

Supplement to the “*Catalogue of Brazilian plants collected by Prince Maximilian of Wied*”

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Background and aims – A supplement list to the “*Catalogue of Brazilian plants collected by Prince Maximilian of Wied*” is supplied, with additions of additional specimens and with corrections and updates of the correct names. This supplement is presented as an electronic appendix to this essay, keeping the original format of the *Catalogue*, as well as the original numbers of the entries that have any sort of changes. The essay itself presents a summary on what has been achieved regarding the Brazilian collections of Wied, in terms of the current holdings of the different herbaria investigated, the available literature, and the information depicted from the labels of specimens and Wied’s travelogue.

Methods – Additional specimens from 23 different herbaria [B, BM, BR, E, F, G, G-DC, GOET, HBG, JE, K, LD, LE, M, MEL, NY, P, PH, S, STR, TO, U, and W] were studied personally, or by checking their holdings available in the internet, or as photographs, digital images received from the curators.

Key results – After the release of the *Catalogue* (2013), 181 additional specimens have been located at the V. L. Komarov Botanical Institute (LE) in Saint Petersburg, along with 249 other specimens attributable to Wied from other herbaria. From these, 44 species not listed in the *Catalogue* have been added here. Lectotypifications for *Calydermos repens* Spreng., *Celastrus quadrangulata* Schrad., *Ethulia involucrata* Nees & Mart., and *Inga ramiflora* Colla are made, as well as the synonymizations of *Calydermos repens* Spreng. under *Centratherum punctatum* Cass., *Acacia lasiopus* Colla under *Piptadenia adiantoides* (Spreng.) J.F.Macbr., *Inga ramiflora* Colla under *Zygia latifolia* (L.) Fawc. & Rendle var. *communis* (Mart.) Barneby & J.W.Grimes. *Panicum vimineum* Schrad. and *P. planotis* Trin. are homotypic synonyms.

Key words – Brazil, historical collections, nomenclature, taxonomy.

INTRODUCTION

Over 200 years have passed since the arrival in Brazil of Maximilian Alexander Philipp (1782–1867), known as Prinz zu Wied-Neuwied (since 1824: or zu Wied; Roth 2001: 139, Hannibal et al. 2009: 5, Myers et al. 2011: 2, Vanzolini & Myers 2015: 17). Wied’s expedition was the first to be undertaken throughout the coastal regions of Rio de Janeiro State, Espírito Santo and Bahia and provided a wealth of botanical material collected by him and his companions, Georg Wilhelm Freyreiss and Friedrich Sellow (Moraes 2011).

Further efforts in searching for the Wied collections in herbaria have proven that they are still a source of specimens overlooked by researchers. Either they are not easily recognizable as material amassed by the Wied expedition, or they are simply stored along with a large number of other speci-

mens held within several botanical institutions, and have yet to be curated. Therefore, our objective here is to update the results obtained after the release of the *Catalogue*, presenting a list of the new specimens located, in an associated appendix that preserves the original format of the *Catalogue*, as well as correcting and clarifying issues in light of these new findings. In this supplement list, fourteen additional holotypes have been located, and 44 additional taxa have been added. What follows is a summary of the botanical achievements from the Wied expedition to Brazil.

MATERIAL AND METHODS

A thorough search for Wied specimens has been conducted by the first author in the general herbarium and herbarium of types of the V. L. Komarov Botanical Institute (LE) in

Saint Petersburg, based on the list of names published in the *Catalogue* (Moraes et al. 2013b). New searches for specimens have been made by curators of BR and M, while other specimens have been located in the databases of herbaria, or from communication by curators, at B, BM, E, F, G, G-DC, GOET, HBG, JE, K, LD, MEL, NY, P, PH, S, STR, TO, U, and W. In the latter case, digital images, or photographs, have been analysed.

RESULTS

How many plants did Wied collect in Brazil?

