

An annotated checklist of the genus *Gymnocalycium* Pfeiffer ex Mittler (Cactaceae)

*DETLEV METZING, **MASSIMO MEREGALLI, ***ROBERTO KIESLING

*If*OE, Abt. Geobotanik & Naturschutz - Universität Bremen

Postfach 330 440, 28344 Bremen, Germany

** Dipartimento di Biologia vegetale - Università di Torino

Viale Mattioli 25, 10125 Torino, Italy.

*** Instituto de Botanica Darwinion

Labarden 200, C.C. 22, 1642 San Isidro, Argentina

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An annotated nomenclatural checklist of the genus *Gymnocalycium* (Cactaceae) is compiled; additional comments about problems of typification and citation in the family are given. Lectotypes for the following names of taxa now combined in *Gymnocalycium* are designated here: *Echinocactus andreae* Boedeker, *Frailea bruchii* Spegazzini, *Gymnocalycium lafaldense* Vaupel. A new combination, *Gymnocalycium mackieanum* (Hooker) Metzging, Meregalli & Kiesling, is given.

Key words: Cactaceae, *Gymnocalycium*, nomenclature, typification.

It is appropriate to begin a study of the Cactaceae with the statement that the classification of this family is in a state of absolute chaos.

(L. Croizat, 1943)

Up to the present time the taxonomy of the Cactaceae has been largely based on Britton & Rose (1919-1923) and Backeberg (1958-1962); modern, comprehensive monographs are lacking. Only in this century literally thousands of new names were added, without any critical revision of their nomenclatural validity, let alone their systematic status. Only about 10 of the nearly 100 genera currently accepted have been subject to modern systematic revisions, sometimes limited to single geographical areas. Recently the controversial topic of generic classification was examined by a "working group" of the IOS (International Organization for Succulent Plant Study), leading to publication of some preliminary reports (Hunt & Taylor, 1986, 1990) and of the CITES Cactaceae Checklist (Hunt, 1992), where the specific names in current usage are listed. The latter was compiled for the purpose of CITES and is not a nomenclatural checklist; the species-list for the majority of the genera was based simply on preliminary evaluations, nomenclatural checklists or taxonomic monographs being available only for a few of them.

Gymnocalycium is a genus belonging to the tribe Trichocereae F. Buxbaum, with about 40-50 species distributed in Southern Brazil, Paraguay, Bolivia, Uruguay and Argentina. Its status as a distinct genus has been accepted in the most recent classification of the family (Barthlott & Hunt, 1993). Because of interest among collectors, the taxonomy of the genus has been marred by a tremendous proliferation of names at or below specific rank (up to about 500!). To increase the nomenclatural ballast, a similarly excessive production of infrageneric names was proposed by various authors, usually without any critical eva-

luation of the phyletical relations among the groupings. Moreover, many of the names were invalidly described.

No systematic monograph has recently been published; a few name-lists of the genus exist, but these are not scientific contributions, rather works realized by, and addressed to, amateurs and collectors; they do not contain any evaluation of the nomenclatural validity of the names (Putnam, 1969; Crombez, 1985; Brockmann, 1986). Although these lists include many data, some names are missing and neither the reported citations nor the original descriptions were checked. A survey of the genus (Meregalli, 1985) included systematic remarks on the taxa, but nomenclatural data were not investigated in detail. Schütz (1986) reproduced the descriptions and added information on many taxa, but he did not make any distinction between validly and invalidly published names, and the latter were kept in use. A partial list, including the names of the Cactaceae published between 1950 and 1990 and based on the *Repertorium Plantarum Succulentarum*, exists (Eggli & Taylor, 1992), but even this is not complete. The most recent checklist (Pilbeam, 1995) is not a systematic monograph but rather, as the title suggests, "A Collector's Guide". A list providing the bibliographical data for Fric's (mostly invalid) names was compiled by Zazvorka & Sedivy (1991).

The present work is the first attempt to compile a complete nomenclatural checklist for the genus *Gymnocalycium*, as a contribution to the IOS Cactaceae Working Group.

Types

A major problem in the systematics of the Cactaceae is the deficiency of deposited type material, which can hardly be justified by a certain difficulty in preparing herbarium specimens (Leuenberger, 1987; Hunt, 1991; Zappi, 1994). The main reason is that most descriptions (especially those published in this century) were provided by amateurs who had little or no knowledge of the nomenclatural rules (see comments by Croizat, 1943; Eggli, 1985a; Hunt, 1991). Even when Art. 36.1 and 37.1 (ICBN, Greuter (ed.), 1994) were fulfilled (and this is not always the case), there are examples where the application of Art. 8.2 was infringed by referring to the deposition of the holotype in Botanic Garden collections, but very often this was a living plant. A similar (but in this case deliberate) misapplication of the same article 8.2 occurs when the deposition of the holotype in an institute is cited in the protologue, but the living specimen never left the author's greenhouse. Although some cases have been documented by us (and will be indicated in notes under the relative taxa), it is clear that it is often impossible to ascertain whether really no type material was deposited or if it was eventually lost, and in consequence these names can hardly be invalidated. We have indicated the doubtful cases with an asterisk (*) beside the name of the taxon. In other instances material labelled as type is present in some institutes, although no such indication is reported in the original descriptions: this is the case of various samples labelled "Isotype" which are preserved in ZSS (Eggli, 1987). It may be difficult to ascertain whether these specimens should be interpreted as true isotypes or only as specimens without type status, which bear the same "field number" as the types but do not belong to the original collection (for some remarks on the "field-numbers" see Leuenberger, 1984).

About the combinations attributed to Berger (1929)

When Berger (1929) published his book "Kakteen" he used a broad "conservative" concept of genus (Gibson *et al.*, 1986; Leuenberger, 1986; Barthlott, 1988). In a former paper dealing with the phylogeny of the Cactaceae (Berger, 1926) he had followed the more splitting classification of Britton & Rose (1919-23), listing the so-called "Kleingattungen" [small genera] and showing their systematic connections; however, their taxonomic rank was not evaluated (Berger, 1926: 25-26). In "Kakteen" he gave a "Übersicht über das

System der Kakteen, wie es hier angewendet werden mußte" [survey over the system of the cacti as it had to be used here] (Berger 1929: V-VIII). He accepted 41 genera, which were segregated in further "Sektion", "Sippe" and "Untergattung" (these ranks, in this order, are not in accordance with Art. 4.2 of the present code). From this system it is however clearly understandable which taxa were accepted as genera and which were placed in infrageneric ranks. *Gymnocalycium* is usually listed as a subgenus ("Untergattung") of *Echinocactus*, but once it is mentioned as a "Sektion" (Berger 1929: 26). Although Berger seemed aware that *Echinocactus* is not a natural (monophyletic) group, he retained it "nur aus praktischen Gründen [only for practical reasons]" (Berger 1929: 17; see also Barthlott, 1988). In the chapter with the descriptions he listed the specific epithets in combination with the genus he accepted, adding the infrageneric taxon with author citation, e.g.:

***Echinocactus sutterianus* Schick (1927)**- *Gymnocalycium* Berger. [sic!, in Berger, 1929: 220].

In similar form (behind the subgenus) he also listed synonyms, e.g. :

***Echinocactus crassihamatus* Web (1896)** - *Ferocactus* Br. u. R. - *Echinocactus Mathssonii* Berge (1897) [sic!, in Berger, 1929: 241].

In the index the epithets are listed both below the genus he accepted and below the name of the infrageneric taxon (for example, the epithet *sutterianus* is reported twice, once below *Echinocactus* and once below *Gymnocalycium*), sometimes with an asterisk and the explanation: "Die mit * versehenen Namen werden hier zum ersten Mal genannt [the names marked with * are mentioned here for the first time]". This led to questions whether such names could be accepted as valid combinations (Croizat, 1947; Leuenberger, 1986; Metzinger, 1988b; Taylor, 1992; Leuenberger, 1993). In the case of *Gymnocalycium*, two points must be analyzed:

- whether the names listed in the index under *Gymnocalycium* and marked with an asterisk (Berger, 1929: 341) are validly published names and, in this case,
- whether these names are validly published combinations in the genus *Gymnocalycium*.

In the first instance these names could be considered as validly published: the indication to the page refers to a basionym and to the original publication. Berger's concept of the taxon *Gymnocalycium* must be analyzed: both in the systematic list and in the description of the species (Berger, 1929: VII, 219) he clearly stated that he regarded *Gymnocalycium* as a *subgenus* of *Echinocactus* (see also Mottram, 1990: 45); according to Berger, the species should be indicated as, for example, *Echinocactus* (subg. *Gymnocalycium*) *sutterianus*. However, many authors adopted Berger's names as combinations in the genus *Gymnocalycium* (see comments in Leuenberger, 1986; Metzinger, 1988). In our opinion, this interpretation does not reflect Berger's opinion, and anyway it would not lead to validly published *Gymnocalycium* names according to Art. 34.1. In fact, Berger himself did not accept *Gymnocalycium* at genus rank in the systematic treatment (Art. 34.1a) and he also suggested that taxonomy would be further developed (Art. 34.1b). Finally, as in the systematic part the specific synonyms are listed together with the infrageneric names (see *E. crassihamatus* example), Art. 34.1c must also be considered. Therefore we do not accept Berger as author of the following combinations: *Gymnocalycium bodenbenderianum*, *Gymnocalycium hossei*, *Gymnocalycium queblianum*, *Gymnocalycium sigelianum* and *Gymnocalycium sutterianum*.

SCOPE OF THE LIST

All the published names of taxa belonging to the genus *Gymnocalycium* are listed. Each epithet in or below the rank of species is listed in its *Gymnocalycium* combination; combinations of the same epithet in other genera are listed immediately below. In the

“cactus literature”, particularly in trade lists, many other names have appeared without description; we have generally ignored them, reporting here only those which had wider use (and sometimes were even cited as validly published). In an appendix the known *nomina nuda*, without further specification of origin (place of publication), are cited. Names of cultivars or hybrids are not reported.

The original description of every name was checked and its validity according to the ICBN (1994) assessed (the following publication was not available: Cels, 1847: Portefeuille des Hort.) Validly published names are printed in **bold italics**; invalid and illegitimate names are printed in *italics*; full references to the place of publication are added (periodical titles are abbreviated according to Bridson, 1991 and Eggli, 1985b). Indication of known type material includes references to collector, type locality (with collecting data according to the protologue) and acronyms of the herbaria where types are deposited (according to the original description or to lists of type material preserved in institutes; acronyms are according to Holmgren *et al.*, 1990). Where no indication of types is given it means that it was lacking in the original publication. Type material personally examined by one of us (RK, DM) is marked with “!”, although it was not the aim of this project to check all the deposited type material. For invalid, illegitimate or incorrect names the articles of the ICBN which have been contravened are indicated in brackets. Notes referring to any particular interpretation are added when necessary; however, taxonomic evaluations are usually avoided, as these are beyond the scope of the present work.

In a few cases an illustration is here used as lectotype, according to Art. 9.2 and 9.9: a lectotype has been selected only when:

- no herbarium type material was apparently preserved or is known to exist today;
 - the protologue reported a precise type locality and the description is clearly referable to the population known to be growing there;
 - the illustration used as lectotype matches the description and was included in the original publication;
- the typification of the name is needed in order to preserve the stability of nomenclature.

Every case is detailed in the note accompanying the designation.

No type is designated when any indication in the protologue is at variance with the present systematic knowledge, when no type locality was given or when the illustration cannot be clearly referred to the specimens used for the description. Similarly no type is designated in cases where a systematic revision is needed to fix the application of a name, when typification should preferably be associated with the designation of an epitype or when a neotype is needed.

