

The collection of letters addressed to D.F.L. von Schlechtendal in the University herbarium in Halle (Saale), Germany (HAL)

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D.F.L. von Schlechtendal (1794–1866) was one of the most important botanists of the 19th century. From 1833 to 1866 he was professor of botany at the University Halle-Wittenberg, where his collection of some 70 000 plant specimens is kept. Schlechtendal described more than 1600 new taxa, including 78 genera, mostly from the New World. Schlechtendal's dense network of scientific contacts is documented by his correspondence, comprising some 5600 letters he received from about 500 persons, including many famous contemporary botanists, natural scientists, travelers and plant collectors. The letters mostly refer to publications and scientific questions concerning the journals ‚Linnaea‘ and ‚Botanische Zeitung‘ edited by Schlechtendal. In particular, the letters of scientists dealing with African, Central and South American, and Australian plants are an important source of taxonomic information. The letters are mostly written in the old German Kurrent script, the ink is fading and the paper is disintegrating. We therefore have started to transliterate all letters (54 % completed), index and digitize them and make them available online. Here we explain their importance, highlighting letters dealing with the plants from Humboldt's and Bonpland's travels and from the correspondence with R.A. Philippi (Chile, 1808–1904) and H. Christ (Switzerland, 1833–1933).

The University Halle-Wittenberg emerged in 1817 under Prussian rule from the union of the University ‚Leucorea‘ founded in Wittenberg (Electorate of Saxony) in 1502 and the Friedrichs University founded in Halle (Electorate of Brandenburg) in 1694. The University herbarium in Halle (Index Herbariorum acronym: HAL) was also founded during this period. Director of the herbarium from 1833 was Diederich Franz Leonhard von Schlechtendal (1794–1866), who worked as professor of botany and director of the botanical garden until his death and was one of the most important botanists of the 19th century (Fig. 1). In the course of his scientific activity, Schlechtendal described and named for the first time about 1600 new plant taxa (genera, species, etc.), most of them from Central and South America (Heklau 1998, Heuchert et al. 2017).

Before his appointment as professor in Halle, he had served as first curator of the Royal Herbarium in Berlin (1819–1833) since his University education. Numerous sources show how he worked intensively throughout his life to increase the plant collections of the University Halle-Wittenberg. Above all, Schlechtendal acted through communication with renowned collectors and scientists on all continents, whom he asked for plant material, mostly in connection with scientific publications in the very important journals ‚Linnaea‘ (from 1826) and ‚Botanische Zeitung‘ (from 1843), which he edited and published, and in which very many descriptions of new plant species and genera were published. Schlechtendal showed great skill in this, so that

Keywords

Botany, Herbarium Halle, Letters, Linnaea, *Pinus halepensis*, *Pinus maritima*, Scientific publishing

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Accepted

19. 9. 2023

DOI

<https://doi.org/10.12685/bauhinia.1350>



Fig. 1. Diederich Franz Leonhard von Schlechtendal. Photography from around 1866.

Schlechtendal has his hand on a volume of the journal ‚Linnaea‘ he published and edited, which is written in capital letters on the spine. Original photograph is kept in the herbarium of the University Halle-Wittenberg.

in this way extremely important plant collections from Central and South America, Australia and Africa came to Halle.

Herbarium Halle under Schlechtendal's Directorship

Halle also owes Schlechtendal duplicates of numerous plant specimens from Berlin, his former place of work. This transfer of herbarium specimens from Berlin to Halle was actually born out of necessity. Schlechtendal was used to having a rich and well-organized herbarium for his scientific work in Berlin, which was not the case in Halle, especially because the important private plant collection of his predecessor in Halle, Kurt Polykarp Joachim Sprengel (1766–1833), could not be purchased for the University herbarium. The catalog of the University herbarium of 1825 contained only 4300 species. Shortly after taking office, Schlechtendal complained in a letter to the management of the University that the existing collection was „so astonishingly meager and deficient” and „does not remotely meet the requirements that one is entitled to make of such a collection in the present time” (Werner 1955: 775). Among other things, he suggested to ask the ‚Königliche Pflanzensammlung’ in Berlin for duplicates, whereupon in the following years more than 1600 plant specimens arrived, among them many from the Willdenow herbarium. Carl Ludwig Willdenow (1765–1812) was director of the Royal Botanical Garden in Berlin from 1801 and one of the formative botanical research personalities of his time. In addition, Schlechtendal was also bequeathed an extremely extensive private herbarium by his father, Diederich Friedrich Karl von Schlechtendal (1767–1842), which also contained many specimens from the Willdenow collection, including in particular specimens from Alexander von Humboldt's and Aimé Bonpland's American voyage (1799–1804) (cf. Tkach et al. 2016, 2019).

