

# Hidden treasures: Brazilian plants collected by Prince Maximilian zu Wied held in the National Herbarium of Victoria (MEL)

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## Abstract

The ‘discovery’ at MEL of some of the earliest extant herbarium specimens known from Brazil is detailed. The history and significance of 325 specimens collected by M.A.P. zu Wied in 1815–1817 is outlined and used to illustrate the value and relevance of the largely uncurated Sonder herbarium and wider foreign collection at MEL.

**Key words:** Sonder herbarium, Wied-Neuwied, Brazil

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## Introduction

Maximilian Alexander Philipp, Prinz zu Wied-Neuwied (1782–1867; zu Wied as of 1824 (Roth 2001)) was one of the first European naturalists to visit Brazil when he explored the south-eastern regions in 1815–1817. Wied was a major in the Prussian army but his passions were ethnology and the natural sciences (Moraes 2009). Whilst in Brazil, Wied made extensive field notes and observations on indigenous South Americans and gathered a wealth of ethnological, zoological and botanical specimens. Despite being relatively well known for his ethnological and zoological studies, Wied’s contributions to botany have, until recently, received less attention. Recognition is long overdue: Wied’s botanical specimens are amongst the earliest extant collections from Brazil and are a precious record of the Atlantic rainforest flora of Rio de Janeiro, Espírito Santo and Bahia (Moraes 2009).

Wied gathered an estimated 5000 specimens of 1000 plant species in Brazil (Kuhn 1991). After failing to attract a buyer for his complete herbarium in 1824 (Eichler 1869), he sold and donated the collection in numerous lots. Karl Friedrich Philipp von Martius purchased a set of 650 specimens in 1828 (Eichler 1869); this material is now part of Herbarium Martii at the National Botanic Garden of Belgium (BR; herbaria are henceforth referred to by *Index Herbariorum* codes (Thiers 2013)). Wied donated approximately 600 specimens to his former professor Heinrich Adolf Schrader in Göttingen (Martius 1837); this material is now held in GOET, LE and W. Other sets ended up with Christian Gottfried Daniel Nees von Esenbeck (now held at B, G, GZU, LE and STR (Moraes et al. 2013b)); Karl Sigismund Kunth (now at B, but partly destroyed during the Second World War; Hiepko 1987; Moraes 2011) and Otto Wilhelm Sonder (primarily at MEL, with small quantities at M and S). Wied also retained specimens in his own private herbarium (Herbarium Wied); this material was presumed

lost until it was rediscovered in the library of the Palace of Neuwied in 1998 (Moraes 2009). Other duplicates and fragments are widely scattered across herbaria including BAA, BM, C, CTES, E, F, FI, FR, JE, K, L, LD, M, MO, NY, OKLA, P, S, TO, U and US (Moraes et al. 2013b).

A comprehensive survey of the literature and herbaria by Moraes et al. (2013b) has located 2741 specimens collected by Wied, with these representing 1274 species. The present study is focussed on the material held at MEL. This material had been largely overlooked until Moraes contacted the Collections Manager in June 2008, originally in pursuit of Friedrich Sellow specimens. Moraes suspected that MEL might hold Wied specimens; a search of the Lauraceae confirmed this and thus began a five-year quest.

## Methods

This study was part of a larger project that involved combing the literature and searching for specimens at herbaria including B, BR, FR, G, GOET, GZU, LD, M, TO, W and Herbarium Wied.

Approximately 70 families at MEL were systemically scoured. Families that are well-represented in the flora of south-eastern Brazil were prioritised, as were those with a high proportion of mounted material. Specimens were verified based on the original labels and annotations, and comparison with material held in other herbaria; this process is discussed in further detail later.

The early part of the collaboration was conducted entirely by e-mail. Progress was initially relatively slow due to challenges with recognising Wied specimens and the time required to extract, database and photograph material, examine images and compile notes, transfer comments onto annotation slips and update database records. Work was greatly expedited when Moraes spent three weeks at MEL in July 2011. Even so, a major limiting factor in this study was the arduous process of searching for specimens: trawling through thousands of folders of unmounted material, painstakingly ensuring that the arrangement of folders was preserved so as not to corrupt the relationship between loose specimens and labels. Specimens were often filed under synonyms or in indeterminavit folders, thus precluding targeted searches.

