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De Herbario Berolinensi Notulae No. 48

URS EGGLI & BEAT ERNST LEUENBERGER

# Type specimens of *Cactaceae* names in the Berlin Herbarium (B)

**Abstract**

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A short history of the *Cactaceae* holdings of the Berlin herbarium and their fate is provided. While a considerable number of historical spirit specimens have escaped the destruction of the herbarium during World War II, the pre-1943 collection of pressed specimens was lost almost entirely. More than half of the present *Cactaceae* holdings of B were made on the base of cultivated material. The importance of these "Garden Herbarium" specimens is stressed, especially for succulent plants, where much of the type material, even of recently described taxa, is of insufficient quality or even fragmentary. A complete survey of all extant *Cactaceae* specimens at B (including the material recently transferred from the former KOELN herbarium) has resulted in a detailed and commented list of type specimens and specimens derived from cultivated descendants of type collections. Nomenclatural and typification problems encountered during this compilation are discussed. A list of photographs preserved at B depicting type material located in other herbaria, is also given. Lectotypes are designated for the names *Cereus lamprospermus, C. rhodoleucanthus, C. stenogonus, C. xanthocarpus, Echinocactus umadeave, Echinopsis rhodotricha, Pilocereus setosus, Rebutia steinbachii* and *Turbinicarpus pseudomacrochele* var. *lausseri.*

Additional key words: cacti, succulents, typification, lectotype, botanical nomenclature, collection history.

## 1. Introduction

The importance of type specimens as permanent anchors for the application of botanical names is universally recognized today, and the numerous initiatives of herbaria to make type specimen information available on the Internet underlines the importance of types. Mechanisms for selecting lecto- or neotypes when the holotype has been lost are an important part of the ICBN (McNeill & al. 2006). But before a replacement specimen can be designated, the existence (or loss) of the holotype must be established, and this information is often not easily available, especially for old names. Typification is only mandatory since 1958 (ICBN Art. 37.1, McNeill & al. 2006), and names published before this date are often not typified or with insufficient type information.

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Since succulents in general and cacti in particular are generally difficult to handle for the herbarium, types are missing for many names in this group. While some authors straight away declared the preparation of herbarium specimens of cacti as hardly possible (e.g., Backeberg 1962: 3916) or attributed questionable usefulness to type specimens (Ritter 1979: 15), the numerous existing and often very well prepared and preserved old and new specimens of many collectors prove the contrary. A particularly practical and successful method to prepare herbarium specimens of succulents has been described in more detail by Eggli & Leuenberger (1996).

Any typification study necessarily starts by establishing the existence and whereabouts of the holotype and possible isotypes. This information is not always easily obtained, but (published) type specimen lists are an important source of information. For cacti, such lists have been compiled, e.g., by Eggli & al. (1996) for taxa described by F. Ritter, Eggli & Leuenberger (2005) for taxa described by M. Cárdenas, and Eggli (1987) for material from Swiss herbaria.

Berlin is undoubtedly one of the most important institutions regarding the study of succulents, in particular of cacti, and important taxonomists such as K. Schumann, M. Gürke, F. Vaupel and E. Werdermann devoted time and interest to the study of cacti. Leuenberger (1978a-b, 1979) produced a first inventory of type specimens of cacti at the Berlin herbarium, although limited to the spirit collection. Since much type material that would be expected at B has been lost (see below), we undertook a project to compile an inventory of all type material presently available at B, including a new evaluation of the spirit collections.

## 2. History of the Berlin Herbarium and its *Cactaceae* holdings

A detailed history of the Berlin herbarium collections was given by Urban (1916) and Hiepko (1987). The loss of the greater part of the herbarium collections, library and archives were reported by Pilger (1953) and Sleumer (1949). Hiepko (1987) provided a selective list of important collections acquired between 1914 and 1986. In this list, a number of collectors known to have collected *Cactaceae* are mentioned, e.g., Ekman, Ule, Werdermann, but nothing is known about the total number of *Cactaceae* specimens. Hiepko (1987) also provided a summary of collections still extant from the time before 1943 (including the spirit collection). Traditionally, no accession numbers were used for the specimens at B, but the complete holdings of the spirit collection were bar-coded in 2004 and 2005.

### 2.1. Sheet specimens in the General Herbarium

The herbarium material of *Cactaceae* was lost in 1943, except for the Willdenow material (Pilger 1953; Hiepko 1987; Leuenberger 2004). The former richness of the Berlin herbarium in neotropical type specimens is well documented through the photograph collection of Berlin types, since 2006 available online at http://emuweb.fieldmuseum.org/botany/search_berlin.php (accessed 15.11.2006). *Cactaceae,* however, are completely lacking among the over 15 000 images made by Macbride in Berlin between 1929 and 1933 of material collected in Central and South America from 1778 through May 1930, representing 154 plant families (Grimé & Plowman 1986).

Scattered information on *Cactaceae* specimens of various collectors deposited at B (e.g., Anisits, Ekman, Fiebrig, Glaziou, Grosse, Kurtz, Reiche, Söhrens, Ule, Werdermann) can be found (among others) in publications of Schumann (1897-98: x, 1899: 133, 1903), Vaupel (1916, 1925, 1926) and Werdermann (1927, 1929, 1931a, 1949).

The tragic fate of the succulent collections was described by Werdermann (1949), but this report was not fully accurate as far as the spirit material is concerned (Leuenberger 1978, 1979).

Present holdings of *Cactaceae* in the herbarium were all accessioned from 1944 onwards and include very few older specimens, e.g., saved duplicates (Werdermann), later donations from other herbaria and also photographs of some older materials. The presence of a limited number of Werdermann specimens is due to the fact that the first set was destroyed in 1943, but replaced by an incomplete set of undistributed duplicates (according to a note in Werdermann's hand dated 1944). This explains the presence of some (though very few) isotype specimens.

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Most specimens in the general herbarium are not yet bar-coded and the sheets are without accession number. Bar-coding was started in 2002 with new material and material selected for digital imaging.

### 2.2. Spirit material

The major part of the spirit material was salvaged (Sleumer 1949). It was rearranged and complemented with a card index in 1961 by F. Butzin (Potztal 1962: 42, 1965: 104). Apart from some jars sealed with unsuitable cork and paraffin wax in the 1930ies, some with material dried out and decayed, the *Cactaceae* collection (c. 600 jars) mostly remained in good condition (Leuenberger 1978, 1979). All specimens were bar-coded in 2005.

The older jars have up to three additional older printed labels with numbers added by hand. The uppermost is the genus number following Dalla Torre & Harms (1900-07). Another label, usually at the bottom of the jar, contains the taxon number assigned in Schumann (1897-98, 1903). These numbers were apparently added to the jars after publication of that work.

A third label bears an old catalogue number, but the catalogue was lost in 1943 (Potztal 1962: 42). This number is crossed out and was replaced by a number in red, representing a sequential jar number (for *Cactaceae*), the same as used in the card index established by F. Butzin in 1961.

### 2.3. Boxed material

From a note by Anonymus (1893) and Hirscht (1896) on the existence of such material, including a further request of Schumann to members of the cactus society to send dead plants for preservation in the botanical museum, it can be assumed that a considerable collection existed. Werdermann (1937: 163) mentioned it as "mummy collection" and later noted that, during his curatorship (before 1943), dead plants from the garden were critically checked for possibly appropriate and useful parts to be preserved in the herbarium (Werdermann 1949: 36). All this old boxed material was lost in 1943.

The current holdings were mostly accessioned from c. 1980 onwards. They derive to a great extent from cultivation in the Botanic Garden Berlin-Dahlem (e.g., from the extensive *Parodia* collection of the private collector Hummel, live plants acquired in 1987), but also from other sources (notably P. J. Braun collections incorporated in 1990).

Most specimens are not yet bar-coded and without accession number. The specimens from cultivation at B have "Garden Herbarium" numbers (see below).

### 2.4. The Garden Herbarium

Documentation of the living *Cactaceae* collection by herbarium specimens and photographs was initiated by the second author in 1977 during the taxonomic revision of *Pereskia,* in order to compare herbarium collections side by side with live material and dried material of the same accessions. This was gradually extended to the whole family *Cactaceae*.

The Garden Herbarium, with precursors dating back to 1952, was started in the current form with consecutive accession numbers in 1974. The number is preceded by the name of the technical assistant preparing the specimens (from 1974 to 1989, *Schwerdtfeger 1-25999;* from October 1989 until July 2008, *Cubr 26000-45595*). A few specimens have been bar-coded and have this additional number as well.

The garden herbarium was originally stored entirely separate from the general herbarium as a reference collection. For safer storage, it has been kept since 1993 within the general herbarium, as parallel collection to each phanerogam family, facilitating quick access to the collection of cultivated plants alone, as well as side by side to the general collection.

Importance of material from cultivation is enhanced by the fact that holotypes of succulent plants often consist of very limited material, sometimes badly prepared, or only very little material collected, e.g., only areole and flower (Ritter). Thus, cultivated descendants of original introductions are of special value, both as specimens (pressed, spirit, boxed), and (alone or additionally)

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as photographs. The large number of specimens prepared on this base is a speciality of the herbaria B and ZSS, and such material can be used to "back up" original types. The depreciating view taken by many concerning cultivated "types" is unwarranted.

Another argument in favour of such material is the fact that cacti are important in cultivation, and much material was described on the base of cultivated material. "Cultitypes" are therefore especially important as base for comparison and to document the plasticity of characters in cultivation.

### 2.5. Material transferred from KOELN

In January 2005 a substantial part the Herbarium of the Arbeitsgruppe Geobotanik und Phytotaxonomie, Botanisches Institut, Universität Köln (KOELN, see Follmann 1998), i.e. primarily consisting of the lichen collection of G. Follmann, was transferred to Berlin-Dahlem (B) on the initiative of G. Follmann (see Holmgren & Holmgren 1998-). Simultaneously, another important collection was moved to Berlin: type specimens (holotypes and isotypes) of 52 names of *Cactaceae* and a few additional non-type specimens deposited at KOELN from c. 1977 onwards, many connected with the work of Lothar Diers. Names based on collections deposited at KOELN were published by W.-R. Abraham, P. J. Braun, L. Diers, E. Esteves Pereira, G. Heimen and R. Paul, all in cactophile journals in Germany, The Netherlands and the USA.

These names were originally published with varying indications of depository, e.g., herbarium of the "Pädagogische Hochschule Rheinland, Abt. Köln" (*Gymnocalycium ambatoense,* Piltz 1980), "Herbarium of the Succulentarium of the University of Cologne" (*Discocactus lindaianus,* Diers & Esteves 1981), or "Herbario Universitatis Colonia (KOELN)" (sic!, *Coleocephalocereus diersianus,* Braun & Esteves 1988).

At the time of the transfer from KOELN to B in 2005, the material was kept in boxes labelled outside as "Collatio Lothar Diers". Actually it is not a classical, mounted herbarium but each "specimen" is composed of one to six loosely kept entities: plastic bags with dried bodies of cacti, entire plants, fragments, fruits and flowers preserved in alcohol in a variety of glass jars or plastic bottles, paper bags containing fruits or seeds, envelopes containing photographs or (very few) notes, and reprints or entire journal issues containing the protologues, in a number of cases with handwritten complementary footnotes (presumably by L. Diers). Each entity is labelled with only minimal data, usually with name, type designation, collector and number (both normally as abbreviated field number only, e.g., *"HB 80",* for *"Heimen & P. J. Braun 80"*).

Sorting of the material by name and collection number and the compilation of a detailed working list of all entities, and comparison with data from IPNI (2004-) and the database of the "Repertorium Plantarum Succulentarum" maintained by U. Eggli (ZSS) revealed several problems:

– The type material for a name, consisting of a single collection number, is kept in up to seven separate entities with differing preservation methods, resulting in problems for storing, bar-coding and databasing.

– For most type numbers, only part of the material (one to three entities) is marked as holotype or isotype. Flower samples and seed samples are often not marked. They bear the same collection number and may, or may not, represent a true part of the type material. Moreover, the samples are not dated, and their status as type or not-type is sometimes impossible to ascertain with absolute accuracy.

– The samples usually lack any indication of country and collecting locality. With very few exceptions, this information is only found in the usually very detailed protologues. Neither collection dates nor preservation dates are indicated. In the protologues, details given in the Latin part, as compared with the German, English or Dutch text, may differ. For many of these names, the protologue does not give detailed locality data but states that this information is stored together with the holotype for conservation reasons. Indeed, for many names, a copy of the protologue with the addition (by hand) of more detailed locality data, was present in the material transferred from KOELN.

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– Some *Cactaceae* material originally published for KOELN was missing when the collection was transferred to Berlin in January 2005. A total of 23 specimens, including some taxa described from 1980 onwards, as well as taxa recently published by Diers & al. were lacking, e.g., *Hildewintera colademononis, Parodia hegeri, Sulcorebutia roberto-vasquezii* and *S. vargasii.* A search for the lacking specimens through G. Follmann led to a communication from L. Diers (5 December 2005) and in February 2006, to a shipment from L. Diers, Bad Neuenahr, of 11 jars containing seven of the missing holotypes and four isotypes of species described between 1980 and November 2005 (by Piltz and by Diers). It has to be assumed that these specimens were not deposited in KOELN despite having been cited for this herbarium. Another specimen, the holotype of *Sulcorebutia vargasii* var. *viridissima* Diers & Krahn, was added by Diers without prior announcement.

## 3. Nomenclatural considerations

### 3.1. Problems associated with garden material and "clonotypes"

For the vast majority of plant taxa, the type material consists of one (or more, then termed isotypes) field-collected and permanently preserved (usually pressed and dried) specimen(s). Establishing whether a given herbarium specimen is the type (holotype, or isotype) of a name should not produce undue problems.

In the case of succulent plants, the situation differs to some degree. More often than not, type specimens are prepared in a botanical collection from cultivated material. When such type material is clearly labelled as to its status (holotype or isotype), no problems arise, but such clear labelling is often absent. Further, the availability of a cultivated "type collection" makes it possible to preserve subsequently additional material. Moreover, the material can be propagated and distributed to other gardens, or even made available to the horticultural trade. Especially in the case of cacti, type material has also been derived from collections made by commercial or semi-commercial collectors, as well as by devoted plant collectors.

As long as all material preserved on the base of living collections is clearly labelled, especially with the preservation date, there are no unsurmountable problems (apart perhaps those covered by ICBN Art. 8.2, Ex. 1, explaining one view of what consists "a gathering", McNeill & al. 2006). Specimens preserved subsequent to the publication of the protologue are usually and loosely termed "clonotypes", a term which is not sanctioned, however, by the ICBN (McNeill & al. 2006).

For the purpose of the present inventory, we continue the concept already introduced for the inventory of the Ritter types (Eggli & al. 1996: 41), i.e. we use the term "type collection" to refer to specimens preserved under the type collection number. Any material that cannot be clearly identified as holotype or isotype is simply assigned "type collection" status.

For some names, an additional complication has to be accounted for: usually, a collection number refers to a single collection event at a single clearly delimited locality. Some collectors, however, used their collection numbers in a different way. Eggli & al. (1996) elucidated the numbering convention adopted by Friedrich Ritter, whose collection numbers are essentially taxon numbers, and up to more than a dozen different localities might be covered by a single collection number. To establish which of the several collections under a given number is the "real" type is often difficult but crucial. When material so numbered enters into cultivation, there is usually no direct link back to the locality information, and it is thus impossible to pin-point its possible type status. For such cases, we use the term "type number".

It could be argued that it is not worth bothering with such corollary material, i.e. any "clonotypes" and "near-clonotypes" from cultivated material. This would, however, deprive us of much important information. More often than not, the preserved original material is confined to the holotype specimen, and this is unfortunately far too often of fragmentary nature, ill-preserved, or perhaps even missing. "Clonotypes" and "near-clonotypes" are then the only possibly original material to establish the characteristics of a taxon and are thus of special importance,

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even though they are not types in the strict sense, but represent "near-paratypes" in the sense of the ICBN (McNeill & al. 2006). They are not strict paratypes (Art. 9.5, "a paratype is a specimen cited in the protologue that is neither the holotype nor an isotype, nor one of the syntypes") because they are not literally cited in the protologues. Because of the importance of these specimens, the complete "near-type" holdings of the Berlin Garden Herbarium have been included into our inventory.

### 3.2. Problems associated with 'synonymous' type numbers

While comparing typification information in protologues with information associated with specimens at B labelled as types, or specimens of suspected type status, problems became apparent when different collections are cited as holotype and isotype(s). An example is *Arrojadoa beateae* P. J. Braun & Esteves, where the holotype is cited as *"Esteves Pereira (E) 261"* and isotypes (for B and ZSS) as *"Braun (Br) 830",* with the added statement that *Braun 830* was collected at the type locality simultaneously with the holotype.

Another example is *Coleocephalocereus braunii:* The holotype is *"Horst, Braun & Esteves 4"* and the collection *"Braun 470"* is given as isotype, again with an additional statement that this (and two further topotype collections) were made simultaneously at the type locality.

Such disparate typification details are problematical in several respects, especially also nomenclaturally: at first glance, it could be argued that the enumeration of more than one collection as holo- and isotypes is an infringement of ICBN Art. 9 and 37 (McNeill 2006) and that the collections are to be treated as syntypes, which would invalidate the names in question. Fortunately, Art. 9.8 allows for a different interpretation, and the use of "isotype" for collections other than the collection from which the holotype was prepared is to be regarded as an "error to be corrected". In the cases of *Arrojadoa beateae* and *Coleocephalocereus braunii,* the "isotype" specimens *Braun 830* and, respectively, *Braun 470,* are thus simply paratypes. In the literature, some of these disparate typifications have been accepted at face value, e.g., by Taylor & Zappi (2004) for *Coleocephalocereus braunii,* or produced erroneous typification statements, e.g., Eggli & Taylor (1986) for the same taxon.

## 4. Notes on suspected types for selected names

For a number of names, typification poses special problems. These cases are shortly discussed here with special emphasis on types or possible types:

***Cereus coryne***

There is a spirit specimen (B 810006729) with the following notes on the associated index card: "eingeordnet Jan. 1900" and "grosses Scheitelstück, wahrscheinlich Originalmaterial", and "vgl. MfK 3: 176-177, 1893: redaktionelle Anmerkung von K. Schumann, 'Pflanze im Hort. Bot. Berol. Ist vielleicht Original'". This specimen could indeed represent original material that survived in cultivation at B and was prepared in 1900, but there is no unambiguous and direct link to material from the time of the protologue and the specimen cannot safely be considered as original material.

***Cereus damazioi***

There is a spirit specimen (B 810006730), consisting of a flower prepared from cultivated material from Rettig, preserved 12.6.1920, i.e. posterior to the publication of the illegitimate (Art. 52.1) name. It could probably have been derived from cultivated descendants of the original type material, but there is no positive clear evidence for this and the specimen is not considered further as original material.

***Cereus hassleri***

This name is based on two syntypes, *Anisits Cact. 13* and *Hassler 1716*. Berlin has a very complete spirit specimen of the *Anisits* syntype, but no material of *Hassler 1716*. No attempt has been

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made to locate specimens of this second syntype but it should be noted that the specimen of this number at NY is not *Cereus hassleri,* but has been annotated as *Selenicereus setaceus* by N. P. Taylor in 1992 (NY virtual herbarium at http://sciweb.nybg. org/science2/hcol/vasc/index.asp, accessed Nov. 2006). Lectotypification is deferred until other specimens of this syntype can be located and compared with the protologue.

***Cereus megalanthus***

There is a spirit specimen (B 810006764), consisting of a stem piece with spines, annotated as *"Cereus megalantha* [sic] K. Sch. Amazonas leg. Ule". The connection with the type is weak, especially because no locality data are given and the flowers noted in the protologue are absent. The material is best not considered as original material.

***Cereus peruvianus*** var. ***reclinatus***

The type collection of this name is a cultivated accession (number 15/49) in the Huntington Botanical Gardens, California, USA. There are no photographs of this accession among the Werdermann photographs of *Cereus* preserved at B, but B has photographs of two herbarium specimens in the Huntington herbarium (HNT), namely HNT 1458 (garden acc. no. 5267, "Type", material pressed ex cult. 23.7.1973) and HNT 7342 (garden acc. no. 5267): "Type", material pressed ex cult. 11.7.1986. It is not established whether this Huntington garden accession (no. 5267) has any connection with the number of the cultivated type collection (15/49) as given in the protologue of the name.

***Cereus pseudocaesius***

This name was published by Werdermann as replacement for *Cereus caesius* Salm-Dyck (non *C. caesius* Salm-Dyck ex Pfeiffer). There are photographs at B of both accession numbers cited by Werdermann. Since Werdermann's publication of the name *C. pseudocaesius* cannot be regarded as containing a valid typification of the replaced name, they are without importance for our list of type specimens.

***Cereus sclerocarpus***

*Cereus sclerocarpus* is based on 3 syntypes from the Galápagos Islands, *Snodgrass & Heller 933* and *934* from P. Christopher, Albemarle Island, and *Snodgrass & Heller 935* from Black Bight on the same island, and all of them are credited to "hb. Berl. & hb. Gr.". Berlin has a spirit specimen (B 810006791), consisting of flower fragments, and the original label has the collection number as *"Heller 934, 935"*. It is impossible to assign the material to any of the two syntype numbers, nor to know whether the specimen is indeed a mixture. "Hb. Gr" has not yet been identified with a modern herbarium and nothing is therefore known about the possible whereabouts of the remaining specimens.

***Cereus schmollii***

There is a spirit specimen at B (B810006790, dried up), the original label of which carries the information "*Hahn-Schmoll (cult.)* (von Schmoll eingeführt)" / "hat Weingart untersucht", dated 28.4.1931. It is thus prior to the protologue, but cannot be considered as holotype or isotype since the protologue does not mention material from Hahn, but refers exclusively to material ex Hort. Knebel (1929) and ex Hort. Rettig (1931).

***Echinopsis korethroides***

The type is *Stümer s.n.* and B has a sheet with a photograph (negative + print by Werdermann, not mentioned by Leuenberger (1997), labelled as "*Eps. Lob.? Korethroides* Werd. W7", "Typ" crossed out, "Fb 896", cult. BG Berlin. The meaning of the numbers are unclear; "Fb 896" could probably refer to a colour photograph ("Farbbild"). The material is certainly authentic, but there are serious doubts whether indeed the type is illustrated.

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***Lobivia schreiteri***

Leuenberger (1978, 1979) records an isotype specimen as *Schreiter s.n.,* but this is not the type collection (type = *Castellanos 29/41*). The specimen is annotated as "mis. R. Schreiter".

***Opuntia lagopus***

The type for this name is given as *Weberbauer s.n.* in the protologue, but the only specimen extant in the spirit collection at B (where the Weberbauer types of other names are located) has the number *Weberbauer 1355.* Crook & al. (2003: 89) selected a neotype for the name (*Webster 26,* K) because they believed that the original material at B was destroyed but carry on to say that it could serve as epitype if original material should be discovered subsequently. Even though there is no locality associated with *Weberbauer 1355* on the label, there is little doubt that this specimen is the holotype of the name. The name is shown as *"Opuntia* cfr. *lagopus"* on the original label, and this might indicate that the specimen is not the type collection. However, we cannot positively establish that the label is indeed original, or whether it was produced slightly later than the protologue, and the "cfr." ("confer") was added because the incongruence of the type number with the protologue. The material of the specimen is without any doubts representing *O. lagopus,* and we are strongly inclined to accept this specimens as the holotype of the name. This makes the neotypification by Crook & al. (l.c.) superfluous.

***Opuntia pachypus***

The case is similar to *Opuntia lagopus,* also based on an unnumbered Weberbauer collection. Again, there is only a single specimen available in the spirit collection at B, which is moreover annotated as "Typus" on the original label. Iliff (in Cactaceae Syst. Init. 9: 5. 2000) unnecessarily designated the plate in the protologue as lectotype, being unaware of the presence of the holotype at B. The lectotypification made by Iliff (2000) is thus unnecessary.

***Trichocereus campos-portoi***

Leuenberger (1979) indicates a type for this name in the inventory of the surviving spirit material at B. This specimen (B 810007164, plus photo in the general herbarium) consists of flower and fruit and is labelled "*Trichocer. campos-portoi* Werd." and "Typ". The type of the name is explicitely stated to be *Werdermann 3994* in the protologue, with further material reported as *Campos-Porto s.n.* The spirit specimen in question is most probably the Campos-Porto collection and thus actually represents a paratype.

## 5. *Cactaceae* types at B

### 5.1. Introduction

The following list is a commented list of all recognized types and recognized authentic material in the Berlin herbarium. It is a positive list, and for taxa that are not listed, no material has been located at Berlin. The list also includes authentic material, i.e. specimens prepared from cultivated parts or descendants of type collections. The nomenclatural base data and notes on lecto- and neotypifications have been derived from the nomenclatural database maintained at the Sukkulenten-Sammlung Zürich (ZSS).

The Berlin herbarium has a good collection of photographs of type specimens preserved in other herbaria and these are listed in a separate appendix.

### 5.2. Conventions adopted

***Collection data.*** – Collection data are primarily cited from the relevant protologues and supplemented from data on the herbarium labels, sometimes also from other published and unpublished sources. Data cited from any of these sources enclosed in double quotation marks, and source(s) are given in square brackets (e.g. [protologue]). Usually, the data are translated into English,

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which is also indicated. Geographical directions (north, south, etc.) are always standardized to the respective 1-character abbreviations.

***Other data.*** – Further data are given whenever relevant. This refers to Berlin accession numbers, preservation dates, accession dates, etc. Not all these data are present for all specimens. Standard herbarium abbreviations for known types are given (first one for the holotype, remaining ones in alphabetical sequence for isotype(s)).

**Abbreviations**

| | |
|---|---|
| adnot. | annotation |
| clono | "clonotype", i.e. cultivated part or descendant of the type collection |
| cult. | cultivation |
| l.c. | loco citato |
| s.a. | sine anno |
| s.n. | sine numero |
| al | bud |
| ar | areole |
| corp | body |
| fl | flower |
| fr | fruit |
| ic | illustrations |
| +ic | for spirit material: separate illustration of the material in the general herbarium |
| juv | juvenile |
| rad | root |
| sem | seed |
| sp | spine |
| ( ) | bracketed entries refer to fragmentary material |

Examples: (rad), corp, ar, sp = body with areoles and spines and fragments of the root, ic (corp), fl = illustration of the body, flower

### 5.3. Alphabetical list of type specimens and other authentic material by basionym

***Acanthocalycium glaucum*** F. Ritter in Taxon 13(4): 143-144. 1964
Notes: When transferred to *Echinopsis,* the correct name is *E. glaucina* H. Friedrich & G. D. Rowley 1974 (non *E. glauca* (F. Ritter) H. Friedrich & G. D. Rowley 1974).
Type: *Ritter 970 loc.1* – Argentina: Catamarca: "N of Belén" [protologue, translated], s.a. (type herbaria: U 117834B) [holotype cited for U in Taxon 12(1): 28. 1963].

B (sheet GH12097) (type number): fl, ic (corp, fl). – Notes: Ex cult. BG Berlin, 22.6.1982, from material originally raised from seeds received 1960 from H. Winter. Collection number established by inference.

***Arequipa spinosissima*** F. Ritter in Taxon 13(3): 115. 1964
Notes: First mentioned (with Krainz & Ritter as authors) in Backeberg, Cact. 2: 1053. 1959 (RPS 10).
Type: *Ritter 196 loc.1* – Peru: Arequipa: "Quicacha" [protologue / isotype label at SGO], s.a. (type herbaria: ZSS AX10497, SGO).

B (sheet GH14195) (type number): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 127-34-74-80, 7.6.1983, from material originally raised from seeds received 1959 from H. Winter. Collection number established by inference.

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***Armatocereus mataranus*** F. Ritter in Succulenta (Amsterdam) 46(2): 23, ill. 1967
Notes: First invalidly published (without type) in Succulenta (Amsterdam) 45: 117. 1966.
Type: *Ritter 672 loc.1* – Peru: Cajamarca: "San Marcos" [protologue / holotype label at U], 6.1957 [collection date according to the original Ritter seed sample at ZSS] (type herbaria: U, SGO, ZSS [seeds only]).

B (sheet GH31644) (type number): ic (corp), corp, ar, sp. – Notes: Ex cult. BG Berlin 127-38-74-80, 2.8.1993, from material originally raised from seeds received 1961 from H. Winter. Collection number established by inference.

***Arrojadoa aureispina*** var. ***guanambensis*** P. J. Braun & Heimen in Kakt. And. Sukk. 31(11): 334-337, ill. 1980
Type: *Heimen & Braun 80* – Brazil: Bahia: "in the further surroundings of Guanambi" [protologue, translated]; "flat rock plates in the shade of a tall scrub forest in a rather moist region", 400 m, 6.1979 [collection cited as "H/B 80" in the protologue] (type herbaria: B (ex KOELN), ZSS).

B (ex KOELN) (spirit B 810013100) (holotype): fl, fr. – Notes: Part of the holotype, annotated as "Glas 1 von 2" [jar 1 of 2]. Collection data given as "HB 80 coll. 6/79 Bras.".
B (ex KOELN) (spirit B 810013101) (holotype): corp, ar, sp. – Notes: Part of the holotype, annotated as "Holotyp" and "Glas 2 von 2 insges." [jar 2 of a total of 2 jars]. Collection data given as "HB 80 coll. 6/79 Bras.".
B (ex KOELN) (boxed 27654) (isotype): sem. – Notes: Collection data given as "HB 80".

***Arrojadoa beateae*** P. J. Braun & Esteves in Kakt. And. Sukk. 40(10): 254-256, ill. (pp. 250-255). 1989
Type: *Esteves Pereira 261* – Brazil: Minas Gerais: "Serra do Espinhaço, SW of Montes Claros" [protologue, standardized]; "in rocks and in quartz sand, in full sun or in the shade of shrubs, tall grasses and trees", 1000 m, 7.1987 (type herbaria: UFG, B (ex KOELN)) [the isotypes cited for B and ZSS in the protologue are paratypes and represent a different collection, although made at the type locality].

B (ex KOELN) (boxed B 100216251) (isotype): corp, ar, sp.

***Arrojadoa canudosensis*** Buining & Brederoo in Cact. Succ. J. (Los Angeles) 44(3): 111-113, ill. 1972
Type: *Horst & Uebelmann HU 251 (1968)* – Brazil: Bahia: "Canudos" [protologue]; "in the caatinga bush", 400 m, 11.6.1968 (type herbaria: U).

B (boxed s.n.) (type number): rad, corp, ar, sp. – Notes: Labelled as "HU 252", which must be a slip of the pen for "HU 251". Leg. P. J. Braun (ex cult.?), labelled as "Typstandort *Arrojadoa canudosensis*".

***Arrojadoa dinae*** var. ***nana*** P. J. Braun & Esteves in Kakt. And. Sukk. 42(8): 190-195, ill., SEM-ill. 1991
Type: *Braun 415* – Brazil: Minas Gerais: "high mountains of the Serra do Espinhaço" [protologue, translated] / "Montezuma" [isotype labels at B]; "under shrubs or in quartz gravel" [protologue, translated], 1000 m, 9.1983 (type herbaria: ZSS, B, B (ex KOELN)).