Names of infraspecific taxa are trinomials. In some cases infraspecific taxa were published as a combination of more than one infraspecific rank, indicating the full infraspecific classification (e.g. *Gymnocalycium catamarcense* subsp. *catamarcense* f. *belense* = *Gymnocalycium catamarcense* f. *belense*, see Art 24.1, Ex.1). These names are listed here as they were published, although the classification is nomenclaturally irrelevant.

Unless otherwise specifically indicated, we would like to point out that we do not accept any name that might be inadvertently validated in this paper.

CHECKLIST

Names in the rank of Genus

Gymnocalycium Pfeiffer ex Mittler

Taschenbuch für Cactusliebhaber 2: 124, 1844. Type: *Cactus gibbosus* Haworth, 1812.

Note: The genus *Gymnocalycium* was introduced by Pfeiffer, but was first validly published by Mittler (1844, see Metzging, 1988a; Eggli & Metzging, 1992). As the spelling

used by Mittler (1844, "*Gymnocalicium*") was different from that used by Pfeiffer in his works (Pfeiffer, 1845-1846, "*Gymnocalygium*") and the last spelling has been used in all subsequent reference works about Cactaceae, it was proposed to conserve the currently used spelling "*Gymnocalygium*" (Eggl & Metzger 1992). The Nomenclature Committee stated that the correction of Mittler's spelling is possible without conservation and that the name should be cited as *Gymnocalygium* Pfeiffer ex Mittler 1844 (Brummitt 1994).

The type of the genus was designated by Pfeiffer (1874, see Eggl & Metzger, 1992: 142). Heath (1992) subsequently stated that *E. denudatus* had been previously designated as type of *Gymnocalygium* by Salm-Dyck (1850), but the note "Hujusce generis typus in flore *E. denudati* inquirendus est ..." given by Salm-Dyck (l.c.: 171) can be interpreted only as meaning that the morphological characters of the flower of *Echinocactus denudatus* are representative for the genus. This statement cannot be accepted as an earlier lectotypification in the sense of the ICBN.

Brachycalygium Backeberg, in: Cactaceae (DKG) s. vol. (1941, pt.2): 76, 1942. Type: *Brachycalygium tilcarensis* Backeberg.

Note. This monotypic genus was described by Backeberg on the basis of irrelevant differences in flower morphology for a taxon now referred to as an infraspecific form of *Gymnocalygium saglionis*. It is therefore considered a synonym of *Gymnocalygium* (Hunt & Taylor, 1986; Barthlott & Hunt, 1993).

Names in infrageneric ranks

The infrageneric classification is mainly based on seed characters. Fric (in Kreuzinger, 1935) first paid attention to this and published a system, which anyway brought no validly published names. This system was later worked out by Schütz (1962, 1969). Buxbaum (1968) published a slightly different system, this too mainly based on seed characters, using different taxonomic ranks. Meanwhile Backeberg had published in various papers (e.g. 1942, 1959) generic segregations based on the morphology of plant and flower. Completely different systems, based on the stem morphology, were invalidly named by Ito (1950, 1957)

Gymnocalygium subgen. *Astrocephalum* Y. Ito nom. inval. (Art. 36.1), Bull. Takarazuka Insectarium 71: 20, 1950.

Gymnocalygium subgen. *Corycephalum* Y. Ito nom. inval. (Art. 36.1), Explanatory Diagram of Austroechinocactinae: 194, 1957.

Gymnocalygium subgen. *Cosmohybocephalum* Y. Ito nom. inval. (Art. 36.1), Bull. Takarazuka Insectarium 71: 20, 1950.

Gymnocalygium subgen. *Discocephalum* Y. Ito nom. inval. (Art. 36.1), Bull. Takarazuka Insectarium 71: 19, 1950.

Gymnocalygium subgen. *Dracocephalum* Y. Ito nom. inval. (Art. 36.1), Explanatory Diagram of Austroechinocactinae: 191, 1957.

Gymnocalygium subgen. *Erythrocephalum* Y. Ito nom. inval. (Art. 36.1), Bull. Takarazuka Insectarium 71: 20, 1950.

Gymnocalygium subgen. *Furiocephalum* Y. Ito nom. inval. (Art. 36.1), Explanatory Diagram of Austroechinocactinae: 181, 1957.

Gymnocalycium subgen. *Goniocephalum* Y. Ito nom. inval. (Art. 36.1), Bull. Takarazuka Insectarium 71: 19, 1950.

***Gymnocalycium* subgen. *Gymnocalycium*.** Type: *Gymnocalycium gibbosum* (Haworth) Pfeiffer ex Mittler.

Gymnocalycium subgen. *Gymnocalycium* nom. illeg. (Art. 52.1), Schütz, Friciana 46: 3-23, 1969. Type: *Gymnocalycium denudatum* (Link & Otto) Pfeiffer ex Mittler. First invalidly published by Kreuzinger: 14, 1935 (Art. 32.1) and by Schütz in: Friciana 1(1): 1-8, 1962 (Art. 35.1) as “*Macrosemineae*”.

Note: Schütz used the autonym for this subgenus because he considered *G. denudatum* as the type of the genus.

Gymnocalycium subgen. *Hybocephalum* Y. Ito nom. inval. (Art. 36.1), Bull. Takarazuka Insectarium 71: 20, 1950.

Gymnocalycium subgen. *Macrohybocephalum* Y. Ito nom. inval. (Art. 36.1), Bull. Takarazuka Insectarium 71: 19, 1950.

Gymnocalycium* subgen. *Macrosemineum Schütz ex Metzinger, Gymnos 9(17): 4, 1992. Type: *Gymnocalycium denudatum* (Link & Otto) Pfeiffer ex Mittler. First invalidly published at subgeneric rank by Schütz in: Friciana 1(1): 1-8, 1962 (Art. 35.1) as “*Macrosemineae*”; previously invalidly published as “Untergruppe” in Kreuzinger: 14, 1935 (Art. 32.1).

Gymnocalycium subgen. *Macrothelocephalum* Y. Ito nom. inval. (Art. 36.1), Bull. Takarazuka Insectarium 71: 19, 1950.

Gymnocalycium subgen. *Microcephalum* Y. Ito nom. inval. (Art. 36.1), Bull. Takarazuka Insectarium 71: 20, 1950.

Gymnocalycium* subgen. *Microsemineum Schütz, Friciana 46: 3-23, 1969. Type: *Gymnocalycium saglionis* (Cels) Britton & Rose. First invalidly published by Kreuzinger: 14, 1935 (Art. 32.1) and by Schütz in: Friciana 1(1): 1-8, 1962 (Art. 35.1) as “*Microsemineae*”.

Gymnocalycium* subgen. *Muscosemineum Schütz, Friciana 46: 3-23, 1969. Type: *Gymnocalycium mihanovichii* (Gürke) Britton & Rose. First invalidly published by Kreuzinger: 14, 1935 (Art. 32.1) and by Schütz in: Friciana 1(1): 1-8, 1962 (Art. 35.1) as “*Muscosemineae*”.

Gymnocalycium subgen. *Ophiocephalum* Y. Ito nom. inval. (Art. 36.1), Explanatory Diagram of Austroechinocactinae: 173, 1957.

Note: Ito (1957) erroneously attributed this name to Ito (1950).

Gymnocalycium subgen. *Ovatisemineum* Schütz nom. illeg. (Art. 52.1), Friciana 46: 3-23, 1969. Type: *Gymnocalycium gibbosum* (Haworth) Pfeiffer ex Mittler. First invalidly published by Kreuzinger: 13, 1935 (Art. 32.1) and by Schütz in: Friciana 1(1): 1-8, 1962 (Art. 35.1) as “*Ovatisemineae*”.

Gymnocalycium* subgen. *Pirisemineum H. Till & M. Hesse, Pl. Syst. Evol. 149: 149-153, 1985. Type: *G. zegarrae* Cardenas.

Note: Type of an infrageneric taxon is the type of a species name (Art. 10.1). Till & Hesse (l.c.: 151) list seeds ex coll. H. Till no. 1322, leg. M. Cardenas s.n. under “species typica”. These seeds can hardly be recognized as type of the species name (see type of *G. zegarrae*).

- Gymnocalycium* subgen. *Pliohybocephalum* Y. Ito nom. inval. (Art. 36.1), Bull. Takarazuka Insectarium 71: 20, 1950.
- Gymnocalycium* subgen. *Raphidocephalum* Y. Ito nom. inval. (Art. 36.1), Explanatory Diagram of Austroechinocactinae: 188, 1957.
- Gymnocalycium* subgen. *Rhombohybocephalum* Y. Ito nom. inval. (Art. 36.1), Bull. Takarazuka Insectarium 71: 20, 1950.
- Gymnocalycium* subgen. *Stephanocephalum* Y. Ito nom. inval. (Art. 36.1), Bull. Takarazuka Insectarium 71: 20, 1950.
- Gymnocalycium* subgen. *Trichomosemineum*** Schütz, Friciana 46: 3-23, 1969. Type: *Gymnocalycium queblianum* (F. Haage ex Quehl) Vaupel ex Hosseus. First invalidly published by Kreuzinger: 14, 1935 (Art. 32.1) and by Schütz in: Friciana 1(1): 1-8, 1962 (Art. 35.1) as "*Trichomosemineae*".
- Gymnocalycium* subgen. *Xanthocephalum* Y. Ito nom. inval. (Art. 36.1), Bull. Takarazuka Insectarium 71: 20, 1950.
- Gymnocalycium* sect. *Abcisosemineae* Pazout nom. invalid. (Art. 37.1), Friciana 5(29): 22, 1965.
- Gymnocalycium* sect. *Calochlora*** Schütz, Friciana 46: 3-23, 1969. Type: *Gymnocalycium calochlorum* (Boedeker) Ito.
- Gymnocalycium* sect. *Coactosemineae* Pazout nom. inval. (Art. 37.1), Friciana 5(29): 22, 1965.
- Gymnocalycium* sect. *Conchatosemineae* Pazout nom. inval. (Art. 37.1), Friciana 5(29): 22, 1965.
- Gymnocalycium* sect. *Denudata*** Schütz, Friciana 46: 8, 1969. Type: *Gymnocalycium denudatum* (Link & Otto) Pfeiffer ex Mittler (see comments in Metzging, 1992).
- Gymnocalycium* sect. *Gibbosa* Schütz nom. illeg. (Art. 52.1), Friciana 7(46): 8, 12, 1969 (see comments in Metzging, 1992).
- Gymnocalycium* sect. *Gymnocalycium*** Type: *Gymnocalycium gibbosum* (Haworth) Pfeiffer ex Mittler.
- Gymnocalycium* sect. *Hybopleura*** Schütz, Friciana 46: 9, 13, 1969. Type: *Gymnocalycium hybopleurum* (K. Schumann) Backeberg.
- Gymnocalycium* sect. *Lafaldensia*** Schütz, Friciana 46: 3-23, 1969. Type: *Gymnocalycium bruchii* (Spegazzini) Hosseus.
- Gymnocalycium* sect. *Loricata*** Schütz, Friciana 46: 3-23, 1969. Type: *Gymnocalycium spegazzinii* Britton & Rose.
- Gymnocalycium* sect. *Macrosemineae* Pazout nom. inval. (Art. 37.1), Friciana 5(29): 27, 1965.
- Gymnocalycium* sect. *Mazanensia*** Schütz, Friciana 46: 3-23, 1969. Type: *Gymnocalycium hossei* (F. Haage) Backeberg.
- Gymnocalycium* sect. *Microsemineae* Pazout nom. inval. (Art. 37.1), Friciana 5(29): 27, 1965.
- Gymnocalycium* sect. *Paraguayensia* Schütz nom. inval. (Art. 43.1) Friciana 46: 3-23, 1969. Type: *Gymnocalycium fleischerianum* nom. inval.
- Gymnocalycium* sect. *Periferalia*** Schütz, Friciana 46: 3-23, 1969. Type: *Gymnocalycium megatae* Ito.