Slechtendal's private herbarium, which was sold to the University Halle-Wittenberg after his death by his widow in 1867, comprised about 70 000 specimens in the ordered part alone. Also sold to the University was Schlechtendal's extensive library of botanical works, which had been described by Heinrich Gustav Reichenbach (1824–1889) as the best private botanical library in Germany (Reichenbach's letter of 28 September 1861 in the Schlechtendal correspondence collection in HAL).

The herbarium of Schlechtendal formed the basis of the present herbarium of the University Halle-Wittenberg. It is very rich in type specimens, including not only those of the species newly described by Schlechtendal himself, but also those of many other botanical authors, including G. Bentham, P.E. Boissier, R. Brown, A.P. de Candolle, A. von Chamisso, C.F. Ecklon, A. Gray, A.H.R. Grisebach, C.F.F. Hochstetter, J.D. Hooker, K.S. Kunth, G. Kunze, J.J.H. Labillardière, C.F. von Ledebour, C.F. Lessing, C.F.P. von Martius, E.H.F. Meyer, F. Miquel, F.J.H. Mueller, C.G.D. Nees von Esenbeck, P.S. von Pallas, E.F. Poeppig, C. & J. Presl, H.G.L.

Reichenbach, A. Richard, C. Schkuhr, C.P.J. Sprengel, E.G. Steudel, C.L. Willdenow, C.L.P. Zeyher.

Funded by the ‚Global Plant Initiative‘ of the Andrew W. Mellon Foundation in the USA, type specimens and their associated data could be indexed and digitized to a large extent within the framework of a long-term project from 2008–2017. Currently, more than 15 250 type specimens have been identified and processed, which are available as part of the databases ‚JACQ Virtual Herbaria‘ and ‚JSTOR Global Plants‘ as high-resolution images with the detailed associated data on the Internet (JACQ Virtual Herbaria 2023, JSTOR Global Plants 2023).

Schlechtendal’s Correspondence

The collection of Schlechtendal’s correspondence with about 500 contemporaneous botanists comprises about 5600 letters. The list of senders reads like the ‚who is who‘ of the 19th century: P.E. Boissier, A.L.P.P. de Candolle, A. von Chamisso, J.F. Drège, A. Gray, J.C. von Hoffmannsegg, R.F. Hohenacker, W.J. Hooker, A. von Humboldt, G. Kunze, C.F.P. von Martius, F. Miquel, R.A. Philippi, E.F. Poeppig and many others are represented (Schubert 1964, Tkach et al. 2014).

Many botanists sent specimens of new plant taxa to Schlechtendal as gift for review and publication in the journals ‚Linnaea‘ or ‚Botanische Zeitung‘. The specimens were usually accompanied by letters to Schlechtendal. There are letters with references to and discussions about many type specimens now held in HAL (Heuchert et al. 2017). In addition, the letters contain information on itineraries of collectors and buyers of plant collections, on the exchange of plant material and discussions on botany, publication activities, the management of botanical gardens, fundraising and academic matters. The importance of correspondence can be explained by the following three examples.

Synonymy of the new plant species from Humboldt’s and Bonpland’s voyage to America

It has long been known, and has often caused wonder (McVaugh 1955, Hiepkö 2006), why there are so many plant names based on the above-mentioned collections of Humboldt and Bonpland published almost simultaneously by Joseph August Schultes and Johann Jacob Römer in Germany on the one hand and by Karl Sigismund Kunth in France on the other.