B (boxed s.n.) (isotype): (rad), corp, ar, sp.
B (boxed s.n.) (isotype): (rad), corp, ar, sp, ceph.
B (boxed s.n.) (isotype): corp, ar, sp, ceph.
B (boxed s.n.) (isotype): (rad), corp, ar, sp.
B (boxed s.n.) (isotype): rad, corp, ar, sp.
B (ex KOELN) (spirit B 810013103) (isotype): corp, ar, sp. – Notes: Labelled "Braun 415 Montezuma, M. Ger."

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***Arrojadoa eriocaulis*** var. ***albicoronata*** Van Heek & al. in Kakt. And. Sukk. 33(11): 224-227, ill. 1982
Type: *Van Heek & al. 81/113* – Brazil: Minas Gerais: "near Grão Mogol" [protologue, translated]; "in sandy-loamy soil between grass and low shrubs in a forested region", 15.8.1981 [the collectors' names are not given in the protologue but can be established from circumstantial evidence] (type herbaria: B (ex KOELN)).

B (ex KOELN) (boxed B 100216252) (holotype): rad, corp, ar, sp. – Notes: Simply labelled "Holotyp" and "81/113".
B (ex KOELN) (boxed B 100216256) (isotype): rad, corp, ar, sp. – Notes: Labelled "Isotyp" but without number and stored in a separate bag included in the bag of the holotype.
B (ex KOELN) (spirit B 810013104) (isotype): fl, fr. – Notes: Without type indication nor collection number, but stored together with the holotype and isotype.

***Arrojadoa eriocaulis*** var. ***rosenbergeriana*** Van Heek & W. Strecker in Kakt. And. Sukk. 44(12): 258-262, ill., SEM-ill. 1993
Type: *Van Heek & al. 85/216* – Brazil: Minas Gerais: "SE of Mato Verde" [protologue, translated]; "semi-shade, in sandy-stony soil", 1985 [the protologue gives only the collection number, and the collectors' names are established by inference. Detailed locality data deposited together with the holotype for conservation reasons according to the protologue. No such data were found with the holotype, however] (type herbaria: B (ex KOELN)).

B (ex KOELN) (spirit B 810013105) (holotype): rad, corp, ar, sp. – Notes: Simply labelled "Holotyp" and "85/216".
B (ex KOELN) (boxed B 100216253) (isotype): rad, corp, ar, sp. – Notes: Simply labelled as "Isotyp" and "85/216".

***Arrojadoa horstiana*** P. J. Braun & Heimen in Kakt. And. Sukk. 32(8): 186-190, ill. 1981
Type: *Heimen & Braun 83* – Brazil: Minas Gerais: "Serra do Espinhaço" [protologue] / "mountains E of Mato Verde" [isotype labels at B]; "campo rupestre, mountain forest" [isotype labels at B, translated], 1000 m, 5.7.1979 [detailed locality data deposited together with the holotype for conservation reasons according to the protologue, but no such data were found with the holotype] (type herbaria: B (ex KOELN)).

B (ex KOELN) (spirit B 810013106) (holotype): corp, ar, sp. – Notes: Part 1 of 2 of the holotype. Simply labelled "Holotyp" and "HB 83".
B (ex KOELN) (spirit B 810013107) (holotype): fl. – Notes: Part 2 of 2 of the holotype. Simply labelled "Holotyp", "HB 83" and "HB 83 coll. 6/79 Bras.".
B (boxed s.n.) (isotype): rad, corp, ar, sp. – Notes: Leg. P. J. Braun sub "Braun 83".
B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun sub "Braun 83".
B (ex KOELN) (boxed B 100216254) (isotype): sem. – Notes: Simply labelled "HB 83".

***Arrojadoa rhodantha*** subsp. ***reflexa*** P. J. Braun in Kakt. And. Sukk. 35(2): 34-38, ill. 1984
Type: *Braun 68* – Brazil: Bahia: "C Bahia, W slopes of the Chapada Diamantina, E of the Rio Paramirim" [protologue, translated] / "Agua da Seca" [isotype labels at B]; "in sandy soil in the shade of shrubs and trees" [protologue, translated], 1000 m, 1979 [detailed locality data deposited together with the holotype for conservation reasons according to the protologue, but no such data were found with the holotype] (type herbaria: B (ex KOELN), B, ZSS).

B (ex KOELN) (boxed B 100216255) (holotype): corp, ar, sp, fl. – Notes: Simply labelled "Holotyp" and "Br 68".
B (boxed s.n.) (isotype): rad, corp, ar, sp.
B (boxed s.n.) (isotype): corp, ar, sp.
B (boxed s.n.) (isotype): rad, corp, ar, sp.

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***Arrojadoa rhodantha*** var. ***occibahiensis*** P. J. Braun in Kakt. And. Sukk. 36(6): 114-115, ill. 1985
Type: *Horst & Uebelmann HU 616* – Brazil: Bahia: "W of the Rio São Francisco" [protologue, translated] / "W of Bom Jesus da Lapa" [isotype label at B]; "in dense dry scrub, at the margins of limestone rocks" [protologue, translated], s.a. (type herbaria: ZSS, B).

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun as "Horst & Braun 616" [sphalm. pro *Horst & Uebelmann HU 616*].

***Arthrocereus itabiriticola*** P. J. Braun in Kakt. And. Sukk. 37(11): 234-237, ill., SEM-ill. 1986
Type: *Horst & Uebelmann HU 330* – Brazil: Minas Gerais: "C Minas Gerais, in the mountains SW of Belo Horizonte, near the road towards São Paulo" [protologue, translated] / "Betim" [1 of 2 isotype labels at B]; "between itabirit rocks" [protologue, translated], 800-1000 m, s.a. (type herbaria: ZSS, B).

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Locality given as "Betim".
B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Locality given as "SW Belo Horizonte, Richtung São Paulo".

***Arthrocereus melanurus*** var. ***estevesii*** Diers & P. J. Braun in Kakt. And. Sukk. 39(5): 100-105, ill., SEM-ill. 1988
Type: *Horst, Braun & Esteves 1* – Brazil: Minas Gerais: "high mountain regions of the S Serra do Espinhaço" [protologue, translated] / "São João del Rey, high mountain regions" [isotype label at B]; "campo rupestre" [protologue], 1000-1500 m, 9.1983 [detailed locality data deposited together with the holotype for conservation reasons according to the protologue] (type herbaria: B (ex KOELN), B, ZSS).

B (ex KOELN) (boxed B 100216257) (holotype): corp, ar, sp. – Notes: Part 1 of 3 of the holotype. Simply labelled as "Holotyp" and "HBE 1". A separate print of the protologue with annotated locality data is archived separately.
B (ex KOELN) (spirit B 810013108) (holotype): fl. – Notes: Part 2 of 3 of the holotype. Simply labelled "Holotyp" and "HBE 1".
B (ex KOELN) (spirit B 810013109) (holotype): fl, fr. – Notes: Part 3 of 3 of the holotype. Simply labelled "Holotyp" and "HBE 1".
B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun sub "Horst, Esteves & Braun 1".
B (ex KOELN) (boxed B 100216258) (isotype): sem. – Notes: Simply labelled "HBE 1".
B (ex KOELN) (spirit B 810013110) (isotype): fl. – Notes: Simply labelled "Isotyp" and "HBE 1".

***Austrocephalocereus estevesii*** subsp. ***grandiflorus*** Diers & Esteves in Kakt. And. Sukk. 40(4): 77-81, ill., SEM-ill. 1989
Type: *Esteves Pereira 149* – Brazil: Goiás: "N of the Serra Geral de Goias, at about latitude 12 degree" [protologue, translated]; "on naked, dark limestone rocks", 600-650 m, s.a. [detailed locality information deposited together with the holotype for conservation reasons according to the protologue] (type herbaria: B (ex KOELN), ZSS).

B (ex KOELN) (boxed B 100216259) (holotype): corp, ar, sp, ceph. – Notes: Part 1 of 3 of the holotype. Simply labelled "Holotyp" and "E-149". A separate print of the protologue with annotated locality data is archived separately.
B (ex KOELN) (spirit B 810013111) (holotype): fl. – Notes: Part 2 of 3 of the holotype. Simply labelled "Holotyp" and "E-149".
B (ex KOELN) (spirit B 810013112) (holotype): fl. – Notes: Part 3 of 3 of the holotype. Simply labelled "Holotyp" and "E-149".
B (ex KOELN) (boxed B 100216261) (isotype): sem. – Notes: Simply labelled "E-149".
B (ex KOELN) (boxed B 100216260) (type collection): corp, ar, sp, ceph. – Notes: A plastic bag with 2 stem parts, without any label but associated with part 1 (of 3) of the holotype of this name and thus most probably additional (iso-?) type material.

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***Austrocephalocereus estevesii*** subsp. ***insigniflorus*** Diers & Esteves in Kakt. And. Sukk. 39(11): 264-268, ill., SEM-ill. 1988
Type: *Esteves Pereira 122* – Brazil: Minas Gerais: "NW region of Minas Gerais, in the region of 16 deg. latitude" [protologue, translated]; "sunny limestone rocks", 600-650 m, s.a. [detailed locality information deposited together with the holotype for conservation reasons according to the protologue] (type herbaria: B (ex KOELN)).

B (ex KOELN) (boxed B 100216262) (holotype): corp, ar, sp. – Notes: Simply labelled "Holotyp" and "E-122". A separate print of the protologue with annotated locality data is archived separately.
B (ex KOELN) (boxed B 100216263) (isotype): corp, ar, sp. – Notes: Simply labelled "Isotyp" and "E-122".
B (ex KOELN) (boxed B 100216264) (isotype): fr, sem. – Notes: Simply labelled "E-122".
B (ex KOELN) (spirit B 810013113) (isotype): fl. – Notes: Simply labelled "E-122".
B (ex KOELN) (spirit B 810013114) (isotype): fl. – Notes: Simply labelled "E-122".

***Binghamia climaxantha*** Werdermann in Repert. Spec. Nov. Regni Veg. 42: 4-5. 1937 (incorrect name, Art.11.4).
Type: *Blossfeld 84* – Peru: Lima: "near Chosica" [protologue, translated]; "sunny steep slopes", 1936 (type herbaria: B) [ex cult. BG Berlin ("lebend eingeführt")].

B (spirit B 810006687) (isotype): corp, ar, sp. – Notes: Ex cult. BG Berlin, April 1937. Since the protologue (p. 5) specifically mentions that both living and herbarium material was received from H. Blossfeld, the specimen must be treated as isotype and not as holotype.

***Blossfeldia liliputana*** Werdermann in Kakteenkunde 1937(11): 162-163, ill. 1937
Type: *Blossfeld & Marsoner s.n.* – Argentina: Jujuy: "near Tumbaya" [protologue, translated], 1500 m, 1936 (type herbaria: B) [ex cult. BG Berlin 1937].

B (spirit B 810006688) (holotype): rad, corp, ar, (fl). – Notes: Ex cult. BG Berlin 1937. Completely dried out. For an illustration see Leuenberger & Eggli (1999a: 3, fig. 1); the envelope contains a flower fragment, no seeds.

***Cactus bleo*** Kunth in Humboldt & al., Nov. Gen. Sp. 6: 69. 1823
Type: *Humboldt & Bonpland 1546* – Colombia: Bolívar: "in ripa fluminis Magdalenae prope Badillas" [protologue] / "Río Magdalena (Badillas)" [holotype label at P-Bonpl], 5.1805 [collection number and locality according to Leuenberger in Willdenowia 32: 138. 2002] (type herbaria: P-Bonpl [lecto], B-W, P) [Lectotype designated by Leuenberger in Mem. New York Bot. Gard. 41: 99. 1986; type herbaria according to Leuenberger in Willdenowia 32: 138. 2002].

B (sheet B-W 9442-1) (isotype): fol, (fl).

***Cactus caripensis*** Kunth in Humboldt & al., Nov. Gen. Sp. 6: 66. 1823
Type: *Humboldt & Bonpland 1249* – Venezuela: "prope Caripe" [protologue] / "Caripe" [holotype label at P-Bonpl] / "Cumana, in lignis putrid. Caripé" [isotype label at B-W], s.a. [collection number and locality data according to Leuenberger in Willdenowia 32: 138, 150. 2002] (type herbaria: P-Bonpl, B-W [sub *Cactus pilosus*]) [type herbaria according to Leuenberger in Willdenowia 32: 144. 2002; name attached to the B-W specimen according to Leuenberger in Willdenowia 34: 314. 2004].

B (sheet B-W 9431-1) (isotype): rad, corp (juv), ar, sp. – Notes: Labelled *Cactus pilosus* (cf. Leuenberger in Willdenowia 34: 314. 2004).

***Cactus horridus*** Kunth in Humboldt & al., Nov. Gen. Sp. 6: 70. 1823, nom. illeg., Art. 53.1.
Notes: Non *Cactus horridus* Salisbury 1796, nec Colla 1833 (= *Echinocactus horridus* Gay 1848). The correct name under *Pereskia* is *P. horrida* DC. 1828.

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Type: *Humboldt & Bonpland 3594* – Peru: "ad flumen Marañón, Provinciae de Jaén de Bracamoros" [protologue] / "Marañón" [holotype label at P-Bonpl]; "in collibus siccis" [protologue], 8.1802 (type herbaria: P-Bonpl [lecto], B-W, MO, P) [lectotype designated by Leuenberger in Mem. New York Bot. Gard. 41: 67. 1986; type herbaria according to Leuenberger in Willdenowia 32: 138. 2002].

B (sheet B-W 9441-1) (isotype): corp, ar, sp, fol.

***Cactus icosagonus*** Kunth in Humboldt & al., Nov. Gen. Sp. 6: 67. 1823
Type: *Humboldt & Bonpland 3293* – Ecuador: "prope pagum Nabón" [protologue] / "Nabon" [holotype label at P-Bonpl], s.a. [locality data according to Leuenberger in Willdenowia 32: 150. 2002] (type herbaria: P-Bonpl, B-W) [type herbaria according to Leuenberger in Willdenowia 32: 146. 2002].

B (sheet B-W 9429-1) (isotype): al, fl.

***Cactus micranthus*** Kunth in Humboldt & al., Nov. Gen. Sp. 6: 65. 1823
Type: *Humboldt & Bonpland 3494* – Peru: "prope Olleros Quitensium" [protologue] / "Olleros" [holotype label at P-Bonpl], 1330 m, s.a. [collection number according to Leuenberger in Willdenowia 32: 138, 144. 2002] (type herbaria: P-Bonpl, B-W [sub *Cactus variabilis*], P) [type herbaria according to Leuenberger in Willdenowia 32: 145. 2002; name attached to specimen at B-W according to Leuenberger in Willdenowia 34: 315. 2004].

B (sheet B-W 9433-1) (isotype): corp, ar, sp. – Notes: Labelled *Cactus variabilis* (cf. Leuenberger in Willdenowia 34: 315. 2004).

***Cactus sepium*** Kunth in Humboldt & al., Nov. Gen. Sp. 6: 67. 1823
Type: *Humboldt & Bonpland 3216* – Ecuador: Chimborazo: "ad radicem Chimborazo prope Riobamba" [protologue] / "Chimborazo" [holotype label at P-Bonpl], 2660 m, s.a. [collection number according to Leuenberger in Willdenowia 32: 138. 2002] (type herbaria: P-Bonpl, B-W [iso?, sub *Cactus endecagonus*]) [type herbaria according to Leuenberger in Willdenowia 32: 148. 2002; status of material at B according to Leuenberger in Willdenowia 34: 313. 2004].

B (sheet B-W 9423-1) (isotype): fl. – Notes: Labelled *Cactus endecagonus*. Type status questionable, cf. Leuenberger in Willdenowia 34: 313. 2004.

***Cactus smithii*** Alexander in Lloydia 2(3): 200-201. 1939
Type: *Smith 3388* – Guyana: Rupununi Distr.: "NW slopes of Kanuku Mt., in drainage of Mokumoku creek (Takutu tributary)" [printed herbarium labels, standardized]; "in dense forest", 150-400 m, 31.3.1938 (type herbaria: B, G, K, LE, NY, U, W).

B (sheet s.n.) (isotype): (corp), ar, sp, ceph.

***Calymmanthium substerile*** F. Ritter, Kakt. And. Sukk. 13(2): 25-28, ill. 1962
Notes: First mentioned as nom. nud. in Backeberg, Cact. 2: 887. 1959 (cf. RPS 10).
Type: *Ritter 315 loc.1* – Peru: Cajamarca; Jaén: "lower Huancabamba gorge" [protologue, translated], "Bucara" [Pucará] [specimen data at ZSS], 8.1954 (type herbaria: SGO, U097800B, ZSS).

B (sheet GH20873) (type number): ic (corp). – Notes: Ex cult. BG Berlin, 26.6.1986, from material raised from seeds received 1957 from H. Winter. Collection number established by inference.

B (sheet GH20873a) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin, 21.7.1993, from material raised from seeds received 1957 from H. Winter. Collection number established by inference.

B (sheet GH20873b) (type number): fl, ic (fl). – Notes: Ex cult. BG Berlin, 11.9.1996, from material raised from seeds received 1957 from H. Winter. Collection number established by inference.

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***Cephalocereus blossfeldiorum*** Werdermann in Kakteenkunde 1937: 4-5. 1937
Type: *Blossfeld 88* – Peru: Cajamarca: "near Huancabamba" [protologue, translated], 1936 (type herbaria: B) [ex cult. BG Berlin ("Pflanze lebend eingeführt")].

B (spirit B 810006691) (holotype): corp, ar, sp. – Notes: Ex cult. BG Berlin, s.a.; Leuenberger (1979) erroneously reports this specimen as consisting of only a flower.

***Cephalocereus kanukuensis*** Alexander in Lloydia 2(3): 200. 1939
Type: *Smith 3380* – British Guiana: "NW slopes of Kanuku Mts., in drainage of Moku-moku Creek (Takutu tributary)" [printed herbarium specimen labels]; "in dense forest", 300 m, 31.3. 1938 (type herbaria: B, G, K, LE, MO, NY, P, U 45282A (Box 911), US).

B (sheet s.n.) (isotype): corp, ar, sp, ic (corp, fl).

***Cephalocereus melanostele*** Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 12-13. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(11): 154-155. 1914.
Type: *Weberbauer 2630* – Peru: Lima: "near Chosica, at the railway Lima - Oroya" [protologue, translated]; "stony ground with very poor vegetation", 800 m, 15.3.1903 (type herbaria: B).

B (spirit B 810006699) (holotype): corp, ar, sp, ceph, fl.

***Cephalocereus purpureus*** Gürke in Monatsschr. Kakteenk. 18(6): 86. 1908
Notes: Non *Cephalocereus purpureus* Werdermann 1933.
Type: *Ule 4* – Brazil: Bahia: "Serra do Sincóra" [protologue]; "on rocks", 800-1200 m, s.a. (type herbaria: B).

B (spirit B 810006695) (holotype): corp, ar, sp, ceph.

***Cephalocereus ulei*** Gürke in Monatsschr. Kakteenk. 18(6): 85. 1908
Type: *Ule 12* – Brazil: Bahia: "on rocks of the Serra do São Ignacio" [protologue, translated], s.a. (type herbaria: B).

B (spirit B 810006698) (holotype): corp, ar, sp, fl.

***Cereus acanthurus*** Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 13-14. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(11): 155. 1914.
Type: *Weberbauer 1699* – Peru: Lima: "near Matucana, a station of the railway from Lima to Oroya" [protologue, translated]; "among rocks with sparse vegetation", 2370 m, 1.11.1902 (type herbaria: B).

B (spirit B 810006701) (holotype): rad, corp, ar, sp, fl.

***Cereus acranthus*** K. Schumann ex Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 14-15. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(11): 155-156. 1914. Name first used as *Pilocereus acranthus* K. Schumann (nom. nud.) by Weberbauer, Pfl.-Welt Peruan. Anden: t. 5b. 1911.
Type: *Weberbauer 1679* – Peru: Lima: "near Santa Clara, a station of the railway Lima - Oroya" [protologue, translated]; "stony ground in the Loma formation", 400-600 m, 26.10.1902 (type herbaria: B).

B (spirit B 810006700) (holotype): corp, ar, sp, fl, [+ic].

***Cereus acutangulus*** Pfeiffer, Enum. Diagn. Cact.: 107. 1837
Notes: Sometimes also cited from the unpublished source Otto, Cat. hort. Berol. 1833.
Type: *Anonymus s.n. in B Garden-Herbarium 15056* – Cult.: s.l. [neotype designation], 2.9.1983 (type herbaria: B [neo]) [neotype designated by Leuenberger in Bot. Jahrb. Syst. 123(2): 174. 2001].

B (sheet GH15056) (neotype): fl, fr, sem, ic (corp). – Notes: Ex cult. BG Berlin, s.n., 2.9.1983.

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***Cereus adscendens*** Gürke in Monatsschr. Kakteenk. 18(5): 66-69, ill. 1908
Type: *Ule 7072* – Brazil: Bahia: "near Tambury" [protologue, translated]; "low ground in the Caatinga", 10.1906 (type herbaria: B [lecto], HBG, K [photo]) [lectotype designated by Taylor & Zappi, Cacti Eastern Brazil: 426. 2004].

B (spirit B 810006702) (lectotype): corp, ar, sp, fl, [+ic]. – Notes: In addition, B has a photograph of the isotype at HBG.

***Cereus amazonicus*** K. Schumann ex Vaupel in Notizbl. Königl. Bot. Gart. Berlin 5(50): 283-284. 1913
Notes: Abridged version with an added illustration published in Monatsschr. Kakteenk. 23(11): 164-167. 1913. Name also mentioned by Ule in Bot. Jahrb. Syst. 40: 412. 1913.
Type: *Ule 53* – Peru: Loreto: "at the Huallaga [River] near Tarapoto" [protologue], 9.1902 (type herbaria: B [status?]).

B (spirit B 810006703) (holotype): corp, ar, sp, fl [+ic]. – Notes: The bottle is without collection number and year, and the treatment of this material as holotype relies on the admittedly weak fact that this is the only specimen present at B, and that the material is absolutely congruent with the figure of the type in Monatsschr. Kakteenk. 23: 165. 1913. B also has a photograph of a topotype (*Ule 6314,* "Tarapoto, Oct.1902", sheet specimen [corp, ar, sp, fl]) at HBG.

***Cereus anisitsii*** K. Schumann in Monatsschr. Kakteenk. 9(12): 185-186. 1899
Type: *Anisits Cact. 19* – Paraguay: "at the rivulet Tagatiya-mi, near Porongo" [protologue, translated]; "on sandy ground", 25.1.1898 (type herbaria: B).

B (spirit B 810006704) (holotype): corp, ar, sp, fl.

***Cereus apiciflorus*** Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 15-16. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(11): 156-157. 1914.
Type: *Weberbauer 3743* – Peru: Ancash; Huari: "above Masin in the valley of the Puccha River" [protologue, translated]; "in open scrub consisting of shrubs, cacti, agaves, bromeliads and herbs", 2500-2600 m, 26.10.1903 (type herbaria: B [fragment only]).

B (spirit B 810006705) (isotype): fl. – Notes: Dried out. The apparent holotype material was illustrated by Werdermann in Kakteenkunde 1940: 5-6, which was subsequently destroyed at B.

***Cereus bonplandii*** Parmentier ex Pfeiffer, Enum. Diagn. Cact.: 108. 1837
Notes: Sphalm. 'bomplandii'.
Type: *Guaglianone & Múlgura 2228* – Argentina: Formosa; Pilcomayo: "Parque Nacional Pilcomayo, alrededores de Laguna Blanca, hacia el E" [neotype label at B]; "palmar", 14.12.1988 (type herbaria: SI [neo], B) [neotype designated by R. Kiesling in Darwiniana 34: 391. 1996].

B (sheet s.n.) (isoneotype): (corp, ar, sp), fl, fr, sem.

***Cereus brachypetalus*** Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 16-17. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(12): 161-162. 1914.
Type: *Weberbauer 1549* – Peru: Arequipa: "near Mollendo" [protologue, translated]; "in rocky sandy ground in the Loma formation", 150 m, 7.10.1902 (type herbarium: B).

B (spirit B 810006717) (holotype): corp, ar, sp, fl, fr.

***Cereus brevistylus*** K. Schumann ex Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 17-18. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(12): 162-163. 1914. Name first used by Weberbauer, Pfl.-Welt Peruan. Anden: 128-129. 1911.

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Type: *Weberbauer 1414* – Peru: Arequipa: "near Yura (station of the railway Arequipa – Puno)" [protologue, translated]; "on stony ground with scarce vegetation", 2400 m, 31.8.1902 (type herbarium: B).

B (spirit B 810006719) (holotype): corp, ar, sp, fl.

***Cereus decumbens*** Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 18-19. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(12): 163. 1914.
Type: *Weberbauer 1550* – Peru: Arequipa: "near Mollendo" [protologue, translated]; "on stony sandy ground with scattered vegetation", 50-100 m, 7.10.1902 (type herbaria: B).

B (spirit B 810006731) (holotype): corp, ar, sp, fl [+ic].

***Cereus deserticola*** Werdermann in Notizbl. Bot. Gart. Berlin-Dahlem 10(96): 764-765. 1929
Notes: Sphalm. 'deserticolus'.
Type: *Werdermann 869 p.p.* – Chile: Antofagasta; Taltal: "near Taltal" [protologue], 500 m, 10.1925 [this is a mixed collection and only the flowers are type of *Cereus deserticola,* see Leuenberger & Eggli in Willdenowia 25: 690. 1995] (type herbaria: B [lecto], BM, G, K, U, US) [lectotype according to Leuenberger & Eggli in Willdenowia 25: 690. 1996].

B (sheet s.n.) (holotype): fl.

***Cereus extensus*** Salm-Dyck ex DC., Prodr. 3: 469. 1828
Type: *de Granville & al.10991* – French Guiana: "Bassin du Maroni, Gobaya Soula (on the river-bank bordering Suriname)" [neotype designation] / "Atachi Bacca-Berge, (Camp 1), forest on the right-hand bank of the Itany River" [neotype label, translated], 100 m, 31.1.1989 (type herbaria: B [neo]) [neotype (ex cult. BG Berlin as *Cubr 33353*) designated by Leuenberger in Bot. Jahrb. Syst. 123: 56. 2001].

B (sheet GH33353) (neotype): corp, ar, sp, fl.

***Cereus glaziovii*** K. Schumann in Fl. Bras. 4: 200-201. 1890
Type: *Glaziou s.n.* – Brazil: Minas Gerais: "Pico d'Itabora do Campo" [protologue], 20.12.1888 (type herbaria: B, K [photo], SPF [photo]).

B (spirit B 810006739) (holotype): corp, ar, sp, fr [+ic].

***Cereus grandicostatus*** Werdermann in Notizbl. Bot. Gart. Berlin-Dahlem 12: 460-461. 1935
Type: *Anonymus s.n.* in *Huntington BG 9/17* – s.l., s.a. (type not preserved) [cult. Huntington BG].

B (sheet 27600) (type collection): ic (corp, ar, sp). – Notes: 6 prints made 1987 from original Werdermann negatives, labelled "cult. Huntington Botanical Garden 9-17, San Marino, California", "Foto E. Werdermann, 1933".

B (sheet s.n.) (type collection): corp, ar, sp, fl. – Notes: A total of 5 sheets prepared ex cult. BG Berlin 1982, 1986, 1992, 1998 and 2001 (from 043-84-74-80, a plant originally received from "Kalifornien 1966", thus most probably representing the living original material of the name cultivated at the Huntington Botanical Garden, San Marino, California).

***Cereus hassleri*** K. Schumann in Monatsschr. Kakteenk. 10(3): 45-46. 1900
Type: *Anisits Cact. 13* – Paraguay: "at the Estancia Tagatiya" [protologue], 20.1.1898 (type herbaria: B [syn], G [isosyn], K [isosyn]) [based on 2 syntypes].

B (spirit B810006743) (syntype): corp, ar, sp, fl. – Notes: This is 1 of 2 syntypes for this taxon.

***Cereus hertrichianus*** Werdermann in Notizbl. Bot. Gart. Berlin-Dahlem 12: 459-460. 1935
Type: *Anonymus s.n. in Huntington BG 44/65* – s.l., s.a. (type not preserved) [cult. Huntington BG].

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B (sheet s.n.) (type collection): ic (corp, ar, sp, fl). – Notes: 2 sheets with prints of a total of 4 photographs made 1987 from original Werdermann negatives "Foto E. Werdermann 1933", "cult. Huntington Botanical Garden 44-65, San Marino, California" (number later added by hand to type-written label).

***Cereus horridus*** var. ***alatosquamatus*** Werdermann in Notizbl. Bot. Gart. Berlin-Dahlem 12: 452. 1935 (incorrect name, Art.11.4).
Type: *Anonymus s.n. in Huntington BG 41/75* – s.l., s.a. (type not preserved) [cult. Huntington BG].

B (sheet s.n.) (type collection): ic (corp, ar, sp). – Notes: 2 prints made 1987 from original Werdermann negatives labelled "Foto E. Werdermann 1933", "cult. Huntington Botanical Garden 41-75, San Marino, California".

***Cereus iquiquensis*** K. Schumann in Monatsschr. Kakteenk. 14(7): 99-100. 1904
Type: *Reiche s.n.* – Chile: Atacama: "Atacama desert near Iquique" [protologue, translated; lectotype specimen index card], s.a. (type herbaria: B [lecto]) [lectotype designated by Leuenberger & Eggli in Haseltonia 7: 76. 2000].

B (spirit B 810006746) (lectotype): fl, [+ic].

***Cereus lamprospermus*** K. Schumann in Monatsschr. Kakteenk. 9: 166. 1899
Type: *Anisits Cact. 2* – Paraguay: "Río Paraguay, near Fuerte Olympo" [protologue, translated, standardized], 12.1.1898 (type herbaria: B [lecto]).

B (spirit B810006749) (lectotype): corp, ar, sp, fl, fr, sem, +ic. – Notes: **Lectotype (here designated)** of *Cereus lamprospermus.* Berlin also has a spirit specimen of the remaining syntype, *Anisits Cact. 11* (B810006758, corp, ar, sp, fl, +ic).
B (spirit B810006750) (isolectotype): corp, ar, sp, fl, fr, sem, +ic.

*Notes.* – This name is based on two syntypes, *Anisits Cact. 2* (2 spirit specimens at B) and *Anisits Cact. 11* (1 spirit specimen at B). The material of all 3 specimens is compatible with the protologue and we here select the most complete specimen as lectotype.

***Cereus leucostel***e Gürke in Monatsschr. Kakteenk. 18(4): 53. 1908
Type: *Ule 2* – Brazil: Bahia: "in the S catinga near Calderão" [protologue, translated], s.a. (type herbaria: B).

B (spirit B 810006756) (holotype): corp, ar, sp, ceph, fr, sem?

***Cereus longiflorus*** Alexander in Lloydia 2(3): 199-200. 1939
Type: *Smith 3387* – British Guiana: Rupununi Distr.: "NW slopes of Kanuku Mt, in drainage of Moku-moku Creek (Takutu tributary)" [printed herbarium labels, standardized]; "in dense forest", 275 m, 31.3.1938 (type herbaria: NY, B [photo], G [photo], K, LE, MO, P, U [photo]).

B (sheet s.n.) (isotype): ic (corp, ar, sp, fl). – Notes: Original photograph and label, accessioned 1956.

***Cereus luetzelburgii*** Vaupel in Z. Sukk. 1(6): 57, ill. 1923
Type: *Lützelburg 22* – Brazil: Bahia: "in the Serra das Almas, 1500 m, and the Serra Marsalina, 1400 m" [protologue, translated], 7.1913 (type herbaria: B [fragment]).