- Gymnocalycium* sect. *Saglionia*** Schütz, Friciana 46: 3-23, 1969. Type: *Gymnocalycium saglionis* (Cels) Britton & Rose.
- Gymnocalycium* sect. *Terminalia*** Schütz, Friciana 46: 3-23, 1969. Type: *Gymnocalycium mihanovichii* (Fric ex Gürke) Britton & Rose.
- Gymnocalycium* ser. *Baldiana*** Buxbaum, in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968. Type: *Gymnocalycium baldianum* (Spegazzini) Spegazzini.
- Gymnocalycium* ser. *Castellanosiana*** Buxbaum, in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968. Type: *Gymnocalycium castellanosii* Backeberg.
- Gymnocalycium* ser. *Chiquitana*** Buxbaum, in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968. Type: *Gymnocalycium chiquitanum* Cardenas.
- Gymnocalycium* ser. *Horridispina* Buxbaum nom. inval. (Art. 43.1), in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968. Type: *Gymnocalycium horridispinum* Frank nom. inval.
- Gymnocalycium* ser. *Hybogona* Backeberg nom. illeg. (Art. 52.1), in: Cactaceae (DKG) s. vol. (1941, pt.2): 38, 1942. Type: *Gymnocalycium gibbosum* (Haworth) Pfeiffer ex Mittler.
- Gymnocalycium* ser. *Lafaldensia*** Buxbaum, in: Krainz: Die Kakteen CVIf, 1968. Type: *Gymnocalycium lafaldense* Vaupel. Original spelling: “*Lafaldenses*”, corrected in: Krainz: Die Kakteen, Liefg. 55/56: (5), 1973.
- Gymnocalycium* ser. *Lafaldensia* Backeberg nom. inval. (Art. 36.1), in: Cactaceae (DKG) s. vol. (1941, pt.2): 38, 1942. Type: *Gymnocalycium lafaldense* Vaupel.
- Gymnocalycium* ser. *Mostiana*** Buxbaum, in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968. Type: *Gymnocalycium mostii* (Gürke) Britton & Rose.
- Gymnocalycium* ser. *Pflanziana*** Buxbaum, in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968. Type: *Gymnocalycium pflanzii* (Vaupel) Werdermann. Original spelling: “*Pflanzianae*”, corrected in: Krainz: Die Kakteen, Liefg. 55/56: (5), 1973.
- Gymnocalycium* ser. *Pileisperma* Buxbaum nom. inval (Art. 34.1), in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968.
- Gymnocalycium* ser. *Quehliana*** Buxbaum, in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968. Type: *Gymnocalycium quehlianum* (F. Haage ex Quehl) Vaupel ex Hosseus.
- Gymnocalycium* ser. *Saglioniana*** Buxbaum, in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968. Type: *Gymnocalycium saglionis* (Cels) Britton & Rose. Original spelling: “*Saglionis*”, corrected in: Krainz: Die Kakteen, Liefg. 55/56: (5), 1973.
- Gymnocalycium* ser. *Schickendantziana* Backeberg nom. inval. (Art. 36.1), in: Cactaceae (DKG) s. vol. (1941, pt.2): 39, 1942. Type: *Gymnocalycium schickendantzii* (F.A.C. Weber) Britton & Rose.
- Gymnocalycium* ser. *Schickendantziana*** Buxbaum, in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968. Type: *Gymnocalycium schickendantzii* (F.A.C. Weber) Britton & Rose. Original spelling: “*Schickendantzianae*”, corrected in: Krainz: Die Kakteen, Liefg. 55/56: (5), 1973.
- Gymnocalycium* ser. *Uruguayensia*** Buxbaum, in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968. Type: *Gymnocalycium uruguayense* (Arechavaleta) Britton & Rose. Original spelling: “*Uruguayenses*”, corrected in: Krainz: Die Kakteen, Liefg. 55/56: (5), 1973.
- Gymnocalycium* subser. *Castellanosiana*** Buxbaum, in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968. Type: *Gymnocalycium castellanosii* Backeberg.

Gymnocalycium* subser. *Denudata Buxbaum, in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968. Type: *Gymnocalycium denudatum* (Link & Otto) Pfeiffer ex Mittler.

Gymnocalycium subser. *Euschickendantziana* Backeberg nom. inval. (Art. 36.1), in: Cactaceae (DKG) s. vol. (1941, pt.2): 39, 1942. Type: *Gymnocalycium schickendantzii* (F.A.C. Weber) Britton & Rose.

Gymnocalycium subser. *Mibanovichiana* Backeberg nom. inval. (Art. 36.1), in: Cactaceae (DKG) s. vol. (1941, pt.2): 39, 1942. Type: *Gymnocalycium mibanovichii* (Fric & Gürke) Britton & Rose.

Gymnocalycium* subser. *Mibanovichiana Buxbaum, in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968. Type: *Gymnocalycium mibanovichii* (Fric ex Gürke) Britton & Rose.

Gymnocalycium* subser. *Schickendantziana Buxbaum, in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968. Type: *Gymnocalycium schickendantzii* (F.A.C. Weber) Britton & Rose. Original spelling: "*Schickendantzianae*", corrected in: Krainz: Die Kakteen, Liefg. 55/56: (5), 1973.

Gymnocalycium* subser. *Uruguayensia Buxbaum, in: Krainz: Die Kakteen, Liefg. 38/39: CVIf, 1968. Type: *Gymnocalycium uruguayense* (Arechavaleta) Britton & Rose. Original spelling: "*Uruguayenses*", corrected in: Krainz: Die Kakteen, Liefg. 55/56: (5), 1973.

Gymnocalycium Calochlora Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Centralia Pazout nom. inval. (Art. 35.1). Friciana 4(23): 17, 1964.

Gymnocalycium Chacensia Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Denudata Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Gibbosa Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Hybopleura Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Incerta Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Lafaldensia Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Loricata Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Mazanensia Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Mibanovichia Pazout nom. inval. (Art. 35.1). Friciana 4(23): 17, 1964.

Gymnocalycium Multiflora Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Nigroantheralia Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Occidentalia Pazout nom. inval. (Art. 35.1). Friciana 4(23): 17, 1964.

Gymnocalycium Periferalia Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Riojensia Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Saglionia Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Stellata Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Terminalia Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

Gymnocalycium Uruguayensia Schütz nom. inval. (Art. 35.1). Friciana 1(1): 1-8, 1962.

The following names were used for captions of seed illustrations by K. Heid in Frankfurter Kakteenfreund 11(2): 55, 1984 and are *nomina nuda*: *Mitraseminae* and *Cerebriseminae*.

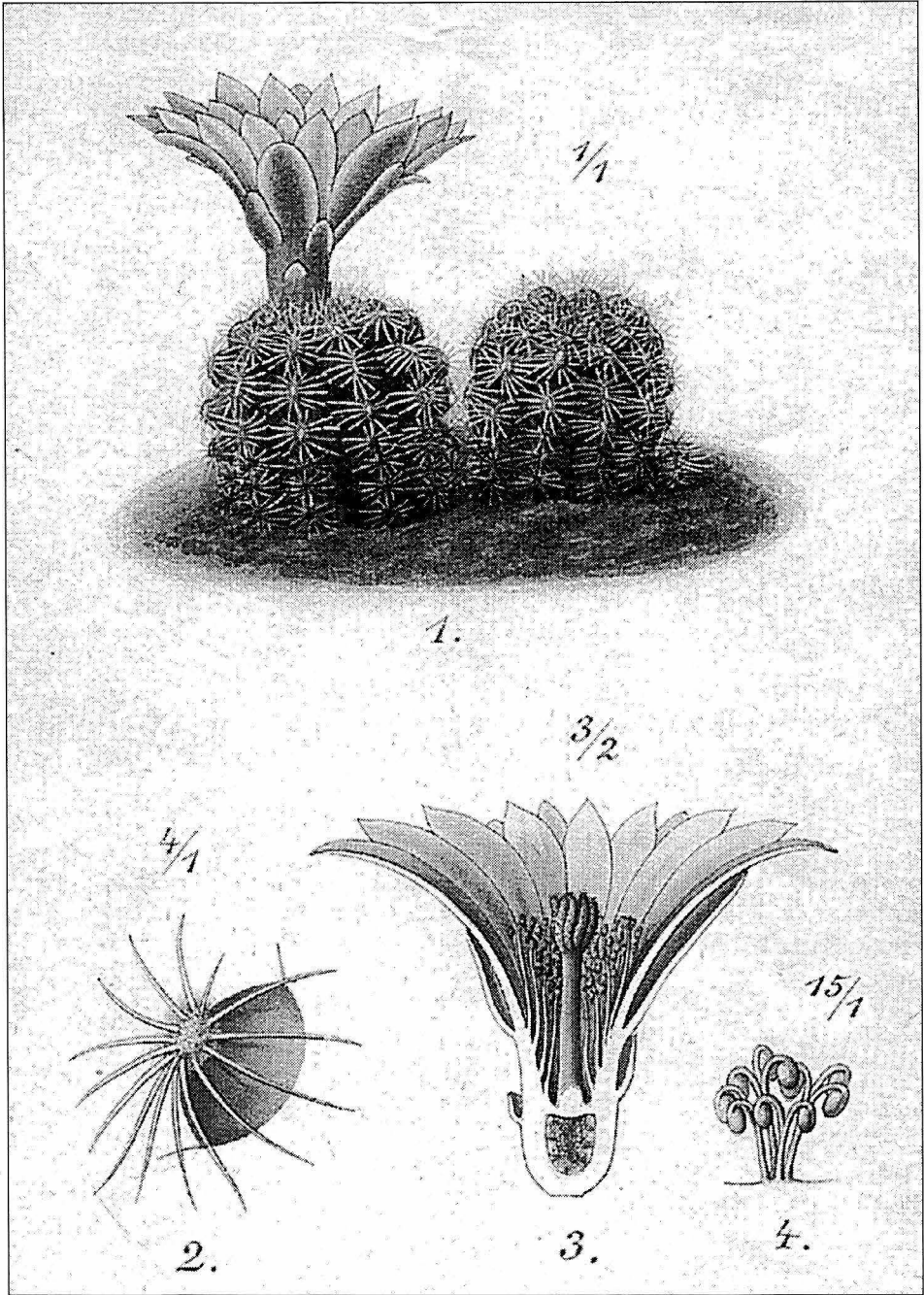


Fig. 1 - *Gymnocalycium lafaldense* Vaupel. Lectotype. Original illustration from Vaupel, Z. Sukkulentenk. 2(14): 192, 1924.

