protologue, and the calligraphy of the author. This specimen shares the morphological features described in the protologue of the species so it is here selected as a neotype.

Duranta stenostachya Todaro (1860: 26)

Type (neotype, designated here):—[LOCATION UNKNOWN]. Orto Botanico di Palermo, A. Todaro s.n. (PAL No. 102.506 [digital image!]), Fig. 3.

Protologue citation:—“Questa specie è stata lungo tempo coltivata nel Real Orto col nome di *Duranta Plumeri*, poichè a quanto pare la determinazione delle specie di questo genere erasi fatta secondo lo Sprengel.”



FIGURE 3. Neotype of *Duranta stenostachya* Todaro kept in PAL.

Notes:—The specimen housed at PAL whose label reads “*Duranta stenostachya* / *D. Plumierii*” matches both the name under which Todaro’s species *D. stenostachya* was cultivated in the botanical garden, and the calligraphy of the author. This specimen shares all the morphological features described in the protologue so it is here selected as a neotype.

Sanders (1989) said the type of this species is a plate presented in the work published by Todaro in 1860. It is worth mentioning that this work does not have any plate and that this drawing was published by Todaro in a later work (1875: 9, Tab. III). The plate which Sanders referred to as type is not suitable because it was published after the protologue therefore it is not original material. (Art. 9.3 of the ICN, McNeill *et al.* 2012).

Concerning the original location of this species there are different opinions. There is no reference to the place of origin in the protologue, but Todaro said in a later work that this plant came from Brazil (1875). Bailey (1949) also mentions that it is native to Brazil. However, there are no records of *D. stenostachya* in Brazil until today. Caro (1956) is the first author that points out Martinica as a possible distribution. More recently, Sanders (1989) and Acevedo-Rodriguez & Strong (2012) indicate the species is endemic to Lesser Antilles.

Duranta turbinata Todaro (1860: 28)

Type (neotype, designated here):—[LOCATION UNKNOWN]. “Era coltivata col nome di *Duranta Ellisia* Linn. In questo Real Orto Botanico, ma per i caratteri delle sue foglie appartiene piuttosto alla sezione delle *Duranta* a foglie piccole”, *A. Todaro s.n.* (PAL No. 102.516 [digital image!]), Fig. 4.

Protologue citation:—“Era coltivata col nome di *Duranta Ellisia*. Linn. in questo Real Orto Botanico, ma per i caratteri delle sue foglie appartiene piuttosto alla sezione delle *Duranta* a foglie piccole.”

Notes:—In PAL there is only a specimen collected by Todaro and labeled as “*D. turbinata*” by him. This specimen matches the morphological features described in the protologue of the species so it is here selected as a neotype.

C2) «Jardin des Plantes de Paris», France

Duranta microphylla Desfontaines (1804: 54)

Type (lectotype, designated here):—[LOCATION UNKNOWN: Meridional America]. Cultivated in Jardin du Roi (Paris, France), *unknown collector* (P barcode 02886200[digital image!], specimen on the lower left corner).

Protologue citation:—“Amérique méridionale; serre-chaude; ligneuse.”

Notes:—Desfontaines (1804) published a catalogue of plants cultivated in the Royal Botanical Garden of Paris, describing several unknown or poorly known species. In the protologue of *D. microphylla* Desfontaines pointed out that this species is a woody plant growing in southern America and it is cultivated in a greenhouse in the botanical garden. There is no further reference to original material. The protologue of the species was misquoted by several authors (Todaro 1875; Moldenke 1971; Moldenke 1979) except for Poiret (1811) and Hamilton (1825). The mistake probably lies in the fact that in the third edition of the catalogue Desfontaines (1829) published a more complete description of *D. microphylla*.

A sheet stored under *Duranta microphylla* was found in P were Desfontaines studied (Stafleu & Cowan 1976); three labels on the sheet read *D. microphylla* but only the specimen at the lower left corner of the sheet has a calligraphy that matches Desfontaines’s handwriting (Steinberg 1973). So, this specimen housed in P is here selected as lectotype. Poiret (1811: 258), who was the first author to accept *D. microphylla* as a valid species wrote down in the label a reference to the original protologue of the species.

D) Species described by other botanists

D1) Ludolf Karl Adelbert von Chamisso

Duranta vestita Chamisso (1832: 115)

Type (lectotype, designated here):—BRAZIL. “Brasilia”, *F. Sellow 4630* (K barcode 000487112 [digital image!]).

Protologue citation:—“Unicum specimen fructu maturo onustum e Brasilia tropica misit Sellowius.”



FIGURE 4. Neotype of *Duranta turbinata* Todaro kept in PAL.

Notes:—Sellow's herbarium is housed in B (Stafleu & Cowan 1985), and the type specimen of this species was destroyed during Second World War (Robert Vogt, pers. comm.). Original material was located in K, where Sellow's duplicates are kept. Thus, the specimen housed in K is here selected as lectotype.

D2) John Donnell Smith

***Duranta mutisii* var. *costaricensis* Donnell Smith (1895: 9)**

Type (lectotype, designated here):—COSTA RICA. La Estrella, Provincia de Cartago, 1888, *J. G. Cooper 6007* (US barcode 00119022 [digital image!], isoelectotypes GH barcode 00026676 [digital image!], K barcode 000487113 [digital image!], MO barcode 152332 [digital image!], NY barcode 00137494 [digital image!], NY barcode 00137495 [digital image!], US barcode 00119025 [digital image!], US barcode 00119026 [digital image!], US barcode 00119024 [digital image!]).