B (spirit B 810006759) (holotype): fl. – Notes: Dried out.

***Cereus micranthus*** Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 19-20. 1913
Notes: Non *Rhipsalis micrantha* (Kunth) DC 1828. Abridged version published in Monatsschr. Kakteenk. 24(12): 163-164. 1914.

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Type: *Weberbauer 1353* – Peru: Puno: "near Sandía" [protologue, translated]; "on rocks between scrub", 2100 m, 31.7.1902 (type herbaria: B, US).

B (spirit B 810006765) (holotype): corp, ar, sp, fl, fr, sem?. – Notes: Dried out.

***Cereus pachyrrhizus*** K. Schumann, Gesamtbeschr. Kakt., Nachtr.: 33-34. 1903
Type: *Anisits Cact. 39* – Paraguay: "on the Cerro Noaga" [protologue, translated]; "naked granite rocks", 350 m, s.a. (type herbaria: B).

B (spirit B 810006771) (holotype): corp, ar, sp, fr, sem? [+ic].

***Cereus penicillatus*** Gürke in Monatsschr. Kakteenk. 18(5): 70-71. 1908
Type: *Ule 7052* – Brazil: Bahia; Maracás: "near Calderão" [protologue, translated]; caatinga, s.a. (type herbaria: B, HBG, K [photo]).

B (spirit B 810006773) (holotype): corp, ar, sp, ceph, fl.

***Cereus peruvianus*** var. ***persicinus*** Werdermann in Notizbl. Bot. Gart. Berlin-Dahlem 12: 448. 1935
Type: *Anonymus s.n. in Huntington BG 9/7* – s.l., s.a. (type not preserved).

B (sheet s.n.) (type collection): ic (corp, ar, sp, fl). – Notes: Prints made 1987 from negatives in the Werdermann archives, "Foto E. Werdermann 1933", cult. Huntington Botanic Garden, California. Even though the photographs do not show the type number (Huntington accession number), they almost certainly illustrate the type of this name.

***Cereus phatnospermu***s K. Schumann in Monatsschr. Kakteenk. 9(12): 186-187. 1899
Type: *Anisits Cact. 27* – Paraguay: Presidente Hayes: "bei Porongo" [protologue], 18.2.1898 (type herbaria: B).

B (spirit B 810006775) (holotype): corp, ar, sp, (al), +ic.

B (spirit B 810006776) (isotype): corp, ar, sp, fl, fr, sem, +ic. – Notes: The original label gives "*Cereus phatnospermus* K. Sch. Paraguay leg. *Anisits*", without date or collection number. According to the protologue, *Anisits 27* is the only material present, and so it is reasonable to assume that this specimen is part of the original gathering. The labels of this bottle and the holotype bottle moreover look very similar, have the same handwriting and are of the same size. The problem is, however, slightly more complicated as there is yet another specimen of this taxon at B (B 810006777) labelled – though in a different handwriting and on a larger-sized label – as *Anisits 49*. This could probably be a later addition to the herbarium, received from Anisits subsequent to the publication of the protologue of this name.

***Cereus piauhyensis*** Gürke in Monatsschr. Kakteenk. 18(6): 84-85. 1908
Type: *Ule 9* – Brazil: Piauí: "on rocks of the Serra Branca" [protologue] [Mpio. São Raimundo Nonato], 1.1907 (type herbaria: B, K [photo], SPF [photo]).

B (spirit B 810006778) (holotype): corp, ar, sp, fl, [+ic].

***Cereus plagiostoma*** Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 20-21. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(12): 164-167, ill. 1914.
Type: *Weberbauer 3906* – Peru: Cajamarca: "near San Miguel" [protologue, translated]; "in open to almost closed association of herbs (numerous grasses), cacti, bromeliads and shrubs", 2200 m, 5.5.1904 (type herbaria: B).

B (spirit B 810006780) (holotype): corp, ar, sp, fl, [+ic].

***Cereus pseudosonorensis*** Gürke in Monatsschr. Kakteenk. 20: 147, 173. 1910
Type: *Runge s.n.* – Mexico: Sonora: s.l. [protologue], s.a. (type herbaria: B [status ?]) [ex cult. BG Berlin].

B (spirit B 810006798) (holotype): ar, sp, fl.

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*Notes.* – This name implicitly includes the type of *Cereus sonorensis* Runge ex K. Schumann 1901 (see below under the latter name).

***Cereus regelii*** Weingart in Monatsschr. Kakteenk. 20(3): 33. 1910
Type: *Anonymus in B Garden Herbarium 12552a* – Cult., s.l., s.a. (type herbaria: B [neo], SI) [neotype designated by Leuenberger in Kakt. And. Sukk. 47(2): 35. 1996].

B (sheet GH12552a) (neotype): corp, ar, sp, fl, ic. – Notes: Ex cult. BG Berlin 045-88-74-80, 10.8.1994, from cultivated material without known wild origin.

***Cereus rhodanthus*** Gürke in Monatsschr. Kakteenk. 18(5): 69. 1908
Type: *Ule 11* – Brazil: Piauí: "in the Catinga de São Raimundo" [protologue, translated], s.l. (type herbaria: B).

B (spirit B 810006785) (holotype): corp, ar, sp, ceph, fl, [+ic].

***Cereus rhodoleucanthus*** K. Schumann in Monatsschr. Kakteenk. 9: 187. 1899
Type: *Anisits Cact. 18* – Paraguay: "near the Estancia Tagatiya" [protologue, translated], 25.1.1898 (type herbaria: B [lecto]).

B (spirit B810006787) (lectotype): corp, ar, sp, fl, fr, sem, +ic. – Notes: **Lectotype (here designated)** of *Cereus rhodoleucanthus.* In addition, B has dried out specimens of the remaining syntypes *Anisits Cact. 5* (B810006788, corp, ar, sp, fl, fr, sem, +ic) and *Anisits Cact. 24* (B810006786, corp, ar, sp, (fl), +ic).

*Notes.* – This name was based on 5 syntypes, *Anisits Cact. 5* (1 spirit specimen present at B, dried out), *Anisits Cact. 18* (1 spirit specimen present at B), *Anisits Cact. 24* (1 spirit specimen present at B, dried out), *Anisits Cact. 62* (no material traced), and *Anisits Cact. 65* (no material traced). The specimen of *Anisits Cact. 18* is the only good material available for lectotypification. It is wholly compatible with the protologue and is selected as lectotype here.

***Cereus sonorensis*** Runge ex K. Schumann in Monatsschr. Kakteenk. 11: 135-136, ill. 1901
Notes: Frequently attributed to Gürke in Monatsschr. Kakteenk. 20: 146. 1910.
Type: *Runge s.n.* – Mexico: Sonora: s.l. [protologue], s.a. (type herbaria: B) [ex cult. BG Berlin].

B (spirit B 810006798) (holotype): ar, sp, fl. – Notes: Labelled "*Cereus sonorensis* Runge ded. K. Schumann", but without year. Areole and flower are obviously the material illustrated in the drawing that accompanies the protologue.

*Notes.* – The first valid description of *Cereus sonorensis* was published by K. Schumann in Monatsschr. Kakteenk. 11: 135. 1901, but the name was used before by Runge, probably in a catalogue (not traced). Gürke (1910) was of the opinion that the original material of Runge represented a different taxon, for which he published the name *C. pseudosonorensis* Gürke. However, Gürke based his new name partly on the Schumann description, partly on additional material. Since the flower details are, however, copied from Schumann, the type of the Schumann name is implicitly included in Gürke's concept of *Cereus pseudosonorensis,* which renders this name illegitimate under ICBN Art. 52.1. *C. pseudosonorensis* is thus typified by the type of *C. sonorensis*.

To make matters worse, Gürke compared his *Cereus pseudosonorensis* with *"Cereus sonorensis",* but from the text it becomes clear that this is not *C. sonorensis* Runge ex K. Schumann 1901, but a supposedly different taxon. Gürke's concept is an implicit publication of the name *C. sonorensis* Runge ex Gürke 1910, which is illegitimate (Art. 53.1) versus *C. sonorensis* Runge ex K. Schumann 1901.

***Cereus squamosus*** Gürke in Monatsschr. Kakteenk. 18: 70. 1908
Type: *Ule 10* – Brazil: Piauí: "on rocks of the Serra Branca" [protologue, translated], 1.1907 (type herbaria: B, K [photo], SPF [photo]).

B (spirit B 810006799) (holotype): corp, ar, sp, fl, [+ic].

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***Cereus squarrosus*** Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 21-22. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(12): 168. 1914.
Type: *Weberbauer 1719* – Peru: Junín: "near Tarma" [protologue, translated]; "loamy ground with scattered vegetation", 3000-3100 m, 25.11.1902 (type herbaria: B).

B (spirit B 810006801) (holotype): corp, ar, sp, fl.

***Cereus stenogonus*** K. Schumann in Monatsschr. Kakteenk. 9: 165-166. 1899
Type: *Anisits Cact. 53* – Paraguay: San Salvador: "near Paso La Cruz" [protologue, translated], 22.2.1898 (type herbaria: B [lecto]) [R. Kiesling in Bol. Soc. Argent. Bot. 24: 383. 1988, mentions type material at NY but the relevant specimen is not one of the syntypes].

B (spirit B810006806) (lectotype): corp, ar, sp, fl, fr, sem, +ic. – Notes: **Lectotype (here designated)** of *Cereus stenogonus*. In addition, B has one spirit specimen each of the remaining syntypes *Anisits Cact. 31* (B810006807, corp, ar, sp, fl, (fr), +ic) and *Anisits Cact. 54* (B810006804, corp, ar, sp, (fr), +ic).

*Notes.* – The name was based on 3 syntypes, *Anisits Cact. 31, Anisits Cact. 53* and *Anisits Cact. 54,* each of which is represented by a spirit specimen at B. All are compatible with the protologue. *Anisits 53* is the most complete specimen, including a fruit and seeds, and is selected here as lectotype.

***Cereus torulosus*** Werdermann in Notizbl. Bot. Gart. Berlin-Dahlem 12: 457-459. 1935
Type: *Anonymus s.n.* in *Huntington BG 36/4* – s.l., s.a. (type not preserved).

B (sheet s.n.) (type collection): ic (corp, ar, sp, fl). – Notes: A print made 1987 from an original negative in the Werdermann archives, made by Werdermann in 1933 and showing the cultivated type specimen at the Huntington Botanical Garden, California.

***Cereus trigonus*** var. ***guatemalensis*** Eichlam ex Weingart in Monatsschr. Kakteenk. 21(5): 69-70. 1911
Type: *cult. Knippel s.n.* – s.l., 1911 (type herbaria: B).

B (spirit B 810006825) (holotype): corp, ar, sp. – Notes: Original label "ded. Weingart 25.4. 1911", thus with nearly absolute certainty the holotype.

*Notes.* – This name was first used by Eichlam (in Monatsschr. Kakteenk. 21(2): 18-21. 1911), based on Eichlam no. 25, but the name was treated as synonym of *Cereus purpusii,* and is thus there invalid under Art. 34.1a. The neotypification by Doweld with *Deam 695* (MO) in Turczaninowia 5: 13. 2002, is unnecessary in the light of the confirmed presence of the holotype at B. This material was deposited by Weingart either shortly before or concurrently with the publication of the protologue of the name and is therefore to be treated as the holotype.

***Cereus weberbaueri*** K. Schumann ex Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 22-23. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(12): 168-169. 1914. Name first used (without description) in Weberbauer, Pfl.-Welt Peruan. Anden: 128-129. 1911.
Type: *Weberbauer 1413* – Peru: Arequipa: "near Yura, a station of the railway Arequipa - Puno" [protologue, translated]; "on stony ground with scattered vegetation", 2400 m, 31.8.1902 (type herbaria: B).

B (spirit B 810006830) (holotype): corp, ar, sp, fl, [+ic].

***Cereus wittii*** K. Schumann in Monatsschr. Kakteenk. 10(10): 154-157, ill. 1900
Type: *Witt s.n.* – Brazil: Amazonas: "imported from Manaos" [protologue, translated], 1900 (type herbaria: B).

B (spirit B 810006832) (holotype): corp, ar, sp, fr.

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***Cereus xanthocarpus*** K. Schumann, Gesamtbeschr. Kakt., Nachtr.: 32. 1903
Type: *Anisits Cact. 59* – Paraguay: "in the Calle Manora" [protologue, translated], s.a. (type herbaria: B [lecto]).

B (spirit B810006833) (lectotype): corp, ar, sp, fr, sem, +ic. – Notes: **Lectotype (here designated)** of *Cereus xanthocarpus.*

*Notes.* – This name was based on 2 syntypes, *Anisits Cact. 59* and *Anisits Cact. 60,* from the same locality. Only *Anisits Cact. 59* could be located at B. The material is completely compatible with the protologue, and the specimen is selected as lectotype here.

***Chileorebutia glabrescens*** F. Ritter in Cactus (Paris) No. 64: suppl.: 1. 1959 (incorrect name, Art. 11.4).
Notes: Repeated in Cactus (Paris) 15(66): 9-10, ill., 1960.
Type: *Ritter 710 loc. 1* – Chile: Región III; Copiapó: "Depart. Copiapó, near coast" [protologue, translated] / "Arica" [holotype label at U], 9.1959 [collection date according to specimen at U] (type herbaria: U 098144B).

B (sheet GH33919) (type number): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 127-85-74-80, 19.6.1995, from material raised from seeds originally received from G. Köhres (without year).
B (sheet GH44751 / B100210950) (type number): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 127-85-74-80, 9.5.2007, from material raised from seeds originally received from Köhres (without year). Garden Herbarium GH 44751.

***Cleistocactus chacoanus*** var. ***santacruzensis*** F. Ritter, Kakt. Südamer. 2: 672, fig. 687. 1980
Notes: Based on the same type collection as *Cleistocactus santacruzensis* Backeberg, but incorrectly designated as illegitimate by Mottram in Cact. Succ. J. (US) 61: 156. 1989.
Type: *Ritter 356 loc. 1* – Bolivia: Santa Cruz: "tile roofs of department capital Santa Cruz" [protologue, translated]; "frequent", 1954 [collection date according to specimen at U] (type herbaria: U, SGO, ZSS) [type cited for U in Ritter, Kakt. Südamer. 1: iii. 1979].

B (sheet GH10078) (type number): fl. – Notes: Ex cult. BG Berlin, 5.6.1981, from material originally raised from seeds received from H. Winter. Collection number established by inference.
B (sheet GH35778) (type number): corp, ar, sp, fr, sem. – Notes: Ex cult. BG Berlin 001-85-74-10, 28.5.1997, from material originally received 1957 from H. Winter. Collection number established by inference.

***Cleistocactus micropetalus*** F. Ritter, Kakt. Südamer. 2: 675, figs. 653, 656. 1980
Type: *Ritter 830 loc. 1* – Bolivia: Chuquisaca; Avilez: "Concepción" [protologue], 1958 (type herbaria: U 160684B, SGO [status?], ZSS [seeds only, status?]) [type cited for U in Ritter, Kakt. Südamer. 1: iii. 1979].

B (sheet GH18323) (type number): fl, ic (corp). – Notes: Ex cult. BG Berlin, 5.7.1985, from material originally raised from seeds received 1959 from H. Winter. Collection number established by inference.
B (sheet GH18323a) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin 027-87-74-80, 25.2.1998, from material originally raised from seeds received 1959 from H. Winter. Collection number established by inference.

***Cleistocactus palhuayensis*** F. Ritter & Shahori in Ritter, Kakt. Südamer. 2: 688-689, fig. 669, 673. 1980
Notes: *Cleistocactus viridiflorus* Backeberg 1963 and *Cephalocleistocactus pallidus* Backeberg 1966 are based on further individuals of the type collection, but it is open to debate whether these names are validly described; if so, they would have priority.
Type: *Ritter 324 loc. 2* – Bolivia: La Paz; Muñecas: "lower Río Palhuaya" [protologue, translated], 10.1954 (type herbaria: U [not found], ZSS) [type cited for U in Ritter, Kakt. Südamer. 1: iii. 1979].

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B (sheet GH20171) (type number): fl, ic (corp). – Notes: Ex cult. BG Berlin 045-36-74-80, 19.6.1986. Collection number inferred by inference.
B (sheet GH20171a) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin 045-36-74-80, 21.7.1993. Collection number inferred by inference.
B (sheet GH20171b) (type number): cor, ar, sp. – Notes: Ex cult. BG Berlin 045-36-74-80, June 1995. Collection number inferred by inference.

***Coleocephalocereus braunii*** Diers & Esteves in Kakt. And. Sukk. 36(2): 28-35, ill. 1985
Type: *Horst, Braun & Esteves 4* – Brazil: Espírito Santo: "W part of the state of Espírito Santo" [protologue] / "E of Pico da Bandeira" [isotype labels at B, translated]; "on very steep granitic-gneissic rocks", 500-600 m, 9.1983 [detailed locality data deposited with the holotype for conservation reasons according to the protologue. Collection date according to isotype labels at B] (type herbaria: B (ex KOELN), B).

B (ex KOELN) (spirit B 810013115) (holotype): corp, ar, sp. – Notes: Part 1 of 2 of the holotype. Simply labelled "Holotyp" and "HBE 4". A separate print of the protologue with annotated locality data is archived separately.
B (ex KOELN) (spirit B 810013116) (holotype): fl, fr. – Notes: Part 2 of 2 of the holotype. Simply labelled "Holotyp" and "HBE 4".
B (boxed s.n.) (isotype): corp, ar, sp, (ceph).
B (boxed s.n.) (isotype): corp, ar, sp, ceph.
B (boxed s.n.) (isotype): rad, corp, ar, sp, ceph.
B (ex KOELN) (boxed B 100216265) (isotype): sem. – Notes: Simply labelled as "HBE 4.

*Notes.* – Whereas the holotype is stated to be *"Horst, Braun & Esteves 4",* the collection *"Braun 470"* is given as isotype, with an additional statement that this (and two further topotype collections) were made simultaneously at the type locality, but actually represents an paratype (see 3.2., above).

***Coleocephalocereus diersianus*** P. J. Braun & Esteves in Kakt. And. Sukk. 39(3): 48-53, ill., SEM-ill. 1988
Type: *Horst, Braun & Esteves 3* – Brazil: Minas Gerais: "frontier region to Espírito Santo" [protologue, translated]; "on steep 'sugar loaf' rock walls with some grasses and Aechmea sp.", 500 m, 1983 [detailed locality data deposited with the holotype for conservation reasons according to the protologue] (type herbaria: B (ex KOELN)).

B (ex KOELN) (spirit B 810013117) (holotype): ar, sp, fl. – Notes: Simply labelled "Holotyp" and "HBE 3". A separate print of the protologue with annotated locality data is archived separately.
B (ex KOELN) (boxed B 100216266) (isotype): sem. – Notes: Simply labelled "HBE 3".

***Coleocephalocereus estevesii*** Diers in Kakt. And. Sukk. 29(9): 201-205, ill. 1978
Type: *Esteves Pereira 66* – Brazil: Minas Gerais; Mpio. Pedra do Indaiá: "S of Belo Horizonte" [protologue, translated], 900-1000 m, 1974 [information on municipio added from Taylor & Zappi (2004)] (type herbaria: B (ex KOELN)).

B (ex KOELN) (boxed B 100216267) (holotype): corp, ar, sp. – Notes: Simply labelled as "Holotyp" and "E-66". A separate print of the protologue with annotated locality data is archived separately.
B (ex KOELN) (boxed B 100216268) (isotype): corp, ar, sp. – Notes: Simply labelled as "Isotyp" and "E-66".
B (ex KOELN) (boxed B 100216269) (isotype): sem. – Notes: Simply labelled as "E-66".
B (ex KOELN) (spirit B 810013118) (isotype): fl. – Notes: Simply labelled as "E-66".

***Copiapoa alticostata*** F. Ritter in Taxon 12(1): 29. 1963
Type: *Ritter 717 loc. 1* – Chile: Región III; Huasco: "Typuslokalität nördl. Nicolasa, Nordchile"

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[holotype label at U] = type locality N of Nicolasa, N Chile, 10.1962 [collection date according to specimen at U] (type herbaria: U 145223B, SGO, ZSS [seeds only]) [holotype cited for U in Taxon 12(1): 28. 1963].

B (sheet GH43998 / B100171592) (type number): ic (juv corp, ar, sp). – Notes: Ex cult. BG Berlin 138-16-74-80, Sept.1991, from material originally raised from seeds received from H. Winter (s.a.). Collection number established by inference.

***Copiapoa calderana*** F. Ritter in Cactus (Paris) No.65: 197-198, ill. 1959
Type: *Ritter 507 loc. 1* – Chile: Región III; Copiapó: "coast N of Caldera" [protologue, translated] / "von der Typuslokalität Caldera" [holotype label at U] = from the type locality Caldera, 1.1956 [originally distributed as *Copiapoa pepiniana*] (type herbaria: U 98048B [lecto], SGO, ZSS) [type cited for ZSS, but none of the specimens at ZSS seems to qualify as holotype. Lectotype designated by Doweld in Sukkulenty 4(1-2): 55. 2001].

B (sheet GH44002 / B100171589) (type collection): ic (corp, ar, sp). – Notes: Ex cult. BG Berlin 138-20-74-80, 26.5.2006, from material originally raised from seed received 1959 from H. Winter.

***Copiapoa dura*** F. Ritter in Taxon 12(1): 31. 1963
Notes: Name first mentioned in Backeberg, Cact. 6: 3827. 1962 (as nom. nud.).
Type: *Ritter 546 loc. 1* – Chile: Región III; Copiapó: "E of Totoral" [protologue, translated], 1956 (type herbaria: U 117603B, SGO [status?], ZSS [seeds only]) [holotype cited for U in Taxon 12(1): 28. 1962].

B (sheet GH44003 / B100171588) (type number): ic (corp, ar, sp). – Notes: Ex cult. BG Berlin 138-26-74-80, 26.5.2006, from material originally raised from seeds received 1959 from H. Winter.

***Copiapoa krainziana*** F. Ritter in Taxon 12(1): 30-31. 1963
Notes: First mentioned in Backeberg, Cact. 6: 3834. 1962 (as nom. nud.).
Type: *Ritter 210 loc. 1* – Chile: Región II; Antofagasta: "mountains at the coast in Dept. Taltal" [protologue, translated], 21.6.1954 [collection date according to material at ZSS] (type herbaria: ZSS T4724, SGO, ZSS).

B (sheet GH30589) (type number): ic (corp). – Notes: Ex cult. BG Berlin, 30.11.1992, from material raised from seeds originally received 1957 from H. Winter. Collection number established by inference.

***Copiapoa laui*** Diers in Kakt. And. Sukk. 31(12): 362-365, ill. 1980
Notes: Sphalm. *'lauii'*.
Type: *Lau 891* – Chile: Antofagasta: "in the farther surroundings of Esmeralda" [protologue, translated]; "in strongly schistose, humus-free soil or schist grit on slightly sloping mountain slopes", 100 m, 1971 [detailed locality data deposited with the holotype for conservation reasons according to the protologue, but this is not the case] (type herbaria: B (ex KOELN), ZSS [type number]).

B (ex KOELN) (spirit B 810013119) (holotype): rad, corp, ar, sp, fl. – Notes: Simply labelled as "Holotyp" and "L 891". A separate print of the protologue (but without annotations as to more detailed locality data) is archived separately.

B (ex KOELN) (boxed B 100216270) (isotype): rad, corp, ar, sp. – Notes: Simply labelled "Isotyp" and "(Lau) L 891".

B (ex KOELN) (boxed B 100216271) (isotype): sem. – Notes: Simply labelled as "L 891" and "unbeschädige Früchte 35 Korn, 48 Korn" [undamaged fruits 35 grains, 48 grains], but the plastic bag contains only 8 seeds.

***Copiapoa marginata*** subsp. ***robustispina*** Doweld in Sukkulenty 4(1-2): 49. 2002
Notes: Based on *Copiapoa bridgesii* sensu F. Ritter 1980.

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Type: *Ritter 245 loc. 1* – Chile: Región III; Chañaral: "mountains N of air strip of Chañaral" [Ritter, Kakt. Südamer. 3: 1060. 1980, translated], 6.1954 (type herbaria: ZSS T4806).

B (sheet GH11982) (type number): fl, ic (corp). – Notes: Ex cult. BG Berlin, 9.6.1982, from material raised from seeds originally received 1957 from H. Winter. Collection number established by inference.

***Copiapoa rubriflora*** F. Ritter in Taxon 12(1): 31. 1963

Type: *Ritter 211 loc. 1* – Chile: Región II; Antofagasta: "S of Taltal, along the coast" [protologue, translated], 1.1954 (type herbaria: ZSS T4727 [lecto], SGO) [lectotype designated by Doweld in Sukkulenty 4(1-2): 55. 2002 ('2001')].

B (sheet GH44001 / B100171590) (type number): ic (corp, ar, sp). – Notes: Ex cult. BG Berlin 138-37-74-80, 26.5.2006, from material originally raised from seeds received 1957 from H. Winter.

***Copiapoa serpentisulcata*** F. Ritter in Cactus (Paris) 15(66): 22-23, ill. 1960

Type: *Ritter 246 loc. 1* – Chile: Región III; Chañaral: "Chañaral" [protologue] / "N of Chañaral, mountain tops" [Ritter, Kakt. Südamer. 3: 1093. 1980], 6.1954 (type herbaria: ZSS T4811, SGO, ZSS) [type cited for Z, later corrected to ZSS].

B (sheet GH21139) (type number): ic (corp). – Notes: Ex cult. BG Berlin, 30.7.1986, from material raised from seeds originally received 1958 from H. Winter. Collection number established by inference.

***Coryphantha pirtlei*** Werdermann in Notizbl. Bot. Gart. Berlin-Dahlem 12: 226. 1934

Type: *Pirtle s.n.* – USA: Texas; Starr County: s.l. [protologue], 1931 (type herbaria: B [authentic material]) [ex cult. BG Berlin 1938].

B (spirit B 810006854) (type collection): corp, ar, sp. – Notes: Ex cult. BG Berlin 1938, and thus later than the protologue.

***Discocactus buenekeri*** W.-R. Abraham in Kakt. And. Sukk. 38(11): 282-285, ill. 1987

Type: *Büneker s.n. in Abraham CWRA27* – Brazil: Bahia: "N Bahia" [protologue, standardized]; "in pure quartz sand" [protologue, translated], 1000 m, 1985 (type herbaria: B (ex KOELN)).

B (ex KOELN) (spirit B 810013120) (holotype): corp, ar, sp, ceph. – Notes: Labelled as "Holotyp"; collection number given as "CWRA 27/1"; "1" most probably relating to 1 of 4 specimens deposited.

B (ex KOELN) (boxed B 100216272) (isotype): fr. – Notes: Labelled "CWRA 27 (3)", the figure "3" most probably relating to the third of 4 specimens deposited.

B (ex KOELN) (boxed B 100216273) (isotype): sem. – Notes: Labelled "CWRA 27 (4)", the figure "4" most probably relating to the fourth of 4 specimens deposited.

B (ex KOELN) (spirit B 810013121) (isotype): fl. – Notes: Labelled "CWRA 27 (2)", the figure "2" most probably relating to the second of 4 specimens deposited.

***Discocactus cangaensis*** Diers & Esteves in Cact. Succ. J. (Los Angeles) 52(3): 107-111. 1980

Type: *Esteves Pereira 79* – Brazil: Goiás: "SW to W region of the state of Goiás" [protologue]; "rocky outcroppings rich in iron mineral, together with some grasses in a gritty soil containing some humus, full sun, rarely in half-shade", 750 m, 1975 [detailed locality data deposited with the holotype for conservation reasons according to the protologue] (type herbaria: B (ex KOELN)).

B (ex KOELN) (boxed B 100216274) (holotype): corp, ar, sp, ceph. – Notes: Simply labelled "Holotyp" and "E-79". A separate print of the protologue with annotated locality data is archived separately.

B (ex KOELN) (boxed B 100216275) (isotype): fr, sem. – Notes: Simply labelled "E-79".

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B (ex KOELN) (boxed B 100216342) (isotype): corp, ar, sp, ceph. – Notes: Simply labelled as "E-79 (a-c) Drei Isotypen", but without connection of the letters a-c with the 3 plant bodies preserved.
B (ex KOELN) (spirit B 810013122) (isotype): fl. – Notes: Simply labelled "E-79".

***Discocactus crassispinus*** P. J. Braun & Esteves in Cact. Succ. J. (Los Angeles) 66(5): 228-235, ill., SEM-ill. 1994
Type: *Esteves Pereira 44* – Brazil: Goiás: "W to SW regions [of Goiás]" [protologue, standardized] / "table mountains NE of Rio Verde" [isotype label at B]; "very often on the tops of table-mountains, in hard soil of red sandy loam and gravel of 'pedra canga'", 780-800 m, 7.1989 (type herbaria: UFG 12349, B, ZSS).

B (boxed s.n.) (isotype): (rad), corp, ar, sp, ceph. – Notes: Leg. P. J. Braun (ex cult.?), without date.

***Discocactus crystallophilus*** Diers & Esteves in Kakt. And. Sukk. 32(11): 258-261, ill. 1981
Type: *Esteves Pereira & Guimarães 84* – Brazil: Minas Gerais; Mun. Augusto de Lima: "C part of Minas Gerais, in the plains E and SE of the Represa Tres Marias" [protologue, translated] / "S of Curvelo" [isotype label at B, translated]; "in sandy soil with smaller and larger quartz pebbles", 700 m, 1977 [probably recollected in later years under the same collection number. Municipio name added from Taylor & Zappi (2004] (type herbaria: B (ex KOELN), B).

B (ex KOELN) (boxed B 100216277) (holotype): corp, ar, sp, ceph. – Notes: Labelled "Holotyp" and "E-84". A separate print of the protologue with annotated locality data is archived separately.
B (boxed s.n.) (isotype): rad, corp, ar, sp, ceph, (fl). – Notes: Leg. P. J. Braun (ex cult. ?), without date.
B (ex KOELN) (boxed B 100216278) (isotype): corp, ar, sp, ceph. – Notes: Labelled "E-84 (a, b)" and "2 Isotypen". The two specimens are, however, not identified with "a" or "b".
B (ex KOELN) (boxed B 100216279) (isotype): sem. – Notes: Simply labelled "E-84" and "Samen und Früchte" [seeds and fruits], but not fruits are present.
B (ex KOELN) (spirit B 810013123) (isotype): fl. – Notes: Simply labelled "E-84".
B (ex KOELN) (spirit B 810013124) (isotype): fl. – Notes: Simply labelled "E-84" and "innen", without known significance.

***Discocactus diersianus*** Esteves in Cact. Succ. J. (Los Angeles) 51(4): 179-183, ill. 1979
Type: *Esteves Pereira 87* – Brazil: Goiás: "SE region of the state of Goiás" [protologue, standardized]; "together with bromeliads on scaled rocks of granite outcrops interspersed with humus, in full sunlight", 650 m, s.a. [detailed locality data deposited with the protologue for conservation reasons according to the protologue] (type herbaria: B (ex KOELN)).

B (ex KOELN) (boxed B 100216280) (holotype): corp, ar, sp, ceph. – Notes: Labelled "Holotyp" and "E-87". A separate print of the protologue with annotated locality data is archived separately.
B (ex KOELN) (boxed B 100216281) (isotype): corp, ar, sp, ceph. – Notes: Labelled "Isotyp" and "E-87".
B (ex KOELN) (boxed B 100216282) (isotype): fr, sem. – Notes: Simply labelled "E-87".
B (ex KOELN) (spirit B 810013125) (isotype): fl. – Notes: Simply labelled "E-87".