Specimen details are listed in full by Moraes et al. (2013b) and are thus not repeated here. Specimen data

can be accessed via Australia's Virtual Herbarium (<http://avh.chah.org.au>). Images of the specimens will also eventually be available online via JSTOR Global Plants (<http://plants.jstor.org>).

## The Sonder herbarium

Wied's specimens came to MEL as part of the vast private herbarium of Otto Wilhelm Sonder (1812–1881). The Victorian government purchased the bulk of Sonder's herbarium in 1883, following a 24-year campaign by Government Botanist Ferdinand von Mueller (Short 1990).

A pharmacist and botanist, Sonder was extraordinarily energetic in his professional endeavours: he was the proprietor of a leading pharmaceutical establishment in Hamburg, a member of the medical board, an accomplished botanist and phycologist, and an avid collector and trader of botanical specimens (Short 1990). Mueller and Sonder established a correspondence sometime before 1858 (Home et al. 1998) and continued to exchange letters, books and specimens until Sonder's death in 1881. Unfortunately, few of their letters survive; much of Mueller's substantial archive of papers and correspondence disappeared, most likely disposed of when MEL was transferred to a new building in 1934–35 (Short 1990). Sonder's papers were destroyed in the aftermath of the Second World War (Home et al. 1998).

Regarded as 'the richest of all private botanical collections in existence' (Mueller 1859), the Sonder herbarium spans all major plant groups, algae and fungi. Mueller variously estimated it to comprise between 250,000 and 330,000 specimens (Mueller 1891, 1892). Such was the size of the collection, a new annexe had to be built at MEL to house it (Short 1990). The Sonder herbarium still accounts for the majority of MEL's estimated 400,000 foreign specimens. It includes important early 19th-century collections from tropical South America, Australia and southern Africa. Of particular note from South America are specimens cited in Martius' *Flora brasiliensis*, including material collected by F. Sellow, L. Riedel, A.F. Regnell, J.F. Widgren and Martius himself.

Mueller had a long-standing agreement with Sonder to purchase the herbarium for £1000 or ten instalments of £120 (Short 1990). Alas, aside from funding a single instalment (comprising three cases of specimens) in

1869, the Victorian government remained indifferent to Mueller's repeated propositions (Short 1990). Mueller persisted, and in 1882 finally triumphed in securing £900 for the balance of the Sonder herbarium. In the meantime, however, N.J. Andersson had approached Sonder seeking to purchase the collection for the Swedish Museum of Natural History (S; Nordenstam 1980). Fortunately for Mueller, Andersson was unable to raise the capital for the entire collection, and instead secured only Sonder's prized South African collection (Nordenstam 1980). Intriguingly, the Sonder collection at MEL is rich in South African specimens, suggesting that Sonder may not have been wholly truthful in his assurances to Andersson that the collection was fully intact (Nordenstam 1980). As noted by Nordenstam (1980), Sonder may well have separated duplicates and fragments for Mueller and/or himself when he sorted through his South African herbarium before shipping it to S in 1875. An alternative explanation, as suggested by Short (1990), is that much of the South African material at MEL derives from the three cases of specimens that arrived in 1869. Closer investigation may resolve this mystery.

Mueller took delivery of 38 cases of Sonder material on 13 November 1883 (Mueller 1883). The collection arrived without an accompanying inventory and is yet to be fully documented. Soon after receiving the material, Mueller flagged his intention to prepare 'a fuller account of the contents of this large collection' (Mueller 1883). Alas, no such record has been located. The only published accounts of the Sonder collection are very general (Court 1972), concerned primarily with the history of its acquisition (Short 1990), or limited to a particular taxonomic group (e.g. Anderson 1971). Efforts to survey and document the collection are hindered by the sheer volume of material and the relatively inaccessible state of the specimens: less than 15 per cent are mounted and databased. Most of the material is still stored much as it was when it arrived at MEL 130 years ago: in bundles of intricately interleaved paper folders containing loose specimens with loose labels. This lack of documentation and poor accessibility mean that MEL's foreign collection is not well known within the international botanical community.