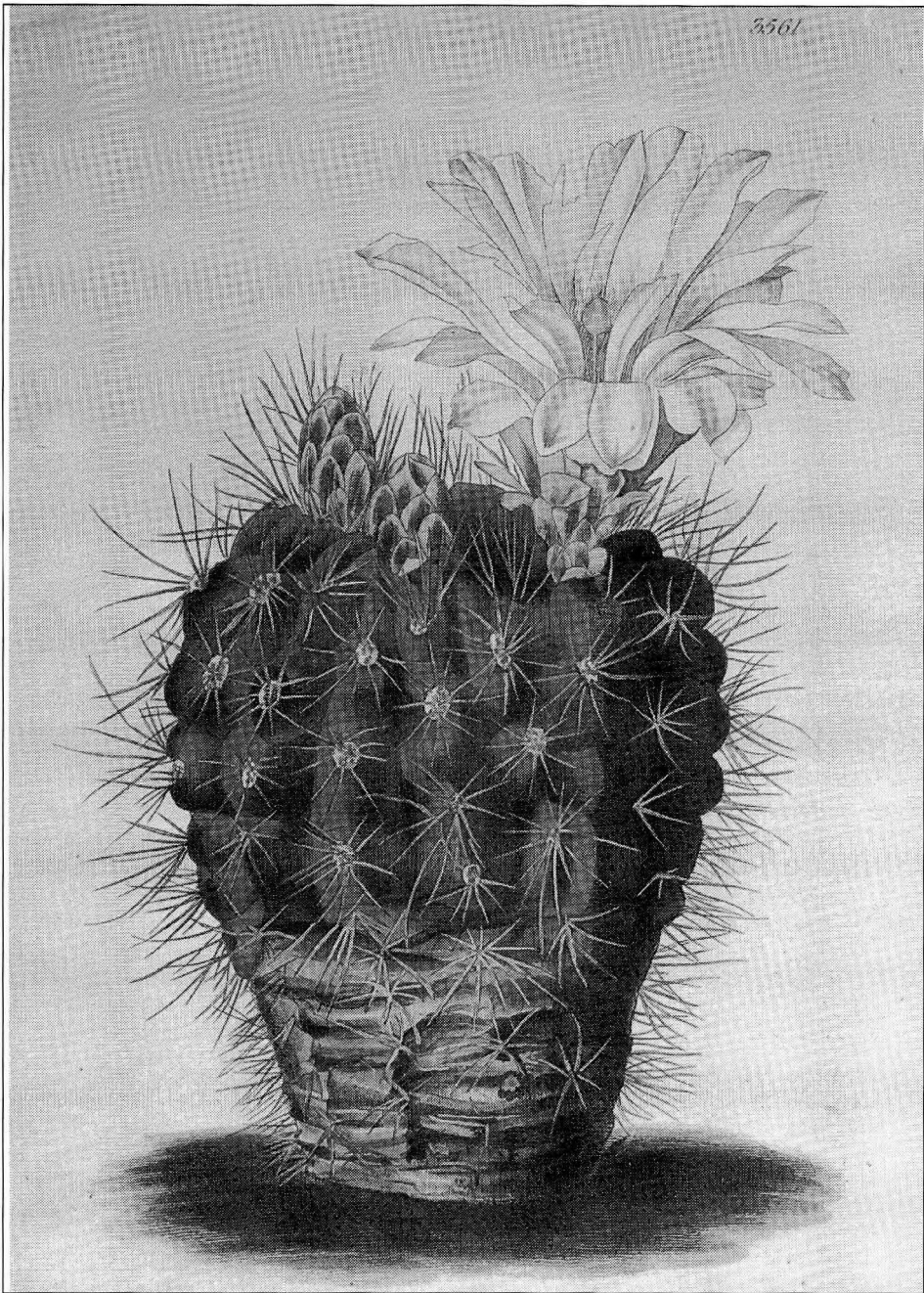


Fig. 2 - *Gymnocalycium mackieanum* (Hooker) Metzging, Meregalli & Kiesling. Original illustration from Curtis's Botanical Magazine, pl. 3561.

Names in and below the rank of species

- Gymnocalycium achirasense*** H. Till & Schatzl ex H. Till, *Kakt. and. Sukk.* 38(8): 191, 1987. Type: Genser B 21, Argentina, Prov. San Luis, near Achiras (WU). Previously invalidly published as *Gymnocalycium achirasense* H. Till & Schatzl nom. inval. (Art. 8.2), *Kakt. and. Sukk.* 30(2): 25-28, 1979.
- Gymnocalycium acorrugatum*** Lambert, *Succulenta* 67(1): 4-7, 1988. Type: J. Lambert 69, 21.11.1983, Argentina, Prov. San Juan, San Augustin de Valle Fertil (U!).
- Gymnocalycium albiareolatum*** Rausch, *Succulenta* 64(10): 213-214, 1985. Type: W. Rausch 716, Argentina, Prov. La Rioja, near Villa Bustos (ZSS).
Note. The name was published with the spelling “*alboareolatum*”, which has to be changed into “*albiareolatum*” according to Art. 60.8 and Rec. 60G (see Huxley *et al.*, 1992).
- Gymnocalycium albiareolatum* var. *ramosum*** Rausch, *Gymnocalycium* 3(3): 31, 1990. Type: W. Rausch 716b, Argentina, Prov. La Rioja, near Sanagasta (ZSS).
- Gymnocalycium albispinum*** Backeberg, in: Backeberg & Knuth: *Kaktus-ABC*: 285 + 416, 1936.
- Gymnocalycium altagraciense*** Bozsing ex Schütz nom. nud., *Kaktusy* 17(3): 59-60, 1981. Note. Although this name was only indicated for traded material, we report it here because it was subsequently cited in various papers (i.e. Schütz, 1986: 24).
- Gymnocalycium ambatoense*** Piltz, *Kakt. and. Sukk.* 31(1): 10-13, 1980. Type: Piltz 22/5, 27.7.1976, Argentina, Prov. Catamarca, Sierra Ambato (Herbarium of the PH Rheinland, Abt. Köln).
- Gymnocalycium amerhauseri*** H. Till, *Gymnocalycium* 7(3): 131-134, 1994. Type: H. Till HT 88-229 (1725), 27.10.1988, Argentina, Prov. Cordoba, Sierra Chica, between Ascochinga and La Cumbre, m 1450-1600 (WU).
- Gymnocalycium andreae*** (Boedeker) Backeberg, in: Backeberg & Knuth: *Kaktus-ABC*: 285, 1935. Basionym: *Echinocactus andreae* Boedeker, 1930. Previously invalidly published as *Gymnocalycium andreae* (Boedeker) Backeberg, nom. inval. (Art. 33.1), *Neue Kakteen*: 89, 1931.
- Echinocactus andreae*** Boedeker, *Monatsschr. Deutsch Kakteen-Ges.* 2: 210-212, 1930.
- Lectotype (designated here):** illustration in Boedeker (l.c.): 211. Type locality: Argentina, Sierra de Cordoba, Pampa de la Esquina, Cerro los Gigantes, m 1500-2000. Note. The infraspecific systematics of *G. andreae* has been revised by Till (1992) and Neuhuber (1994). The species was divided into four infraspecific taxa, but Boedeker’s name was not typified. Its typification will guarantee the stability of the infraspecific nomenclature. The illustration in Boedeker matches the description and clearly refers to the original collection. It was reproduced in *Gymnocalycium* 5 (2): 62, 1992.
- Gymnocalycium andreae* f. *svecianum*** Pazout ex H. Till, *Gymnocalycium* 5(2): 66, 1992. Type: W. Rausch 108 (HT 581), 1964, Argentina, Prov. Cordoba, Sierra Grande (WU). Previously invalidly published as *Gymnocalycium andreae* var. *svecianum* Pazout nom. inval. (Art. 37.1) in: Pazout, Valnicek & Subik: *Kaktusy*: 132, 1960.

Gymnocalycium andreae* ssp. *carolinense Neuhuber, *Gymnocalycium* 7(3): 127-130, 1994. Type: G. Neuhuber 88-31/52, 28.04.1988, Argentina, Prov. San Luis, Sierra de San Luis, m 1400-1600 (WU).

Gymnocalycium andreae* var. *grandiflorum Krainz & Andreae, in: H. Krainz: Die Kakteen, Liefg. 4: CVIe, 1957. Type: C. Hosseus s.n. (Z 1031), 1932, Argentina, Prov. Cordoba, Cerro de Uritorco (ZSS).

Note. The holotype was cited as a living plant; according to Eggli (1987) herbarium material labelled "holotype" (but numbered Z 1040) is preserved in ZSS.

Gymnocalycium anisitsii (K. Schumann) Britton & Rose, *The Cactaceae* 3: 159-161, 1922. Basionym: *Echinocactus anisitsii* K. Schumann 1900.

Echinocactus anisitsii K. Schumann, *Blühende Kakteen* 1: pl. 4, 1900. Type: Anisits 21, Paraguay (B, see Leuenberger, 1979).

Gymnocalycium anisitsii* ssp. *multiproliferum (P.J. Braun) P.J. Braun & Esteves, *Succulenta* 74 (3): 131, 1995. Basionym: *Gymnocalycium damsii* var. *multiproliferum* P.J. Braun 1991 (see *G. damsii* var. *multiproliferum*).

Gymnocalycium antherosacos F. Ritter nom. nud., *Kakteen in Südamerika* 2: 476, 1980.

Gymnocalycium antherostele F. Ritter, *Kakteen in Südamerika* 2: 475-476, 1980. Type: F. Ritter 963, 1.1959, Argentina, Prov. Salta, General Moldes (U !).

Gymnocalycium armatum F. Ritter, *Kakteen in Südamerika* 2: 662-663, 1980. Type: F. Ritter 1131, 1962, Bolivia, Prov. Mendez, El Paicho (U !)

Gymnocalycium armatum var. *albiflorum* in: Eggli & Taylor 1992: 76 was an erroneous entry for *Gymnocalycium friedrichii* var. *albiflorum*.

Gymnocalycium artigas Herter, *Revista Sudamer. Bot.* 10(1): 1, 1951. Type: Herter 9.1947 (H.H. 99.773), Uruguay, Dept. Durazno, Blanquillo. *Plantae Urugayense exsiccatae* 1722a.

Gymnocalycium asterium Castellanos nom. illeg. (Art. 52.1), *Revista Fac. Ci. Arg.* 6(2): 256, 1957 (see Strong, 1975 for nomenclatural remarks).

Gymnocalycium asterium Y. Ito nom. illeg. (Art. 52.1), *Explanatory Diagram of Austroechinocactinae* 191, 1957 (see Strong, 1975 for nomenclatural remarks).

Gymnocalycium asterium var. *minimum* Pazout nom. inval. (Art. 43.1), *Friciana* 1(6): 7, 1962. Based on *G. asterium* var. *minimum* Pazout 1960 nom. nud.

Gymnocalycium asterium var. *paucispinum* Backeberg nom. inval. (Art. 43.1, 8.2), *Kakteenlexikon*: 164, 1966.

Gymnocalycium baldianum (Spegazzini) Spegazzini, *Anales Soc. Ci. Argent.* 99: 135, 1925. Basionym: *Echinocactus baldianus* Spegazzini 1905.

Echinocactus baldianus Spegazzini, *Anales Mus. Nac. Buenos Aires* 11(Ser.2,4): 505-506, 1905 (see Kiesling, 1984).