***Discocactus estevesii*** Diers in Cact. Succ. J. (Los Angeles) 50(2): 83-85, 94, ill. 1978
Type: *Esteves Pereira 2* – Brazil: Goiás: "valley of the Paranaiba river, SE region of Goiás" [protologue]; "clay soil with stones between grasses on small rises", 650 m, s.a. [detailed locality data deposited with the holotype for conservation reasons according to the protologue] (type herbaria: B (ex KOELN), ZSS).

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B (ex KOELN) (boxed B 100216283) (holotype): corp, ar, sp, ceph. – Notes: Labelled "Holotyp" and "E-2". A separate print, which contrary to the protologue is without annotated locality data, is archived separately.
B (ex KOELN) (boxed B 100216284) (isotype): corp, ar, sp, ceph. – Notes: Labelled "2 Isotypen" and "E-2 (a-c)", but without connection of the lower-case letters to specimen parts.
B (ex KOELN) (boxed B 100216285) (isotype): sem. – Notes: Simply labelled "E-2".
B (ex KOELN) (spirit B 810013126) (isotype): fl. – Notes: Simply labelled "E-2".

***Discocactus goianus*** Diers & Esteves in Kakt. And. Sukk. 31(3): 73-79, ill., SEM-ill. 1980
Type: *Esteves Pereira 10* – Brazil: Goiás: "C and S part of the state of Goiás" [protologue, translated] / "S of Goiánia" [isotype label at B]; "together with bromeliads on sunny rocky places near rivers", 650-700 m, s.a. (type herbaria: B (ex KOELN), B).

B (ex KOELN) (boxed B 100216286) (holotype): corp, ar, sp, ceph. – Notes: Labelled "Holotyp" and "E-10". A copy of the protologue with annotated locality data is archived separately.
B (boxed s.n.) (isotype): corp, ar, sp, ceph, (fl). – Notes: Leg. P. J. Braun (ex cult. ?), without date.
B (ex KOELN) (boxed B 100216287) (isotype): corp, ar, sp, ceph. – Notes: Labelled "Isotyp" and "E-10".
B (ex KOELN) (boxed B 100216288) (isotype): sem. – Notes: Simply labelled "E-10".
B (ex KOELN) (spirit B 810013127) (isotype): fl. – Notes: Simply labelled "E-10" and "E 10 V", without known significance of the second annotation.

***Discocactus latispinus*** Buining & Brederoo in Succulenta (Amsterdam) 56(11): 259. 1977
Notes: Again given as new species in Buining, Gatt. Discocactus: 95-100, ill. 1980.
Type: *Horst & Uebelmann HU 146* – Brazil: Minas Gerais: "Serra do Cabral" [protologue], s.a. [collection cited as "H 146" in the protologue] (type herbaria: U, ZSS).

B (boxed s.n.) (type number): corp, ar, sp, ceph. – Notes: Leg. P. J. Braun ex cult. without date, accessioned 1991. This is very probably a later re-collection of the taxon under the original collection number, and thus not part of the original introduction (pre-1977).

***Discocactus lindanus*** Diers & Esteves in Cact. Succ. J. (Los Angeles) 53(2): 56-60, ill. 1981
Notes: Sphalm. 'lindaianus', and mandatorily correctable under Art. 60.11, Rec. 60C(d).
Type: *Esteves Pereira 9* – Brazil: Goiás: "E to NE region of the state of Goiás" [protologue] / "Chapada dos Veadeiros, campo cerrado" [isotype label at B]; "on broken scaly flat rocks, interspersed with humus, sand and fine gravel", 1100-1200 m, 1974 [probably recollected under the same collection number in later years] (type herbaria: B (ex KOELN), B).

B (ex KOELN) (boxed B 100216289) (holotype): corp, ar, sp, ceph. – Notes: Labelled as "Holotyp", collection number given as "E-9". A copy of the protologue with annotated locality data is archived separately.
B (boxed s.n.) (isotype): corp, ar, sp, ceph. – Notes: Leg. P. J. Braun (ex cult.?), without date, accessioned 1990.
B (ex KOELN) (boxed B 100216290) (isotype): corp, ar, sp, ceph. – Notes: Originally labelled "E-9 (a-c)" and "3 Isotypen", but the letters are not associated with the 3 plant bodies making up the specimen.
B (ex KOELN) (boxed B 100216291) (isotype): sem. – Notes: Collection given as "E-9" on the original label.
B (ex KOELN) (spirit B 810013128) (isotype): fl. – Notes: Collection data given as "E-9" on the original label.
B (ex KOELN) (spirit B 810013129) (isotype): fl. – Notes: Collection number given as "E-9" on the original label.

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***Discocactus multicolorispinus*** P. J. Braun & Brederoo in Kakt. And. Sukk. 32(3): 54-59, ill. 1981

Notes: Name doubtfully valid because the type collection is only specified in a very general manner and without indication of the collector.

Type: *Bueneker s.n.* – Brazil: Minas Gerais: "near a small village on the W slope of the Serra de Minas in the Serra do Espinhaço" [protologue, translated]; "under low shrubs and hidden in very stony, quartzite-rich soil", 1000-1100 m, 1977 [collector name and collection year according to isotype label at B. Detailed locality date deposited with the holotype for conservation reasons according to the protologue] (type herbaria: U, B, ZSS).

B (boxed s.n.) (isotype): corp, ar, sp, ceph, (fl). – Notes: Leg. P. J. Braun (ex cult. ?) without date; accessioned 1991.

***Discocactus prominentigibbus*** Diers & Esteves in Kakt. And. Sukk. 39(1): 14-19, ill., SEM-ill. 1988

Type: *Esteves Pereira 151* – Brazil: Goiás: "between the rivers Rio Tocantins and Rio Araguaia in the central, somewhat northern region of Goias" [protologue, translated]; "in half shade of trees and shrubs, or in full sun, in coarse sandy-gravelly soil", 800 m, s.a. [detailed locality data deposited together with the holotype for conservation reasons according to the protologue] (type herbaria: B (ex KOELN)).

B (ex KOELN) (boxed B 100216292) (holotype): corp, ar, sp, ceph. – Notes: Labelled "Holotyp" on the original label. Collection data simply given as "E-151". A separate print with annotated locality data is archived separately.

B (ex KOELN) (boxed B 100216293) (isotype): corp, ar, sp, ceph. – Notes: Labelled "Isotyp" on the original label. Collection details simply given as "E-151". The specimen consists of 4 entire plant bodies.

B (ex KOELN) (boxed B 100216294) (isotype): fr, sem. – Notes: Collection details simply given as "E-151". With an additional label "Samen + Früchte (leer)".

B (ex KOELN) (spirit B 810013130) (isotype): fl. – Notes: Collection details simply given as "E-151".

B (ex KOELN) (spirit B 810013131) (isotype): fl. – Notes: Collection details simply given as "E-151".

***Discocactus pseudolatispinus*** Diers & Esteves in Kakt. And. Sukk. 38(10): 242-247, ill., SEM-ill. 1987

Type: *Esteves Pereira 111* – Brazil: Minas Gerais: "central-northern Minas Gerais" [protologue] / "Montes Claros - Brasilia, at the artificial lake Tres Marias, campo cerrado" [isotype label at B], 700-800 m, s.a. [detailed locality information deposited with the holotype for conservation reasons according to the protologue] (type herbaria: B (ex KOELN), B).

B (ex KOELN) (boxed B 100216295) (holotype): corp, ar, sp, ceph. – Notes: Labelled "Holotyp" on the original label. Collection data simply given as "E-111". A separate print with annotated locality information is archived separately.

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun ex cult. without year; accessioned 1990.

B (ex KOELN) (boxed B 100216296) (isotype): fr, sem. – Notes: Collection data simply given as "E-111".

B (ex KOELN) (spirit B 810013132) (isotype): fl. – Notes: Collection data simply given as "E-111".

***Discocactus pulvinicapitatus*** Buining & Brederoo, Gatt. Discocactus: 100-105, ill. 1980

Type: *Horst & Uebelmann HU 425* – Brazil: Minas Gerais: "near the Rio Jequitai" [protologue] / "E of Jequitai" [isotype label at B] / "20 km E of Engenheiro Omar, Rio Jequitai" [unrecorded source], 650 m, s.a. [collection cited as "H 425" in the protologue] (type herbaria: U, B [type number], ZSS [type number]).

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B (boxed s.n.) (type number): corp, ar, sp, ceph, (fl). – Notes: Leg. P. J. Braun (ex cult.?), without year; accessioned 1991. Probably a later re-collection under the same field number.
B (boxed s.n.) (type number): corp, ar, sp, ceph, (fl). – Notes: Leg. P. J. Braun (ex cult.?), without year; accessioned 1991. Probably a later re-collection under the original field number.

***Discocactus subterraneo-proliferans*** Diers & Esteves in Kakt. And. Sukk. 31(9): 266-271, ill. 1980
Type: *Esteves-Pereira 12* – Brazil: Goiás: "central region of the Araguaia valley in the W of the state of Goiás" [protologue, translated]; "below scattered small trees and shrubs on flat ground in fine, loose predominantly quartzitic sand with little humus", 200-250 m, 10.1973 (type herbaria: B (ex KOELN)).

B (ex KOELN) (boxed B 100216297) (holotype): corp, ar, sp, ceph. – Notes: Labelled "Holotyp" on the original label; collection data simply given as "E-12". A separate print of the protologue with annotated locality data is archived separately.
B (ex KOELN) (boxed B 100216298) (isotype): corp, ar, sp, ceph. – Notes: Labelled "Isotyp" on the original label; collection data given as "E-12 (b)", which rises doubt as to the correctness of the isotype statement. The specimen consists of 2 plant bodies.
B (ex KOELN) (boxed B 100216299) (isotype): fr, sem. – Notes: Collection data simply given as "E-12".
B (ex KOELN) (spirit B 810013133) (isotype): fl. – Notes: Collection data simply given as "E-12".

***Discocactus zehntneri*** var. ***horstiorum*** P. J. Braun in Succulenta (Amsterdam) 69(10): 218, ill. 1990
Type: *Horst 667* – Brazil: Bahia: "N Bahia, high mountains (c.1000 m), in manganese ore" [protologue, translated] / "Mimoso, high mountains, between mangan ore, caatinga" [isotype labels at B], 1000 m, 1988 (type herbaria: B, B, ZSS (ex KOELN), K).

B (boxed s.n.) (isotype): corp, ar, sp.
B (boxed s.n.) (isotype): (rad), corp, ar, sp, ceph.
B (ex KOELN) (boxed B 100216300) (isotype): corp, ar, sp, ceph. – Notes: Labelled as "Isotyp" on the original label. Locality data simply given as "Bahia".

***Echinocactus anisitsii*** K. Schumann, Blüh. Kakt.: t. 4. 1900
Type: *Anisits Cact. 21* – Paraguay: "at the river Tagatiya-mi" [protologue, translated], 25.1.1898 (type herbaria: B).

B (spirit B 810006860) (holotype): corp, ar, sp, fl, fr, [+ic]. – Notes: Original label: *Echinocactus anisitsii* K. Sch. Paraguay leg. Anisits", i.e. without the collection number that is given in the protologue, but the contents are compatible with the protologue.

***Echinocactus aurantiacus*** Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 23-24. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(12): 169-170. 1914.
Type: *Weberbauer 3846* – Peru: Cajamarca: "near San Pablo" [protologue, translated]; "on rocks", 2200-2400 m, 29.4.1904 (type herbaria: B).

B (spirit B 810006865) (holotype): rad, corp, ar, sp, fl.

***Echinocactus damsii*** K. Schumann, Gesamtbeschr. Kakt., Nachtr.: 119-120, ill. 1903
Type: *Anisits s.n.* – Paraguay: "in the N part" [protologue, translated], s.a. (type herbaria: B).

B (spirit B 81006872) (holotype): rad, corp, ar, sp. – Notes: Original label: *"Echinocactus damsii* K. Sch. Paraguay *Anisits n. 21"*. The collection number ("n. 21") has probably been added and is in error, as *Anisits Cact. 21* is the type of *Echinocactus anisitsii*.

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***Echinocactus grandis*** Rose in Contr. U.S. Natl. Herb. 10(3): 126. 1909
Type: *Pringle 6696* – Mexico: Puebla: "limestone hills near Tehuacan, 6500 ft." [original printed label], 2000 m, 7.8.1897 (type herbaria: B, ENCB, G, HBG, LE, US, Z).

B (sheet s.n.) (isotype): corp, ar, sp, fl. – Notes: Specimen received from E.

***Echinocactus hastifer*** Werdermann & Bödeker in Notizbl. Bot. Gart. Berlin-Dahlem 11(104): 274-276. 1931
Type: *Anonymus s.n.* – Mexico?: cultivated material without known wild origin, but presumably Mexico., s.a. (type herbaria: B) [ex cult. BG Berlin, June 1930].

B (spirit B 810006882) (holotype): fl. – Notes: Ex cult. BG Berlin, June 1930.

***Echinocactus molendensis*** Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 24-25. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(12): 170-171. 1914.
Type: *Weberbauer 1506* – Peru: Arequipa: "Mollendo" [protologue]; "on stony sandy ground with poor vegetation" [protologue, translated], 20 m, 3.10.1902 (type herbaria: B).

B (spirit B 810006890) (holotype): rad, corp, ar, sp. – Notes: There is a second specimen at B (B 810006891, dried out and useless) numbered *"Weberbauer 1806",* which is presumably a mis-print for the type number.

***Echinocactus myriacanthus*** Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 25-26. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(12): 171. 1914.
Type: *Weberbauer 4272* – Peru: Amazonas; Chachapoyas: "at the wall of the valley of the Marañón above Balsas" [protologue, translated]; "in grass steppe with few cacti", 2200 m, 25.6.1904 (type herbaria: B).

B (spirit B 810006893) (holotype): rad, corp, ar, sp, fl.

***Echinocactus nidulans*** Quehl in Monatsschr. Kakteenk. 21: 119. 1911
Type: *Anonymus ex hort. Quehl s.n.* – Mexico?: s.l., s.a. (type herbaria: B [fragmentary flower]) [ex cult. hort. Quehl].

B (spirit B 810006896) (holotype): fl. – Notes: Labelled "Quehl Original 12. Mai 1911". Dried out.
B (spirit B 810006895) (type collection): fl. – Notes: Labelled as "ded. Quehl 17.2.", but without year. Dried out.

***Echinocactus peruvianus*** K. Schumann, Gesamtbeschr. Kakt., Nachtr.: 113-114. 1903
Type: *Weberbauer s.n.* – Peru: Lima: "in the Andes above Lima" [protologue, translated]; "together with *Opuntia vestita*", 4000 m, s.a. (type herbaria: B).

B (spirit B 810006901) (holotype): rad, corp, ar, sp, fl.

***Echinocactus reichei*** K. Schumann, Gesamtbeschr. Kakt., Nachtr.: 110-111. 1903
Type: *Reiche s.n.* – Chile: s.l. [protologue], s.a. (type herbaria: B) [ex cult. BG Berlin, 18.7.1903].

B (spirit B 810006906) (holotype): corp, ar, sp. – Notes: Labelled as "aus Chili von Reiche".

***Echinocactus umadeave*** Fric ex Werdermann in Monatsschr. Deutsch. Kakteen-Ges. 3: 223-226, ill. 1931
Notes: Based on *Friesia umadeave* Fric (nom. nud.) in Möllers Deutsche Gärtn.-Zeitung 45(4): 42-44. 1930.
Type: *Stümer s.n.* – Argentina: Salta/Jujuy: "Salta & Jujuy", s.l. [protologue], 1930 (type herbaria: B [lecto]) [lectotype designated by Kattermann, Succ. Pl. Res. 1: 136. 1994, but see below]

B (spirit B 810006918) (isotype): fl. – Notes: Ex cult. BG Berlin, without year. Labelled "Original zur Blütenbeschreibung" [original of the flower description]. Dried out.

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B (spirit B 810006917) (lectotype): corp, ar, sp. – Notes: Labelled "1931", which could signify that the specimen was received 1931, or that it was prepared from cultivation in 1931. Dried out. **Lectotype (here designated)** of *Echinocactus umadeave*.

*Notes.* – The name is based on 2 syntypes, *Ritter s.n.* and *Stümer s.n.* Kattermann (1994) selected the Stümer material as lectotype, but did not indicate which of the 2 specimens present at B is the actual lectotype. While Kattermann's selection of *Stümer s.n.* as lectotype of the name can stand, it needs to be refined (ICBN Art. 9.14). We select here the specimen B810006917 as lectotype of *Echinocactus umadeave*.

***Echinocactus violaciflorus*** Quehl in Monatsschr. Kakteenk. 22: 102. 1912
Type: *Anonymus s.n. in De Laet s.n.* – Mexico: Zacatecas: s.l. [protologue], s.a. (type herbaria: B [status?, useless fragment]).

B (spirit B 810006919) (type collection): fl. – Notes: Labelled "ded. Quehl" but without date. Dried out and completely useless.

***Echinocactus vorwerkianus*** Werdermann in Backeberg, Neue Kakteen: 101. 1931
Notes: See also Repert. Spec. Nov. Regni Veg. 30: 65. 1932 (Latin diagnosis). Leuenberger (Willdenowia 8: 631. 1979) listed a specimen at B as type, which could be seen as implicit (lecto-) typification. However the specimen consists of a flower only, and since the protologue has only a description of the plant body, but not of the flower, this specimen must be posterior to the publication of the taxon and can thus not serve as lectotype.
Type: *Anonymus s.n. in Vorwerk s.n.* – Colombia: "near Sagomosa [sic] NE of Bogotá" [protologue, translated]; "cattle pasture", 1200 m, s.a. (type herbaria: B†, B ["clono"]) [ex cult. BG Berlin, without date].

B (spirit B 810006920) (type collection): fl. – Notes: Dried out. ex cult. BG Berlin, without year.

***Echinocactus weberbaueri*** Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 26-27. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(12): 172. 1914.
Type: *Weberbauer 4271* – Peru: Amazonas; Chachapoyas: "at the E wall of the valley of the Marañón, above Balsas" [protologue, translated]; "in grass steppe, sometimes with and sometimes without shrubs, together with *Echinocactus myriacanthus* (the only other cactus observed)", 2000-2100 m, 25.6.1904 (type herbaria: B).

B (spirit B 810006921) (holotype): rad, corp, ar, sp, fl.

***Echinopsis backebergii*** Werdermann in Backeberg, Neue Kakteen: 84, ill. 1931
Notes: See also Repert. Spec. Nov. Regni Veg. 30: 64. 1932 (Latin diagnosis); non *Echinopsis backebergii* Fric (nom. inval.).
Type: *Backeberg s.n.* – Bolivia: La Paz: s.l. [protologue], s.a. (type herbaria: B [†; photo]; [lecto, icon]: Backeberg, Neue Kakteen: ill. p. 83 upper right corner) [lectotype (designated by M. Hjertson in Cactaceae Syst. Init. 20: 14-15. 2005). Details about the typifications are vague in the protologue but are clarified in the 1932-publication].

B (sheet s.n.) (isolectotype): ic (corp, ar, sp). – Notes: Print and negative. Labelled as "Lob. backebergii (Werd.) Typ!" in Werdermann's handwriting. This photograph differs from that published in the protologue.

*Notes.* – *Echinopsis backebergii* was based on two collections, viz. material collected by Backeberg (as indicated by the asterisk that precedes the name, cf. p. 63 with the explanation of the symbols used) and a herbarium specimen (presumably part of loans Werdermann received from S during 1928-30, perished in the 1943-fire at B) collected earlier by Dr Asplund (without number). The two collections must be regarded as syntypes. This and all the other names published as new in Backeberg's book were again covered by Werdermann (1932), giving Latin diagnoses and sometimes additional information. For *E. backebergii,* Werdermann now clearly

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gives the collection of Asplund (*Asplund 623,* 1920) as type, and this is to be regarded as lectotypification. Because Hjertson (2006) could not find any material of *Asplund 623,* he designated the illustration in Backeberg (1931b: 83, upper right) as lectotype. This habitat photograph by Backeberg shows a flowering plant in habitat and so Hjertson implicitely selected the Backeberg syntype as new lectotype. B has a photograph of a cultivated plant of this accession.

***Echinopsis calochlora*** subsp. ***glaetzleana*** P. J. Braun & Esteves in Kakt. And. Sukk. 45(8): 158-161, ill., SEM-ill. 1994
Type: *Braun 236* – Brazil: Mato Grosso do Sul: "S Pantanal, NW of Bonito" [protologue, translated]; "on rocks" [isotype label at B, translated], 7.1983 (type herbaria: ZSS, B).

B (boxed s.n.) (isotype): corp, ar, sp.

***Echinopsis chrysantha*** Werdermann in Notizbl. Bot. Gart. Berlin-Dahlem 11(104): 264-265. 1931
Type: *Anonymus s.n.* – Argentina: "Prov. Los Andes?", s.l. [protologue], s.a. (type herbaria: B [†; photo]; [lecto, icon]: Gartenflora 80: 302, ill. 1931) [ex cult. BG Berlin; lectotype designated by Hunt & Taylor in Cactaceae Syst. Init. 21: 7. 2006].

B (sheet s.n.) (type collection): ic (corp, ar, sp, fl). – Notes: Print and negative. Labelled on non-original labels "ohne Sammler und Datum, lebend, cult. hort. Berol.", "Foto des Typus". The photograph depicts *Echinopsis chrysantha* (left plant) and *E. hossei* (right plant). The same plant of *E. chrysantha* is also illustrated with a colour photograph in Blüh. Kakt.: t. 18, Oct. 1931.

***Echinopsis chrysochete*** Werdermann in Repert. Spec. Nov. Regni Veg. 39: 271-272. 1936
Type: *Marsoner s.n.* – Argentina: Jujuy: s.l. [protologue], 2800 m, 1934 (type herbaria: B [†; photo]) [ex cult. BG Berlin].

B (sheet s.n.) (type collection): ic (corp, ar, sp). – Notes: 2 prints and negative. Labelled on a non-original label "Lebend, cult. Bot. G.", and on an original label "gepfropfte Köpfe und getrocknete Import Typ" in Werdermann's handwriting. According to H. Blossfeld (pers. comm. to BEL, 2.8.1979), the type was collected by Marsoner but was also distributed under the number *Blossfeld 6*.

***Echinopsis densispina*** Werdermann in Kakteenkunde 8(8): 142-143, ill. 1934
Type: *Stümer 222* – Argentina/Bolivia: "N Argentina or adjacent Bolivia", s.l. [protologue], s.a. (type herbaria: B [fragment]) [ex cult. BG Berlin, 3.10.1932].

B (spirit B 810006963) (holotype): fl. – Notes: Dried out. ex cult. BG Berlin, 3.10.1932.

***Echinopsis hossei*** Werdermann in Notizbl. Bot. Gart. Berlin-Dahlem 11(104): 265-267. 1931
Type: *Hosseus s.n.* – Argentina: "wahrscheinlich Prov. Cordoba und Los Andes", s.l. [protologue], 1929 (type herbaria: B [fragmentary flower]) [ex cult. BG Berlin, 3.6.1931].

B (spirit B 810006939) (type collection): fl. – Notes: Dried out. ex cult. BG Berlin, 3.6.1931.
B (sheet s.n.) (type collection): ic (corp, ar, sp, fl). – Notes: Labelled "lebend, 1 Exemplar eingeführt, cult. Bot. G., 1930 blühend" [living, 1 individual imported, cultivated Bot. Garden, flowering 1930], "Foto der Typpflanze" [photograph of the type plant].

***Echinopsis marsoneri*** Werdermann in Repert. Spec. Nov. Regni Veg. 30: 55-56. 1932
Notes: Name also used (nom. inval., Art. 32.1c) by A. V. Fric, Cat. "Akklimatisations- und Versuchsgarten 1932-33", [unpaged]. 1933.
Type: *Stümer s.n.* – Argentina: "N Argentina: Gobern. Los Andes" [protologue], 1931 (type herbaria: B [†; photo]) [ex cult. BG Berlin c.1932].

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B (sheet s.n.) (type collection): ic (corp, ar, sp, fl). – Notes: Labelled on a non-original label "Lebend, cult. hort. Berol. Foto der Typpflanze" [living, cult. Berlin Garden, photograph of the type plant], "farbige Abb. der Typpfl. bei Werdermann, Blüh. Kakt. t. 26, 1932" [coloured illustration of the type plant], and in Werdermann's handwriting "Lob. marsoneri Werd. Typ!". The published colour photograph differs from the b/w negative but without doubt illustrates the same individual.

***Echinopsis mistiensis*** Werdermann & Backeberg in Backeberg, Neue Kakteen: 84-85, ill. 1931
Type: *Backeberg s.n.* – Peru: Arequipa: "volcano Misti near Arequipa" [protologue, translated], 3500 m, s.a. (type herbaria: B†, B [photo of authentic material]) [described from living material].

B (sheet s.n.) (type collection): ic (corp, ar, sp). – Notes: Photograph (negative and print) labelled "Lobivia vom Misti Import Bbg.1931", "*Backeberg s.n.,* lebend, cult. hort. Bot. Berol.", "Foto der Typpflanze?", and thus most probably authentic material.

***Echinopsis rhodotricha*** K. Schumann in Monatsschr. Kakteenk. 10: 147-148. 1900
Type: *Anisits Cact. 25* – Paraguay: "near the Arroyo La Cruz, 6 km from the now deserted S. Salvador, at the Río Tagatiya-mi" [protologue, translated], 25.1.1898 (type herbaria: B [lecto]).

B (spirit B810006946) (isolectotype): corp, ar, sp, fl, fr, sem, +ic.

B (spirit B810006945) (lectotype): corp, ar, sp, fl, fr, sem, +ic. – Notes: **Lectotype (here designated)** of *Echinopsis rhodotricha.* In addition, B has a spirit specimen of the remaining syntype, Anisits Cact.20 (B810006944; corp, ar, sp, (fl, fr), +ic).

*Notes.* – This name is based on 2 syntypes, *Anisits Cact. 20* (1 spirit specimen present at B) and *Anisits Cact. 25* (2 spirit specimens present at B), both from the same locality. All of them agree with the protologue and we here select the most complete specimen of *Anisits Cact. 25* as lectotype.

***Echinopsis scoparia*** Werdermann in Kakteenkunde 8(8): 144-145, ill. 1934
Type: *Stümer s.n.* – Argentina: s.l. [protologue], s.a. (type herbaria: B [†; photo]) [ex cult. hort. Hahn, Lichterfelde, c.1934].

B (sheet s.n.) (type collection): ic (corp, ar, sp, fl). – Notes: Labelled "Lob. scoparia Werd. Typ" in Werdermann's handwriting, and on a non-original label, copied from the protologue, "Stümer s.n. lebend in Sammlung Hahn, Lichterfelde. Foto der Typpflanze" [*Stümer s.n.,* living in the collection Hahn, Lichterfelde. Photograph of the type plant].

***Echinopsis silvatica*** F. Ritter in Succulenta (Amsterdam) 44(2): 24. 1965
Type: *Ritter 782 loc. 1* – Bolivia: Tarija; O'Connor: "Tacuarandi" [protologue], s.a. (type herbaria: U 160265B, SGO [status ?], ZSS [seeds only]).

B (sheet GH15002) (type number): fl, ic (corp). – Notes: Ex cult. BG Berlin, 9.8.1983, from material raised from seeds originally received 1959 from H. Winter. Collection number established by inference.

***Echinopsis violacea*** Werdermann in Notizbl. Bot. Gart. Berlin-Dahlem 11(104): 262-263. 1931
Type: *Stümer s.n.* – Argentina: Córdoba: s.l. [protologue]; "in rock fissures on grassy slopes" [protologue, translated], 1000 m, 1930 (type herbaria: B [fragmentary flower]) [ex cult. BG Berlin 1931].

B (spirit B 810006684) (holotype): fl. – Notes: Dried out. ex cult. BG Berlin 1931.

***Epiphyllum chrysocardium*** Alexander in Cact. Succ. J. (Los Angeles) 28(1): 3-6, ill. 1956
Type: *MacDougall A. 198* – Mexico: Chiapas: "region known as the Selva negra, between Tapalapa and Blanca Rosa near Santa Lucía and Rio Napak" [protologe]; "tropical rain-forest", 9.2.1951 [collection number not cited in the original publication and here inserted from the speci-

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men at G. Distributed as Univ. California Bot. Gard. 54.1242. Locality given as "Pueblo Nuevo, Blanca Rosa" by Kimnach, MacDougall collections by name, by locality, by collection number, 1992] (type herbaria: B, G, NY, ZSS).

B (sheet s.n.) (isotype): corp, ar, fl.

***Eriocereus spinosissimus*** Buining & Brederoo in Kakt. And. Sukk. 28(3): 49-51, ill. 1977
Type: *Horst & Uebelmann HU 328* – Brazil: Mato Grosso: "oberhalb Cuiabá" [protologue], "30 km towards Chapada de Guimarães, at the mountain" [collectors, pers. comm], s.a. (type herbaria: U, B ["clono"]).

B (spirit B 810000104) (type collection): fl. – Notes: Leg. W. Schindhelm ex cult., without date, accessioned c.1984.
B (sheet GH31420) (type collection): fl. – Notes: Ex cult. BG Berlin 225-01-85-30, 2.7.1993. Material originally from W. Schindhelm, acquired 1970 from W. Uebelmann.
B (sheet GH37443) (type collection): fl. – Notes: Ex cult. BG Berlin 225-01-85-30, 5.8.1999. Material originally ex cult. W. Schindhelm, acquired 1970 from W. Uebelmann.
B (sheet s.n.) (type collection): fl, ic (corp, ar, sp, fl). – Notes: Leg. W. Schindhelm ex cult., "Uebelmann 1971 Importe". Accessioned 24.8.1984.

***Espostoa lanata*** subsp. ***roseiflora*** J. E. Madsen & Z. Aguirre in Nordic J. Bot. 23(1): 24-25, ill. 2004
Type: *Madsen & Galvez 7444* – Ecuador: Loja: "La Toma – El Tambo, km 5-11 (along gravel roads), vicinity of Río Catamayo" [protologue]; "dry rocks with cacti", 1300-1500 m, 15.10.2000 [Shrubby or arborescent with age, to 5 m high; trunk always evident; flowers 4.5-5 cm long; floral tube and petaloids purple; fruits (one seen) club-shaped, 3 cm wide, 2.5 cm long, caducous (collected on the ground), dark purple at the apex, light purple at the base, not crowned by floral remnants] (type herbaria: AAU, B, K, LOJA, MO, QCA, QCNE, S, ZSS).

B (sheet s.n.) (isotype): corp, ar, sp, ceph, fl, sem. – Notes: J. Madsen.

***Facheiroa estevesii*** P. J. Braun in Kakt. And. Sukk. 37(4): 74-79, ill., SEM-ill. 1986
Type: *Esteves Pereira 186* – Brazil: Bahia: "SW part of the State of Bahia" [protologue] / "Bahia, E Rio São Francisco" [holotype label] / "S of Malhada" [isotype label at B, standardized]; "limestone rocks" [protologue], 500-550 m, 1984 [collection date according to isotype label at B.