## The Wied collection at MEL

Little is known as to how and when Sonder acquired Wied's specimens. Wied began distributing material to botanists such as Schrader, Nees and Martius soon after he returned from Brazil in 1817. It is possible, but unlikely, that Sonder received specimens directly from Wied. As noted by Eichler (1869), Wied first offered his collection for sale in 1824, at which time Sonder was just 12 years old. Specimens at BR indicate that Wied continued to send material to Martius until 1839. However, Sonder did not establish his pharmacy until 1841 (Stafleu & Cowan 1985) and is thus unlikely to have had the means to acquire collections such as Wied's before then. More plausible is that Sonder obtained the Wied specimens through other channels at a later date. Sonder became very well-connected in the commercial trade of botanical specimens: as well as purchasing collections for himself, he acted as an agent to procure specimens on behalf of others (Nordenstam 1980). He also regularly loaned and exchanged material with a wide range of prominent botanists (Nordenstam 1980). Given that Berg (1857) cited Wied specimens as 'Herb. Sonder' in his account of the Myrtaceae in the *Flora brasiliensis*, Sonder evidently obtained at least some of the Wied material well before 1857.

A search of more than 70 families at MEL has so far yielded 325 Wied specimens, spanning 150 genera and 259 species of vascular plants. Of particular note are 145 type specimens, including several unicates, e.g.:

- MEL 2353741 – Holotype of *Stenocalyx sulcatus* var. *strictus* O.Berg, *Fl. Bras.* 14(1): 339 (1857) = *Eugenia sulcata* var. *stricta* (O.Berg) Mattos (Myrtaceae; fig. 1).

Also of note are duplicates of specimens that were destroyed by fire when the Botanical Museum in Berlin (B) was bombed by the allied forces on the night of March 1–2, 1943 (Hiepko 1987), e.g.:

- MEL 2062015 – Lectotype of *Zollernia falcata* Wied-Neuw. & Nees = *Z. glabra* (Spreng.) Yakovlev (Fabaceae)
- MEL 289020 – Isolectotype of *Zollernia splendens* Wied-Neuw. & Nees (Fabaceae)
- MEL 2353844 and MEL 2353845 – Syntypes of *Evolvulus maximilianii* Mart. ex Choisy (Convolvulaceae)
- MEL 2353782 – *Anthurium intermedium* Kunth (Araceae)

At least one specimen represents a new record: *Neomarica humilis* (Klatt) Capell. has not previously been recorded from Bahia (Capellari Jr. 2000; Gil 2012). Two specimens located at MEL are the first (and possibly only) verifiable record of this species from Bahia, and are thus a compelling example of the importance and enduring value of Wied's collections:

- MEL 2355228 – Holotype of *Cypella humilis* Klatt, *Linnaea* 31: 540 (1862) = *Neomarica humilis* (Klatt) Capell. (Iridaceae; fig. 2)
- MEL 2355229 – Isotype of *Cypella humilis* Klatt = *Neomarica humilis* (Klatt) Capell. (Iridaceae)

These specimens also present an interesting nomenclatural case. The original label on MEL 2355228 is annotated by Nees with 'Moraea Northiana v.  $\beta$  breviscapa N. ab E'. Nees and Martius (Wied-Neuwied 1823) somewhat ambiguously describe 'Moraea northiana var. scapo foliis brevior, spathis unifloris' and propose the name *Moraea breviscapa* should the taxon be deemed a species in its own right. However, under article 36.1 of the *International Code of Nomenclature for algae, fungi, and plants* (McNeill et al. 2012), this does not constitute valid publication of the name *Moraea breviscapa*. Klatt's (1862) subsequent publication of *Cypella humilis* Klatt is thus valid.

The specimens at MEL are richly documented with Wied's original labels. Paradoxically, recognising Wied specimens was a challenge in the early stages of the study. Wied's labels tend to be either scrawled in pencil or (relatively) neatly penned in ink. The former vary in format, detail and legibility (at least to the uninitiated; figs. 8b–d and f). The latter are more distinctive (and legible) and typically include more detail (figs. 8a and j). Aside from Wied's own labels, there is a remarkable array of other labels and annotations, including specimens labelled by Sonder (fig. 8g) and/or annotated by Martius (figs. 8e and h), Berg (fig. 8a), Nees (fig. 8b), Klatt (fig. 8b), Koernicke (fig. 8g) and others.

Wied is not explicitly designated as the collector on almost two thirds of the sheets at MEL; these specimens can only be recognised based on the handwriting, localities, and/or annotations by botanists such as Berg and Martius. Where Wied is indicated on the label, he is variously denoted as Neovid., Neowied., Neuwied, Princ. Neovidensis, Prinz Max. v. Neuwied and

variations thereof. Wied numbered a small proportion of specimens himself, but for some reason, most of these numbers have been crossed out. Several specimens have been numbered by Schrader (fig. 7) and Nees.