- Gymnocalycium baldianum* var. *albiflorum*** C.A.L. Bercht, *Gymnos* 11(21): 1-9, 1994. Type: C.A.L. Bercht 1232, 18.12.1992, Argentina, Prov. Catamarca, North of El Alto (U).
- Gymnocalycium bayrianum*** H. Till, *Kakt. and. Sukk.* 38(8): 191, 1987. Type: Schickendantz s.n. (WU). Previously invalidly published as *Gymnocalycium bayrianum* H. Till nom. inval. (Art. 8.2, 37.1), *Kakt. and. Sukk.* 18: 222-224, 1967.
- Gymnocalycium bicolor* (*)** Schütz, *Friciana* 1(7): 2-3 + 8, 1962. Type: F. Ritter 433 ex cult., Argentina, Prov. Cordoba (living material in Bmo Succulent collection, nom. inval. art. 8.2?). Note. Isotypes are cited by Eggli (1987), but they may not belong to the type material (see comment about typification).
- Gymnocalycium bodenbenderianum*** (Hosseus ex Berger) A. W. Hill, *Index Kewensis Plantarum Phanerogamarum*, Suppl. 8: 105, 1933. Basionym: *Echinocactus bodenbenderianus* Hosseus ex Berger, 1929. Note: Nyffeler (in press) has drawn our attention to the fact that Hill (l.c.) validly published some combinations which were attributed to Berger (1929).
Echinocactus bodenbenderianus Hosseus ex Berger, *Kakteen* : 221-222, 1929. Note. The taxon was recently revised (Till & Neuhuber, 1992), without typification of the species name. The original description is accompanied by a photo, but the habitat information given in the protologue is vague and the plant depicted cannot be ascribed with certainty to a defined population; adequate typification is impossible without clear data on the true identity and provenance of the original plants.
- Gymnocalycium bodenbenderianum* ssp. *intertextum*** (Backeberg ex H. Till) H. Till, *Gymnocalycium* 6(1): 83, 1993. Basionym: *Gymnocalycium intertextum* Backeberg ex H. Till, 1987 (see *G. intertextum*).
- Gymnocalycium borthii*** Koop ex H. Till, *Kakt. and. Sukk.* 38(8): 191, 1987. Type: H. Borth 55, Argentina, Prov. San Luis, near Quines (WU). Previously invalidly described as *Gymnocalycium borthii* Koop nom. inval. (Art. 8.2), *Kakt. and. Sukk.* 27(2): 25-27, 1976.
- Gymnocalycium bozsingianum*** Schütz, *Kaktusy* 13(6): 124-126, 1977. Type: in Herbarium SCK, Plsen.
- Gymnocalycium brachyanthum*** (Gürke) Britton & Rose, *The Cactaceae* 3: 159, 1922. Basionym: *Echinocactus brachyanthus* Gürke 1907.
Echinocactus brachyanthus Gürke, *Monatsschr. Kakteenk.* 17: 123, 1907. Neotype: G. Neuhuber 91-77/1183, 5.12.1991, Argentina, Prov. San Luis, prope Suyuque, m 1320 (WU, Till & Neuhuber des., 1993)
- Gymnocalycium brachypetalum*** Spegazzini, *Anales Soc. Ci. Argent.* 99: 135, 1925. Type (?): LPS 23048 "*G. brachypetalum* Speg." (see Kiesling, 1984: 237). Note. An entry on Gray Herbarium Index (Anonymous, 1968: 214) cites *Echinocactus brachypetalus* Werdermann.
- Gymnocalycium bruchii*** (Spegazzini) Hosseus, *Revista Centro Estud. Farm. Cordoba* 2(6): 22, 1926. Basionym: *Frailea bruchii* Spegazzini 1923.
Frailea bruchii Spegazzini, *Anales Soc. Ci. Argent.* 96: 73-74, 1923. **Lectotype (desi-**

gnated here): illustration in Spegazzini (l.c.): 74, reproduced by Kiesling (1984: 111).

Type locality: Argentina, Sierra de Cordoba, near Alta Gracia.

Note. *G. bruchii* is a species widely distributed and fragmented in various populations of uncertain systematic status. The illustration in Spegazzini (l.c.) matches the description and clearly refers to the original collection; the typification of Spegazzini's epithet guarantees the correct application of the name and defines the typical population (see also discussion for *G. lafaldense*) (for missing herbarium material see Kiesling, 1984: 234-235). The original attribution of this taxon to *Frailea* has been extensively discussed (Hosseus, 1929; Oehme, 1941; Simon, 1963; Frank, 1975).

Gymnocalycium bruchii* var. *brigittae Piltz, Succulenta 66: 213-216, 1987. Type: Piltz 214, 1.7.1980, Argentina, Prov. Cordoba, western slopes of the Sierra Grande (KOELN).

Gymnocalycium bruchii var. *hossei* Backeberg nom. inval. (Art. 37.1), Die Cactaceae 3: 1699-1700, 1959. Previously published as *Gymnocalycium bruchii* var. *hossei* Backeberg nom. inval. (Art. 36.1), in: Backeberg & Knuth: Kaktus-ABC: 286-287, 1936.

Gymnocalycium bruchii* var. *niveum Rausch, Succulenta 68 (9): 179-180 + title plate, 1989. Type: W. Rausch 727, Argentina, Prov. Cordoba, near Capilla del Monte (ZSS).

Gymnocalycium buenekeri Swales, Cact. Succ. J. Gr. Brit. 40(4): 97-100, 1978. Type: Swales G.261 ex cult. (K).

Gymnocalycium calochlorum (Boedeker) Y. Ito, Cacti 1952: 90, 1952. Basionym: *Echinocactus calochlorus* Boedeker 1932.

Echinocactus calochlorus Boedeker, Monatschr. Deutsch Kakteen-Ges. 4: 260-262, 1932.

Note. Two illustrations were included in Boedeker (l.c.), but no precise locality information was known to the author and the description was based on more than one specimen; the typification of this name requires a complete revision of the whole complex of related taxa.

Gymnocalycium calochlorum* var. *proliferum (Backeberg) Backeberg, Die Cactaceae 3: 1718, 1959. Basionym: *Echinocactus prolifer* Backeberg, 1932 (see *G. proliferum*).

Gymnocalycium capillaense (Schick) Hosseus, Revista Centro Estud. Farm. Cordoba 2(6): 16, 1926. Basionym: *Echinocactus capillaensis* Schick 1923.

Echinocactus capillaensis Schick, Möller's Deutsche Gärtn.-Zeitung 38(26): 201-202, 1923

Note. In the original description (Schick, l.c.) the epithet was written "*capillensis*"; the author stated that this spelling is a typographical error and thus it was later corrected to "*capillaensis*" (Oehme, 1938). In accordance with Art. 60.1 and 61.1 this is the spelling that should be used. We cannot see any evidence from the Code (see Art. 60) that the original spelling should be considered "*capillensis*", although this form could be philologically preferable. For a similar case ("*esperanzaensis*" versus "*esperanzensis*") see Brummitt & Taylor (1990: 303). For comments about typification see *E. sutterianus*.

Gymnocalycium cardenasianum F. Ritter, Taxon 13(4): 144, 1964. Type: F. Ritter 88, 1953, Bolivia, Prov. Mendez, Carrizal (U!).

- Gymnocalycium carminanthum* (*)** Borth & Koop, Kakt. and. Sukk. 27(4): 73-76, 1976. Type: H. Borth 130, Argentina, Prov. Catamarca, Sierra de Ambato (LI). Note. The original description only cites the holotype (probably a living plant, Art. 8.2?). Isotypes are reported for ZSS by Eggli (1987) but their origin cannot be determined (see notes in the chapter about typification).
- Gymnocalycium castellanosii*** Backeberg, in: Backeberg & Knuth: Kaktus-ABC: 287 + 416-417, 1936.
- Gymnocalycium castellanosii* var. *armillatum*** Piltz, Gymnos 9(18): 48-51, 1993. Type: Piltz 217/2, Argentina, Prov. La Rioja, Sierra de Ulapes (U).
- Gymnocalycium castellanosii* var. *bozsingianum*** (Schütz) Piltz, Gymnos 9(18): 43, 1993. Basionym: *Gymnocalycium bozsingianum* Schütz 1977 (see *G. bozsingianum*).
- Gymnocalycium catamarcense*** H. Till & W. Till, *Gymnocalycium* 8(1):142-143, 1995. Type: H. Till 93-632/2259, 19.2.1993, Argentina, Prov. Catamarca, North of Andalgalá, m 1340 (holotype, WU); HT 88-132/1817, 2.10.1988, between Andalgalá and Agua de Paloma, m 1050; G. Neuhuber 91-475/115+116, 20.12.1991, 10 km before Andalgalá, m 950 (paratypes, WU).
- Gymnocalycium catamarcense* subsp. *catamarcense* f. *belense*** H. Till & W. Till, *Gymnocalycium* 8(1): 143, 1995. Type: H. Till 93-630/2235, 19.2.1993, Argentina, Prov. Catamarca, western slopes of Cuesta de Belen, m 1200 (WU).
- Gymnocalycium catamarcense* subsp. *catamarcense* f. *ensispinum*** H. Till & W. Till, *Gymnocalycium* 8(1): 143, 1995. Type: H. Till 88-135/1830, 2.10.1988, Argentina, Prov. Catamarca, Cuesta Chilca (WU).
- Gymnocalycium catamarcense* subsp. *catamarcense* f. *montanum*** H. Till & W. Till, *Gymnocalycium* 8(1): 143, 1995. Type: H. Till 88-164/1838, Argentina, Prov. Catamarca, Los Nacimientos, m 2250 (holotype, WU); Amerhauser 93-770-5, 16.12.1993, m 2600 (paratype, WU).
- Gymnocalycium catamarcense* subsp. *acinacispinum*** H. Till & W. Till, *Gymnocalycium* 8(1): 146, 1995. Type: H. Till 87-45/1566, 16.10.1987, Argentina, Prov. Catamarca, western base of Sierra de Manchao (holotype, WU); II. Till 87-45/1567, same locality (paratype, WU).
- Gymnocalycium catamarcense* subsp. *schmidianum*** H. Till & W. Till, *Gymnocalycium* 8(1):145, 1995. Type: H. Till 87-60/1590, Argentina, Prov. Catamarca, south of Tinogasta, m 1600 (WU).
- Gymnocalycium centeterium*** auct. non Lehmann ex Pfeiffer, 1837, Hosseus in: Revista Centro Estud. Farm., Córdoba 2(6): 22, 1926. Note. This name of a taxon now doubtfully attributed to *Eriosyce curvispina* (Bertero ex Colla) Kattermann (see Kattermann, 1994: 142) was misapplied by Hosseus to a species of *Gymnocalycium*, probably to be referred to *G. valnicekianum*; Hosseus's interpretation was later widely used.

- Gymnocalycium chiquitanum*** Cardenas, Cactus 18(78): 95-97, 1963. Type: Hammerschmid 5562, Bolivia, Prov. Chiquitos, San Jose, Herbarium Cardenasianum, Cochabamba.
- Gymnocalycium chubutense*** (Spegazzini) Spegazzini, Anales Soc. Ci. Argent. 99: 137, 1925. Basionym: *Echinocactus gibbosus* var. *chubutensis* Spegazzini 1902.
Echinocactus gibbosus* var. *chubutensis Spegazzini, Anales Mus. Nac. Buenos Aires 7(Ser. 2, IV): 285, 1902. No type material has been indicated by Kiesling (1984).
- Gymnocalycium chuquisacanum*** Cardenas, Cact. Succ. J. (U.S.) 38: 146-147, 1966. Type: M. Cardenas 6226, 5.1958, Bolivia, Dept. Chuquisaca, Prov. Azero, near Boyuibe, Herbarium Cardenasianum, Cochabamba.
- Gymnocalycium cintiense*** (Cardenas) Hutchison, Natl. Cact. Succ. J. 14: 38, 1959. Basionym: *Weingartia cintiensis* Cardenas, Revista Agric. 10: 9-10, 1958. Note. Now attributed to the genus *Rebutia* K. Schumann (Hunt, 1992).
- Gymnocalycium comarapense* Backeberg nom. inval. (Art. 34.1), Die Cactaceae 3: 1775-1776, 1959.
- Gymnocalycium cumingii*** (Britton & Rose) Hutchison, Natl. Cact. Succ. J. 14: 38, 1959. Basionym: *Echinocactus cumingii* Hopffer 1843. Note. Now attributed to the genus *Rebutia* K. Schumann (Hunt, 1992).
- Gymnocalycium curvispinum* Fric nom. nud., Möller's Deutsche Gärtn.-Zeitung 44: 170, 1929. Note. This name was erroneously listed as valid by Hill (1933) and by Zazvorka & Sedivy (1991).
- Gymnocalycium damsii*** (K. Schumann) Britton & Rose, The Cactaceae 3: 163, 1922. Basionym: *Echinocactus damsii* K. Schumann 1903.
Echinocactus damsii K. Schumann, Gesamtbeschreibung der Kakteen, 2. Nachträge: 119-120, 1903. Type: Anisits s.n., Paraguay (B, see Leuenberger, 1979).
- Gymnocalycium damsii* var. *centrispinum* Backeberg nom. inval. (Art. 8.2), Descriptiones Cactacearum Novarum 3: 6, 1963.
- Gymnocalycium damsii* var. *multipliferum*** P.J. Braun, Kakt. and. Sukk. 42(10): 228-231, 1991. Type: Braun 230, Brazil, Mato Grosso do Sul, Pantanal, southwest of the Serra da Bodoquena, holotype: ZSS, isotypes: ZSS, B.
Note: Leuenberger (in litt., 1995) reports that the isotype preserved in B bears the following label: "Mato Grosso do Sul; NO Porto Murtinho, südl. Pantanal; Braun 230, leg. 1983" and indicates that the holotype is in ZSS and another isotype is in K; both locality and indication to the deposition of type material are in partial disagreement with the protologue. Another specimen from the Braun 230 collection is labelled "E Porto Murtinho", again reflecting the problem of the "field numbers", often used to identify a taxon and not a well defined population.
- Gymnocalycium damsii* var. *rotundulum* Backeberg nom. inval. (Art. 8.2), Descriptiones Cactacearum Novarum 3: 6, 1963.
- Gymnocalycium damsii* var. *torulosum* Backeberg nom. inval. (Art. 8.2), Descriptiones Cactacearum Novarum 3: 6, 1963.