Detailed locality data deposited with the holotype for conservation reasons according to the protologue, but no data were found with the holotype] (type herbaria: B (ex KOELN), B, K, UFG, ZSS) [isotypes at K and UFG according to Taylor & Zappi, Cacti Eastern Brazil: 432. 2004].

B (ex KOELN) (boxed B 100216301) (holotype): corp, ar, sp, ceph. – Notes: Labelled "Holotyp" and representing part 1 of 2 of the holotype.
B (ex KOELN) (spirit B 810013134) (holotype): al, fr. – Notes: Labelled as "Holotyp" and representing part 2 of 2 of the holotype.
B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.?).

***Facheiroa tenebrosa*** P. J. Braun & Esteves in Kakt. And. Sukk. 39(6): 126-131, ill., SEM-ill. 1988
Type: *Esteves Pereira 183* – Brazil: Bahia: "in the SW frontier region between the states of Minas Gerais and Bahia" [protologue, translated] / "S Serra do Ramalho" [isotype label at B]; "isolated limestone rocks" [protologue], 550-600 m, 1984 [collection year according to the isotype label at B. Detailed locality data deposited together with the holotype for conservation reasons according to the protologue, but no such data were found] (type herbaria: B (ex KOELN), B, K, UFG, ZSS) [isotypes at K and UFG according to Taylor & Zappi, Cacti Eastern Brazil: 431. 2004].

B (ex KOELN) (boxed B 100216302) (holotype): corp, ar, sp, ceph. – Notes: Labelled as "Holotyp" on the original label, and representing part 1 of 3 of the holotype; locality simply given as "Bahia".

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B (ex KOELN) (spirit B 810013135) (holotype): corp, ar, sp, ceph. – Notes: Labelled "Holotyp" on the original label, and representing part 2 of 3 of the holotype. Collection data simply given as "E-183".
B (ex KOELN) (spirit B 810013136) (holotype): fl. – Notes: Labelled "Holotyp" on the original label and representing part 3 of 3 of the holotype. Collection details simply given as "Esteves 183".
B (boxed s.n.) (isotype): corp, ar, sp, ceph. – Notes: Leg. P. J. Braun (ex cult.?).

***Frailea fulviseta*** Buining & Brederoo in Kakt. And. Sukk. 24(8): 170-172, ill. 1973
Type: *Horst & Uebelmann HU 352* – Brazil: Rio Grande do Sul:
"São Francisco de Assis" [protologue], 100-200 m, s.a. [locality given more precisely as "Tafelberg 5 km N of São Francisco de Assis" by W. Uebelmann (pers. comm.1990)] (type herbaria: U).
B (boxed s.n.) (type number): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.?). Although the original label says "1972: Brasilien, Rio Grande do Sul, São Francisco de Assis, Typstandort", there is some doubt whether this indeed represents the original collection, or a later re-collection under the original number.

***Frailea mammifera*** Buining & Brederoo in Krainz, Kakt., Lief. 50-51: C VIe, ill. 1972
Notes: Publication year sometimes erroneously cited as 1973.
Type: *Horst & Uebelmann HU 345* – Brazil: Rio Grande do Sul: "N of Dom Pedrito" [protologue, translated], 250 m, s.a. (type herbaria: ZSS).
B (boxed s.n.) (type number): rad, corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.?); original label "Brasilien, Rio Grande do Sul, Typstandort", and most probably a later re-collection under the original number.

***Gymnocalycium ambatoense*** Piltz in Kakt. And. Sukk. 31(1): 10-13, ill. 1980
Type: *Piltz 22/5* – Argentina: Catamarca: "Sierra Ambato" [protologue]; "shady places below grasses and shrubs", 900-1100 m, 27.7.1976 [detailed locality data deposited with the holotype according to the protologue, but no such data was found] (type herbaria: B (ex KOELN)).
B (ex KOELN) (spirit B 810013156) (holotype): corp, ar, sp, fl. – Notes: Labelled as "Holotyp". Collection data simply given as "P-22/5". Additional data on the original label: "Ripp.+ Blüt. gleichzeitig fix." [ribs and flowers simultaneously preserved].
B (ex KOELN) (spirit B 810013157) (isotype): fl, fr, sem. – Notes: Labelled as "Isotyp". Collection data simply given as "P-22".

***Gymnocalycium bruchii*** var. ***brigittae*** Piltz in Succulenta (Amsterdam) 66(10): 213-216, ill., SEM-ill. 1987
Notes: Republished in Gymnos 5(9): 30-34. 1988.
Type: *Piltz 214/3* – Argentina: Córdoba: "W slopes of the Sierra Grande" [protologue, translated]; "stony grassland", 1800 m, 1.7.1980 (type herbaria: B (ex KOELN)).
B (ex KOELN) (spirit B 810013158) (holotype): corp, ar, sp, fl. – Notes: Labelled as "Holotyp". Collection data simply given as "P-214/3".
B (ex KOELN) (spirit B 810013159) (isotype): fl. – Notes: Labelled as "Isotyp". Collection data simply given as "P-214".

***Gymnocalycium cardenasianum*** F. Ritter in Taxon 13(4): 144. 1964
Notes: First mentioned as nom. nud. in Backeberg, Cact. 3: 1747. 1959.
Type: *Ritter 88 loc. 1* – Bolivia: Tarija; Mendez: "Carrizal" [protologue], 1953 (type herbaria: U 117818B, SGO, ZSS) [holotype cited for U in Taxon 12(1): 28, 1963].

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B (sheet GH19350) (type number): ic (corp). – Notes: Ex cult. BG Berlin, 8.1.1986, from material raised from seeds originally received 1956 from H. Winter. Collection number established by inference.

***Gymnocalycium damsii*** var. ***multiproliferum*** P. J. Braun in Kakt. And. Sukk. 42(10): 228-231, ill. 1991
Type: *Braun 230* – Brazil: Mato Grosso do Sul: "SW of the Serra da Bodoquena" [protologue, translated] / "c. 50 km NE of Porto Murtinho [P. J. Braun, pers. comm] / "E of Porto Murtinho" [isotype label at B]; "Pantanal" [protologue], 1983 (type herbaria: ZSS, B, ZSS).

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (accessioned at B in 1991) sub *Gymnocalycium* sp.

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Received at B as isotype but no original Braun label present.

***Gymnocalycium pflanzii*** var. ***albipulpa*** F. Ritter, Kakt. Südamer. 2: 660-661, fig. 642. 1980
Type: *Ritter 397 loc. 1* – Bolivia: s.l. [protologue], s.a. [originally distributed as *Gymnocalycium bolivianum* Cárdenas ex F. Ritter (nom. nud.)] (type herbaria: U [not found], SGO [status ?], ZSS [seeds only]) [type cited for U in Ritter, Kakt. Südamer. 1: iii. 1979].

B (sheet GH16276) (type number): fl, ic (corp). – Notes: Ex cult. BG Berlin, 4.7.1984, from material raised from seeds originally received 1960 from H. Winter. Collection number established by inference.

***Gymnocalycium taningaense*** Piltz in Kakt. And. Sukk. 41(2): 22-26, ill., SEM-ill. 1990
Type: *Piltz 212/6* – Argentina: Córdoba: "near Taninga" [protologue, translated], 950 m, s.a. [type number erroneously given as "F 212/6" in the protologue] (type herbaria: B (ex KOELN)).

B (ex KOELN) (spirit B 810013160) (holotype): corp, ar, sp, fl. – Notes: Labelled as "Holotyp". Collection data simply gievn as "P-212/6".

B (ex KOELN) (spirit B 810013161) (isotype): fl, fr, sem. – Notes: Labelled "Isotyp". Collection data simply given as "P-212".

***Hildewintera colademononis*** Diers & Krahn in Kakt. And. Sukk. 54(8): 221, ill. 2003 (incorrect name, Art.11.4).
Type: *Krahn 950* – Bolivia: Santa Cruz; Florida: "Cerro El Fraile" [protologue], 2000 (type herbaria: B (ex KOELN)).

B (ex KOELN) (spirit B 810013162) (holotype): corp, ar, sp. – Notes: Labelled "Holotyp". Collection data simply given as "WK 950".

B (ex KOELN) (spirit B 810013163) (isotype): fl. – Notes: Labelled as "Isotyp", but collection data given as "WK 950/A". This most probably refers to a second individual of the same collection, as the protologue does not mention more than one locality for the taxon.

***Horridocactus andicola*** F. Ritter in Succulenta (Amsterdam) 1959(7): 97-100, ill. 1959
Type: *Ritter 468 loc. 1* – Chile: Región V; Los Andes: "Cerro Chivato (zwischen Santiago und Los Andes)" [holotype label at U] = Cerro Chivato (between Santiago and Los Andes), 5.1955 (type herbaria: U, SGO [status ?], ZSS [seeds only, status ?]) [type cited for ZSS but eventually found at U].

B (sheet GH22399) (type collection): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 153-92-74-80, 2.8.1987, from material originally raised from seeds received 1957 from H. Winter. Collection number established by inference.

B (sheet GH31084) (type collection): fl. – Notes: Ex cult. BG Berlin 153-92-74-80, 27.5.1993, from material originally raised from seeds received 1957 from H. Winter. Collection number established by inference.

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***Horridocactus paucicostatus*** F. Ritter in Succulenta (Amsterdam) 1959(9): 113-114, ill. 1959
Type: *Ritter 521 loc.1* – Chile: Región II; Antofagasta: "c. 20 km N of Paposo" [protologue, translated], s.a. (type herbaria: U 097984B, SGO [status ?], ZSS [seeds only, status ?]) [Type cited for ZSS in the protologue, but eventuall found at U. – F. Kattermann (Succ.Pl. Res.1: 162, 1994) unnecessarily designated the illustration on p. 114 of the protologue as lectotype].

B (sheet GH36449) (type collection): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 154-09-74-80, 13.5.1998, from material raised from seeds originally received 1957 from H. Winter. Collection number established by inference.

***Horridocactus paucicostatus*** var. ***viridis*** F. Ritter in Succulenta 1959(9): 113-114. 1959
Type: *Ritter 521a loc. 1* – Chile: Región II; Antofagasta: "surroundings of Paposo" [protologue], s.a. (type herbaria: U 087554, SGO [status ?], ZSS [seeds only, status ?]) [type cited for ZSS in the protologue, but eventually found at U].

B (sheet GH23762) (type collection): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 154-11-74-80, 13.7.1988, from material originally raised from seeds received 1960 from H. Winter. Collection number established by inference.

***Leocereus bahiensis*** var. ***barreirensis*** P. J. Braun & Esteves in Kakt. And. Sukk. 41(9): 205. 1990
Type: *Esteves Pereira 118* – Brazil: Bahia: "W part of the state of Bahia, near the city of Barreiras" [protologue, translated]; "on standstone rocks", s.a. [probably collected 1979, cf. one of the isotype labels at B] (type herbaria: UFG 12.360, B, ZSS).

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.?).
B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.?); original label: "Brasilien, Bahia, Barreiras, Campo Cerrado, 1979?".

***Leocereus bahiensis*** var. ***exiguospinus*** P. J. Braun & Esteves in Kakt. And. Sukk. 41(9): 205. 1990
Type: *Esteves Pereira 135* – Brazil: Bahia: "in the surroundings of Canabrava" [protologue, translated]; "caatinga" [isotype label at B], 1981 [probably collected 1981, cf. isotype label at B] (type herbaria: UFG †, B, ZSS) [holotype reported as missing as of Jan. 1991 by Taylor & Zappi, Cacti Eastern Brazil: 428. 2004].

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.?); original label: "Brasilien, Bahia, Canabrava, Caatinga, 1981?".

***Leocereus bahiensis*** var. ***robustispinus*** P. J. Braun & Esteves in Kakt. And. Sukk. 41(9): 205. 1990
Type: *Braun 702* – Brazil: Bahia: "in the N of the state of Bahia, upper parts of the Serra do Inácio, near Gameleira" [protologue, translated], 7.1986 [collection date according to isotype label at B] (type herbaria: ZSS, B).

B (boxed s.n.) (isotype): corp, ar, sp, (al). – Notes: Leg. P. J. Braun (ex cult.?).

***Leocereus estevesii*** P. J. Braun in Kakt. And. Sukk. 41(9): 204-205. 1990
Type: *Esteves Pereira 207* – Brazil: Piauí: "S of Piauí, frontier region towards S Maranhão" [protologue, translated]; "on heavily weathered sandstone rocks in very dry region" [data associated with isotype at ZSS], s.a. [collection date 1984 or 1985 according to isotype at B] (type herbaria: UFG 12.380, B, B (ex KOELN), ZSS).

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.?), accessioned 1990.
B (ex KOELN) (boxed B 100216303) (isotype): corp, ar, sp. – Notes: Labelled "Isotyp" on the original label. Locality data simply given as "Piauí".

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***Lobivia amblayensis*** Rausch in Kakt. And. Sukk. 23(3): 67-88, ill. 1972
Type: *Rausch 19* – Argentina: Salta: "E of Amblayo" [protologue, translated], 2800 m, s.a. (type herbaria: W, ZSS).

B (sheet GH31078) (type collection): ic (corp), fl. – Notes: Ex cult. BG Berlin 123-18-85-50, 27.5.1993, from material originally received from Wien-Schönbrunn.

***Lobivia famatimensis*** var. ***sanjuanensis*** Rausch in Kakt. And. Sukk. 28(4): 75. 1977
Type: *Rausch 557* – Argentina: San Juan: "near San Juan" [protologue, translated], 1700 m, s.a. (type herbaria: ZSS).

B (sheet GH29575) (type collection): ic (corp), fl. – Notes: Ex cult. BG Berlin 201-17-82-30, 19.5.1992, from material originally received from Wien-Schönbrunn.

***Lobivia quiabayensis*** Rausch in Kakt. And. Sukk. 21(3): 45. 1970
Notes: First published in Kakt. And. Sukk. 19(2): 22-23, ill. 1968, and there doubtfully invalid (Art. 37.1).
Type: *Rausch 205* – Bolivia: La Paz: "near Quiabaya" [protologue, translated], 3500 m, s.a. (type herbaria: W).

B (sheet GH19846) (type collection): ic (corp), fl. – Notes: Ex cult. BG Berlin 201-06-82-30, 13.5.1986, from material originally received from Wien-Schönbrunn.

B (sheet GH33656) (type collection): fl. – Notes: Ex cult. BG Berlin 201-06-82-30, 4.5.1995, from material originally received from Wien-Schönbrunn.

***Lobivia rauschii*** Zecher in Succulenta (Amsterdam) 53(3): 42-43, ill. 1974
Notes: When transferred to *Echinopsis,* the valid name is *E. yuquina* D. R. Hunt 1991.
Type: *Rausch 635* – Bolivia: Chuquisaca; Sud-Cinti: "S of Culpina" [protologue, translated] / "near Yuquina" [W. Rausch, pers. comm.1991], 3200 m, s.a. (type herbaria: ZSS).

B (sheet GH24852) (type collection): ic (corp, ar, sp). – Notes: Ex cult. BG Berlin 201-20-82-30, 19.5.1989, from material originally received from Wien-Schönbrunn.

***Lobivia tiegeliana*** var. ***uriondoensis*** Rausch in Succulenta (Amsterdam) 58(10): 233-234, ill. 1979
Type: *Rausch 90* – Bolivia: Tarija: "near Concepcion" [protologue, Latin diagnosis, translated] / "near Uriondo" [protologue, Dutch description, translated], s.a. (type herbaria: ZSS).

B (sheet GH29921) (type collection): ic (corp, fl), fl. – Notes: Ex cult. BG Berlin 201-02-82-30, 14.7.1992, from material originally received from Wien-Schönbrunn.

***Lobivia zecheri*** Rausch in Succulenta (Amsterdam) 50(8): 146, ill. (p. 141). 1971
Type: *Rausch 407* – Peru: Ayacucho: "along the road from Ayacucho to Huanta" [protologue, translated], 2400 m, 1970 (type herbaria: W, ZSS).

B (sheet GH15850) (type collection): ic (corp), fl. – Notes: Ex cult. BG Berlin 201-10-82-30, from material originally received from Wien-Schönbrunn.

B (sheet GH22137) (type collection): ic (corp), fl. – Notes: Ex cult. BG Berlin 147-59-74-80, 3.7.1987, from material originally received 1978 from G. Köhres.

***Mammillaria aylostera*** Werdermann in Kakteenkunde 1938: 99, 112. 1938
Type: *Ritter s.n.* – Mexico: Guerrero: "at the lower Balsas river in the coastal plain" [protologue, translated]; "in open scrub", s.a. (type herbaria: B ["clono"]) [ex cult. BG Berlin 14.1.1939].

B (spirit B 810006969) (type collection): corp, ar, sp. – Notes: Ex cult. BG Berlin, 14.1.1939, and thus posterior to the protologue.

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***Mammillaria beiselii*** Diers in Kakt. And. Sukk. 30(3): 57-60, ill. 1979
Type: *Beisel & Krasucka 100* – Mexico: Colima / Michoacán: "near Balmerio la Brisa"; "together with *Aporocactus* sp.", 25.4.1978 [detailed locality information supplied directly by the collector] (type herbaria: B (ex KOELN), ZSS).

B (ex KOELN) (boxed B 100216304) (holotype): rad, corp, ar, sp. – Notes: Labelled as "Holotyp" on the original label. Collection data simply given as "BK 100". A copy of the protologue with annotated locality data is archived separately.
B (ex KOELN) (boxed B 100216305) (isotype): corp, ar, sp. – Notes: Labelled as "Isotyp" on the original label. Collection data simply given as "BK 100".
B (ex KOELN) (boxed B 100216306) (isotype): sem. – Notes: Collection data simply given as "BK 100", and without type annotation.
B (ex KOELN) (spirit B 810013137) (isotype): ar, sp, fl. – Notes: Collection data simply given as "BK 100", and without type annotation.

***Mammillaria duwei*** Rogozinski & P. J. Braun in Kakt. And. Sukk. 36(8): 158-164, ill. 1985
Type: *Duwe & Rogozinski 1* – Mexico: Guanajuato: "E part of the state of Guanajuato, near the city of San Luis de la Paz" [protologue]; "on and between limestone rock outcrops in organic soil", 1983 (type herbaria: KOELN (missing), B, ZSS).

B (boxed s.n.) (isotype): rad, corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.?).

***Mammillaria hahniana*** Werdermann in Monatsschr. Deutsch. Kakteen-Ges. 1(4): 77-79, ill. 1929
Type: *Schmoll s.n.* – Mexico: Querétaro: "locality will be announced later" [protologue, translated] / "Sierra de Jalpan, above 2000 m" [neotype designation], 2000 m, 1928 (type herbaria: B [neo]) [ex cult. hort. Hahn, June 1931. Neotype (as lectotype, correctable under 9.8) designated by Hunt & Taylor in Cactaceae Syst. Init. 21: 8. 2006].

B (spirit B 810006971) (neotype): rad, corp, ar, sp.

*Notes.* – The spirit specimen (B810006971) was prepared from cultivated material from the nursery of Hahn and is dated June 1931. Despite the fact that it is doubtlessly posterior to the protologue (1929), it was designated as lectotype by Hunt & Taylor (2006: 8). This is to be treated as correctable error (ICBN Art. 9.8), and the specimen is the neotype of the name.

***Mammillaria herrerae*** Werdermann in Notizbl. Bot. Gart. Berlin-Dahlem 11(104): 276-277. 1931
Type: *Anonymus [Schmoll?] s.n.* – Mexico: Querétaro: "near Cadereyta" [protologue], s.a. [A Schmoll collection fide Doweld in Sukkulenty 3(1-2): 40. 2000] (type herbaria: B) [ex cult. BG Berlin].

B (spirit B 810006972) (holotype): corp, ar, sp, sem, [+ic]. – Notes: Dried out. ex cult. BG Berlin, July 1930. The sheet with the photograph of the dried out material additionally has a SEM photograph of the seed.

***Mammillaria huitzilopochtli*** D. R. Hunt in Cact. Succ. J. Gr. Brit. 41(4): 106-107, ill. 1979
Type: *Lau 66* – Mexico: Oaxaca: "Tomellín valley, gorge near confluence of Río Salado and Río Quiotepec" [protologue]; "red conglomerate rocks", 15.2.1973 (type herbaria: K).

B (sheet s.n.) (type collection): corp, ar, sp, fr, sem. – Notes: Ex cult. ZSS 91. 1809.

***Mammillaria melispina*** Werdermann in Notizbl. Bot. Gart. Berlin-Dahlem 12: 226-227. 1934
Type: *Viereck s.n.* – Mexico: Tamaulipas: "near Jaumave" [protologue, translated]; "under shrubs", 1932 (type herbaria: B [fragment]) [ex cult. BG Berlin].

B (spirit B 810006973) (type collection): (fl). – Notes: Dried out. ex cult. BG Berlin, without date.

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***Mammillaria microhelia*** Werdermann in Monatsschr. Deutsch. Kakteen-Ges. 2: 236-238, ill. 1930
Type: *Singer s.n.* – Mexico: Querétaro: "Sierra de San Morán" [protologue]; "weathered rocky soil", 2000 m, s.a. (type herbaria: B [useless fragment]) [ex cult. BG Berlin].

B (spirit B 810006975) (type collection): (fl). – Notes: Dried out and completely useless. ex cult. BG Berlin, May 1930.

***Mammillaria microheliopsis*** Werdermann in Notizbl. Bot. Gart. Berlin-Dahlem 11(104): 278-279. 1931
Type: *Anonymus s.n.* – Mexico: s.l. [protologue], s.a. (type herbaria: B [fragment]) [ex cult. BG Berlin].

B (spirit B 810006974) (holotype): (fl). – Notes: Dried out. ex cult. BG Berlin 1931.

***Mammillaria silvatica*** Reppenhagen, Gatt. Mammillaria: 89-90, fig. 21 (p. 188), SEM ill. 71-72 (p. 209). 1987
Type: *Reppenhagen 1603* – Mexico: Jalisco: "Los Cerritos" [protologue], 1500 m, 17.2.1980 (type herbaria: ZSS).

B (sheet GH41280 / B100112651) (type collection): rad, corp, ar, sp. – Notes: Ex cult. BG Berlin 185-38-84-40, preserved 3.11.2003.

***Mammillaria voburnensis*** var. ***gerhardii*** Diers in Kakt. And. Sukk. 44(11): 244-246, ill. 1993
Type: *Freudenberger s.n.* – Mexico: Michoacán: "SE of the locality of *Mammillaria beiselii,* near coast and somewhat inland" [protologue, translated], s.a. (type herbaria: B (ex KOELN)).

B (ex KOELN) (boxed B 100216307) (holotype): corp, ar, sp. – Notes: Labelled as "Holotyp" on the original label. Collection data given as "Ge-F 84-5", probably relating to a collection date of May 1984. A copy of the protologue with annotated locality data is archived separately.

B (ex KOELN) (boxed B 100216308) (isotype): corp, ar, sp. – Notes: Labelled "Isotyp" on the original label. Collection data simply given as "Ge-F 84-5" (see above for explanation).

B (ex KOELN) (boxed B 100216309) (isotype): fr, sem. – Notes: Without indication of type status. Collection details simply given as "Ge-F 84-5" (see above for explanation).

***Matucana comacephala*** F. Ritter in Succulenta (Amsterdam) 37(3): 92-93, ill. 1958
Type: *Ritter 587 loc. 1* – Peru: Ancash; Huari: "E of the Cordillera Blanca" [protologue, translated] / "Rahuapampa" [Ritter, Kakt. Südamer. 4: 1492. 1981], 1956 [collection date according to the protologue] (type herbaria: ZSS, SGO, U).

B (sheet GH14194) (type number): fl, ic (corp, fl). – Notes: Ex cult. BG Berlin, 7.6.1983, from material raised from seeds originally received 1960 from H. Winter. Collection number established by inference.

***Matucana polzii*** Diers & al. in Kakt. And. Sukk. 37(6): 114-119, ill., SEM-ill. 1986
Type: *Zecher 762* – Peru: Huánuco: "upper reaches of the Río Marañón" [protologue, translated], 2100-2300 m, s.a. [detailed locality data was deposited with the holotype for conservation reasons according to the protologue] (type herbaria: ZSS, B (ex KOELN)) [the holotype is cited for KOELN in the protologue but was actually deposited at ZSS in 1984].

B (ex KOELN) (boxed B 100216310) (isotype): fr, sem. – Notes: Simply labelled "EZ 762", and without indication of type status.

B (ex KOELN) (spirit B 810013138) (isotype): rad, corp, ar, sp. – Notes: Simply labelled "EZ 762" and without type indication. A specimen annotated as holotype was deposited at ZSS in 1984, though the holotype is cited for KOELN in the protologue. A separate print of the

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protologue with additional locality data added by hand is archived separately. Even though the presence of this annotated separate print would be an argment to treat this specimen as the actual holotype, the absence of any such indication on the specimen should take precedence, and it is accordingly to be treated as isotype.

***Melocactus amethystinus*** Buining & Brederoo in Krainz, Kakt., Lief. 50-51: C VId, [1-4], ill. 1972
Notes: The publication year is sometimes erroneously given as 1973.
Type: *Horst & Uebelmann HU 270 (1968)* – Brazil: Bahia: "near Brejinho das Ametistas near Caetité" [protologue, translated], 1000 m, 15.7.1968 (type herbaria: U 531291).

B (sheet GH22926) (type number): rad, corp, ar, sp, ic (corp). – Notes: Ex cult. BG Berlin 189-38-81-50, 29.1.1988, from material originally raised from seeds received 1981 from ZSS, and thus most probably representing a later re-collection under the original collection number.

B (boxed GH22926a+b) (type number): corp, ar, sp, ceph. – Notes: Ex cult. BG Berlin 189-38-81-50, Jan. 2005, from material originally raised from seeds received 1981 from ZSS, and thus most probably representing a later re-collection under the original collection number.

***Melocactus estevesii*** P. J. Braun in Kakt. And. Sukk. 41(1): 6-10, ill. 1989
Notes: Volume for 1990, issue already distributed on 22 Dec 1989.
Type: *Esteves Pereira 157* – Brazil: Roraima: "Brasilia septentrionalis, regio borealis Roraimae, ad occidentem versus" [protologue], s.a. (type herbaria: UFG 12.385, B, K, ZSS).

B (boxed s.n.) (isotype): ar, sp, (ceph). – Notes: Leg. P. J. Braun (ex cult. ?). Locality given as "Roraima, NW of Boa Vista, S of the frontier to Venezuela, region of the Ianomami, on rocks in rainforest" [translated].

B (boxed s.n.) (isotype): juv: corp ar sp. – Notes: Leg. P. J. Braun (ex cult. ?). Locality given as "NW Roraima".

***Melocactus ×horridus*** Werdermann pro sp. in Notizbl. Bot. Gart. Berlin-Dahlem 12: 227-228. 1934
Type: *Werdermann 2934a* – Brazil: Pernambuco: "in the farther surroundings of Villa Bella" [protologue, translated]; "open places in the caatinga on rocks", 3.1932 (type herbaria: B [status ?, sub 2954a, sphalm.]) [ex cult. BG Berlin?].

B (spirit B 810006985) (holotype): rad, corp, ar, sp, ceph, [+ic]. – Notes: Labelled "(evt. nachträglich fixiert, XI/35)", i.e. probably put in spirit in Nov. 1935, posterior to the protologue.

***Melocactus paucispinus*** Heimen & R. Paul in Kakt. And. Sukk. 34(10): 227-229, ill. 1983
Type: *Heimen & al. 81/149* – Brazil: Bahia: "Seabra, C Bahia" [protologue]; "between and below shrubs in pure white quartz sand" [protologue, translated], s.a. (type herbaria: B (ex KOELN)).

B (ex KOELN) (boxed B 100216311) (holotype): corp, ar, sp, ceph. – Notes: Labelled as "Holotyp". Collection details simply given as "81/149".

B (ex KOELN) (boxed B 100216312) (isotype): sem. – Notes: Simply labelled "81/149" and without indication of type status.

***Melocactus peruvianus*** Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 28. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(12): 172-173. 1914.
Type: *Weberbauer 2629* – Peru: Lima: "near Chosica, at the railway Lima - Oroya" [protologue, translated]; "stony ground with very scattered vegetation", 800 m, 15.3.1903 (type herbaria: B).

B (spirit B 810006986) (holotype): rad, corp, ar, sp, ceph, (fl).

***Melocactus saxicola*** Diers & Esteves in Kakt. And. Sukk. 35(9): 196-201, ill. 1984
Type: *Esteves Pereira 119* – Brazil: Bahia; Mun. Barreiras: "mountains in the W part of Bahia, margin of an escarpment c. 200 km W of the Rio São Francisco" [protologue, translated],

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700-800 m, s.a. ["Mun. Barreiras" added from Taylor & Zappi, Cacti Eastern Brazil: 384. 2004. Detailed locality data deposited with the holotype for conservation reasons according to the protologue] (type herbaria: B (ex KOELN), UFG) [isotype at UFG according to Taylor & Zappi, Cacti Eastern Brazil: 384. 2004].

B (ex KOELN) (boxed B 100216313) (holotype): rad, corp, ar, sp, ceph, fr. – Notes: Labelled as "Holotyp" on the original label. Collection data simply given as "E-119". A copy of the protologue with annotated locality data is archived separately.

B (ex KOELN) (boxed B 100216314) (isotype): fr, sem. – Notes: Collection data simply given as "E-119", and without annotation of type status.

B (ex KOELN) (spirit B 810013139) (isotype): fl, fr. – Notes: Collection data simply given as "E-119", and without indication of type status.

***Micranthocereus streckeri*** Van Heek & Van Criek. in Kakt. And. Sukk. 37(5): 102-105, ill. 1986
Type: *Van Heek & al. 85/250* – Brazil: Bahia: "W of Seabra, C Bahia" [protologue, translated], s.a. [detailed locality data deposited with the holotype for conservation reasons according to the protologue] (type herbaria: B (ex KOELN)).

B (ex KOELN) (spirit B 810013140) (holotype): corp, ar, sp, ceph. – Notes: Labelled as "Holotyp" on the original label. Collection data simply given as "85/250". A letter by W. Strecker with detailed locality data is archived separately.

B (ex KOELN) (boxed B 100216316) (isotype): sem. – Notes: Simply labelled "85/250" "Samen", and without indication of type status.

B (ex KOELN) (boxed B 100216317) (isotype): ic (corp, fl). – Notes: An envelope with a photograph labelled "85/250".

B (ex KOELN) (spirit B 810013141) (isotype): fl. – Notes: Simply labelled "85/250", and without indication of type status.

B (ex KOELN) (boxed B 100216315) (type collection): sem. – Notes: Outside of the envelope labelled "vom Standort Strecker V.91", inside as "85/250". "V.91" is interpreted as referring to May 1991, which makes this material posterior to the protologue. Without indication of type status.

***Neoporteria castanea*** F. Ritter in Taxon 12(1): 34. 1963
Type: *Ritter 236 loc. 1* – Chile: Región VII; Curicó: "near Villa Prat" [protologue, translated], 4.1954 [date according to protologue] (type herbaria: U 117863B, SGO, ZSS) [holotype cited for U in Taxon 21(1): 28. 1963].

B (sheet GH33784) (type collection): ic (corp, ar, sp), fl. – Notes: Ex cult. BG Berlin 150-83-74-80, 31.5.1995, from material originally raised from seeds received 1957 from H. Winter. Collection number established by inference.