In Moraes et al. (2013b), 2,741 Wied specimens were located in different herbaria. After the release of the *Catalogue*, another 430 specimens have been located, achieving the updated figure of 3,171 specimens distributed in 140 families, 581 genera, 1,234 species of vascular plants, and 23 families, 37 genera, and 59 species of non-vascular cryptogams. From them, 581 are nomenclatural types. Schrader, Nees von Esenbeck, and Nees von Esenbeck & Martius have described about a third of the new species collected by Wied (195), whereas the various authors that contributed in *Flora Brasiliensis* have described other 141, in a period of sixty years (1840–1906). Still in the nineteenth century, another 176 species were described in different journals, or books, by the same, or by different, authors of the *Flora Brasiliensis*, and 66 were described by Luigi Colla from material sent by Martius (see Moraes et al. 2014). In the twentieth century, only three new species have been described from the Wied collections. In general, most of the gatherings collected by Wied have been verified by specialists and are well determined. However, there are 25 gatherings that remain with status unknown (without any annotation), and about 67 that are still determined just into genus or family.

Where to find Wied's specimens

Currently, Wied specimens (including fragments) from Brazil have been located at B, BAA, BM, BR, C, CTES, E, F, FI, FR, G, G-DC, GOET, GZU, "Herbarium Wied" (see Moraes 2009), JE, K, L, LD, LE, M, MEL, MO, NY, OKLA, P, PH, RB, S, TO, U, US, and W. After the release of the *Catalogue*, other specimens have been located at B, BM, BR, E, F, G, G-DC, GOET, HBG, JE, K, LD, LE, M, MEL, NY, P, PH, S, STR, TO, U, and W (acronyms according to Thiers continuously updated). In table 1, a summary of the number of specimens located in different herbaria is presented.

Where did Wied collect plants in Brazil?

In a detailed account of his expedition to Brazil, Wied-Neuwied (1820, 1821) reported the places, dates, and the itineraries accomplished along the journey. Furthermore, the original maps of the expedition [drawn by Lieutenant Hoffmann and currently housed at the Brasilien-Bibliothek of the Robert Bosch GmbH (Löschner et al. 1988)], along with the updated itinerary published by Bokermann (1957; see also Vanzolini & Myers 2015), and the annotated list of toponyms of the known collections of plants (Moraes 2009), provide a framework for the knowledge of the areas explored by Wied.

Table 1 – Number of specimens of the Wied expedition located in herbaria.

Herbarium	Number of specimens
B	53
BM	31
BR	1,813
G	34
GOET	188
GZU	74
K	45
LD	30
LE	205
M	69
MEL	327
TO	93
W	15
Herbarium Wied	125
Others	69
Total	3,171

Taken from information available on their labels (table 2), the 3,171 specimens located on his expedition belong to about 1,503 different gatherings. Of them, 247 do not inform the provenance of the collection.

Over a four months period in the state of Rio de Janeiro (from 17 Jul. 1815 up to 26 Nov. 1815), the majority of gatherings, 122, were collected in the region of Cabo Frio, and 81 gatherings were collected along the route taken from the capital to Espírito Santo, which was more or less the same path trailed by the couriers to Vitória (see Rocha 1973: 57).

The state of Espírito Santo was crossed by the expedition in little more than a month, from 26 Nov. 1815 till the first days of January 1816, and mainly following the coast. In this part of the expedition, Wied, Freyreiss, and Sellow followed separate paths. Wied and Freyreiss proceeded northwards to Caravelas, leaving Barra de Jucu on 19 Dec. They stayed together until they reached the farm of Morro d'Arara (Mucuri region, Bahia), where Freyreiss decided to return to the Province (Espírito Santo). Freyreiss crossed the Rio Mucuri on 3 Feb. 1816, while Wied went down the Mucuri. Freyreiss rejoined Sellow in the region of Vitória, who stayed there

Table 2 – Localities and number of gatherings made by Wied, from available information on labels of exsiccatae.
Number of gatherings in parentheses.