Gymnocalycium damsii var. *tucavocense* Backeberg nom. inval. (Art. 8.2), *Descriptiones Cactacearum Novarum* 3: 6, 1963.

Gymnocalycium deeszianum Dölz, *Kakteenkunde* (unnumbered volume): 54-55, 1943. Note. An illustration is supplied, but the description does not give any locality indication. This taxon belongs to the complex of *G. capillaense* and any typification of the name must be associated with an epitype.

Gymnocalycium delaetii (K. Schumann) Hosseus, *Revista Centro Estud. Farm.*, Cordoba 2(6): 22, 1926. Basionym: *Echinocactus delaetii* K. Schumann 1901. ***Echinocactus delaetii*** K. Schumann, *Monatsschr. Kakteenk.* 11: 186, 1901. Note. The Berlin Herbarium, where Schumann's herbarium was kept, was largely destroyed during the second world war (see Werdermann, 1949; Leuenberger, 1979). The description reports the province of Tucuman as place of origin, but the good illustration seems better referable to the populations from the province of Salta. Due to the still unresolved systematic relations with *G. schickendantzii* and to the uncertain collecting location, the typification of this name requires a systematic analysis. *Gymnocalycium delaetii* (K. Schumann) Y. Ito nom. inval. (Art. 33.2), *Explanatory Diagram of Austroechinocactinae* 174, 1957. Basionym: *Echinocactus* K. Sch. 1901 [sic!].

Gymnocalycium denudatum (Link & Otto) Pfeiffer ex Mittler, *Taschenbuch für Cactustliebhaber* 2ed.: 48 + 124, 1844. Basionym: *Echinocactus denudatus* Link & Otto 1828. ***Echinocactus denudatus*** Link & Otto, *Icones plantarum rariorum* (Abbildungen neuer und seltener Gewächse), 2: 17 + plate 9, 1828. Note. The excellent illustration could serve as lectotype. However, there is still uncertainty about the precise locality of the original collections (see Middleditch, 1975) and the precise application of the epithet would probably require an epitype. ***Cereus denudatus*** (Link & Otto) Pfeiffer, *Enumeratio diagnostica Cactearum hucusque cognitarum*, 1837. Basionym: *Echinocactus denudatus* Link & Otto 1828.

Gymnocalycium denudatum var. *andersobnianum* (F. Haage) Y. Ito nom. inval. (Art. 33.2), *Explanatory Diagram of Austroechinocactinae*: 170, 1957. Basionym: *Echinocactus* var. Haage jr., 1898 [sic!].

Echinocactus denudatus* var. *andersobnianus F. Haage, *Monatsschr. Kakteenk.* 8: 36, 1898. Original spelling: "*Andersobniana*".

Gymnocalycium denudatum* var. *argentinense F. Haage, *Kakteen-Preisverzeichnis* 1928: 14. Original spelling: "*argentiniensis*". Alternative name (Art. 34.2) for *Echinocactus denudatus* var. *argentiniensis* F. Haage 1928.

Echinocactus denudatus* var. *argentiniensis F. Haage, *Kakteen-Preisverzeichnis* 1928: 14.

Gymnocalycium denudatum var. *argentinense* Y. Ito nom. illeg. (Art. 53.1), *The Cactaceae*: 378, 1981.

Gymnocalycium denudatum var. *backebergii* Pazout nom. inval. (Art. 37.1), *Friciana* 3(15): 6, 1963.

Echinocactus denudatus* var. *bruennowianus F. Haage, *Monatsschr. Kakteenk.* 8: 37, 1898. Original spelling: "*Bruennowiana*".

Gymnocalycium denudatum var. *delaetianum* (F. Haage) Y. Ito nom. inval. (Art. 33.2),

Explanatory Diagram of Austroechinocactinae: 170, 1957. Basionym: *Echinocactus* var. Haag jr., 1898 [sic!].

Echinocactus denudatus* var. *delaetianus F. Haage, Monatsschr. Kakteenk. 8: 36-37, 1898. Original spelling: “*de Laetiana*”.

Gymnocalycium denudatum var. *flavispinum* (Schelle) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 170, 1957. Basionym: *Echinocactus* var. Schelle, 1907 [sic!].

Echinocactus denudatus flavispinus Schelle nom. inval. (Art. 32.1), Handbuch der Kakteenkultur: 189, 1907.

Echinocactus denudatus* var. *Flore Roseo Labouret [sic!], Monographie de la famille des Cactées: 258, 1853.

Gymnocalycium denudatum var. *golzianum* (Mundt) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 170, 1957. Basionym: *Echinocactus* var. Mundt., 1897 [sic!].

Echinocactus denudatus* var. *golzianus Mundt, Monatsschr. Kakteenk. 7: 197, 1897. Original spelling: “*Golziana*”.

Gymnocalycium denudatum var. *heuschkelianum* (F. Haage) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 170, 1957. Basionym: *Echinocactus* var. Haag jr., 1898 [sic!].

Echinocactus denudatus* var. *heuschkelianus F. Haage, Monatsschr. Kakteenk. 8: 36, 1898. Original spelling: “*Heuschkeliana*”.

Gymnocalycium denudatum var. *meiklejohnianum* (F. Haage) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 170, 1957. Basionym: *Echinocactus* var. Haag jr., 1898 [sic!].

Echinocactus denudatus* var. *meiklejohnianus F. Haage, Monatsschr. Kakteenk. 8: 36, 1898. Original spelling: “*Meiklejohniana*”.

Gymnocalycium denudatum var. *octogonum* (K. Schumann) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 170, 1957. Basionym not definable.

Gymnocalycium denudatum var. *paraguayense* F. Haage ex Y. Ito nom. inval. (Art. 36.1), Cacti 1952: 85, 1952. Based on *Echinocactus denudatus* var. *paraguayense* nom. nud.

Gymnocalycium denudatum var. *roseiflorum* (Hildmann ex K. Schumann) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 170, 1957. Basionym: *Echinocactus* var. Hildm., 1898 [sic!].

Echinocactus denudatus* var. *roseiflorus Hildmann ex K. Schumann, Gesamtbeschreibung der Kakteen: 414, 1898. Original spelling: “*roseiflora*”.

Gymnocalycium denudatum var. *scheidelianum* (F. Haage) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 170, 1957. Basionym: *Echinocactus* var. Haag jr., 1898 [sic!].

Echinocactus denudatus* var. *scheidelianus F. Haage, Monatsschr. Kakteenk. 8: 37, 1898. Original spelling: “*Scheideliana*”.

Gymnocalycium denudatum var. *wagnerianum* (F. Haage) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 170, 1957. Basionym: *Echinocactus* var. Haag jr., 1898 [sic!].

Echinocactus denudatus* var. *wagnerianus F. Haage, Monatsschr. Kakteenk. 8: 37, 1898. Original spelling: “*Wagneriana*”.

Gymnocalycium denudatum var. *wieditzianum* (F. Haage) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 170, 1957. Basionym: *Echinocactus* var. Haag jr., 1898 [sic!].

Echinocactus denudatus* var. *wieditzianus F. Haage, Monatsschr. Kakteenk. 8: 36, 1898. Original spelling: “*Wieditziana*”.

***Gymnocalycium erinaceum* (*)** Lambert, Succulenta 64: 64-66, 1985. Type: J. Lambert 40, 5.12.1981, Argentina, Prov. Cordoba, Sierra Tulumba, Sauce Punco (U). Note: The type was not found in Utrecht by one of us (Metzing) in 1990 and 1991. The type plant was reportedly given by Lambert to a Dutch collector for subsequent delivery to Utrecht but it is not known whether any herbarium type material has really been deposited. The validity of this name cannot be determined, but it is anyway quite doubtful (Art. 8.2 was probably contravened). See introductory notes about typification.

***Gymnocalycium erinaceum* var. *paucisquamosum* (*)** Piltz, Gymnos 11(21): 12-17, 1994. Type: J. Piltz 400/3, 26.08.1987, Argentina, Prov. Cordoba, Sierra Chica near Ongamira, m 1000 (U).

Note. The validity of this taxon depends on the validity of *G. erinaceum* (Art. 43.1).

Gymnocalycium eurypleurum F. Ritter, Kakteen in Südamerika 1: 268, 1979. Type: F. Ritter 1178, 1963, Paraguay, foot of Cerro Leon (U !). Previously invalidly described as *Gymnocalycium eurypleurum* F. Ritter ex Plesnik nom. inval. (Art. 8.2), Kaktusy 8(3): 70-72, 1972.

Note. The type of Plesnik's name was a living plant and no material has been given to any herbarium (Milt, 1984, pers. comm. to Metzing).

Gymnocalycium eytianum Cardenas, Kakt. and. Sukk. 9(2): 25-26, + 9(3): 46, 1958. Type: M. Cardenas 5065, 3.1949, Bolivia, Dept. Santa Cruz, Prov. Cordillera, near Eyti, Herbarium Cardenasianum, Cochabamba (now in LIL).

Gymnocalycium ferox (Backeberg) Slaba nom. inval. (Art. 41.3b), Kaktusy 20(4): 80, 1984. Based on *Gymnocalycium hybopleurum* var. *ferox* Backeberg 1966 nom. inval.

Gymnocalycium ferox var. *ferocior* (Backeberg) Slaba nom. inval. (Art. 41.3b, 43.1), Kaktusy 20(4): 83, 1984. Based on *Gymnocalycium hybopleurum* var. *ferocior* Backeberg 1966 nom. inval.

Gymnocalycium ferrarii Rausch, Kakt. and. Sukk. 32(1): 6-7, 1981. Type: W. Rausch 718, Argentina, Prov. Catamarca, near Santa Teresa (ZSS).

Gymnocalycium fidaianum (Backeberg) Hutchison, Cact. Succ. J. (U.S.) 29: 11, 1957. Basionym: *Echinocactus fidaianus* Backeberg, Kakteenfreund 2: 117, 1933. Note. Now attributed to the genus *Rebutia* K. Schumann (Hunt, 1992).