***Neoporteria litoralis*** F. Ritter in Succulenta (Amsterdam) 38(3): 28-29, ill. 1959
Type: *Ritter 219 loc. 1* – Chile: Región IV; Elqui: "rocky coast of Coquimbo" [protologue], 1.1954 (type herbaria: ZSS, SGO, U) [none of several specimens at ZSS annotated as holotype].

B (sheet GH30546) (type collection): ic (corp, ar, sp), fl. – Notes: Ex cult. BG Berlin 150-98-74-80, 12.11.1992, from material originally raised from seeds received 1957 from H. Winter. Collection number established by inference.

***Neoporteria microsperma*** F. Ritter in Succulenta (Amsterdam) 1963(1): 6, ill. 1963
Type: *Ritter 535 loc. 1* – Chile: Región IV; Elqui: "15 km östl. La Serena" [protologue / isotype label at SGO] = 15 km E of La Serena, s.a. (type herbaria: U 117643B, SGO, ZSS [seeds only]) [no herbarium cited for the type].

B (sheet GH21018) (type collection): ic (corp, ar, sp), fl. – Notes: Ex cult. BG Berlin 150-88-74-80, 13.10.1986, from material originally raised from seeds received 1960 from H. Winter. Collection number established by inference.

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***Neoporteria wagenknechtii*** F. Ritter in Succulenta (Amsterdam) 1963(1): 5. 1963
Type: *Ritter 715 loc. 5* – Chile: Región IV; Elqui: "canyon of Juan Soldado N of La Serena" [protologue, translated], s.a. (type herbaria: U 145231B, SGO [status?]).

B (sheet GH21017) (type collection): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 152-11-74-80, 13.1.1986, from material originally raised from seeds received 1960 from H. Winter. Collection number established by infernce.

B (sheet GH22562) (type collection): ic (corp, ar, sp), fl. – Notes: Ex cult. BG Berlin 152-12-74-80, 26.8.1987, from material originally raised from seeds received 1961 from H. Winter. Collection number established by inference.

B (sheet GH22563) (type collection): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 152-11-74-80, 26.8.1987, from material originally raised from seeds received 1960 from H. Winter. Collection number established by inference.

***Neoporteria wagenknechtii*** var. ***napina*** F. Ritter in Succulenta 1963: 5. 1963
Type: *Ritter 714 loc. 4* – Chile: Región IV; Elqui: "Choros Bajos" [holotype label at U] / "mountains of Choros Bajos, N of La Serena" [protologue, translated], 10.1962 [collection date according to the specimen at U] (type herbaria: U 145239B) [no herbarium cited for the type].

B (sheet GH21019) (type collection): ic (corp, ar, sp), fl. – Notes: Ex cult. BG Berlin 152-02-74-80, 13.10.1986, from material originally raised from seeds received 1959 from H. Winter. Collection number established by inference.

***Notocactus concinnus*** var. ***aceguensis*** N. Gerloff in Internoto 10(4): 99-106, ill., SEM-ill. 1989
Notes: Sphalm. *'aceguaensis'*.
Type: *Stockinger 196* – Brazil: Rio Grande do Sul: "c. 8 km W of the frontier city of Aceguá" [protologue, translated]; "between lumps of rocks in humus-filled crevices, in the shade of shrubs", s.a. (type herbaria: B) [ex cult. hort. Gerloff 1988].

B (spirit B 81000259) (holotype): rad, corp, ar, sp, fl.
B (spirit B 81000258) (isotype): fl.
B (sheet s.n.) (isotype): ic (corp, ar, sp, fl), fr, sem. – Notes: Labelled "Teil des Holotypus".
B (sheet s.n.) (type collection): ic (corp, ar, sp, fl).

***Notocactus fuscus*** F. Ritter, Kakt. Südamer. 1: 178, fig. 121. 1979
Notes: Since no original type material is available, Doweld (in Sukkulenty 3(1-2): 60. 2000) designates fig. 121 of the protologue as lectotype.
Type: *Ritter 1379* – Brazil: Rio Grande do Sul: "c. 15 km W of São Francisco de Assis" [protologue, translated], 3.1965 [collection date according to the protologue] (type herbaria: U [not found], ZSS [status ?]) [type cited for U in Ritter, Kakt. Südamer. 1: iii. 1979].

B (sheet GH41050 / B100094952) (type number): rad, corp, ar, sp. – Notes: Ex cult. BG Berlin 152-34-74-80, prepared 27.8.2003. Plant originally received from Uhlig in 1968.

***Notocactus scopa*** var. ***xiphacanthus*** W.-R. Abraham in Succulenta (Amsterdam) 66(12): 256-260, ill. 1987
Type: *Abraham 156* – Uruguay: Lavalleja: "N of Minas, on a 500 m long hill" [protologue, translated]; "in soil of ph 5.3 in rock crevices", 200 m, 1.1983 (type herbaria: B (ex KOELN)).

B (ex KOELN) (spirit B 810013142) (holotype): corp, ar, sp. – Notes: Labelled as "Holotyp" on the original label; collection data simply given as "WRA 156".

B (ex KOELN) (boxed B 100216318) (isotype): sem. – Notes: Collection data simply given as "WRA 156", without type status annotation.

B (ex KOELN) (boxed B 100216319) (isotype): ic (corp). – Notes: An envelope, simply labelled as "WRA 156", with 2 faded habitat photographs and a piece of paper with detailed locality data, dated 7.2.1988 and thus only added after the publication of the protologue.

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B (ex KOELN) (spirit B 810013143) (isotype): fl. – Notes: Collection data simply given as "WRA 156 Blüte", without type status annotation.

***Opuntia assumptionis*** K. Schumann in Monatsschr. Kakteenk. 9: 153-154. 1899
Type: *Anisits Cact. 63* – Paraguay: "near Asunción" [protologue, translated], 3.3.1898 (type herbaria: B).

B (spirit B 810006995) (holotype): corp, ar, sp, fr, sem, [+ic].

***Opuntia atacamensis*** Philippi in Fl. Atacam.: 24, no. 150. 1860
Type: *Werdermann 1050* – Chile: Antofagasta; Taltal: "Punta del Viento" [isoneotype label at B], 3500 m, 2.1926 (type herbaria: K [neo], B) [neotype designated by Iliff in Cactaceae Syst. Init. 9: 5-6. 2000].

B (sheet s.n.) (isoneotype): corp, ar, sp.

***Opuntia cardiosperma*** K. Schumann in Monatsschr. Kakteenk. 9: 150, 153. 1899
Type: *Anisits Cact. 64* – Paraguay: "near Recoleta, in the vicinity of Asunción" [protologue, translated], 3.3.1898 (type herbaria: B).

B (spirit B 810007001) (holotype): corp, ar, sp, fr, sem, [+ic].

***Opuntia corotilla*** K. Schumann ex Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 28-29. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(12): 173-174. 1914.
Type: *Weberbauer 1412* – Peru: Arequipa: "between Airampal and Pámpa at the railway Arequipa - Puno" [protologue, translated]; "sandy ground near a dry watercourse", 3200-3400 m, 26.8.1902 (type herbaria: B).

B (spirit B 810007003) (holotype): corp, ar, sp, fl, [+ic].

***Opuntia dactylifera*** Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 29-30. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(12): 174-177, ill. 1914.
Type: *Weberbauer 1357* – Peru: Puno: "Azangaro" [protologue]; "rocky meadows", 3600 m, 15.8.1902 (type herbaria: B).

B (spirit B 810007008) (holotype): corp, ar, sp, fl, fr, [+ic].

***Opuntia estevesii*** P. J. Braun in Cact. Succ. J. (Los Angeles) 62(4): 165-169, ill. 1990
Type: *Esteves Pereira 191* – Brazil: Bahia: "S and SW part of the state of Bahia" [protologue, standardized]; "on calcareous rocks in full sunshine", 500-550 m, 1984 (type herbaria: UFG 12.377, B, ZSS).

B (boxed s.n.) (isotype): corp, ar, sp, (fr). – Notes: Locality given as "Bahia, S Malhada".
B (ex KOELN) (boxed B 100216320) (isotype): corp, ar, sp. – Notes: Labelled as "Isotyp" and "junge Seitentriebe" [young lateral stems]. Collection data simply given as "Esteves 191".

***Opuntia hanburyana*** F. A. C. Weber in Gard. Chron., ser. 3, 35: 34, fig.15. 1904
Notes: Authorship frequently but erroneously given as F. A. C. Weber ex A. Berger.
Type: *Anonymus s.n.* – Cult.: "not common in the gardens of the Riviera" [protologue], s.a. (type herbaria: B [authentic material ?]) [ex cult. La Mortola, 1902].

B (spirit B 810007027) (type collection): corp, ar, sp, (juv fr). – Notes: Probably authentic material. Labelled "La Mortola acc. 1902".
B (spirit B 810007028) (type collection): (corp, ar, sp). – Notes: Probably authentic material. Labelled "cult. La Mortola ded. Hanbury 1902" on a non-original label. Material partially rotten.

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***Opuntia helleri*** K. Schumann in Proc. Amer. Acad. Arts 38(4): 180-181. 1902
Type: *Snodgrass & Heller 917* – Ecuador: Galápagos Islands: "Wenman Island", s.l. [protologue], s.a. (type herbaria: B, "Herb. Gr.").

B (spirit B 810007029) (holotype): corp, ar, sp, fl.

***Opuntia hyptiacantha*** F. A. C. Weber in Bois, Dict. Hort.: 894. 1898
Type: *Anonymus s.n.* – Mexico: s.l. [protologue], s.a. (type herbaria: B [authentic material?]) [ex cult. La Mortola 1902].

B (spirit B 810007030) (type collection): fr, sem. – Notes: Probably authentic material. Labelled "cult. in La Mortola 1902 ded. Hanbury".
B (spirit B 810007031) (type collection): fr, sem. – Notes: Probably authentic material. Labelled "La Mortola acc.1902".

***Opuntia ignescens*** Vaupel in Bot. Jahrb. Syst. 50 (Beiblatt 111): 30-31. 1913
Notes: Abridged version published in Monatsschr. Kakteenk. 24(12): 177. 1914.
Type: *Weberbauer 1370* – Peru: Arequipa: "near Sumbay at the railway Arequipa - Puno" [protologue, translated]; "stony ground with scanty vegetation", 3830 m, 25.8.1902 (type herbaria: B).

B (spirit B 810007032) (holotype): corp, ar, sp, fl, [+ic].

***Opuntia lagopus*** K. Schumann, Gesamtbeschr. Kakt., Nachtr.: 151-152. 1903
Notes: Crook & al. (in Bradleya 21: 89. 2003) unnecessarily designated *Webster 26* (K) as neotype, being unaware of the existence of the holotype.
Type: *Weberbauer 1355* – Peru: Arequipa: "neighbourhood of Arequipa" [protologue, translated, but erroneous, fide Crook & al. in Bradleya 21: 89. 2003], 4000 m, s.a. [the type number is not given in the protologue but was inferred from the only specimen present at B] (type herbaria: B).

B (spirit B810007038) (holotype): corp, ar, sp.

***Opuntia leoncito*** Werdermann in Notizbl. Bot. Gart. Berlin-Dahlem 10(97): 752-754. 1929
Type: *Werdermann 944* – Chile: Atacama; Copiapó: "Cord. Rio Turbio, Co. Cadillal" [protologue / type label at B], 3800 m, 1.1926 (type herbaria: B, HBG, K, NY, SI, US, Z).

B (sheet s.n.) (holotype): corp, ar, sp, (fl).

***Opuntia pachypus*** K. Schumann in Monatsschr. Kakteenk. 14: 26-29, ill. 1904
Type: *Weberbauer 1677* – Peru: "bei Santa Clara, einer Station an der Lima-Oroyabahn" [protologue, translated]; "stony soil in the Loma formation", 400 m, s.a. [the type number is not given in the protologue but was inferred from the only specimen present at B, cf. Leuenberger (1978: 104)] (type herbaria: B).

B (spirit B 810007055) (holotype): corp, ar, sp, (fr?). – Notes: Labelled as "Typus" in an old handwriting on the original label.

***Opuntia paraguayensis*** K. Schumann in Monatsschr. Kakteenk. 9: 149. 1899
Type: *Hassler s.n.* – Paraguay: s.l. [neotype designation], s.a. (type herbaria: B [neo]) [neotype designated by Leuenberger in Willdenowia 31: 185. 2001].

B (spirit B 810007056) (neotype): corp, ar, sp.

***Opuntia saxatilis*** var. ***pomosa*** P. J. Braun & Esteves in Cact. Succ. J. (Los Angeles) 63(3): 124-129, ill. 1991
Type: *Esteves Pereira 156* – Brazil: Minas Gerais: "NW part of the state [of Minas Gerais], E of D. F. Brasilia" [protologue, p. 129]; "on outcrops of calcareous rocks", 650 m, s.a. ["several collections 1978-1987" [protologue, p. 129]] (type herbaria: UFG 12.368, B, ZSS).

B (sheet s.n.) (isotype): rad, (corp), ar, sp. – Notes: Leg. P. J. Braun (ex cult.?).

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***Opuntia schumannii*** F. A. C. Weber in Gard. Chron., ser. 3, 35: 34, fig. 16. 1904
Notes: Non *Opuntia schumannii* Speg. 1905. Author citation frequently but erroneously given as F. A. C. Weber ex A. Berger.
Type: *Anonymus s.n.* – Cult.: "received it in 1899 from Mr. Winter in Bordighera" at La Mortola [protologue], s.a. (type herbaria: B [authentic material?]) [ex cult. La Mortola 1902].

B (spirit B 810007067) (type collection): corp, ar, sp, fr, (sem?). – Notes: Probably authentic material. Labelled "La Mortola cult. ded. Hanbury 1902".

***Opuntia spegazzinii*** F. A. C. Weber in Bois, Dict. Hort.: 898. 1898
Type: *Anonymus s.n.* – Argentina: Salta: s.l. [protologue], s.a. (type herbaria: B [status ?, fragmentary]).

B (spirit B 810007068) (type collection): (corp, ar, sp), [+ic]. – Notes: Probably authentic material (fragments only), labelled "ded. Weber 1899 Argentina".

***Opuntia stenarthra*** K. Schumann in Monatsschr. Kakteenk. 9: 149-150. 1899
Type: *Anisits Cact. 17* – Paraguay: "near Estancia Tagatiya" [protologue / lectotype designation], 25.1.1898 (type herbaria: B [lecto]) [lectotype designated by Leuenberger in Bot. Jahrb. Syst. 123: 432. 2002].

B (spirit B 810007071) (lectotype): corp, ar, sp, fl, fr. – Notes: In addition, B has one specimen each of the paralectotypes *Anisits Cact. 6* (B 81007070, corp, ar, sp; dried out) and *Anisits Cact. 47* (B- 10007072, corp, ar, sp, al, fl).

***Oreocereus fossulatus*** var. ***rubrispinus*** F. Ritter, Kakt. Südamer. 2: 697-699. 1980
Type: *Ritter 100a loc. 1* – Bolivia: La Paz; Murillo: "Valencia" [protologue], 10.1954 [collection date according to the protologue] (type herbaria: U, ZSS [status ?]) [type cited for U in Ritter, Kakt. Südamer. 1: iii. 1979].

B (sheet GH36093) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin s.n., 3.9.1997, from material originally received 1957 from H. Winter. Collection number established by inference.

***Parodia argerichiana*** Weskamp in Kakt. And. Sukk. 36(1): 8-9, ill. 1985
Type: *Herzog 108* – Argentina: Salta: "at the E slopes of the Sierra del Muerto ["del León Muerto" in the Latin diagnosis] between Santa Barbara and Santa Rosa" [protologue, translated], 2300-2500 m, 1981 (type herbaria: B) [ex cult. hort. Weskamp, 28.11.1984].

B (spirit B 810007111) (holotype): corp, ar, sp. – Notes: Part 1 of 2 of the holotype.
B (sheet s.n.) (holotype): fl, sem. – Notes: Part 2 of 2 of the holotype.

***Parodia ayopayana*** var. ***elata*** F. Ritter, Kakt. Südamer. 2: 542, fig. 413. 1980
Type: *Ritter 746a loc. 1* – Bolivia: Cochabamba; Ayopaya: "mouth of the river that comes from Santa Rosa into the Río Sacambaya" [protologue, translated] / "Mündung des Rio Sta. Rosa" = mouth of the Río Santa Rosa [isotype label at SGO], 1958 [collection date according to specimen at U] (type herbaria: U, SGO, ZSS [seeds only]) [type cited for U in Ritter, Kakt. Südamer. 1: iii. 1979].

B (boxed GH41491) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin 343-24-87-80, prepared 2003 from material originally received 1987 from U. Hummel.
B (sheet s.n.) (type number): ic (corp, ar, sp, (fl)). – Notes: Photograph from the legacy of U. Hummel, made 1970 ex cult. Matthes, Streitfeld, labelled "Samenherkunft: Bolivien ... leg. *F. Ritter FR 746a* (1959)".

***Parodia betaniana*** F. Ritter, Kakt. Südamer. 2: 426-427, fig. 284. 1980
Type: *Ritter 920* – Argentina: Salta: "Betania" [protologue / isotype label at SGO], 1.1959 [collection date according to original Ritter seed sample at ZSS ("I.59.") and the specimen at U ("1959")] (type herbaria: U, SGO, ZSS [seeds only]) [type cited for U in Ritter, Kakt. Südamer. 1: iii. 1979].

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B (boxed GH24341) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin, prepared 16.1.1989 from material originally received from U. Hummel.

***Parodia cachiana*** Weskamp, Gatt. Parodia II: 131, 134-135. 1992
Notes: A re-description of *Parodia kilianana* Backeberg 1963 (nom. inval.).
Type: *Herzog 104* – Argentina: Salta: "near Cachi Adentro" [protologue, translated], 2200-2400 m, s.a. (type herbaria: WU) [ex cult. W. Weskamp (see Weskamp, Gatt. Parodia II: 132, for details on the typification)].

B (boxed GH41549) (type collection): corp, ar, sp. – Notes: Ex cult. BG Berlin 341-46-87-80, prepared 2003 from material originally received 1987 from U. Hummel.

***Parodia camargensis*** var. ***prolifera*** F. Ritter in Succulenta (Amsterdam) 1962(2): 20. 1962
Type: *Ritter 723 loc. 1* – Bolivia: Chuquisaca; Sud-Cinti: "Las Carraras" [protologue], 5.1958 [collection date according to the protologue, p. 21] (type herbaria: U 116988B, SGO, ZSS [seeds only]).

B (sheet GH11868) (type number): ic (corp, ar, sp, fl). – Notes: Ex cult. BG Berlin 048-69-74-80, 3.6.1982, from material raised from seeds originally received 1960 from H. Winter.
B (boxed s.n.) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin, 20.6.1989, from material originally received 1987 from U. Hummel.

***Parodia caraparianа*** F. H. Brandt in Cact. Succ. J. (Los Angeles) 49(3): 119-120, ill. 1977
Notes: First mentioned in Kakt. Orch.-Rundschau 1975/76(2): 20. 1975, and later again mentioned as provisional name in Frankfurter Kakt.-Freund 5(2): 12. 1978.
Type: *Lau 398* – Bolivia: Tarija; O'Connor: "in the hills between Carapari and Palos Blancos" [protologue], 1100 m, s.a. [type given as "leg. Alfred Lau" and cited as "F. H. Brandt no. 72/a"] (type herbaria: HEID).

B (sheet GH22184) (type collection): ic (corp), fl. – Notes: Ex cult. BG Berlin 059-50-74-80, 7.7.1987, from material originally received from U. Hummel.

***Parodia cardenasii*** F. Ritter in Succulenta (Amsterdam) 43(4): 58. 1964
Type: *Ritter 914 loc. 1* – Bolivia: Tarija; O'Connor: "Angosto de Villa Montes" [protologue], 1963 [collection date according to specimen at U] (type herbaria: U 160398B, ZSS [seeds only]).

B (sheet GH33880) (type number): ic (corp), ar, sp, fl. – Notes: Ex cult. BG Berlin 343-70-87-80, 14.6.1995, from material originally received 1987 from U. Hummel.
B (boxed GH33880a) (type number): (rad), corp, ar, sp. – Notes: Ex cult. BG Berlin 343-70-87-80, made 2003, from material originally reveived 1987 from U. Hummel.

***Parodia chlorocarpa*** F. Ritter, Kakt. Südamer. 2: 427, fig. 286-287. 1980
Type: *Ritter 921* – Argentina: Salta: "Mojotoro" [protologue], 1.1959 [collection date according to original Ritter seed sample at ZSS ("I.59.") and the specimen at U ("1959")] (type herbaria: U, SGO, ZSS [seeds only]) [type cited for U in Ritter, Kakt. Südamer. 1: iii. 1979].

B (boxed GH29699) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin s.n., 20.6.1989, from material originally received 1987 from U. Hummel.
B (boxed GH29699a) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin 343-96-87-80, made 2003 from material originally received 1987 from U. Hummel, raised from seeds, labelled "S. Haag 78".
B (boxed s.n.) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin, 20.6.1989, from material originally received 1987 from U. Hummel, without further details.

***Parodia comosa*** F. Ritter in Cactus (Paris) 17(75): 21-22, ill. 1962
Type: *Ritter 111 loc.1* – Bolivia: La Paz: "gorge of Río La Paz, at the frontier of Prov. Loayza and Yungas-Sud" [protologue, translated], 1953 (type herbaria: U 117883B, SGO [status ?], ZSS).

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B (sheet GH25119) (type number): ic (corp, al). – Notes: Ex cult. BG Berlin, 28.6.1989, from material raised from seeds originally received 1959 from H. Winter. Collection number established by inference.

B (sheet s.n.) (type number): ic (corp, ar, sp, (fl)). – Notes: Photograph from the legacy of U. Hummel, made 1970 ex cult. Matthes, Streitfeld, labelled "Samenherkunft: Bolivien, leg. *F. Ritter FR 111* (1959)".

***Parodia dichroacantha*** F. H. Brandt & Weskamp in Kakt. And. Sukk. 18(5): 87-88, ill. 1967
Type: *Fechser s.n.* – Argentina: Salta: "somewhat N of frontier Tucuman - Salta" [protologue, translated]; "partly in rock crevices, partly in red soil", 1000 m, s.a. (type herbaria: B, ZSS [status ?]) [ex cult. hort. Weskamp, 8.7.1967].

B (spirit B 810007112) (holotype): rad, corp, ar, sp. – Notes: Part 1 of 2 of the holotype.

B (sheet s.n.) (holotype): ic (corp, ar, sp), fl. – Notes: Part 2 of 2 of the holotype.

***Parodia formosa*** F. Ritter in Succulenta (Amsterdam) 43(4): 57. 1964
Type: *Ritter 735 loc. 1* – Bolivia: Tarija; O'Connor: "Margarita" [protologue], 4.1958 [collection date according to original Ritter seed sample at ZSS] (type herbaria: U 098001B, SGO, ZSS [seeds only]).

B (boxed GH41488) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin 344-50-87-80, made 2003 from material originally received 1987 from U. Hummel, raised from seeds received from "S. Klimt 22.10.1979".

***Parodia guachipasana*** Weskamp, Gatt. Parodia II: 151-154, fig. 4. 1992
Type: *Herzog 184* – Argentina: Salta: "at the foot of the Cuesta del Cebilar, S of Guachipas, at intermediate altitudes" [protologue, translated], s.a. (type herbaria: WU) [ex cult. W. Weskamp].

B (boxed GH23415a) (type collection): corp, ar, sp. – Notes: Ex cult. BG Berlin 342-01-87-80, made Jan. 2005 from material originally received 1987 from U. Hummel.

***Parodia hegeri*** Diers & al. in Kakt. And. Sukk. 56(5): 127-130, ill. 2005
Type: *Krahn 960* – Bolivia: Potosí; Linares: "c. 20 km S of Duraznos" [protologue, translated], 3100-3600 m, s.a. (type herbaria: B (ex KOELN), LPB).

B (ex KOELN) (spirit B 810013164) (holotype): corp, ar, sp, fl. – Notes: Labelled "Holotyp". Collection data simply given as "WK 960". Additional data on the original label: "Rip. + Blüt. ders. Pflanze" [ribs and flowers of the same plant].

B (ex KOELN) (spirit B 810013165) (isotype): fl. – Notes: Labelled "Isotyp", but collection number given as "WK960/A". This most probably refers to a second individual of the type collection.

***Parodia heyeriana*** Weskamp, Gatt. Parodia II: 155-161, fig. 9. 1992
Type: *Herzog 101* – Argentina: Salta: "in the neighbourhood of the village La Viña" [protologue, translated, standardized], s.a. (type herbaria: WU) [ex cult. W. Weskamp].

B (boxed GH33885a) (type collection): corp, ar, sp. – Notes: Ex cult. BG Berllin 341-43-87-80, made 2003, from material originally received 1987 from U. Hummel.

***Parodia hummeliana*** A. B. Lau & Weskamp in Kakt. And. Sukk. 29(10): 226-227, ill. 1978
Type: *Lau 567* – Argentina: Salta: "c. 6 km E of the village of Amblayo" [protologue, translated]; "in a gorge on slopes of red standstone", 3200 m, 1972 (type herbaria: B) [ex cult. hort. Weskamp, 21.6.1978].

B (spirit B 810007113) (holotype): rad, corp, ar, sp. – Notes: Part 1 of 2 of the holotype.

B (sheet s.n.) (holotype): fl, sem. – Notes: Part 2 of 2 of the holotype.

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B (boxed GH23434) (type collection): ic (corp), fl. – Notes: Ex cult. BG Berlin 059-46-74-80, 8.6.1988, from material originally received 1987 from U. Hummel.
B (sheet GH29698) (type collection): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 344-86-87-80, 4.6.1992.
B (boxed GH29698a) (type collection): corp, ar, sp. – Notes: Ex cult. BG Berlin 344-86-87-80, made 2003, from material originally received 1987 from U. Hummel.

***Parodia laui*** F. H. Brandt in Kakt. And. Sukk. 24(11): 244-245, ill. 1973
Notes: Sphalm. *'lauii'*.
Type: *Lau 322* – Bolivia: Cochabamba; Campero?: "in the mountains along the road from Mizque to Mina Asientos, mountains above the Río Caine" [protologue, translated], 2700 m, s.a. [type cited as *"Brandt 18/a"* with the additional data "found by Alfred B. Lau" [translated]] (type herbaria: HEID) [ex cult. F. H. Brandt].
B (sheet GH22200) (type collection): ic (corp), fl. – Notes: Ex cult. BG Berlin 059-43-74-80, 7.7.1987, from material originally received 1987 from U. Hummel.
B (sheet GH23846) (type collection): ic (corp), fl. – Notes: Ex cult. BG Berlin 345-02-87-80, 21.7.1988, from material originally received 1987 from U. Hummel.

***Parodia lohaniana*** A. B. Lau & Weskamp in Kakt. And. Sukk. 30(6): 137-138, ill. 1979
Type: *Lau 457* – Argentina: Salta: "between Payogasta and Potrero" [protologue, translated], 2600 m, 1971 (type herbaria: B) [ex cult. hort. Weskamp, March 1979].
B (spirit B 810007114) (holotype): corp, ar, sp. – Notes: Part 1 of 2 of the holotype.
B (sheet s.n.) (holotype): fl, sem. – Notes: Part 2 of 2 of the holotype.

***Parodia maassii*** var. ***carminatiflora*** F. Ritter in Succulenta (Amsterdam) 1963(12): 179-180. 1963
Type: *Ritter 46c loc. 1* – Argentina: Salta: "von südlich Tres Morros" = from S of Tres Morros [original label at SGO; protologue, translated], 1959 [collection date according to the protologue; the specimen at U is dated "1963"] (type herbaria: U 160281B, SGO, ZSS [status ?]).
B (boxed GH41552) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin 345-16-87-80, 2003, material originally received 1987 from U. Hummel, who in turn raised it from seed received 14.1.1978 from Weskamp.

***Parodia maxima*** F. Ritter in Succulenta (Amsterdam) 43(2): 23. 1964
Type: *Ritter 87 loc. 1* – Bolivia: Tarija; Mendez: "Cieneguillas" [protologue], 1963 [date according to specimen at U] (type herbaria: U 160716B, SGO, ZSS).
B (boxed GH41548) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin 345-36-87-80, 2003, material originally received 1987 from U. Hummel.

***Parodia mercedesiana*** Weskamp in Kakt. And. Sukk. 35(3): 56-57, ill. 1984
Type: *Herzog 116* – Argentina: Salta: "NW of Las Curtiembres" [protologue, translated]; "on a slope of reddish sandstone with grass tussocks", 1800 m, 1980 (type herbaria: B) [ex cult. hort. Weskamp, 9.3.1984].
B (spirit B 810007115) (holotype): rad, corp, ar, sp. – Notes: Part 1 of 2 of the holotype. Dried out.
B (sheet s.n.) (holotype): fl, sem. – Notes: Part 2 of 2 of the holotype.
B (sheet GH22167) (type collection): ic (corp), fl. – Notes: Ex cult. BG Berlin s.n., 6.7.1987, from material originally received 1987 from U. Hummel.
B (boxed GH22167+23442) (type collection): corp, ar, sp. – Notes: Ex cult. BG Berlin s.n., 20.6.1989, material originally received 1987 from U. Hummel.
B (sheet GH23442) (type collection): ic (corp), fl. – Notes: Ex cult. BG Berlin 059-47-74-80, 8.6.1988, from material originally received from U. Hummel.

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***Parodia multicostata*** F. Ritter & Jelinek ex F. Ritter, Kakt. Südamer. 2: 529-530, fig. 391. 1980
Type: *Ritter 733 loc. 1* – Bolivia: Chuquisaca: "am Wege von Yamparaez nach Sotomayor, näher bei letzterer Ortschaft" [protologue] = path from Yamparaez to Sotomayor, closer to the last-mentioned place, 1958 [collection date according to specimen at U] (type herbaria: U, SGO [status ?], ZSS) [type cited for U in Ritter, Kakt. Südamer. 1: iii, 1979].

B (sheet GH22487) (type collection): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin s.n., 18.8.1987, from material originally received 1987 from U. Hummel.

B (sheet GH42184 / B100120555) (type collection): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 345-58-87-80, 28.7.2004, from material orginally received 1987 from U. Hummel.

B (sheet GH42443 / B100161210) (type collection): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 345-58-87-80, 30.9.2004, from material originally received 1987 from U. Hummel.

***Parodia otuyensis*** F. Ritter in Cactus (Paris) 17(76): 52-53, ill. 1962
Type: *Ritter 913 loc. 1* – Bolivia: Potosí; Saavedra: "Otuyo" [protologue], 12.1958 (type herbaria: U 117586B, SGO, ZSS [seeds only]).

B (sheet s.n.) (type number): ic (corp, ar, sp). – Notes: Photograph from the legacy of U. Hummel, made 1970 ex cult. Matthes, Streitfeld, labelled "Samenherkunft: Bolivien, leg. *F. Ritter FR 913* (1960)".

***Parodia procera*** F. Ritter in Taxon 13(3): 117. 1964
Type: *Ritter 742 loc.1* – Bolivia: Chuquisaca; Sud-Cinti: "region of mouth of Río Challamarca" [protologue, translated], s.a. (type herbaria: U 117823B, SGO, ZSS [seeds only]) [holotype cited for U in Taxon 12(1): 28].

B (sheet GH21021) (type number): fl. – Notes: Ex cult. BG Berlin, 13.10.1986, from material raised from seeds originally received 1959 from H. Winter. Collection number established by inference.