Protologue citation:—“Shrub 10–20^{ft} high, growing in cultivated grounds at Estrella, Prov. Cartago, Costa Rica, alt. 4400^{ft}, Apr. 1888, Juan J. Cooper, no. 6007.”

Notes:—J. G. Cooper’s collections are mostly housed in US and NY and John Donnell Smith worked in herbarium US (Stafleu & Cowan 1976). The author mentioned a single gathering in the protologue, however more than one sheet of the type material was found there. So the sheet showing the best quality of preservation of the important diagnostic features of the taxon is here chosen as lectotype (Art. 9.17 of the ICN, McNeill *et al.* 2012, McNeill 2014).

D3) Harold Moldenke

***Duranta armata* Moldenke (1941: 499)**

Type (lectotype, designated here):—PERU. Cuzco, Upa blanca, 1923, *F. L. Herrera 85* (NY barcode 137497 [digital image!], fragment ex B). Epitype (designated here):—PERU. Departamento de Junin, valle del Urubamba, cerca de Yucay, Dic. 1926, *F. L. Herrera 1461* (US No. 1283237!), Fig. 5.

Protologue citation:—“PERU—CUZCO: Upa Blanca, near Cuzco, alt. 3400–3600 m., *Fortunato L. Herrera 85*, TYPE; in the herbarium of the Botanisches Museum at Berlin, received there in February, 1923.”

Notes:—The protologue information of *Duranta armata* says: ‘Upa Blanca, near Cuzco, alt. 3400–3600 m., F. L. Herrera 85. TYPE; in the herbarium of the Botanisches Museum at Berlin, received there in February, 1923’. No material of *Duranta armata* with the given data was found in B. As it is known, a large part of the collections in B was destroyed in 1943 during Second World War and if the specimen was there as indicated by Moldenke in the protologue, it was likely to be among the destroyed material (R. Lücking & R. Vogt, pers. comm.). No other original material was located since there were no duplicates. However, there are fragments removed from the destroyed holotype by Moldenke during his visit to the herbarium in 1936 as well as a photograph of the holotype which had also been taken by him and his wife. Moldenke mentions in the manuscript of the protologue that a photo is housed in NY (it is currently housed there; T. Wendt, pers. comm.) and another in Z (it was not found). The fragments of the holotype are mounted in a herbarium sheet in NY and are labeled as “fragment of type!”. This material is an isotype and in the absence of the original holotype has priority in the designation of a lectotype (J. McNeill, pers. comm.). Thus, the specimen housed in NY is here selected as a lectotype.

Since the fragments cannot be critically identified for purposes of the precise application of the name to a taxon, an epitype is simultaneously designated supporting that lectotype (Art. 9.8 of the ICN, McNeill *et al.* 2012). The specimen above mentioned is here chosen as epitype given its congruence with the description in the protologue.

***Duranta vestita* var. *glabrescens* Moldenke (1947: 364)**

Type (lectotype, designated here):—BRAZIL. Cascata, São Paulo, December 14 1938, *J. Kiehl & A. S. Costa Serra 42081* (NY barcode 00137520 [digital image!]).

Protologue citation:—“The type was collected by J. Kiehl and A. S. Costa Serra [Herb. Inst. Agron. do Estado São Paulo, Secc. Bot. 4027; Herb. Inst. Bot. São Paulo 42081] at Cascata, São Paulo, Brazil, on December 14, 1938 and is deposited in the Britton Herbarium at the New York Botanical Garden.”

Notes:—Moldenke (1947) mentioned two collections in the protologue (syntypes); only one specimen, Kiehl & Costa Serra 4027, is currently housed in NY (NY barcode 00137520 [digital image!]) while the other collection, Kiehl & Costa Serra 42081 (SP barcode 001683 [digital image!]), is housed in SP. The specimen found in NY bears a label that reads “Type!” by Moldneke in 1947, so is here selected as lectotype.



FIGURE 5. Epitype of *Duranta armata* Moldenke kept in US.

D4) Jean Luis Marie Poiret

Duranta buxifolia Poiret (1811: 528)

Type (lectotype, designated here):—[UNITED STATES OF AMERICA]. Saint-Thomas Island, 1797, *M. Ledru 184* (P barcode 00675530 [digital image!], isolectotype P barcode 02886036 [digital image!]).

Protologue citation:—“Cette plante croît à l’île de Saint-Thomas, où elle a été recueillie par M. Ledru.”

Notes:—Jean L. M. Poiret worked in herbarium P (Stafleu & Cowan 1983) where two specimens collected by Ledru,

with original labels were found. For these reasons the specimen showing the best quality of preservation of the important diagnostic features of the taxon was chosen as lectotype (Art. 9.17 of the ICN, McNeill *et al.* 2012, McNeill 2014).

D5) Ignatz Urban

Duranta erecta var. *domingensis* Urban (1912: 355)

Type (lectotype, designated here):—DOMINICAN REPUBLIC. Santo Domingo, 1910, *H. von Türckheim 3210* (BR barcode 0000013485054 [digital image!]).

Protologue citation:—“Hab. in Sto. Domingo prope Constanza 1250 m. alt. in montibus, m. April. flor.: H. Von Tuerckheim n. 3210.”

Notes:—Türckheim’s collections are housed in B where I. Urban worked (Stafleu & Cowan 1986). These collections were mainly destroyed after Second World War and this type specimen was lost. However, there is an isotype housed in BR, so that specimen is here selected as lectotype.

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