The background to this is the parallel processing of collections from the voyage to America, which Humboldt and Bonpland had sent in part to Willdenow in Berlin, but for the most part to the Muséum National d’Histoire Naturelle in Paris. After several unsuccessful attempts (with Bonpland and Willdenow), the latter were thoroughly examined and scientifically processed by Kunth on Humboldt’s behalf starting in 1813.

The diagnoses of the plants of Humboldt and Bonpland published by Schultes and Römer had been written by Willdenow

in Berlin and noted on the herbarium specimens. These were copied and provided to Schultes by D.F.K. von Schlechtendal (pat.). Schlechtendal (pat.) was a lawyer by profession and an enthusiastic naturalist with botanical preferences who had a close friendship with Willdenow (see above) and was in charge of Willdenow's herbarium after his death, as can be seen from a letter from Schultes to Schlechtendal (fil.) (6 June 1821, Landshut in Bavaria). Schlechtendal (fil.) was still chief curator of the Royal Herbarium in Berlin at that time.

The letter shows that the diagnoses for Humboldt's and Bonpland's plants were not written by Schultes and Römer themselves, but came from Willdenow and were sent to them by Schlechtendal (pat.). Furthermore, Schultes asked Schlechtendal (fil.) for additional information on Humboldt's and Bonpland's specimens in Willdenow's herbarium in Berlin and at the same time repeats the disapproval of Kunth voiced by many colleagues, in which certainly also the Prussian/German-French hostility resonates in the background.

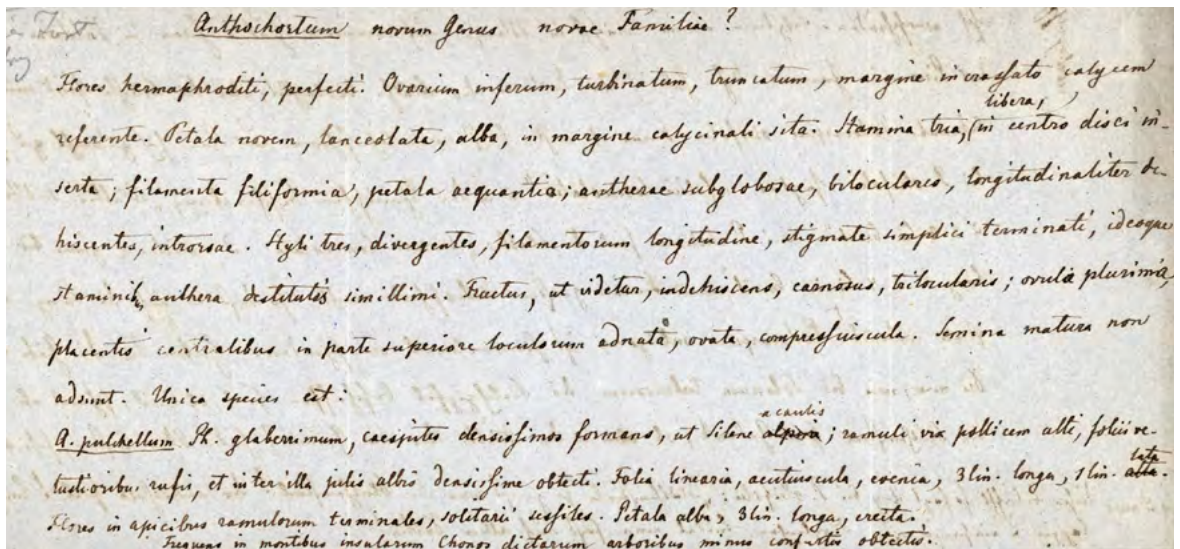


Fig. 2. Cut-off lower part of a letter sheet belonging to a letter from R.A. Philippi to Schlechtendal, dated 13 August 1857. The text is written in particularly careful, clear handwriting and was obviously intended to be passed directly to the typesetter. Schlechtendal's letter collection in the herbarium of the University Halle-Wittenberg.