The collecting locality is specified on approximately half of the specimens at MEL, but is sometimes heavily abbreviated (e.g. Str.d.C.F.B. = Straße des Colonel Felisberto Brant, a road linking Ilhéus with Minas Gerais. Wied travelled from 'S. Pedro Alcantara' (Itabuna) to 'Barra da Vareda' (Inhobim) (Wied-Neuwied 1821)). Although Wied's itineraries have been well-documented by Wied himself (Wied-Neuwied 1820, 1821) and others (e.g. Urban 1906; Bokermann 1957), there are occasionally discrepancies between the localities and dates recorded on the labels and those documented in Wied's own itineraries (Moraes et al. 2013b). Certain localities can be regarded as exclusive toponyms, in that they were not visited by any other European collectors in the early 19th century (e.g. 'Aldea Velha', 'Barra de Jucu', 'Campos Novos', 'Itapemirim', 'Moribeca', 'Mucuri', 'Rio Belmonte', 'Rio Doce' and 'Tamburil and Valo'; Moraes et al. 2013a).

Online resources such as JSTOR Global Plants were invaluable for accessing images of specimens held in other herbaria. However, the value of such resources was only fully realised when images were accompanied by a transcribed and translated record of the label information. Unfortunately, only a small minority of records include this level of detail. There is enormous scope for online resources to become a powerful tool to aid curators to recognise handwriting, decipher and translate labels, interpret localities and georeference specimens.

Despite encompassing just over half of the total number of families collected by Wied, this study indicates that the material at MEL represents the second most comprehensive set of Wied specimens, eclipsed only by the Herbarium Martii at BR. This is nicely exemplified in both the Myrtaceae and Eriocaulaceae. In his account of the Myrtaceae for the *Flora brasiliensis*, Berg (1857) cited Wied specimens for 31 species; 23 have so far been found at MEL, 18 of which are nomenclatural types. Only three of these have been recognised previously (Anderson 1971). In the Eriocaulaceae, Koernicke (1863) cited 20 Wied specimens in the *Flora brasiliensis*; 18 have been located at MEL and all but one are known only from MEL.



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**Figure 1.** MEL 2353741 – Holotype of *Stenocalyx sulcatus* var. *strictus* O.Berg. [Rio de Janeiro, M.A.P. zu Wied s.n.], Sept. 1815. See fig. 8a for label detail and transcription. All images reproduced with permission from the National Herbarium of Victoria (MEL), Royal Botanic Gardens Melbourne.



**Figure 2.** MEL 2355228 – Holotype of *Cyrella humilis* Klatt. [Bahia:] Capo da Filisberto [via Felisbertia], M.A.P. zu Wied s.n., s.d.  
See fig. 8b for label detail and transcription.



**Figure 3.** MEL 2331220 – *Cocoloba arborescens* (Vell.) R.A.Howard (Polygonaceae). [Rio de Janeiro: between] St. Juan [= San João] – Rio dos Oistres [= Rio dos Ostras, *M.A.P. zu Wied s.n.*, Sep 1815]. See fig. 8c for label detail and transcription.



**Figure 4.** MEL 2341135 – *Alsodeia physiphora* Mart. = *Rinorea laevigata* (Sol. ex Ging.) Hekking (Violaceae). [Rio de Janeiro: Fazenda de] Campos Novos [= Tamoios] et Rio Jo. [= Rio de Janeiro, M.A.P. zu Wied s.n., Sep. 1815]. See fig. 8d for label detail and transcription.





**Figure 5.** MEL 2353803 – *Adenocalymma trifoliatum* (Vell.) R.C.Laroche (Bignoniaceae). [Bahia:] Str d Capt. Filisbert. [= Straße des Capitam Filisberto Gomes da Silva, M.A.P. zu Wied s.n., Jan 1817]. See figs. 8e–f for label detail and transcription.



**Figure 6.** MEL 2353747 – Syntype of *Paepalanthus fluitans* Mart. ex Körn. = *Leiothrix fluitans* (Mart. ex Körn.) Ruhland (Eriocaulaceae). Brazil. M.A.P. zu Wied s.n., s.d. See fig. 8g for label detail and transcription.



**Figure 7.** MEL 2353799 – *Pyrostegia venusta* (Ker Gawl.) Miess (Bignoniaceae). [Bahia:] R.B. [= Rio Belmonte, M.A.P. zu Wied s.n., 1816]. See figs. 8h–j for label detail and transcription.