State	Locality	Number of gatherings
	Barra da Vareda	26
	Belmonte (12) and Rio Belmonte (96)	108
	inter Fazenda Tamburil and Quartel Geral do Valo	42
Bahia	Rio Ilhéus (22), Ilhéus (99), and via Felisbertia (182)	303
	other places: Alcobaça (2), Almada (13), Camamu (1), Caravelas (16), Comechatiba (1), Olivença (6), Porto Seguro (16), region of Poções (3), region of Vitória da Conquista (15), Rio Itaípe (3), Rio Peruaçu (1), São Pedro de Alcântara (6), Trancoso (6), Una (2), valley of Rio de Contas (10), Vila de Porto Alegre (36), Vila Viçosa (25)	162
	not indicated	97
Total Bahia		738
	region of Vitória: Barra de Jucu (Vila Velha; 50), Fazenda Coroaba (9), Pedra d'Ágoa (9), Vitória (5)	73
	Cachoeiro de Itapemirim	18
Espírito Santo	region of Linhares: Rio Doce (39) and Regência (6)	45
	other places: Aldeia Velha (13), Praia Mole (3), São Mateus (2), Vila Nova de Almeida (29), Vila Nova de Benevente (1), inter Rio Doce and São Mateus (1)	49
	not indicated	17
Total Espírito Santo		202
	region of Cabo Frio: Cabo Frio (98), Fazenda de Campos Novos (15), São Pedro dos Índios (2), Vila de São João (7)	122
	region of Campos dos Goytacazes: Campos (26), Rio Bragança (1), Rio Paraíba (35), Abadia de São Bento (7)	69
Rio de Janeiro	other places: Curral de Ubatuba (12), Fazenda de Barreto (8), Fazenda de Muribeca (14), Fazenda de Tapebuçu (15), Itabapuaana (4), Paulista (7), Rio de Janeiro (15), inter Cabo Frio and Espírito Santo (3), inter Campos and Cabo Frio (3)	81
	not indicated	44
Total Rio de Janeiro		316
	not indicated	247
Total		1,503

with part of the troop until June 1816; they met up with Wied again near the Rio Mucuri in September 1816 (Wied-Neuwied 1820, Urban 1906, Papavero 1971, Moraes 2008, 2009). This fact can explain the discrepancies found between the dates on the labels of many of Wied's collections, particularly those from Espírito Santo and southern Bahia, and those documented in his travelogue (Wied-Neuwied 1820, 1821). For these cases, it is plausible to assume that Wied received specimens collected either by Sellow or by Freyreiss, later labelling them as being of his own achievement. Ac-

ording to Moraes et al. (2013a), it is common to find gatherings by Wied, Sellow, and/or Freyreiss for the same species in Herbarium Martii at BR. For the most part, however, only those distributed by Wied include a date (month and year) and specific locality. On the other hand, the collections by Sellow during the expedition with Wied are related to his journey II (1815–1818), when c. 1,800 gatherings were collected from states of Rio de Janeiro, Espírito Santo and Bahia (see Urban 1906, Moraes 2008).

The state of Bahia presents the greatest number of gatherings, with 738 noted. This amount could be expected since Wied spent over fifteen months in Bahia. The majority of these, 303, were collected along the “via Felisbertia”, or near Ilhéus, or along the River Ilhéus.