- Gymnocalycium fleischerianum* Backeberg nom. inval. (Art. 37.1), Die Cactaceae: 1703, 1959. Previously invalidly published as *Gymnocalycium fleischerianum* Backeberg nom. inval. (Art. 36.1), in: Backeberg & Knuth: Kaktus-ABC : 288-289, 1936. Note. Erroneously attributed to Jajo, 1934.
- Gymnocalycium fleischerianum* var. *andersohnianum* (F. Haage) Schütz nom. inval. (Art. 43.1), Friciana 6(40): 11, 1966. Basionym: *Echinocactus denudatus* var. *andersohnianus* F. Haage, 1898.
- Gymnocalycium fleischerianum* var. *anoplum* Y. Ito nom. inval. (Art. 8.2, 37.1, 43.1), The Cactaceae: 380, 1981.
- Gymnocalycium fleischerianum* var. *heuschkelianum* (F. Haage) Schütz nom. inval. (Art. 43.1), Friciana 6(40): 11, 1966. Basionym: *Echinocactus denudatus* var. *heuschkelianus* F. Haage, 1898.
- Gymnocalycium fleischerianum* var. *meiklejohnianum* (F. Haage) Schütz nom. inval. (Art. 43.1), Friciana 6(40): 11, 1966. Basionym: *Echinocactus denudatus* var. *meiklejohnianus* F. Haage 1898.
- Gymnocalycium fricianum* Plesnik nom. inval. (Art. 37.1), Kakt. and Sukk. 15(6): 110, 1964.
- Gymnocalycium friedrichii* (Werdermann) Pazout nom. inval. (Art. 34.1), Friciana 4(23): 3-19, 1964. Based on *Gymnocalycium mihanovichii* var. *friedrichii* Werdermann, 1936. Note. Pazout (l.c.) named this combination with the assumption that in case *G. mihanovichii* var. *friedrichii* were to be considered a good species, then other *G. mihanovichii* varieties would have to be combined in *G. friedrichii*. This statement clearly contravenes Art. 34.1. Later, Schütz (1979: 17) listed *G. friedrichii* (Werdermann) Pazout, giving the previous combination (Pazout, 1964) as direct reference, and cited *G. mihanovichii* var. *friedrichii* Werdermann among the synonyms. This again cannot be considered a validly published combination: in fact, the combinations that he intended to name as new were clearly evidenced by the use of bold face (e.g., *G. friedrichii* var. *albiflorum* (Pazout) Schütz **nov. comb.**, in Schütz, 1979: 17).
- Gymnocalycium friedrichii* var. *albiflorum* (Pazout) Schütz nom. inval. (Art. 43.1), Friciana 8(51): 17, 24, 1979. Basionym: *Gymnocalycium mihanovichii* var. *albiflorum* Pazout 1963.
- Gymnocalycium friedrichii* var. *angustostriatum* (Pazout) Pazout nom. inval. (Art. 33.2, 43.1), Friciana 4(23): 17, 1964.
- Gymnocalycium friedrichii* var. *moserianum* Pazout nom. inval. (Art. 43.1, 37.1), Succulentia 45: 99-100, 1966.
- Gymnocalycium friedrichii* var. *pazoutianum* G. Moser & Valnicek nom. inval. (Art. 43.1, 37.1), Kaktusy 3: 58-60, 1967.
Note. Also invalidly described in Friciana 44: 3-15, 1967.
- Gymnocalycium friedrichii* var. *piraretaense* (Pazout) Pazout nom. inval. (Art. 43.1), Friciana 6(23): 12, 1964. Basionym: *Gymnocalycium mihanovichii* var. *piraretaense* Pazout 1951.

Gymnocalycium froelichianum sensu Osten, Anales Mus. Hist. Nat. Montevideo Ser.2, 5(1): 77-78 + pl.67 & 69, 1941.

Note. A misapplication of the name *Echinocactus froelichianus* K. Schumann, 1903 (now attributed to the genus *Eriosyce* Philippi, see Kattermann, 1994): the two illustrations labelled *G. froelichianum* show *G. valnicekianum* (plate 67) and *G. monvillei* (plate 69).

Gymnocalycium gerardii (Boedeker) Y. Ito nom. inval. (Art. 32.1, 41.3), The Cactaceae: 399, 1981. Based on *Gymnocalycium gibbosum* var. *gerardii* Boedeker nom. nud.

Gymnocalycium gibbosum (Haworth) Pfeiffer ex Mittler, Taschenbuch für Cactusliebhaber 2ed.: 48 + 124, 1844. Basionym: *Cactus gibbosus* Haworth 1812.

Cactus gibbosus Haworth, Synopsis Plantarum Succulentarum: 173, 1812. Lectotype: tab. 137 in Bot. Reg. 2, 1816 (designated by Kiesling, 1988: 226).

Echinocactus gibbosus (Haworth) DC., Prodromus systematis naturalis regni vegetabilis 3: 463, 1828. Basionym: *Cactus gibbosus* Haworth 1812.

Cereus gibbosus (Haworth) Pfeiffer, Enumeratio diagnostica Cactearum hucusque cognitarum, 1837. Basionym: *Cactus gibbosus* Haworth 1812.

Gymnocalycium gibbosum var. *albispinum* Cichra nom. inval. (Art. 34.1), Friciana 3(20): 7-10, 1963.

Gymnocalycium gibbosum var. *caespitosum* Fric ex Fleischer nom. inval. (Art. 8.2), Friciana 4(24): 3-11, 1964. Based on *Gymnocalycium gibbosum* var. *caespitosum* Fric nom. nud.

Note. The holotype was certainly a living plant in the Municipal collection of Brno, Czech Republic.

Gymnocalycium gibbosum var. *caespitosum* f. *intermedium* Fleischer nom. inval. (Art. 36.1; 37.1), Friciana 4(24): 4, 1964. Original spelling: "*intermedia*".

Gymnocalycium gibbosum var. *caespitosum* f. *minimum* Fleischer nom. inval. (Art. 36.1; 37.1), Friciana 4(24): 4, 1964. Original spelling: "*minima*".

Gymnocalycium gibbosum var. *celsianum* (Labouret) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 190, 1957. Basionym: *Echinocactus* var. Lab., 1853 [sic!].

Echinocactus gibbosus* var. *celsianus Rümpler, Carl Friedrich Förster's Handbuch der Cacteenkunde: 583, 1885.

Gymnocalycium gibbosum var. *cerebriforme* (Spegazzini) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 190, 1957. Basionym: *Echinocactus* var. Speg., 1899 [sic!].

Echinocactus gibbosus* var. *cerebriformis Spegazzini, Anales Soc. Ci. Argent. 48: 50, 1896. No material referable to the type collection is preserved in Spegazzini's herbarium (see Kiesling, 1984).

Echinocactus gibbosus* var. *cristatus Rümpler, Carl Friedrich Förster's Handbuch der Cacteenkunde: 584, 1885.

Gymnocalycium gibbosum var. *fenellii* (F. Haage ex Quehl) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 190, 1957. Basionym: *Echinocactus* var. Haag Jr., 1899 [sic!].

Note. Often misspelled "*fennellii*".

- Echinocactus gibbosus* var. *fenellii*** F. Haage ex Quehl, Monatschr. Kakteenk. 9: 115-116, 1899.
- Gymnocalycium gibbosum* var. *ferox* (Labouret) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 190, 1957. Basionym: *Echinocactus* var. Lab., 1885 [sic!].
- Echinocactus gibbosus* var. *ferox*** Rümpler, Carl Friedrich Förster's Handbuch der Cacteenkunde: 583, 1885.
- Gymnocalycium gibbosum* var. *hyptiacanthum* Fric ex Y. Ito nom. inval. (Art. 36.1), Cacti 1952: 89, 1952.
- Gymnocalycium gibbosum* var. *leonense* (Hildmann ex K. Schumann) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 190, 1957. Basionym: *Echinocactus* var. Hildm., 1898 [sic!].
- Echinocactus gibbosus* var. *leonensis*** Hildmann ex K. Schumann, Gesamtbeschreibung der Kakteen: 409, 1898.
- Gymnocalycium gibbosum* var. *leucanthus* (K. Schumann) Y. Ito [sic!] nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 190, 1957. Basionym: *Echinocactus* var. K. Sch. [sic!]. Typographical error for "*leucacanthus*"; basionym wrongly attributed to Schumann.
- Echinocactus gibbosus* var. *leucacanthus*** Rümpler, Carl Friedrich Förster's Handbuch der Cacteenkunde: 583, 1885.
- Gymnocalycium gibbosum* var. *leucodictyon* (K. Schumann) Y. Ito nom. inval. (Art. 33.2). Explanatory Diagram of Austroechinocactinae: 190, 1957. Basionym: *Echinocactus* var. Ke. Sch., 1898 [sic!].
- Echinocactus gibbosus* var. *leucodictyus*** Rümpler, Carl Friedrich Förster's Handbuch der Cacteenkunde: 583, 1885.
- Echinocactus leucodictyus*** Salm Dyck, Cactee in Horto Dyckensi cultae anno 1849: 171, 1850.
- Gymnocalycium gibbosum* var. *nigrum* Backeberg nom. inval. (Art. 37.1), Die Cactaceae 3: 1755, 1959. Previously invalidly published as *Gymnocalycium gibbosum* var. *nigrum* Backeberg nom. inval. (Art. 36.1), in: Backeberg & Knuth: Kaktus-ABC: 289, 1936.
- Gymnocalycium gibbosum* var. *nobile* (K. Schumann) Y. Ito, nom. inval. (Art. 33.1), Cacti 1952: 88, 1952. Based on *Echinocactus gibbosus* var. *nobilis* K. Schumann 1898 nom. illeg. (Art. 53.1).
- Cactus nobilis* Haworth non Mill. ex L. 1767 nom. illeg. (Art. 53.1). Synopsis Plantarum Succulentarum: 174, 1812.
- Echinocactus gibbosus* var. *nobilis*** Lemaire, Cactearum genera nova speciesque novae: 91, 1839.
- Note. The nomenclatural history of the epithet *nobile* for an infraspecific taxon of *G. gibbosum* is somewhat complex. It was first used at specific rank by Haworth (1812), combined in the genus *Cactus*, but this was illegitimate as homonym of *Cactus nobilis* Mill. ex L., 1767. The current citation of Haworth as author of the epithet is therefore incorrect. Further descriptions of *Echinocactus gibbosus* var. *nobilis* appeared in Labouret (1853), who attributed the name to Monville, and later in Rümpler (1885) and Schumann (1898); the two latter authors gave no reference to former descriptions (these names are thus to be considered as junior homonyms of Lemaire's name).
- Gymnocalycium gibbosum* var. *pluricosatum* (Rümpler) Y. Ito nom. inval. (Art. 33.2),

Explanatory Diagram of Austroechinocactinae: 190, 1957. Basionym: *Echinocactus* var. Föst., 1885 [sic!].

Echinocactus gibbosus* var. *pluricostatus Rümpler, Carl Friedrich Förster's Handbuch der Cacteenkunde: 584, 1885.

Gymnocalycium gibbosum var. *polygonum* (K. Schumann) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 190, 1957. Basionym: *Echinocactus* var. K. Sch., 1898 [sic!].

Echinocactus gibbosus* var. *polygonus K. Schumann, Gesamtbeschreibung der Kakteen: 409, 1898. Original spelling: "*polygona*".

Gymnocalycium gibbosum var. *rostratum* Fleischer nom. inval. (Art. 8.2), Friciana 4(24): 5 + 9 (ill.), 1964.

Note. The holotype was certainly a living plant in the Municipal Collection of Brno, Czech Republic.