**Figure 8.** Label detail. **a.** MEL 2353741. Scrispiti Wied: "19./ Eugenia/ Sept. 1815/ Buschbaum von 10–12 f. [= shrubby tree of 10–12 ft]". Scrispiti Berg: "Stenocalyx sulcatus  $\gamma$  strictus Bg./ Martius"; **b.** MEL 2355228. Scrispiti Wied (in pencil): "Ist der [...] / Str[aße] d[es] Capt. Filisbert." Scrispiti Nees: "Moraea Northiana v.  $\beta$  breviscapa". Scrispiti Klatt: "Cypella humilis (Marica humilis Lodd., Bot. Cab. 1081." Scrispiti Sonder: "(Nees ab Esenb.)/ Max. Prinz. v. Neuwied/ Capo Fili[s]berto/ Brasil"; **c.** MEL 2331220. Scrispiti Wied: "Pentand[ria] monogynia/ zwisch[en] St. Juan – Rio dos Oistres/ Bl[ume] weißgelblich [= flower whitish-yellow]"; **d.** MEL 2341135. Scrispiti Wied: "Alsodeia – Violaceae/ Pentand[ria] monogyn[ia]/ Campos novos et Rio Jo./ Capsula tricocca/ A. physiphora Mart. [...]"; **e.** MEL 2353803. Scrispiti Martius: "Adenocalymna longiracemosum  $\beta$  trichocladum"; **f.** MEL 2353803. Scrispiti Wied: "Bignonia/ Str[aße] d[es] Capt. Filisbert?"; **g.** MEL 2353747. Scrispiti Sonder: "Brasilia/ Prz. M. v. Neuwied". Scrispiti Koernicke: "Paepalanthus (Lophophyllum) fluitans Mart"; **h.** MEL 2353799. Scrispiti Martius: "Bignonia venusta Ker/ videtur./ DC. n. 88"; **i.** MEL 2353799. Scrispiti Wied: "Schrader Bignon./ No. VI +"; **j.** MEL 2353799. Scrispiti Wied: "Schlingende Pfl./ mit hoch Orangen/ farbiger Blumen/ R.B. [= twining plant with highly orange colored flowers/ Rio Belmonte]".

All of the specimens found so far at MEL are vascular plants. Wied is known to have collected cryptogams, but these specimens are poorly documented in both the literature and herbaria. The Sonder herbarium is rich in cryptogamic material; if any of Wied's cryptogamic specimens have survived, they are quite possibly at MEL. However, partial searches of the bryophyte, lichen and Rhodophyta collections have so far failed to yield any specimens.

Based on the findings to date, MEL is likely to hold Wied specimens of a further 100 species.

## Conclusion

This study has delivered several noteworthy outcomes. First and foremost, the Wied specimens unearthed at MEL are fully accessible to researchers for the first time in almost 200 years. These specimens are a precious record of the Atlantic rainforest flora of south-eastern Brazil in the early 19th century. Far from being a mere historical curiosity, this material is directly relevant to current research and conservation efforts. In particular, the high proportion of types means that the Wied collection at MEL is essential to taxonomic studies of the Brazilian flora.

Secondly, the curated specimens will facilitate the recognition of further Wied material, both at MEL and elsewhere. Because the MEL specimens are so well-documented with original labels, they are an invaluable reference to aid curators to recognise and decipher Wied's labels. Many of the specimens held in other herbaria bear labels and/or annotations from Martius, Schrader, Nees, Wilhelm Klenze (Klaenze) and Karl Theodor Mencke (Menke), and have been wrongly attributed to these botanists in both the literature and herbarium databases. Already, MEL material has been instrumental in disentangling such misinterpretations (e.g. Moraes et al. 2013a, 2013b).

Thirdly, this study highlights the value of international collaboration in curating historical collections. More specifically, this investigation demonstrates the benefits of engaging a knowledgeable external botanist or curator to survey and assess specimens in partnership with the custodian collection's staff. In this respect, this study could serve as a model for future projects targeting specific components of MEL's foreign collection. Such projects would essentially function as reconnaissance

missions to identify significant but cryptic specimens and equip collections staff with the knowledge and resources necessary to curate specimens accurately and efficiently.

Finally, this study is a small step towards uncovering and documenting the hidden riches of the Sonder collection at MEL. Perhaps more than anything, it provides a tantalising promise of other significant, but as yet undiscovered, material.

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