The text reads: „*Anthochortum novum* Genus novae Familiae? Flores hermaphroditi, perfecti. Ovarium inferum, turbinatum, truncatum, margine incrassato calycem referente. Petala novem, lanceolata, alba, in margine calycinali sita. Stamina tria, libera, in centro disci inserta; filamenta filiformia, petala aequantia; antherae subglobosae, biloculares, longitudinaliter dehiscentes, introrsae. Styli tres, divergentes, filamentorum longitudine, stigmata simplici terminati, ideoque staminibus anthera destitutis simillimi. Fructus, ut videtur, indehiscens, carnosus, trilocularis; ovula plurima, placentis centralibus in parte superiore loculorum adnata, ovata, compressiuscula. Semina matura non adsunt. Unica species est: *A. pulchellum* Ph. *glaberrimum*, caespites densissimos formans, ut *Silene acaulis*; ramuli vix pollicem alti, foliis veluti oribus rufis, et inter illa pilis albis densissime obtecti. Folia linearia, acutiuscula, evenia, 3 lin. longa, 1 lin. lata. Flores in apicibus ramulorum terminales, solitarii sessiles. Petala alba, 3 lin. longa, erecta. Frequens in montibus insularum Chonos dictarum arboribus minus confertis obtectis.

Letters of R.A. Philippi and the fate of *Anthochortum pulchellum* Phil. in mscr.

The letter collection comprises about 14 letters and letter fragments of Rudolf Amandus Philippi (1808–1904), German emigrant to Chile, who carried out extensive natural history work and served as director of the Chilean National Museum, whose collections he considerably expanded (Reiche 1904, Zirstein 2001). Philippi described numerous plant genera and species, including quite a few in publications printed by Schlechtendal in ‚Botanische Zeitung‘ and ‚Linnaea‘. In the collection of letters there is, for example, the essay on the new genus of the Solanaceae, *Latua* Phil., published in ‚Botanische Zeitung‘ (vol. 16, issue 33, 13 August 1858), in which also the extreme poisonous effect of this plant on humans was described (Philippi 1858). On the letter there are additions and deletions in Schlechtendal’s handwriting, so that it is recognizable that this letter served the typesetter directly as a template.

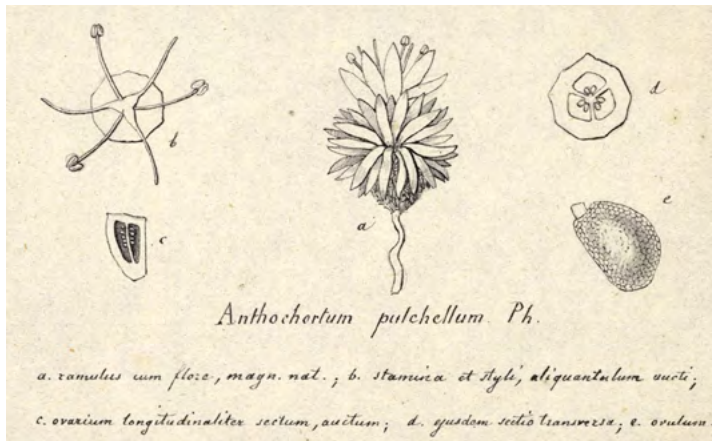


Fig. 3. Original ink drawing by R.A. Philippi with still faintly recognizable preliminary drawing executed in pencil. The detailed drawing shows features of the genus „*Anthochortum*“ Philippi intended to describe. The plant belongs to the genus *Donatia* J.R.Forst. & G. Forst described already in 1775 by father and son Forster and represents *D. fascicularis* J.R.Forst. & G.Forst., which was noticed by Schlechtendal, so that Philippi’s planned publication was omitted. Schlechtendal’s letter collection in the herbarium of the University Halle-Wittenberg.

The text reads: „*Anthochortum pulchellum* Ph.; a. ramulus cum flore, magn. nat.; b. stamina et styli, aliquantulum aucti; c. ovarium longitudinaliter sectum, auctum; d. ejusdem sectio transversa; e. ovulum.”