B (sheet s.n.) (type number): ic (corp, ar, sp). – Notes: Photograph from the legacy of U. Hummel, made 1970 ex cult. Matthes, Streitfeld, labelled "Samenherkunft: Bolivien, ..., leg. *F. Ritter FR 742* (1959)".

***Parodia purpureo-aurea*** F. Ritter in Succulenta (Amsterdam) 43(4): 57. 1964
Notes: No collection number is cited for the type in the protologue; the typification here is according to Ritter, Kakt. Südamer. 2: 545. 1980.
Type: *Ritter 1134 loc. 1* – Bolivia: Tarija; O'Connor: "in the C-E part of the Prov. O'Connor" [protologue, translated] / "Serere" [Ritter, Kakt. Südamer. 2: 545.1980], 1963 [collection date according to specimen at U] (type herbaria: U 160321, SGO, ZSS [seeds only]) [no herbarium cited for the holotype].

B (boxed GH41481) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin 345-08-87-80, material originally received 1987 from U. Hummel, labelled "Haag 1987".

***Parodia riojensis*** F. Ritter & Weskamp ex Weskamp, Gatt. Parodia: 474-476, fig. 75. 1987
Type: *Ritter 917 loc. 1* – Argentina: Catamarca / La Rioja: "frontier region of the provinces of Catamarca and La Rioja, near the village Mazan, at the S margin of the Pipanaco depression" [protologue, translated], 1000-1100 m, 1958 (type herbaria: DR, SGO [status ?]).

B (sheet GH23716) (type number): fl, ic (corp, ar, sp, fl). – Notes: Ex cult. BG Berlin 346-15-87-80, 6.7.1988, material originally received 1987 from U. Hummel with the note "Hum. 81, Klimt 76".

B (boxed GH23716a) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin 346-15-87-80, 2003, material originally received 1987 from U. Hummel, probably raised from seed in 1976.

B (boxed GH41483) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin 346-14-87-80, 2003, material originally received 1987 from U. Hummel, labelled "Hum. 81, Haag 77".

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***Parodia ritteri*** Buining in Succulenta (Amsterdam) 1959(2): 17-20, ill. 1959
Type: *Ritter 85 loc. 1* – Bolivia: Tarija; Mendez: "near El Puente" [protologue, translated], 2500 m, 1953 (type herbaria: U [not found], SGO, ZSS [lecto) [lectotype designated from amongst 2 isotypes by Doweld in Sukkulenty 3(1-2): 62. 2000].

B (boxed GH41547) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin 346-17-87-80, 2003, material originally received 1987 from U. Hummel. The identity of this specimen appears somewhat questionable, and a mix-up may have occurred in cultivation [B. Leuenberger, in adnot. Oct. 2005].

***Parodia setispina*** F. Ritter in Succulenta (Amsterdam) 43(4): 57-58. 1964
Type: *Ritter 1153 loc. 1* – Bolivia: Tarija; O'Connor: "in the centre of the E part of the Prov. O'Connor" [protologue, translated] / "Cañada" [Ritter, Kakt. Südamer. 2: 545. 1980], 1963 [collection date according to specimen at U] (type herbaria: U 160764B, SGO [status ?], ZSS [seeds only, status?]).

B (sheet GH41835 / B100126438) (type number): ic (corp), fl. – Notes: Ex cult. BG Berlin 346-74-87-80, 2.6.2004, from material originally received from U. Hummel.

***Parodia sotomayorensis*** F. Ritter, Kakt. Südamer. 2: 530, fig. 392-393. 1980
Type: *Ritter 734 loc. 1* – Bolivia: Chuquisaca: "oberhalb Sotomayor am Río Pilcomayo" [protologue] = above Sotomayor, at the Río Pilcomayo; "near the river on a rocky slope" [protologue, translated], 1958 [collection date according to specimen at U] (type herbaria: U, SGO) [type cited for U in Ritter, Kakt. Südamer. 1: iii. 1979].

B (sheet GH22477) (type collection): ic (forp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 346-77-87-80, 18.8.1987, from material originally received from U. Hummel.
B (sheet GH29696) (type collection): ic (corp, ar, sp), fl. – Notes: Ex cult. BG Berlin s.n., 4.6.1992.

***Parodia subterranea*** F. Ritter in Succulenta (Amsterdam) 43(3): 43. 1964
Type: *Ritter 731 loc. 1* – Bolivia: Chuquisaca; Sud-Cinti: "La Cueva" [protologue], 1963 [collection date according to specimen at U] (type herbaria: U 098009B, SGO, ZSS [status?]).

B (boxed GH33877a) (type number): (rad), corp, ar, sp. – Notes: Ex cult. BG Berlin 346-92-87-80, 2003, material originally received 1987 from U. Hummel, raised from seeds from G. Köhres.
B (sheet s.n.) (type number): ic (corp, ar, sp). – Notes: Photograph from the legacy of U. Hummel, made 1970 ex cult. Matthes, Streitfeld, labelled "Pflanzenherkunft: Bolivien, ..., leg. *F. Ritter FR 731* (1959)".

***Parodia subtilihamata*** F. Ritter, Kakt. Südamer. 2: 537-538, fig. 234, 574. 1980
Type: *Ritter 741 loc. 1* – Bolivia: Chuquisaca; Sud-Cinti: "oberhalb Challamarca" [holotype label at U] / "above Challamarca, far above the valley bottom" [protologue, translated]; "together with Rebutia tuberosa" [protologue, translated], 2400 m, 1958 [collection date according to specimen at U] (type herbaria: U, SGO, ZSS [seeds only]) [type cited for U in Ritter, Kakt. Südamer. 1: iii. 1979].

B (sheet GH22149) (type collection): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 347-01-87-80, 6.7.1987, from material originally received 1987 from U. Hummel.
B (sheet GH40775 / B100120296) (type collection): corp, ar, sp, (al), ic. – Notes: Ex cult. BG Berlin 347-05-87-80, 25.6.2003, from material originally received 1987 from U. Hummel.
B (sheet GH42396 / B100138998) (type collection): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 347-03-87-80, 13.9.2004, from material originally received 1987 from U. Hummel.
B (sheet GH43073 / B100171028) (type collection): fl. – Notes: Ex cult. BG Berlin 347-05-87-80, 30.5.2005, from material originally received 1987 from U. Hummel.

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***Parodia suprema*** F. Ritter in Cactus (Paris) 17(76): 51-52, ill. 1962
Type: *Ritter 912 loc. 1* – Bolivia: Tarija; Mendez: "San Antonio" [protologue], 3500 m, 12.1958 (type herbaria: U 117907B, SGO [status ?], ZSS).

B (sheet GH24792) (type number): ic (corp, fl). – Notes: Ex cult. BG Berlin, 1988, from material raised from seeds originally received 1960 from H. Winter. Collection number established by inference.

B (sheet s.n.) (type number): ic (corp, ar, sp). – Notes: Photograph from the legacy of U. Hummel, made 1970 ex cult. Matthes, Streitfeld, labelled "Bolivien ..., leg. *F. Ritter FR 912* (1960)".

***Parodia tumbayana*** Weskamp, Gatt. Parodia II: 132, 136-137. 1992
Notes: A re-description of *Parodia setosa* Backeberg 1963 (nom. inval.).
Type: *Piltz 171* – Argentina: Jujuy: "Tumbaya" [protologue], 2100 m, s.a. (type herbaria: WU) [ex cult. W. Weskamp (see Westkamp, Gatt. Parodia II: 132. 1992 for details on the typification)].

B (boxed GH 23831a) (type collection): corp, ar, sp. – Notes: Ex cult. BG Berlin 341-91-87-80, 2003, material originally received 1987 from U. Hummel. Collection number given as "Piltz 171/80/1", probably denoting that the material was received in Jan.1980.

***Parodia uebelmanniana*** F. Ritter, Kakt. Südamer. 2: 425-426, fig. 282. 1980
Type: *Ritter 919 loc. 1* – Argentina: Salta: "Lumbreras" [protologue, isotype label at SGO], 2.1959 [collection date according to the protologue] (type herbaria: U [not found], SGO, ZSS [seeds only, status ?]) [type cited for U in Ritter, Kakt. Südamer. 1: iii. 1979].

B (sheet GH23975) (type collection): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 346-38-87-80, 9.8.1988, from material originally received 1987 from U. Hummel. Association with this collection number established with question mark only.

***Pereskia grandifolia*** var. ***violacea*** Leuenberger in Mem. New York Bot. Gard. 41: 116-118, ill. 1986
Type: *da Silva 89* – Brazil: Minas Gerais; Mun. Santana do Riacho: "area of the future Parque Estadual da Serra do Cipó" [protologue, translated], 650 m, 23.9.1981 (type herbaria: HRB, B).

B (sheet s.n.) (isotype): corp, ar, sp, fol, fl.

***Phyllocactus pommer-eschei*** Hildmann in Gartenflora 41: 225, t. 1370, fig. 2. 1892
Type: *Anonymus s.n.* – Cult.: s.a. (type herbaria: B [authentic material?]).

B (spirit B 810007113) (type collection): (corp), fl. – Notes: The specimen is undated and has an old original label with just the name and no other data. Judging from the label in comparison with other old specimens at B, the material could have been prepared in the time period 1900/1905. It could be original material or have been prepared from cultivated early descendants of the original material.

***Phyllocactus thomasianus*** K. Schumann in Monatsschr. Kakteenk. 5(1): 6-7, t. 1. 1895
Notes: In epitype (designated by Ralf Bauer in Kakt. And. Sukk. 54(9): 247. 2003 and in Cact. Succ. J. (US) 37: 165, ill. 1965.
Type: *Anonymus s.n.* – Cult.: s.a. (type herbaria: [lecto, icon]: Monatsschr. Kakteenk. 5: t. [], 1895) [lectotype designated by Ralf Bauer in Kakt. And. Sukk. 54(9): 247. 2003].

B (spirit B 810007135) (type collection): fl. – Notes: Original label: "hort. bot. Berol. 1902". The specimen is thus posterior to the protologue but mot probably represents original material.

***Pilocereus setosus*** Gürke in Monatsschr. Kakteenk. 18(4): 52-53, ill. (+i 18(2): 21). 1908
Type: *Ule 1 p.p.* – Brazil: Bahia; Mun. Maracás: "near Calderão" [protologue, translated]; "rocky ground in the caatinga", 1906 [collection date according to old original label of the holotype at B] (type herbaria: B [lecto], K [photo], SPF [photo]) [lectotype].

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B (spirit B 810007142) (lectotype): corp, ar, sp, fl, [+ic]. – Notes: **Lectotype (here designated)** of *Pilocereus setosus.*

*Notes*. – This name is based on 2 syntypes, *Ule 1* and *Ule 1b,* respectively, according to the protologue both from "rocky ground near Calderão in the Catinga" [protologue, translated]. The 2 specimens in the Berlin spirit collection are numbered *Ule 1* and *Ule 1a.* Of these specimens, only *Ule 1* (note that this number was used twice by the collector, the other one representing the type collection of *Pilocereus ulei*) is a syntype eligible as lectotype, and we here designate the specimen B810007142 as lectotype of the name. Incidentally, this specimen was also listed simply as "type" of the name by Taylor & Zappi (2004).

***Pilocereus strausii*** Heese in Gartenflora 56: 410, fig. 49. 1907
Notes: Reference erroneously given as Gartenflora 62: 383. 1907 by Backeberg, Cact. 2: 1013. 1959.
Type: *Anonymus (Fiebrig) s.n.* – Bolivia: s.l. [protologue], 4.1904 [date according to the protologue. The collector is not given in the protologue but doubtlessly must have been Friebrig [Leuenberger, pers. comm]] (type herbaria: [lecto, icon]: Gartenflora 56: fig. 49. 1907) [lectotype designated by Hunt & Taylor in Cactaceae Syst. Init. 21: 6. 2006].

B (spirit B 810006809) (type collection): fl. – Notes: Original label: "Blüte, am 1. Juni 1920, Bot. Garten Dahlem". The material is most likely part of the original introduction (see also Dörfler, Monatsschr. Deutsche Kakt.-Ges.1930: 49). Material stored under the name *Cereus strausii.*

***Pilocereus ulei*** K. Schumann, Gesamtbeschr. Kakt., Nachtr.: 64-65. 1903
Notes: Non *Cephalocereus ulei* Gürke 1908.
Type: *Ule 1 p.p.* – Brazil: Rio de Janeiro: "around Cabo Frio" [protologue, translated], s.a. (type herbaria: B, K [photo], SPF [photo]).

B (spirit B 810007143) (holotype): corp, ar, sp, fr, [+ic].

***Pilosocereus albisummus*** P. J. Braun & Esteves in Kakt. And. Sukk. 38(5): 126-131, ill., SEM-ill. 1987
Type: *Esteves Pereira 123* – Brazil: Minas Gerais: "in the W part of the state of Minas Gerais" [protologue, translated] / "W frontier of Minas Gerais, E of D. F. Brasilia" [isotype label at B, translated]; "limestone rocks" [isotype label at B], 650 m, s.a. [detailed locality information deposited together with the holotype for conservation reasons according to the protologue, but no such information was found at ZSS] (type herbaria: ZSS, B, K).

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.?).

***Pilosocereus braunii*** Esteves in Kakt. And. Sukk. 38(5): 132. 1987
Notes: Additional detailed description in Kakt. And. Sukk. 40(1): 6-13, ill., SEM-ill. 1989.
Type: *Braun 70* – Brazil: Bahia: "W part of Bahia" [protologue, translated] / "Porto Novo" [isotype label at B] / "W Bom Jesus de Lapa" [isotype label at B (ex KOELN)]; "limestone rocks" [isotype label at B, translated], 400-550 m, s.a. [detailed locality information deposited together with the holotype for conservation reasons according to the protologue, but no such information found at ZSS] (type herbaria: ZSS, B, B (ex KOELN)).

B (boxed s.n.) (isotype): corp, ar, sp, ceph. – Notes: Leg. P. J. Braun (ex cult.?), s.a.
B (ex KOELN) (boxed 27773) (isotype): corp, ar, sp. – Notes: Labelled "Isotyp". Collection data simply given as "Braun 70".
B (ex KOELN) (spirit B 810013144) (isotype): fl. – Notes: Simply labelled "Isotyp", and with collection data.

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***Pilosocereus cristalinensis*** P. J. Braun & Esteves in Kakt. And. Sukk. 38(5): 132 (7): 163-167, ill., SEM-ill. 1987
Type: *Esteves Pereira 73* – Brazil: Goiás: "near Cristalina" [protologue, translated]; "campo cerrado" [isotype label at B], 1050 m, s.a. (type herbaria: ZSS, B, UFG) [isotype at UFG according to Taylor & Zappi, Cacti Eastern Brazil: 335. 2004].

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.?), without year.

***Pilosocereus densiareolatus*** subsp. ***brunneolanatus*** P. J. Braun & Esteves in Kakt. And. Sukk. 50(11): 286-289, ill. 1999
Type: *Esteves Pereira 224* – Brazil: Bahia: "W of the Rio São Francisco, W of the village of Cocos" [protologue, translated]; "on an isolated limestone outcrop", 500-550 m, s.a. (type herbaria: UFG 12.381, B [missing], B (ex KOELN), K, ZSS) [isotype at B missing as of April 2006].

B (ex KOELN) (boxed B 100216323) (isotype): corp, ar, sp, ceph, fl. – Notes: Labelled as "*Pilosocereus superfloccosus* var.", without type status data, collection data simply given as "Esteves 224".

***Pilosocereus densivillosus*** P. J. Braun & Esteves in Kakt. And. Sukk. 45(6): 108-114, ill., SEM-ill. 1994
Type: *Esteves Pereira 49* – Brazil: Goiás: "W of the state of Goiás, and in the neighbouring state of Mato Grosso do Sul, more or less along the Rio Araguaia" [protologue, translated] / "SW Goiás, rocks near the Rio Araguaia" [isotype label at B] / "SW of Caiaponia" [anonymous source]; "red sediment rocks" [protologue, translated], 750 m, 1989 (type herbaria: UFG 12.350, B).

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.?), s.a.

***Pilosocereus flexibilispinus*** P. J. Braun & Esteves in Kakt. And. Sukk. 41(5): 82-88, ill., SEM-ill. 1990
Type: *Esteves Pereira 145* – Brazil: Tocantins: "SE of the state of Tocantins" [protologue. translated] / "Dianopolis" [isotype label at B]; "limestone rocks", 600 m, s.a. (type herbaria: UFG 12.364, B, B (ex KOELN), ZSS).

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.?), s.a.
B (ex KOELN) (boxed B 100216322) (isotype): corp, ar, sp. – Notes: Labelled "Isotyp". Collection data given as "Esteves 145" and "Tocantins".

***Pilosocereus lindaianus*** P. J. Braun & Esteves in Kakt. And. Sukk. 38(5): 132. 1987
Notes: Additional detailed description and illustrations in Kakt. And. Sukk. 39(10): 222-228. 1988. Spelling sometimes corrected to *'lindanus'*.
Type: *Esteves Pereira 60* – Brazil: Goiás: "NE part of the State of Goiás" [protologue, translated] / "NNE part of the State of Goiás" [Kakt. And. Sukk. 39: 227. 1988]; "on black rocks in full sun or partial shade of cerrado trees" [Kakt. And. Sukk. l.c], 1100-1230 m, 1973 [the locality is given as "Mun. Alto Paraíso de Goiás, Chapada dos Veadeiros" by Taylor & Zappi, Cacti Eastern Brazil: 335. 2004] (type herbaria: ZSS, B (ex KOELN), UFG) [isotype at UFG according to Taylor & Zappi, Cacti Eastern Brazil: 335. 2004].

B (ex KOELN) (spirit B 810013145) (isotype): corp, ar, sp. – Notes: Labelled "Iso". Collection data simply given as "Esteves 60".

***Pilosocereus pusillibaccatus*** P. J. Braun & Esteves in Cact. Succ. J. (Los Angeles) 58(6): 240-243, ill. 1986
Type: *Esteves Pereira 202* – Brazil: Maranhão: "S region of the state of Maranhão and on the border to Piauí" [protologue] / "S Piauí / Maranhão" [isotype label at B]; "sandstone rocks" [isotype label at B, translated], 500 m, s.a. [collection date given as "1984/5?" on the isotype label at B]

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(type herbaria: ZSS, B, K, UFG) [isotypes at K and UFG according to Taylor & Zappi, Cacti Eastern Brazil: 335. 2004].

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.?), without year.

***Pilosocereus rizzoianus*** P. J. Braun & Esteves in Cact. Succ. J. (Los Angeles) 64(3): 148-155, ill., SEM-ill. 1992

Type: *Esteves Pereira 58* – Brazil: Goiás: "NE part of the State of Goiás" [protologue] / "N Goiás, near frontier to Tocantins, lower altitudes" [isotype label at B, translated]; "in very dry campo cerrado on outcrops of granitic rocks" [protologue], 800 m, 1975 (type herbaria: UFG 12.351, B, ZSS).

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.?), s.a.

***Pilosocereus rosae*** P. J. Braun in Kakt. And. Sukk. 35(8): 178-181, ill. 1984

Type: *Horst & Uebelmann HU 546* (1982) – Brazil: Minas Gerais: "W slopes of the Serra do Espinhaço" [protologue, translated] / "W slopes of the Serra do Espinhaço, NW of Diamantina" [isotype label at B]; "between large boulders of crystalline rocks" [protologue, translated], 1982 (type herbaria: ZSS, B, K).

B (boxed s.n.) (isotype): corp, ar, sp, ceph. – Notes: Leg. P. J. Braun (ex cult.), s.a.

B (boxed s.n.) (isotype): corp, ar, sp, ceph. – Notes: Leg. P. J. Braun (ex cult.), s.a.

B (ex KOELN) (spirit B 810013146) (isotype): corp, ar, sp. – Notes: Labelled as "Iso", without collection details.

***Pilosocereus schoebelii*** P. J. Braun in Cact. Succ. J. (Los Angeles) 59(4): 150-156, ill., SEM-ill. 1987

Type: *Braun 426* – Brazil: Minas Gerais: "mountain in the vicinity of the city of Janauba" [protologue] / "quartzite mountain E of Janauba" [isotype label at B]; "quartzite rocks" [protologue], 550-600 m, 1983 [detailed locality information deposited together with the holotype for conservation reasons according to the protologue, but not present at ZSS] (type herbaria: ZSS, B, B (ex KOELN †)).

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.), s.a.

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.), s.a.

***Pilosocereus supthutianus*** P. J. Braun in Kakt. And. Sukk. 36(5): 100-103, ill., (8): 170 [erratum]. 1985

Type: *Horst & Uebelmann HU 547* (1982) – Brazil: Minas Gerais: "W slopes of the Serra do Espinhaço" [protologue, translated] / "c. 40 km from Engenheiro Dolabela towards Sitio, Fazenda Olho d'Agua" [anonymous source] / "Serra do Espinaço, SE of Montes Claros" [isotype label at B, translated], 1982 [detailed locality data deposited together with the holotype for conservation reasons according to the protologue, but not present at ZSS] (type herbaria: ZSS, B, B (ex KOELN)).

B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.), accessioned 1991.

B (ex KOELN) (spirit B 810013147) (isotype): corp, ar, sp. – Notes: Labelled as "Isotyp", without collection details.

***Piptanthocereus bageanus*** F. Ritter, Kakt. Südamer. 1: 238. 1979 (incorrect name, Art.11.4).

Type: *Ritter 1007* – Brazil: Rio Grande do Sul: "Bagé" [protologue], 5.1959 [collection date according to specimens at SGO and ZSS; specimen at U simply dated "1959"] (type herbaria: U) [type cited for U in Ritter, Kakt. Südamer. 1: iii. 1979].

B (sheet GH12757) (type number): fl, ic (corp, ar, sp, fl). – Notes: Ex cult. BG Berlin, 29.8.1982, from material raised from seeds originally received 1960 from H. Winter. Collection number established by inference.

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B (sheet GH12757a) (type number): fl. – Notes: Ex cult. BG Berlin, 27.8.1986, from material raised from seeds originally received 1960 from H. Winter. Collection number established by inference.

B (sheet GH12757b/B100182614) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin, 9.8.2005, from material raised from seeds originally received 1960 from H. Winter. Collection number established by inference.

***Piptanthocereus neonesioticus*** F. Ritter, Kakt. Südamer. 1: 237. 1979 (incorrect name, Art. 11.4).

Type: *Ritter 1009* – Brazil: Santa Catarina: "Florianopolis" [specimen at SGO] / "island Santa Catarina near Florianopolis" [protologue], 4.1959 [collection date according to original Ritter seed sample at ZSS] (type herbaria: U [not found], SGO, ZSS [seeds only]) [type cited for U in Ritter, Kakt. Südamer. 1: iii. 1978].

B (sheet GH13147) (type number): (fl), ic (corp, ar, sp). – Notes: Ex cult. BG Berlin s.n., 21.9.1982, from material raised from seeds originally received 1960 from H. Winter. Collection number established by inference.

B (sheet GH21015) (type number): fl, ic (corp, ar, sp, fl). – Notes: Ex cult. BG Berlin s.n., 13.10.1986, from material raised from seeds originally received 1960 from H. Winter. Collection number established by inference.

B (sheet GH21015a/B100182616) (type number): corp, ar, sp. – Notes: Ex cult. BG Berlin s.n., 9.8.2005, from material raised from seeds originally received 1960 from H. Winter. Collection number established by inference.

***Pseudopilocereus diersianus*** Esteves in Kakt. And. Sukk. 32(4): 86-90, 1981

Type: *Esteves Pereira 18* – Brazil: Goiás: "NE part of the State of Goiás, W side of the Serra Geral de Goiás" [protologue, translated]; "in clefts or rubble of limestone rocks with some humus", 600-700 m, 1.1974 [locality given as"'Montes Belos' [possibly Monte Alegrete de Goiás, or Campos Belos]" by Zappi, Succ. Pl. Res. 3: 138. 1994] (type herbaria: B (ex KOELN), UFG).

B (ex KOELN) (boxed B 100216324) (holotype): corp, ar, sp, ceph. – Notes: Labelled as "Holotyp". Collection details simply given as "E-18". A copy of the protologue with annotated locality data is archived separately.

B (ex KOELN) (spirit B 810013148) (isotype): fl. – Notes: Collection details simply given as "E-18". Without type status annotation.

***Pseudopilocereus parvus*** Diers & Esteves in Kakt. And. Sukk. 33(5): 100-104, ill. 1982

Type: *Esteves Pereira 94* – Brazil: Goiás: "Serra Geral de Goiás, at the frontier between the States of Goiás and Bahia" [protologue, translated]; "in full sun or half-shade on rocks", 900-1000 m, 4.1978 (type herbaria: B (ex KOELN), UFG) [isotype at UFG according to Zappi, Succ. Pl. Res. 3: 115, 1994].

B (ex KOELN) (boxed B 100216325) (holotype): corp, ar, sp. – Notes: Labelled "Holotyp". Collection data simply given as "E-94". A copy of the protologue with annotated locality data is archived separately.

***Pseudopilocereus vilaboensis*** Diers & Esteves in Kakt. And. Sukk. 34(5): 106-111, ill. 1983

Type: *Esteves Pereira 20* – Brazil: Goiás: "Serra Dourada" [protologue] / "Serra Dourada near Goiás" [isotype label at B]; "on rocks in full sun" [protologue, translated], 900-1000 m, s.a. [additional locality data "hill with T.V. tower" cited by Zappi, Succ. Pl. Res. 3: 126. 1994] (type herbaria: B (ex KOELN), B, UFG) [isotype at UFG according to Zappi, Succ. Pl. Res.3: 126. 1994].

B (ex KOELN) (boxed B 100216326) (holotype): corp, ar, sp. – Notes: Labelled "Holotyp" and representing part 1 of 2 of the holotype. Collection data simply given as "E-20". A copy of the protologue with annotated locality data is archived separately.

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B (ex KOELN) (boxed B 100216327) (holotype): corp, ar, sp. – Notes: Labelled "Holotyp" and representing part 2 of 2 of the holotype. Collection data simply given as "E-20".
B (boxed s.n.) (isotype): corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.), accessioned 1991.
B (ex KOELN) (boxed B 100216328) (isotype): fr. – Notes: Collection data simply given as "E-20". Without type status indication.
B (ex KOELN) (boxed B 100216329) (isotype): sem. – Notes: Collection data simply given as "E-20". Without type status indication.
B (ex KOELN) (spirit B 810013149) (isotype): fl. – Notes: Collection data simply given as "E-20". Without type status indication.

***Pygmaeocereus bieblii*** Diers in Kakt. And. Sukk. 46(11): 256-260, ill., SEM-ill. 1995
Type: *Biebl 89-1* – Peru: Ancash: "c. 100 km NW of Huaraz, W side of the Cordillera Blanca" [protologue, translated]; "between rock rubble in sandy-gravelly ground", 1989 (type herbaria: B (ex KOELN)).
B (ex KOELN) (boxed B 100216330) (holotype): corp, ar, sp. – Notes: Labelled "Holotyp". Collection data simply given as "BIE 89-1".
B (ex KOELN) (boxed B 100216331) (isotype): corp, ar, sp. – Notes: Labelled "Isotyp". Collection data simply given as "BIE 89-1 (J)", without known significance of the letter.
B (ex KOELN) (boxed B 100216332) (isotype): fr, sem. – Notes: Collection data simply given as "BIE 89-1". Without type status indication.
B (ex KOELN) (boxed B 100216333) (isotype): ic (corp, ar, sp, fl, fr, sem). – Notes: Collection data simply given as "BIE 89-1". This specimen consists of 9 undated photographs, of which 5 are from Mr. Biebl from the locality, and 4 are SEM illustrations of the seed. In addition, there is a sheet of paper with locality data.
B (ex KOELN) (spirit B 810013150) (isotype): fl. – Notes: Collection data simply given as "BIE 89-1". Without type status indication.

***Pyrrhocactus aconcaguensis*** F. Ritter in Succulenta (Amsterdam) 1960(9): 108-109, ill. 1960
Type: *Ritter 542 loc. 1* – Chile: Región V; San Felipe: "Chacres" [protologue] / "Chacras" [Chagres] [type labels at SGO and U], s.a. (type herbaria: U 098032B, SGO, ZSS [seeds only]) [holotype cited for ZSS in the protologue but eventually found at U.-F. Kattermann (Succ. Pl. Res. 1: 144. 1994) unnecessarily designated the ill. in the protologue as lectotype].
B (sheet GH33788) (type collection): fl. – Notes: Ex cult. BG Berlin 153-91-74-80, 31.5.1995, from material origially raised from seeds received 1959 from H. Winter. Collection number established by inference.

***Pyrrhocactus echinus*** F. Ritter in Taxon 12(1): 33. 1963
Type: *Ritter 537 loc. 1* – Chile: Región II; Antofagasta: "Cerro Coloso near Antofagasta" [protologue, translated], 1956 (type herbaria: U 116948B, SGO, ZSS [status ?]) [holotype cited for U in Taxon 12(1): 28. 1963] ill.
B (sheet GH20606) (type number): fl, ic (corp). – Notes: Ex cult. BG Berlin, 25.7.1986, from material raised from seeds originally received 1959 from H. Winter. Collection number established by inference.

***Pyrrhocactus robustus*** F. Ritter in Succulenta (Amsterdam) 39(6): 65-68. 1960
Type: *Ritter 239a loc. 4* – Chile: Región V; Quillota: "Ocoa, high mountains" [protologue, translated], s.a. (type herbaria: ZSS [status ?], SGO [status ?], U [status ?]) [no herbarium cited for the type. F. Kattermann (Succ. Pl. Res.1: 146, 1994) probably made an implicit selection of the ZSS specimen as [lecto-] type].
B (sheet GH20390) (type collection): ic (corp, ar, sp), fl. – Notes: Ex cult. BG Berlin 153-98-74-80, 1.7.1986, from material originally raised from seeds received 1959 from H. Winter. Collection number established by inference.

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***Pyrrhocactus transitensis*** F. Ritter in Taxon 12(1): 33. 1963
Type: *Ritter 485 loc. 1* – Chile: Región III; Huasco: "near Transito" [protologue, translated] / "Transito" [type labels at U and SGO], 10.1962 [collection date according to specimen at U] (type herbaria: U 145319B, SGO, ZSS [seeds only, status ?]) [holotype cited for U in Taxon 12(1) 28. 1963].

B (sheet GH33791) (type collection): ic (corp, ar, sp), fl. – Notes: Ex cult. BG Berlin 154-04-74-80, 31.5.1995, from material originally raised from seeds received 1959 from H. Winter. Collection number established by inference.

***Rebutia albipilosa*** F. Ritter in Taxon 12(1): 29. 1963
Type: *Ritter 754 loc. 1* – Bolivia: Tarija; O'Connor: "Narvaez" [protologue], 1958 (type herbaria: U 117570B, SGO, ZSS [seeds only]) [holotype cited for U in Taxon 12(1) 28. 1963].

B (sheet GH12100) (type number): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin, 22.6. 1982, from material raised from seeds originally received 1978 from G. Köhres 1978. This accession is not associated with any one of several collections under this collection number, and its correct identification is doubtful.

***Rebutia blossfeldii*** Werdermann in Repert. Spec. Nov. Regni Veg. 39: 273. 1936
Type: *Blossfeld s.n.* – Argentina: Jujuy: s.l. [protologue], 1934 (type herbaria: B [†; photo]).