As pointed out by Moraes et al. (2013b: 23), the “Str. v. C. F. B.” [Strasse von Colonel Felisberto Brant], or “via Felisbertia”, “Waldstrasse”, and “Minas-Strasse”, as indicated by Wied-Neuwied (1821) and from the labels, is the road opened by Tenente-Coronel Filisberto Gomes da Silva, a relative of Marechal Felisberto Caldeira Brant, who had ordered and paid for this enterprise two years before Wied’s travels. This road also linked the harbour of Ilhéus to the border with Minas Gerais and the eastern of village of Rio Pardo (Spix & Martius 1828). Wied left “S. Pedro d’Alcantara” (Itabuna) on 6 Jan. 1817 for “Barra da Vareda”, where he arrived on 30 Jan. 1817, along the road of Captain Filisberto (Wied-Neuwied 1821: 123–160). Wied stayed in “Barra da Vareda” from 31 Jan. to 5 Feb. 1817 and collected 26 plant species from what it is now called the municipality of Inhobim (see Bokermann 1957: 236, Paynter & Traylor 1991a: 292).

The region of “Rio Belmonte”, or “Rio Grande de Belmonte”, i.e. the Rio Jequitinhonha, was explored by Wied from mid-August to 28 Sep. 1816. The farthest place visited upstream of the Rio Jequitinhonha was the “Quartel do Salto”, later called “vila de Salto Grande”, and currently named the municipality of “Salto da Divisa”, on the southern border of Bahia and Minas Gerais. In his narrative, Wied states that he remained in Quartel do Salto for two days, visiting the surroundings, but highlighting his successful achievement of unearthing a skull of a young Botocudo warrior that had been buried in a forest nearby. The labels of specimens collected in this part of the expedition state “Rio Belmonte”, or “Rio Grande de Belmonte”, only. Nevertheless, from Wied’s narrative we are informed that the species *Sebastiania riparia* Schrad. (Schrader 1821: 713), *Ocotea angustifolia* Schrad. (Schrader 1821: 711), and *Schultesia capitata* Schrad. (Schrader 1821: 708), for instance, were collected precisely in the rocks of “corredeira (rapid) Cachoeirinha”, located nearby and upstream at the “Quartel dos Arcos” (later the population of “Cachoeirinha”). This area has since been submersed by the reservoir of the dam of the Itapebi hydroelectric plant, built between 1999 and 2003 (see Sousa 2006).

In the region known as “Sertão da Ressaca”, Wied made collections from “Fazenda Tamburil” (8 Feb. 1817), “Fazenda da Ressaca” (9 Feb.), “Fazenda da Ilha” (10 Feb.), and the “Quartel Geral do Valo”, a former customs post on the border with Minas Gerais, known currently as Valo Fundo. According to Zimmer (1955: 10–11) and Paynter & Traylor (1991a: 345), Valo Fundo is located in Lavrador, in the municipality of Piripá. In Valo, Wied stayed for at least eight days, but he did not enter into Minas Gerais (Wied-Neuwied 1821: 193): “Having spent many days in the borders of Minas, an indisposition due to the climate, and that could have worsened if I were careless, forced me to give up the project of entering in the province”. Several of the specimens on which labels just read “campos”, or “certão”, most likely belong to this part of the expedition. Regarding the “Fazenda Tamburil”, Bokermann (1957: 236) refers to it as possibly being located

at the municipality of Condeúba. However, as pointed out by Paynter & Traylor (1991b: 644), it would be located within the municipality of Tremedal, which seems to be more plausible than Condeúba as is situated considerably farther westward from Valo Fundo (see also Rocha 2013).

What is still missing?

The estimated number of 5,000 specimens collected by the Wied expedition in Brazil (see Kuhn 1991) can be taken as a real figure since 3,171 of them have been located so far. Considering that the holdings of the many herbaria that possess Wied specimens have just been partially scrutinized (except for BR and M, whose searches have been more thoroughly and specifically conducted on this topic), it is simply a matter of time before more specimens are unearthed by curators and researchers of different groups of plants. It is also important to highlight the fact that many of those specimens were destroyed during WWII in Berlin, Giessen, and Vienna, for instance. Zepernick (1995: 242) pointed out that about 100 Wied specimens would have been at the Botanical Museum Berlin-Dahlem (B) before the Anglo-American bombing on 1 Mar. 1943. In spite of that, at least 53 Wied specimens have survived at B, and are listed in the *Catalogue*. Of fundamental importance is the information given by Hiepko (1987) that in 1855 a part of the herbarium of Nees von Esenbeck was acquired, amassing nearly 10,000 species of Cyperaceae, Juncaceae, Poaceae, and Restionaceae. From this, it is highly plausible to assume that many of the specimens cited by Nees von Esenbeck for these families, and that are still missing, would be part of the material destroyed during the war.