Of other letters, only cut-out parts have survived, which were apparently intended directly for the typesetter by Schlechtendal. For example, two fragments of one of Philippi’s letters from 13 August 1857 have survived, namely the upper and lower parts of the sheet, the middle is missing. On the lower part of the back of the letter there is a 7-line Latin diagnosis of a supposedly new genus or possibly even new family written by Philippi in particularly legible handwriting (Fig. 2). It begins with „*Antho-*

chortum novum Genus novae Familiae?” This is followed by a 3-line species description of „*A. pulchellum* Ph.” and the locality. There is also a beautiful ink drawing by Philippi of the plant, on which the preliminary pencil drawing can still be faintly recognized (Fig. 3).

This drawing as well as the diagnosis were never printed, because firstly in a letter written four weeks later on 14 September 1857, Philippi informed Schlechtendal that Grisebach (professor of botany in Göttingen, Germany) had written to him that the name *Anthochortum* had already been given to a Restionaceae by Nees. Philippi asked Schlechtendal to change the name *Anthochortum* to *Chartanthus*. Also the latter name was not published, because secondly Schlechtendal seemed to have noticed that the plant Philippi’s was the already 1775 described genus *Donatia* J.R.Forst. & G.Forst. (Forster and Forster 1775). Schlechtendal noted this genus name written in pencil in the upper left corner of the leaf section with Philippi’s handwritten diagnosis of *Anthochortum*. Schlechtendal, in contrast to Philippi, apparently knew the work „*Characteres generum plantarum quas in itinere ad insulas maris australis collegerunt...*” by father and son Forster, which contained an exactly correct diagnosis (p. 5) and correct illustration (Tab. V) of their new genus *Donatia* with the single species *D. fascicularis* included (Forster and Forster 1775), thus even conspecific with the plant Philippi’s.

However, one cannot blame Philippi for this error with his supposedly new genus „*Anthochortum*”, because in his letters to Schlechtendal he repeatedly complained about the lack of necessary scientific literature and the extremely slow procurement by the national library of Chile. In the present example, he absolutely correctly recognized that it was a special plant that did not belong to any of the families known to him, and he made a diagnosis that was as extensive as it was accurate, as well as an exact and detailed drawing, which emphatically underlines his outstanding talent as a natural scientist.

Correspondence of the Basel jurist and naturalist Hermann Christ on the publication process and nomenclatural confusion in *Pinus*

The four letters from Basel lawyer and naturalist Hermann Christ-Socin (1833–1933) provide a clear insight into the nature of the publication process of scientific papers and highlight nomenclatural challenges that remain to today. August H.R. Grisebach, a German botanist at the University Göttingen, commented in a short publication in the journal ‚*Flora*’ (Grisebach 1863) on a survey of the European Pinaceae published by Christ (1863a). Grisebach praised Christ’s treatment in principle, but disagreed with Christ’s classification/evaluation of *Pinus maritima* Lamb. because Christ considered the species conspecific with *P. halepensis* Mill., while Grisebach himself considered it conspecific with *P. brutia* Tenore. With the first letter from Christ to Schlechtendal (9 September 1863), Christ sent along a manuscript, in which he replied to Grisebach’s criticism.

Already a few days later (12 September 1863), Christ had found out in the meantime that Schlechtendal was not the editor of the journal ‚Flora oder allgemeine botanische Zeitung...‘, in which Grisebach had published his article but of the ‚Botanische Zeitung‘, another journal with a similar title. Schlechtendal evidently sent the manuscript to the editors of the ‚Flora‘ in Regensburg according to Christ’s request, as ‚Flora‘ published it in the issue 24 of volume 46 on 2 October 1863 (Christ 1863b).

A third letter (15 January 1864) accompanies a manuscript on *Pinus sylvestris* and related species in the Lower Engadin (Southwest Switzerland). Apparently Schlechtendal rejected this manuscript of Christ, probably because he himself was working on a publication on *Pinus* that appeared in *Linnaea* 33, issues 3–4 (December 1864) and issue 6 (June 1865) (Schlechtendal 1864a,b, 1865). Christ’s manuscript finally appeared in March 1864 in ‚Flora‘ (Christ 1864) as a continuation of his earlier publication „Beiträge zur Kenntnis südeuropäischer *Pinus*-Arten“ (Christ 1863b). Schlechtendal’s earlier publication in „*Linnaea* XXIX 1857“, to which Christ refers (Christ 1864: p. 147), included observations on German and Swiss *Pinus* species (Schlechtendal 1857).