B (sheet s.n.) (type collection): ic (corp, ar, sp, fl). – Notes: Labelled "Jujuy 1934, Blossfeld s.n., lebend, cult. hort. Berol., blühend Nov. 1935. Foto der Typpflanze".

***Rebutia hoffmannii*** Diers & Rausch in Kakt. And. Sukk. 28(5): 105-106, ill. 1977
Type: *Rausch 521a* – Argentina: Salta: "Los Toldos" [W. Rausch, pers. comm.1991], s.a. (type herbaria: ZSS, B [clono]).

B (sheet GH29529) (type collection): ic (corp, fl), ar, sp, fl. – Notes: Ex cult. BG Berlin 163-01-88-30, 13.5.1992, labelled "Argentinien, Salta, leg. Hoffmann & Rausch (Typ-coll.!), cult. Prof. Schreier 1977".

***Rebutia sarothroides*** Werdermann in Repert. Spec. Nov. Regni Veg. 39: 272-273. 1936
Notes: Concurrently published in Werdermann (ed.), Blüh. Kakt. And. Sukk. Pfl.: t. 106 + text. 1936.
Type: *Marsoner s.n.* – Argentina: "N Argentina", s.l. [protologue], 1934 (type herbaria: B [†; photo]).

B (sheet s.n.) (type collection): ic (corp, ar, sp). – Notes: Labelled on a non-original label "Argentinien 1934, *Marsoner s.n.,* lebend, cult. bei Hahn in Lichterfelde, Foto der Typpflanze" and in Werdermann's handwriting "Reb. sarothroides Werd. Typ!". The same plant but with flowers was also illustrated in colour in Blüh. Kakt. And. Sukk. 27: t. 106. 1936.

***Rebutia steinbachii*** Werdermann in Notizbl. Bot. Gart. Berlin-Dahlem 11(104): 268-270. 1931
Notes: See W. Gertel in Kakt. And Sukk. 39(8): 190-192. 1988, on assumed cultivated propagation of the type plant (*Steinbach s.n.,* presumably from the surroundings of Cochabamba, 2500 m), and Leuenberger in Kakt. And. Sukk. 40(5): 116-118. 1989, on the questionable status of this material. Gertel deposited a neotype (*Gertel 123,* ex cult.) at ZSS in 1999, but this is superseded by the lectotypification provided below.
Type: *Steinbach s.n.* – Bolivia: Cochabamba?: "most probably from the neighbourhood of Cochabamba" [protologue, translated], 2500 m, s.a. (type herbaria: B [lecto, icon]).

B (sheet s.n.) **(lectotype, here designated):** ic (corp, ar, sp, fl). The specimen consists of a photograph (negative and 2 prints) made of the flowering type plant in 1930 at the Botanic Garden Berlin-Dahlem.

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*Notes.* – The photograph, made prior to the publication of the protologue, must be interpreted as part of the original material and is here designated as lectotype of *Rebutia steinbachii* in the absence of a holotype specimen. It is labelled "Typ!" in Werdermann's handwriting.

***Rebutia violascens*** F. Ritter, Kakt. And. Sukk. 28(4): 76. 1977
Type: *Ritter 352 loc. 1* – Bolivia: Chuquisaca; Nor-Cinti: "nördlich Camargo" [holotype label at U] = "N of Camargo" [protologue, translated], 1958 [collection date according to specimen at U] (type herbaria: U, ZSS [seeds only]).

B (sheet GH23269) (type collection): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 154-21-74-80, 13.5.1988, from material originally received 1979 from G. Köhres.

***Rebutia walteri*** Diers in Kakt. And. Sukk. 40(8): 186-190, ill., SEM-ill. 1989
Type: *Hoffmann 1960A* – Argentina: Salta: "Santa Victoria" [protologue], 2500-2700 m, s.a. (type herbaria: B (ex KOELN)).

B (ex KOELN) (boxed B 100216334) (isotype): fr, sem. – Notes: Collection data simply given as "Hoffm. 1960A", and without indication of type status.

B (ex KOELN) (spirit B 810013151) (lectotype): rad, corp, ar, sp. – Notes: Collection data simply given as "Hoffm. 1960/A", and without indication of type status. This specimen is here selected as lectotype of Rebutia walteri.

***Rhipsalis epiphylloides*** Campos-Porto & Werdermann in Jahrb. Deutsch. Kakteen-Ges. 1: 47-48, ill. 1935
Type: *Campos-Porto s.n.* – Brazil: Rio de Janeiro; Mun. Itatiaia ?: "on the Itatiaya mountains" [protologue, translated] [Serra da Itatiaia]; "hanging from trees", 1600 m, s.a. (type herbaria: B [fragment]).

B (spirit B 810007150) (holotype): (corp). – Notes: Dried out. Labelled "Itataya, c. 1500 m ... Werd. 1932".

***Rhipsalis riocampanensis*** J. E. Madsen & Z. Aguirre in Nordic J. Bot. 23(1): 26-28, ill. 2004
Type: *Madsen & al.7595* – Ecuador: Loja: "mountains of Río.
Campana" [protologue]; "upper montane rain forest with Weinmannia and Clusia, area penetrated by large streams, virgin forest exposed to occasional cutting of timber, border of Podocarpus National Park", 2250 m, 4.1.2001 ["Epiphyte, pendent, 2 m long; first-order stems suberect at first, soon pendent, to 1.2 m long, round at base or sometimes trigonous in lower 10 cm, not ribbed; flowers white, 1(-2) per areole; fruits 1-2 per areole, whitish, few ripe (probably early taken by birds). New growth slightly reddish at the edges" [printed type labels]] (type herbaria: AAU, B, BONN, K, LOJA, MO, QCA, QCNE, ZSS).

B (sheet s.n.) (isotype): corp, ar, sp, fr.

***Selenicereus atropilosus*** Kimnach in Cact. Succ. J. (Los Angeles) 50(6): 268-270, ill. 1978
Type: *Boutin & Kimnach 3190* – Mexico: Jalisco: "3 miles past turnoff to San Sebastian, on road from Mascota to Puerta Vallarta" [protologue], 780 m, s.a. [= Huntington Bot. Gard. 24980, distributed as ISI 1056] (type herbaria: B, HNT, MEXU, US, ZSS).

B (sheet GH15955) (type collection): corp, ar, sp, fl. – Notes: Ex cult. BG Berlin 001-02-83-30, 29.5.1984.

B (sheet GH15955a) (type collection): corp, ar, sp, fr, sem. – Notes: Ex cult. BG Berlin 001-02-83-30, 1992.

***Sulcorebutia alba*** Rausch in Succulenta (Amsterdam) 50(5): 94-96, ill. 1971
Type: *Rausch 472* – Bolivia: Chuquisaca; Oropeza: "road from Sucre to Los Alamos, Chiqui Tayoj" [protologue, translated], 2900 m, s.a. (type herbaria: W, ZSS).

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B (sheet GH21773) (type collection): ic (corp, ar, sp), fl. – Notes: Ex cult. BG Berlin 175-12-82-40, 20.5.1987, from material originally received from BG Wien-Schönbrunn.

***Sulcorebutia breviflora*** subvar. ***viridior*** Diers in Kakt. And. Sukk. 42(4): 101, ill. (pp. 98-99). 1991
Type: *Lau 313* – Bolivia: Cochabamba; Arce: "way from Ansaldo towards the Río Caine" [protologue, translated], 2000 m, 16.3.1970 [collection date and altitude according to Feldnummernliste Alfred B. Lau, Teil 2 (= Sonderheft 1994, Arbeitskreis für Mammillarienfreunde)] (type herbaria: B (ex KOELN)).

B (ex KOELN) (boxed B 100216337) (holotype): rad, corp, ar, sp. – Notes: Labelled "Holotyp". Collection data simply given as "L 313". Apparently a cultivated plant.

B (ex KOELN) (boxed B 100216338) (isotype): sem. – Notes: Collection data simply given as "L 313". Without indication of type status.

***Sulcorebutia breviflora*** var. ***laui*** Diers in Kakt. And. Sukk. 42(4): 100-101, ill. 1991
Type: *Lau 314* – Bolivia: Potosí; Bilbao: "S shore of Río Caine, but c.10 km SE of the locality of L 315 and on a different hill chain" [protologue, translated], 2400-2500 m, 18.3.1970 [collection date and altitude according to Feldnummernliste Alfred B. Lau, Teil 2 (= Sonderheft 1994, Arbeitskreis für Mammillarienfreunde)] (type herbaria: B (ex KOELN)).

B (ex KOELN) (boxed B 100216335) (holotype): corp, ar, sp. – Notes: Labelled "Holotyp". Collection data simply given as "L 314". Apparently a cultivated plant.

B (ex KOELN) (boxed B 100216336) (isotype): sem. – Notes: Collection data simply given as "L 314". Without type status indication.

B (ex KOELN) (spirit B 810013152) (isotype): fl. – Notes: Collection data simply given as "L 314". Without type status indication.

***Sulcorebutia frankiana*** Rausch in Kakt. And. Sukk. 21(6): 104-105, ill. 1970
Type: *Rausch 290* – Bolivia: Sucre: "along the road to Los Alamos" [protologue, translated], 2700 m, s.a. (type herbaria: W, ZSS).

B (sheet GH21565) (type collection): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 175-05-82-40, 28.4.1987.

***Sulcorebutia mizquensis*** Rausch in Kakt. And. Sukk. 21(6): 102-103, ill. 1970
Type: *Rausch 194* – Bolivia: Cochabamba: "near Mizque" [protologue, translated], 2600 m, s.a. (type herbaria: W, ZSS).

B (sheet GH21566) (type collection): ic (corp, ar, sp, fl), fl. – Notes: Ex cult. BG Berlin 175-08-82-40, 28.4.1987.

***Sulcorebutia rauschii*** G. Frank in Kakt. And. Sukk. 20(12): 238-239, ill. 1969
Type: *Rausch 289* – Bolivia: Chuquisaca: "near Zudañez" [protologue, translated], 2700 m, s.a. (type herbaria: W, ZSS) [type cited for the collection of W. Rausch but placed in W].

B (sheet GH23272) (type collection): ic (corp, ar, sp), fl. – Notes: Ex cult. BG Berlin 229-29-83-30, 13.5.1988.

B (sheet GH33764) (type collection): rad, corp, ar, sp, fl. – Notes: Ex cult. BG Berlin 175-13-82-40, 29.5.1995, from material originally received from Wien-Schönbrunn.

***Sulcorebutia roberto-vasquezii*** Diers & Krahn in Kakt. And. Sukk. 56(8): 213-215, ill., (12): 323 [erratum]. 2005
Type: *Krahn 986* – Bolivia: Chuquisaca: s.l. [protologue: "in parte regionibus orientalis Boliviae"], 1300-1400 m, s.a. (type herbaria: B (ex KOELN), BOLV, LPB).

B (ex KOELN) (spirit B 810013166) (holotype): rad, corp, ar, sp. – Notes: Labelled "Holotyp". Collection data simply given as "WK 986".

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***Sulcorebutia tarabucoensis*** Rausch in Kakt. And. Sukk. 21(3): 45. 1970
Notes: First invalidly published (Art. 37.1) in Kakt. And. Sukk. 15(5): 92, ill., 1964.
Type: *Rausch 66* – Bolivia: Chuquisaca; Yamparaez: "mountains in the vicinity of Tarabuco" [protologue, translated], 3500 m, s.a. (type herbaria: W, ZSS).

B (sheet GH33766) (type collection): corp, ar, sp, fl. – Notes: Ex cult. BG Berlin 229-03-83-30, 29.5.1995.

***Sulcorebutia vargasii*** Diers & Krahn in Kakt. And. Sukk. 56(11): 282-286, ill. 2005
Type: *Krahn 995* – Bolivia: Santa Cruz; Valle Grande: s.l., "habitat in collibus saxosis provinciae Valle Grande" [protologue], 2300 m, s.a. (type herbaria: B (ex KOELN), BOLV, LPB).

B (ex KOELN) (spirit B 810013167) (holotype): rad, corp, ar, sp. – Notes: Labelled "Holotyp". Collection data simply given as "WK 995".

***Sulcorebutia vargasii*** var. ***viridissima*** Diers & Krahn in Succulenta (Amsterdam) 85(1): 13, ill. 2006
Type: *Krahn 996* – Bolivia: Santa Cruz; Valle Grande: s.l. [protologue]; rocky places in the mountains [protologue, translated], 2300 m, s.a. (type herbaria: B, BOLV, LPB).

B (spirit B 810013168) (holotype): corp, ar, sp. – Notes: Labelled "Holotyp". Collection data simply given as "WK 996".

***Thelocephala fulva*** F. Ritter, Kakt. Südamer. 3: 1011-101. 1980
Notes: Given as comb. nov., but in fact a sp. nov.
Type: *Ritter 500 loc. 1* – Chile: Región III; Copiapó: "Totoral" [protologue], 1956 [collection date according to specimen at U] (type herbaria: U, SGO [status ?], ZSS [seeds only, status ?]) [type cited for U in Ritter, Kakt. Südamer. 1: iii. 1979].

B (sheet GH15812) (type number): fl. – Notes: Ex cult. BG Berlin, 8.5.1984, from material raised from seeds originally received 1959 from H. Winter. Collection number established by inference.

***Trichocereus vasquezii*** Rausch in Kakt. And. Sukk. 25(9): 193-194, ill. 1974
Type: *Rausch 619* – Bolivia: Santacruz: "along the road Pojo - Comarapa (Catalinas)" [protologue, translated], 2400 m, s.a. (type herbaria: W [not found], ZSS).

B (sheet GH22620) (type collection): fl. – Notes: Ex cult. BG Berlin 201-19-82-30, 3.9.1987, from material originally received from Wien-Schönbrunn.

***Trichocereus vatteri*** R. Kiesling in Hickenia 1(6): 31-32. 1976
Notes: Probably invalid (Art. 37.1) since two elements are given in the type citation.
Type: *Ritter 426* – Argentina: La Rioja: "Famatina", towards the W, 2.1955 [collection data and date according to specimen at ZSS] (type herbaria: LP).

B (sheet GH15012) (type collection): ic (corp), ar, sp, fl. – Notes: Ex cult. BG Berlin 012-75-74-80, 10.8.1983.

***Trichocereus volcanensis*** F. Ritter, Kakt. Südamer. 2: 448-449. 1980
Type: *Ritter 400 loc. 1* – Argentina: Jujuy: "Volcán" [protologue / type labels], 2300 m, 1955 [collection date and altitude added from specimen at ZSS] (type herbaria: U, SGO, ZSS) [Type cited for U in Ritter, Kakt. Südamer. 1: iii. 1979].

B (sheet GH31648) (type collection): corp, ar, sp. – Notes: Ex cult. BG Berlin 154-88-74-80, 2.8.1993, from material originally raised from seeds received 1957 from H. Winter. Collection number established by inference.

B (sheet GH33828) (type collection): corp, ar, sp. – Notes: Ex cult. BG Berlin 154-88-74-80, 8.6.1995, from material originally raised from seeds received 1957 from H. Winter. Collection number established by inference. This specimen consists of 2 sheets.

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***Turbinicarpus pseudomacrochele*** var. ***lausseri*** Diers & G. Frank in Kakt. And. Sukk. 42(5): 106-109, ill., SEM-ill. 1991
Notes: No collection is actually given as type, which is cited for KOELN, the information given here is extracted "by inference".
Type: *Lausser s.n.* – Mexico: Querétaro: "frontier region of Querétaro and Hidalgo, S parts of the Sierra del Doctor" [protologue, translated]; "in small depressions and clefts, on limestone", 2200 m, s.a. (type herbaria: B (ex KOELN)).

B (ex KOELN) (boxed B 100216339) (isotype): sem. – Notes: The original label has only the taxon name and neither an indication of the type status nor collection data.

B (ex KOELN) (spirit B 810013153) (lectotype): corp, ar, sp, fl. – Notes: **Lectotype (here designated)** of *Turbinicarpus pseudomacrochele* var. *lausseri.* The original label has only the taxon name and neither an indication of the type status nor any collection details.

***Turbinicarpus pseudomacrochele*** var. ***sphacelatus*** Diers & G. Frank in Kakt. And. Sukk. 44(8): 158-161, ill. 1993 (nom. inval., Art.37.3).
Notes: Sphalm. *'sphacellatus', 'spacellatus'*.
Based on: *Anonymus s.n.* – Mexico: Querétaro?: s.l. [protologue], s.a. (herbaria: B (ex KOELN)).

B (ex KOELN) (spirit B 810013154) (type collection): ar, sp, fl. – Notes: The original labels have only the taxon name (1 of 2 labels as *T. sphacellatus*), but no collection details nor an indication of type status.

***Turbinicarpus swobodae*** Diers in Kakt. And. Sukk. 38(4): 86-91, ill., SEM-ill. 1987
Type: *Swoboda s.n*. – Mexico: Nuevo León: "near Rayones" [protologue, translated]; "narrow rock fissures in full sun", s.a. (type herbaria: B (ex KOELN)).

B (ex KOELN) (spirit B 810013155) (holotype): corp, ar, sp, fl. – Notes: Labelled as "Holotyp". Collection data simply given as "HS-Mat.".

B (ex KOELN) (boxed B 100216340) (isotype): ic (corp, ar, sp). – Notes: An envelope labelled "HS-Material" with 4 photographs, 1 from the habitat and 3 showing cultivated material.

***Uebelmannia pectinifera*** var. ***horrida*** P. J. Braun in Kakt. And. Sukk. 35(12): 264-266, ill. 1984
Type: *Horst & Uebelmann HU 550 (1982)* – Brazil: Minas Gerais: "W slopes of the Serra do Espinhaço, S of Montes Claros" [protologue, translated] / "W slopes of the Serra do Espinhaço above Engenheiro Dolabela towards Sitio" [anonymous source], 1982 (type herbaria: ZSS, B (ex KOELN)).

B (boxed s.n.) (isotype): (rad), corp, ar, sp. – Notes: Leg. P. J. Braun (ex cult.?), s.a.

B (ex KOELN) (boxed B 100216341) (isotype): corp, ar, sp. – Notes: Labelled as "Isotyp", without any collection data.

***Weberbauerocereus johnsonii*** F. Ritter, Kakt. And. Sukk. 13(5): 72-74, ill. 1962
Type: *Ritter 570 loc. 1* – Peru: Cajamarca: "Zangal" [protologue] / "Zangal, San Pablo" [isotype label at ZSS], 7.1956 (type herbaria: U117563B, SGO [status ?], ZSS).

B (sheet GH38420 / B100002144) (type collection): ic (corp, ar, sp). – Notes: Ex cult. BG Berlin 155-04-74-80, 1.5.1977, from material raised from seeds originally received 1960 from H. Winter. Collection number established by inference.

B (sheet GH38420a /B100171586) (type collection): ic (corp, ar, sp). – Notes: Ex cult. BG Berlin 155-04-74-80, Aug. 2003, from material originally raised from seeds received 1960 from H. Winter.

***Weberbauerocereus winterianus*** F. Ritter, Kakt. And. Sukk. 13(4): 54. 1962
Type: *Ritter 165 loc. 1* – Peru: La Libertad; Otusco: "Samne" [protologue] / "Cerro Currunday, bei Samne" [isotype label at SGO] = Cerro Currunday, near Samne, 1953 [collection date according to material at ZSS] (type herbaria: U 117763B, SGO, ZSS).

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B (sheet GH38422 / B100002147) (type collection): ic (corp, ar, sp). – Notes: Ex cult. BG Berlin 155-09-74-80, 1.12.1993, from material originally raised from seeds received 1960 from H. Winter. Collection number established by inference.

B (sheet GH38422a) (type collection): ic (corp, ar, sp). – Notes: Ex cult. BG Berlin 155-09-74-80, 2006, from material originally raised from seeds received 1960 from H. Winter. Collection number established by inference.

B (sheet GH38422b /B100171587) (type collection): ic (corp, ar, sp). – Notes: Ex cult. BG Berlin 155-09-74-80, 2006, from material originally raised from seeds received 1960 from H. Winter. Collection number established by inference.

***Weberbauerocereus winterianus*** var. ***australis*** F. Ritter in Kakt. And. Sukk. 13(4): 56. 1962
Type: *Ritter 1066 loc. 1* – Peru: Ancash: "gorge of Huécocho, a branch of the Casma gorge" [protologue, translated], 2000 m, s.a. (type herbaria: U 117595B, ZSS [seeds only]).

B (sheet GH43999 / B100171591) (type collection): ic (corp, ar, sp). – Notes: Ex cult. BG Berlin 155-10-74-80, prepared 2003, from material raised from seeds originally received 1963 from H. Winter (s.a.); collection number established by inference.

***Wilcoxia tamaulipensis*** Werdermann in Kakteenkunde 1938(8): 85-87, ill. 1938
Type: *Anonymus s.n. in Hummel s.n.* – Mexico: Tamaulipas: "probably state of Tamaulipas" [protologue, translated], s.a. (type herbaria: B [fragmentary]) [ex cult. hort. Hummel, 15.4.1937].

B (spirit B 810007166) (holotype): (corp, ar, sp). – Notes: Dried out. ex cult. hort. Hummel 15.4.1937.

### 5.4. Missing types from B and KOELN

The following types have been explicitly cited for B in protologues but have not been found:

*Arrojadoa beateae* P. J. Braun & Esteves in Kakt. And. Sukk. 40(10): 250-256, ill., SEM-ill. 1989. Type: *Esteves Pereira 261* (UFG). The isotype *(Braun 830)* cited for B represents a paratype, although made simultaneously with the holotype collection and at the type locality.

*Discocactus piauiensis* P. J. Braun & Esteves in Kakt. And. Sukk. 46(3): 57-62, ill. 1995. Type: *Esteves Pereira 114* (UFG, B [missing], ZSS).

*Pilosocereus densiareolatus* subsp. *brunneolanatus* P. J. Braun & Esteves in Kakt. And. Sukk. 50(11): 286-289, ill. 1999. Type: *Esteves Pereira 224* (UFG, B [missing], K, KOELN, ZSS).

The following types have been explicitly cited for KOELN in the protologues, but have not been found amongst the specimens transferred to B:

*Cleistocactus horstii* P. J. Braun in Kakt. And. Sukk. 33(10): 204-209, ill. 1982. Type: *Horst & Uebelmann HU 373* (1974) (KOELN [Succulentarium] [missing], ZSS).

*Coleocephalocereus fluminensis* var. *braamhaarii* P. J. Braun in Kakt. And. Sukk. 33(6): 118-121, ill. 1982. Type: *Braamhaar 1/1980* (KOELN [Succulentarium] [missing], ZSS.

*Frailea buenekeri* W.-R. Abraham in Succulenta 69(3): 64-68, ill. 1990. Type: *Büneker 27* (KOELN [Succulentarium] [missing].

*Mammillaria duwei* Rogozinski & P. J. Braun in Kakt. And. Sukk. 36(8): 158-164, ill. 1985. Type: *Duwe & Rogozinski 1* (KOELN [Succulentarium] [missing], B, ZSS. While the type at KOELN is missing, B received a specimen (consisting of two plant bodies) labelled as isotype in 1991, which is not cited in the protologue.

*Notocactus gutierrezii* W.-R. Abraham in Kakt. And. Sukk. 39(7): 150-154, ill. 1988. Type: *Abraham 253* (KOELN [missing]).

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*Notocactus linkii* var. *albispinus* W.-R. Abraham in Succulenta 69(5): 117-120, ill. 1990. Type: *Abraham 281* (KOELN [missing].

*Notocactus megapotamicus* var. *multicolorispinus* W.-R. Abraham & Büneker in Kakt. And. Sukk. 43(1): 20-22, ill. 1991. Type: *Büneker 202* (KOELN [Succulentarium] [missing]).

*Notocactus rubrigemmatus* W.-R. Abraham in Kakt. And. Sukk. 39(2): 38-41, ill. 1988. Type: *Schlosser 156* (KOELN [Succulentarium] [missing]).

*Notocactus rudibuenekeri* W.-R. Abraham in Succulenta 67(6): 133-138, ill. 1988. Type: *Abraham 355* (KOELN [Succulentarium] [missing]).

*Notocactus scopa* var. *machadoensis* W.-R. Abraham in Succulenta 67(4): 81-84, ill. 1988. Type: *Abraham 361* (KOELN [Succulentarium] [missing]).

*Notocactus scopa* var. *marchesii* W.-R. Abraham in Kakt. And. Sukk. 40(7): 174-176, ill. 1989. Type: *Abraham 34* (KOELN [Succulentarium] [missing]).

*Notocactus scopa* var. *xicoi* W.-R. Abraham in Succulenta 67(5): 111-114, ill. 1988. Type: *Abraham 332* (KOELN [Succulentarium] [missing]).

*Notocactus uebelmannianus* var. *nilsonii* Königs in Internoto 13(2): 56, 1992. Type: *Stockinger 137* (KOELN [missing]).

*Pilosocereus densiareolatus* subsp. *brunneolanatus* P. J. Braun & Esteves in Kakt. And. Sukk. 50(11): 286-289, ill. 1999. Type: *Esteves Pereira 224* (UFG 12.381, B [missing], K, KOELN, ZSS.

*Pilosocereus schoebelii* P. J. Braun in Cact. Succ. J. (US) 58(4): 150-156, ill., SEM-ill. 1987. Type: *Braun 426* (ZSS, KOELN [missing]. The material at KOELN is missing, but B has two isotype specimens that are not cited in the protologue.

*Wigginsia schaeferiana* W.-R. Abraham & Theunissen in Internoto 9(1): 21-25, ill. 1988. Type: *Abraham 163* (KOELN [Succulentarium] [missing]).

### 5.5. List of photographs of type specimens from other herbaria

The Berlin herbarium has a considerable number of photographs of type specimens deposited in other herbaria. These photographs are usually mounted on herbarium sheets and are intercalated in the general herbarium. Since there are numerous photographs of specimens not otherwise easily accessible, a list of the taxa represented with such photographs is given here:

*Cactus bleo* Kunth (holotype at P-Bonpl, isotype at P)
*Cactus ficus-indica* L. Raf. (neotype at S)
*Cactus horridus* Kunth (holotype at P-Bonpl, isotype at P)
*Cactus humifusus* Raf. (neotype at US)
*Cactus serpens* Kunth (holotype at P-Bonpl, epitype at UC)
*Cereus adscendens* Gürke (holotype at HBG)
*Cereus atacamensis* Phil. (possible type at SGO as SGO 052685)
*Cereus deserticola* Werderm. (isotypes at BM, G, SI, all mixed collections, cf. Leuenberger & Eggli 1996).
*Cereus longiflorus* Alexander (holotype at NY)
*Cereus nigripilis* Phil. (holotype at SGO [a mixed collection, cf. Leuenberger & Eggli 1999b], isotype at HAL)
*Cereus oligolepis* Vaupel (neotype at M)
*Cereus penicillatus* Gürke (holotype at HBG)
*Cereus phaeacanthus* Gürke (lectotype at HBG)
*Cereus tarijensis* Vaupel (isotype at HBG)

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*Cleistocactus longiserpens* Leuenb. (holotype at USM, isotype at UC)
*Echinocactus escayachensis* Vaupel (isotype at HBG)
*Echinocactus rhodacanthus* Salm-Dyck (neotype at K)
*Echinocactus sandillon* Gay (syntype at P; Gay 322, annotated as lectotype by R. Kiesling in 1984, but this proposed lectotypification seems to have remained unpublished)
*Echinocactus sandillon* Gay (possible syntype at SGO; the specimen SGO 05692 has a total of 3 original labels, one of which has only the taxon name, one of which is "Gay 1300", "*Echinocactus sandillon* vulgo Sandillon". "Prov.a Coquimbo" "in collibus Illapel Aprili 1837", and one "Illapel Decemb. 1862 Landb.[eck]" so the sheet has to be interpreted as a mixture, without any possibility to coordinate the labels with the fragmented material. IN addition, there is a later label by the herbarium curator, M. Muñoz, from 1992, identifying the sheet as isotype.
*Eulychnia castanea* Phil. (holotype at SGO)
*Gymnocalycium tillianum* Rausch (holotype at W)
*Lobivia glauca* Rausch (holotype at W)
*Lobivia glauca* var. *paucicostata* Rausch (holotype at W)
*Maihuenia brachydelphys* K. Schum. (neotype at CORD)
*Maihuenia tehuelches* Speg. (holotype at LP)
*Maihuenia valentinii* Speg. (holotype at LP)
*Opuntia atacamensis* Phil. (neotype at K) (there is also an isotype at B)
*Opuntia bicolor* Phil. (possible type at SGO as SGO 52664: "Las Arañas", Dec. 1861).
*Opuntia caespitosa* Poepp. (lectotype at W)
*Opuntia camachoi* Espinosa (holotype at SGO)
*Opuntia darwinii* Hensl. ("isoneotype" at LP, but a lectotype is existing)
*Opuntia glomerata* Haw. (neotype at BACP)
*Opuntia grata* Phil. (lectotype at HAL, isolectotype at K)
*Opuntia ovallei* Gay (holotype at P)
*Opuntia patagonica* Phil. (holotype at SGO)
*Opuntia rahmeri* Phil. (holotype at SGO)
*Opuntia spiniflora* Phil. (holotype at SGO)
*Opuntia tarapacana* Phil. (holotype at SGO)
*Pereskia amapola* F. A. C. Weber (holotype at P)
*Pereskia bahiensis* Gürke (lectotype at HBG)
*Pereskia colombiana* Britton & Rose (isotype at US)
*Pereskia conzattii* Britton & Rose (holotype at US)
*Pereskia corrugata* Cutak (holotype at MO)
*Pereskia cubensis* Britton & Rose (lectotype at US, 2 isotypes at NY)
*Pereskia diaz-romeroana* Cárdenas (2 isotypes at US)
*Pereskia grandifolia* Haw. (neotype [icon] at K)
*Pereskia lychnidiflora* DC. (iconotype: Mociño, Hunt Inst. Bot. Doc., copy published as part of the protologue, original reproduced in Bradleya 12: 17. 1994; and also a photograph of a specimen of "*Cactus macrochanthos,* Nueva España, Herb. Pavon" at G, apparently the specimen used for the drawing of the plate in the protologue of *P. lychnidiflora*) (see also Leuenberger 1988)
*Pereskia moorei* Britton & Rose (holotype at BM)
*Pereskia nicoyana* F. A. C. Weber (neotype at US)
*Pereskia opuntiiflora* DC. (iconotype: Mociño, Hunt Inst. Bot. Doc., copy published as part of the protologue, original reproduced in Bradleya 12: 19. 1994) (see also Leuenberger 1988)
*Pereskia panamensis* F. A. C. Weber (lectotype at P)
*Pereskia weberiana* K. Schum. (lectotype at NY)
*Pereskia zehntneri* Britton & Rose (lectotype at US)
*Pereskia zinniiflora* DC. (iconotype: Mociño, Hunt Inst. Bot. Doc., copy published as part of the protologue, original reproduced in Bradleya 12: 18. 1994)(see also Leuenberger 1988)

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*Rebutia buiningiana* Rausch (holotype at W)
*Rebutia eos* Rausch (holotype at W)
*Rebutia fulviseta* Rausch (holotype at W)
*Rebutia heliosa* Rausch (holotype at W)
*Wittia amazonica* K. Schum. (isotype at HBG)
*Zehntnerella squamulosa* Britton & Rose (isotype [2 sheets] at NY)

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