Of the 128 specimens cited in literature that remain not located, 32 are nomenclatural types, mainly the names published by Schrader or by Nees von Esenbeck & Martius:

- Allagoptera pumila* Nees (Nees von Esenbeck 1821a: 296, 1821b: 328);
Anemia incisa Schrad. (Schrader 1824: 865);
Anemia obliqua Schrad. (Schrader 1824: 864);
Aruba alba Nees & Mart. (Nees von Esenbeck & Martius 1823b: 174, t. 28);
Canna platyphylla Nees & Mart. in Schultes (1822: 66a);
Canna reflexa Nees & Mart. in Schultes (1822: 66a);
Casselia integrifolia Nees & Mart. in Wied-Neuwied (1823: 76, t. 6, fig. B);
Chloris fasciculata Schrad. in Schultes (1824: 339);
Dichorisandra gracilis Nees & Mart. in Wied-Neuwied (1823: 14, t. 1, fig. 3);
Gomphia semiserrata Nees & Mart. in Wied-Neuwied (1824: 41);
Gynerium parviflorum Nees (Nees von Esenbeck 1829: 463);
Isolepis congesta Schrad. in Schultes (1824: 70);
Isolepis glaucescens Schrad. in Schultes (1824: 68);
Isolepis hirtella Schrad. in Schultes (1824: 70);
Isolepis trichoides Schrad. in Schultes (1824: 64);
Kyllinga caespitosa Nees (Nees von Esenbeck 1842: 12);
Lebretonia latifolia Nees & Mart. (Nees von Esenbeck & Martius 1823a: 98);
Mangliilla brasiliensis Nees & Mart. in Wied-Neuwied (1823: 86);

Mariscus longus Schrad. ex Nees (Nees von Esenbeck 1842: 44);
Millingtonia clematis Schrad. (Schrader 1821: 712; it remains an unplaced name);
Paspalum millegrana Schrad. in Schultes (1824: 175);
Petrea denticulata Schrad. (Schrader 1821: 712; it remains an unplaced name);
Protium aromaticum Engl. (Engler 1874: 273);
Psidium inaequilaterum O.Berg (Berg 1857: 399);
Sida denudata Nees & Mart. (Nees von Esenbeck & Martius 1823a: 100);
Styrax ferrugineum Nees & Mart. in Wied-Neuwied (1823: 88);

and of the following cryptogams:

Cladonia pityrea (Flörke) Fries var. *furfuracea* Eschw. in Martius (1833: 267);
Lejeunea gottscheana Lindenb. in Gottsche et al. (1845: 382);
Parmelia damaecornis (Sw.) Eschw. var. *quercifolia* Eschw. in Martius (1833: 215);
Sphaerococcus dumosus Mart. (Martius 1833: 39);
Sphaerococcus maximilianii Mart. (Martius 1828: 8, t. 4);
Sphaerococcus micrococcus Mart. (Martius 1833: 39).