A final letter was sent from Christ to Schlechtendal (7 June 1865) to request publication of another paper „on the forms in which the European *Pinus* species occur“, underlining how prolific Christ was. This publication was accepted by Schlechtendal and printed in three issues of the ‚Botanische Zeitung‘ (Christ 1865). In *P. halepensis* Mill., Christ distinguishes three forms on the basis of characteristics of the strobilus, including one which he calls „*maritima* Lamb.“ (Christ 1865: p. 223).

Interestingly, the debate about the correct name of the *Pinus* species discussed by Christ and Grisebach is by no means closed, as the application of the names *P. halepensis* and *P. brutia* is indeed unclear due to questions of their nomenclatural types. Therefore, a proposal has recently been made to conserve the name *P. halepensis* Mill. with a conserved type to avoid the name *P. halepensis* having to replace *P. brutia* Ten. and the name *P. maritima* Mill. having to replace *P. halepensis* (Ferrer-Gallego and Farjon 2019). However, the proposed type specimen from the Algarve in Portugal is perhaps not the most fortunate choice for a species that bears as epithet the name of a city at the opposite end of the Mediterranean, Aleppo in Syria (*P. halepensis*‘).

As can be seen from the long list of Christ’s publications (Senn 1934), the works mentioned in the letters to Schlechtendal belong to his early botanical works. The journals ‚*Linnaea*‘ and ‚*Botanische Zeitschrift*‘, published and edited by Schlechtendal, corresponded quite well to the character of Christ’s publications and seemed to be a suitable publication organ. Apparently, Christ did not resent Schlechtendal’s rejection of a manuscript, which can be assumed on the basis of the letters. It is possible that he would also have placed his further works in these journals, but after Schlechtendal’s death in 1866, no publication by Christ appeared in either of the two journals.

It is also interesting to note the short time span of only 3.5 weeks from the submission of a manuscript to its appearance in ‚Flora‘, although the manuscript was erroneously sent first to Schlechtendal in Halle instead of to the editorial office in Regensburg (letters 1 and 2). The time span for publication in ‚Botanische Zeitung‘ was 4 weeks (letter 4). Today’s authors can only dream of such a rapid pace of publication.

Edition of Schlechtendal’s Correspondence

The approximately 5600 surviving letters from his contemporaries to Schlechtendal are mostly written in the old and long-unused German Kurrent script. Moreover, some of the authors had quite illegible handwriting, which makes the recording of the letters very difficult and time-consuming. The translation work is mainly done by mostly elderly volunteers of the ‚Sütterlinstube Halle‘ and Mrs. Elfriede Wagner (1926–2023), a former teacher in the Vogtland (Saxony, Germany), who specialise in reading old manuscripts, an activity that can be described with the modern term of ‚citizen science‘.

So far, about 54 % of the letters have been transliterated, i.e. transferred into a legible modern handwriting. Some of them have already been transferred into word processing software. Letters from several authors have been processed as topics of scientific term papers by biology students. We intend to publish the letters of Schlechtendal’s correspondents with plant-scientific explanations and other comments important for understanding, i.e. in edited and annotated form. The letters of Kurt Sprengel, Schlechtendal’s predecessor as director of the Botanical Garden in Halle, and Wilhelm Sonder in Hamburg, have already been edited and published (Machoy et al. 2021, Tkach et al. 2022).

Acknowledgments

We thank Mrs. Elfriede Wagner (Netzschkau) and volunteers of the ‚Sütterlinstube Halle‘ for the careful translation of the handwritten letters. We would also like to thank Mrs. Heike Heklau (Halle) for her cooperation in the processing of the letters and the joint supervision of student work on Schlechtendal’s correspondence. We thank Mrs. Anita Hohmann, Mrs. Gisela Marx, Mrs. Ursula Nitschke and Mrs. Brunhilde Richter, volunteers of the ‚Sütterlinstube Halle‘, for the careful translation of the handwritten letters of H. Christ.

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