Of the cryptogams and algae, 42 of them are still not located. As reported by Moraes et al. (2013b), Wied (1850, 1853) indicated that he had sent 34 species of algae collected in Porto Seguro to Frans K. Mertens, who had identified them. Monika Steinhof (Übersee-Museum Bremen,

Germany, pers. comm.) has examined the collections of algae in BREM, which holds material of Herbarium Mertens, but she stated that the algae had been neglected there for a long period, and that the specimens are poorly labelled, i.e. they usually have a name given to the specimen, but without further information about the gathering, or there are materials with the classical annotation that they are from Brazil (“e Brasilia”), and nothing else. However, as indicated by Stafleu & Cowan (1981), specimens of the Herbarium of Mertens can be found in LE and PC (types of algae), where no search for them has been undertaken yet. Regarding the bryophytes, Sayre (1977: 520) informed that Wied material can be found in STR-Nees, which is also quoted by Stafleu & Cowan (1981), who detailed that the fungi, lichens and hepaticae of the Herbarium of Nees von Esenbeck are at STR, which is another herbarium that has not been scrutinized yet (see Frahm 2009), though Wied has not been listed as a collector represented in STR by Hoff et al. (2012).

In several passages from the diaries of Wied’s memorable journey between Rio de Janeiro and Bahia (Wied-Neuwied 1820, 1821), he reported many of the plants found or observed on those occasions, naming some of them at least up to the genus. These books are decorated by numerous drawings, which were based on original pictures made by Wied. However, as pointed out by Röder (1954, 1955a, 1955b, 1969), “[t]he original pictures possess high scientific value, but they have suffered in the rendition. Some were retouched by his brother Charles and his sister Luise, not to mention the engravers”. In several of his original drawings, currently



Quäcke schießt unter Simonis Anleitung den großen Schmetterling
Im Januar 1817.

Figure 1 – Watercolour made by Wied in January 1817 showing a scene in “via Felisbertia”. Wied portrayed the Botocudo Quäcker, under Simonis instructions, shooting the “big butterfly”. In the travelogue, Wied described the scene and identified the species as “*Phalaena agrippina*”, the white witch moth – *Thysania agrippina* (Cramer, 1776). Among the tropical plants decoratively placed side by side, a species of *Heliconia* stands on the far right. The fat-trunked tree is seemingly a “Mamão-do-mato”, *Jacaratia spinosa* (Aubl.) A.DC., which is also mentioned by Wied in the travelogue, in the beginning of the trip from São Pedro de Alcântara (Itabuna) to Barra da Vareda (Inhobim). Illustration from Löschner et al. (2001).

held by the Brasilien-Bibliothek of the Robert Bosch GmbH (Löschner et al. 1988, 2001), Wied sketched such plants like the *Heliconia* L. (fig. 1), which can be recognized at first glance. In the same figure, the peculiar fat-trunked tree, where the “big butterfly” is perched, is most likely the tree of “Mamão-do-mato”, *Jacaratia spinosa* (Aubl.) A.DC. Although this was mentioned by Wied in the travelogue (Wied-Neuwied 1821: 126) from the beginning of the trip from São Pedro de Alcântara (Itabuna) to Barra da Vareda (Inhobim), specimens of the tree and the *Heliconia* have not been located up till now. The same happens for groups like the Bromeliaceae and Cactaceae, which have been also quoted and/or drawn by Wied in several instances, but the material for only three of these species have been located so far.

SUPPLEMENTARY DATA

Supplementary data are available in pdf at *Plant Ecology and Evolution*, Supplementary Data Site (<http://www.ingentaconnect.com/content/botbel/plecevo/supp-data>), and consist of a supplement list to the “*Catalogue of Brazilian plants collected by Prince Maximilian of Wied*”. In this list, lectotypifications for *Calydermos repens* Spreng., *Celastrus quadrangulata* Schrad., *Ethulia involucreta* Nees & Mart., and *Inga ramiflora* Colla are made, as well as the synonymizations of *Calydermos repens* Spreng. under *Centratherum punctatum* Cass., *Acacia lasiopus* Colla under *Piptadenia adiantoides* (Spreng.) J.F.Macbr., *Inga ramiflora* Colla under *Zygia latifolia* (L.) Fawc. & Rendle var. *communis* (Mart.) Barneby & J.W.Grimes. *Panicum vimineum* Schrad. and *P. planotis* Trin. are included as homotypic synonyms.

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