Gymnocalycium gibbosum var. *schlumbergeri* (K. Schumann) Y. Ito nom. inval. (Art. 33.1), Cacti 1952: 89, 1952. Based on *Echinocactus gibbosus* var. *schlumbergeri* K. Schumann 1898 nom. illeg. (Art. 53.1).

Note. Ito (l.c.) published the combination as "*Gymnocalycium* var. *schlumbergeri* (K. Sch.) Y. Ito nov. comb." [sic!], which is invalid according to Art. 33.1. Furthermore he neglected that *E. gibbosus* var. *schlumbergeri* was previously described by Rümpler in 1885.

Echinocactus gibbosus* var. *schlumbergeri Rümpler, Carl Friedrich Foerster's Handbuch der Cacteenkunde: 584, 1885.

Echinocactus gibbosus* var. *ventanicola Spegazzini, Anales Mus. Nac. Buenos Aires Ser. 3 2: 7, 1903. Type: see Kiesling (1984).

Note: For combination in *Gymnocalycium* see *G. platense* var. *ventanicolum* (Spegazzini) Kiesling.

Gymnocalycium glaucum F. Ritter, Sukkulentenkunde 7/8: 37, 1963. Type: F. Ritter 961 1959, Argentina, Prov. Catamarca, SE Tinogasta (U!).

Gymnocalycium grandiflorum Backeberg, in: Backeberg & Knuth: Kaktus-ABC: 289 + 417, 1936.

Note. See comments in *G. monvillei* ssp. *grandiflorum* for systematic interpretation.

Gymnocalycium griseopallidum Backeberg nom. inval. (Art. 8.2), Kakteenlexikon: 167, 1966

Gymnocalycium guanchinense Schütz, Zpravy 2: 21, 1947.

Gymnocalycium guanchinense var. *robustius* F. Ritter nom. inval. (Art. 30.3, 36.1, 37.1), Katalog H. Winter: 14, 1962.

Gymnocalycium guanchinense var. *tinogastaense* F. Ritter nom. inval. (Art. 34.1), Kakteen in Südamerika 2: 477, 1980.

Gymnocalycium guerkeanum (Heese) Britton & Rose, The Cactaceae 3: 132, 1922. Basionym: *Echinocactus guerkeanus* Heese 1911.

Echinocactus guerkeanus Heese, Monatsschr. Kakteenk. 21: 132, 1911. Note. The description features an illustration (a grafted plant), which shows a speci-

men belonging to a taxon living in Uruguay and nearby territories; however, the data given in the protologue do not allow to attribute this specimen to any of the known natural populations, while the country of origin (Bolivia) conflicts with present knowledge of the chorology of the species depicted. It is not unusual in the Cactaceae (particularly for older names) to have wrong indication about distribution, but under these circumstances any typification of this name requires a complete revision.

Gymnocalycium hamatum F. Ritter, *Kakteen in Südamerika* 2: 663-664, 1980. Type: F. Ritter 819, 1958, Bolivia, Prov. Gran Chaco, Palos Blancos (U!).

Gymnocalycium hammerschmidii Backeberg nom. inval. (Art. 8.2), *Descriptiones Cactearum Novarum* III: 7, 1963.

Gymnocalycium horizontbalonium Fric ex Kreuzinger, *Möller's Deutsche Gärt.-Zeitung* 44: 254, 1929.

Gymnocalycium horridispinum G. Frank ex H. Till, *Kakt. and. Sukk.* 38(8): 191, 1987. Type: H. Fehser s.n., Argentina, Prov. Córdoba, southwest of Salsacate (WU). Previously invalidly published as *Gymnocalycium horridispinum* G. Frank nom. inval. (Art. 37.1), *Kakt. and. Sukk.* 14(1): 8-10, 1963.

Gymnocalycium horstii Buining, *Kakt. and. Sukk.* 21(9): 162-165, 1970. Type: L. Horst HU79, Brazil, Rio Grande do Sul, Cacapava (U)

Gymnocalycium horstii var. *buenekeri* Buining nom. inval. (Art. 37.1), *Kakt. and. Sukk.* 21(9): 162-165, 1970.

Gymnocalycium bossei (F. Haage) A. W. Hill, *Index Kewensis Plantarum Phanerogamarum*, Suppl. 8: 105, 1933. Basionym: *Echinocactus bossei* F. Haage 1927. ***Echinocactus bossei*** F. Haage, *Katalog der Fa. Haage, Erfurt*: 14-15, 1927. Note. Till & Till (1987) revised this and related taxa, reproducing the original illustration (which depicts a plant of unknown geographical origin), but did not typify Haage's name. Their interpretation was accepted by subsequent authors (i.e. Lambert, 1993a); it would be desirable to typify this name, but in consideration of the still unresolved infraspecific systematics of the species this would require material of known provenance.

Gymnocalycium bossei var. *crassispinum* Y. Ito nom. inval. (Art. 37.1), *The Cactaceae*: 394, 1981

Gymnocalycium bossei var. *longispinum* (F. Haage) Hort. nom. nud., Backeberg, *Kakteenlexikon*: 168, 1966

Echinocactus hybogonus Salm-Dyck, *Cactaeae in Horto Dyckensi cultae anno 1849*: 167-168, 1850.

Note. No combination in *Gymnocalycium* exists, but this name has always been included in the synonymy of *G. saglionis*.

Echinocactus hybogonus (var.) *saglionis* (Cels) Labouret nom. inval. (Art. 11), *Monographie de la famille des Cactées*: 257, 1853. Basionym: *Echinocactus saglionis* Cels 1847.

- Gymnocalycium hybopleurum*** (K. Schumann) Backeberg, in: Backeberg & Knuth: Kaktus-ABC: 289, 1936. Basionym: *Echinocactus multiflorus* var. *hybopleurus* K. Schumann 1898 (see *G. multiflorum* var. *hybopleurum*).
- Gymnocalycium hybopleurum* var. *breviflorum* Backeberg nom. inval. (Art. 8.2), Kakteenlexikon: 168, 1966.
- Gymnocalycium hybopleurum* var. *centrispinum* Backeberg nom. inval. (Art. 8.2), Kakteenlexikon: 168, 1966.
- Gymnocalycium hybopleurum* var. *euchlorum* Backeberg nom. inval. (Art. 37.1), Die Cactaceae 3: 1752, 1959. Previously invalidly described as *Gymnocalycium hybopleurum* var. *euchlorum* Backeberg nom. inval. (Art. 36.1), in: Backeberg & Knuth: Kaktus-ABC: 289, 1936.
- Gymnocalycium hybopleurum* var. *ferocior* Backeberg nom. inval. (Art. 8.2), Kakteenlexikon: 168, 1966.
- Gymnocalycium hybopleurum* var. *ferox* Backeberg nom. inval. (Art. 8.2), Kakteenlexikon: 168, 1966.
- Gymnocalycium hyptiacanthum*** (Lemaire) Britton & Rose, The Cactaceae 3: 156, 1922. Basionym: *Echinocactus hyptiacanthus* Lemaire 1839.
- Echinocactus hyptiacanthus*** Lemaire, Cactearum genera nova speciesque novae: 21, 1839.
- Cactus hyptiacanthus*** (Lemaire) Steudel, Nomenclator botanicus 2, 1: 246, 1840. Basionym: *Echinocactus hyptiacanthus* Lemaire 1839.
- Gymnocalycium hyptiacanthum* var. *citriflorum* (Fric) Schütz nom. nud. Note. Although never described, this combination frequently appeared in the “cactus literature” (i. e., Haage, 1981; Schütz, 1986).
- Gymnocalycium hyptiacanthum* var. *eleutheracanthum* (Monville ex Labouret) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 198, 1957. Basionym: *Echinocactus* var. Monv., 1853 [sic!].
- Echinocactus hyptiacanthus* var. *eleutheracanthus*** Monville ex Labouret, Monographie de la famille des Cactées: 249, 1853.
- Gymnocalycium hyptiacanthum* var. *megalothelum* (Monville ex Labouret) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 198, 1957. Basionym: *Echinocactus* var. Monv., 1853 [sic!].
- Echinocactus hyptiacanthus* var. *megalothelus*** Monville ex Labouret, Monographie de la famille des Cactées: 249, 1853. Original spelling: “*megalotelus*”.
- Gymnocalycium hyptiacanthum* var. *nitidum* (Monville ex Labouret) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 198, 1957. Basionym: *Echinocactus* var. Monv., 1853 [sic!].
- Echinocactus hyptiacanthus* var. *nitidus*** Monville ex Labouret, Monographie de la famille des Cactées: 249, 1853.
- Gymnocalycium immemorum*** Castellanos & Lelong, Lilloa 4: 195-196, 1939. Type: Castellanos & Lelong 6.1.1939, El Zapato, Capilla del Monte, n. 30526 (BA !).

Gymnocalycium intertextum Backeberg ex H. Till, Kakt. and. Sukk. 38(8): 191, 1987
 Type: H. Fehser s.n., Argentina, ex cult. in coll. H. Till sub U 2176 (WU). Isotype: H. Fehser s.n., ex cult. in coll. H. Till sub U 2176, HT 722 (WU). Previously invalidly described as *Gymnocalycium intertextum* Backeberg nom. inval. (Art. 8.2), Kakteenlexikon: 168, 1966.

Gymnocalycium izozogsii Cardenas, Cact. Succ. J. (U.S.) 38: 144-145 + 161, 1966. Type: M. Cardenas 6225, 4. 1965, Bolivia, Dept. Santa Cruz, Prov. Cordillera, Izozog Basin, near El Atajado, Herbarium Cardenasianum, Cochabamba.

Gymnocalycium joossensianum (Boedeker) Britton & Rose, The Cactaceae, 3: 166, 1922. Basionym: *Echinocactus joossensianus* Boedeker 1918.

Echinocactus joossensianus Boedeker, Monatsschr. Kakteenk. 28: 140, 1918.

Gymnocalycium kieslingii O. Ferrari, Cact. Succ. J. (U.S.) 57: 244-246, 1985. Type: O. Ferrari 19/1980, 1980, Argentina, Prov. La Rioja, Cuesta la Cebila, El Alto (SI !).

Gymnocalycium kieslingii f. albiareolatum O. Ferrari, Cact. Succ. J. (U.S.) 57: 244-246, 1985. Type: O. Ferrari s.n., 1982, Argentina, Prov. La Rioja, near Villa Sanagasta (SI !). Original incorrect spelling: "*alboareolatum*" (Art. 60.8 and Rec. 60G).

Gymnocalycium kieslingii f. castaneum O. Ferrari, Cact. Succ. J. (U.S.) 57: 246, 1985. Type: O. Ferrari s.n., 1974, Argentina, Prov. La Rioja, a few kilometers north of Villa Sanagasta (SI!).

Gymnocalycium knebelii Fric nom. nud.

Note. Although never described, this name frequently appeared in the "cactus literature" (i.e., Backeberg, 1959: 1785; Haage, 1981: 255).

Gymnocalycium kozelskyanum Schütz nom. inval. (Art. 8.2), Kaktusy 2: 47-48, 1966. Type (living plant) in Coll. Schuetziana, Brno.

Gymnocalycium kurtzianum (Gürke) Britton & Rose, The Cactaceae 3: 163, 1922. Basionym: *Echinocactus kurtzianus* Gürke 1906.

Echinocactus kurtzianus Gürke, Monatsschr. Kakteenk. 16: 55, 1906.

Gymnocalycium kurtzianum var. *pachyacanthum* nom. nud., Backeberg, Die Cactaceae 3: 1762, 1959

Gymnocalycium lafaldense Vaupel, Z. Sukkulantenk. 2(14): 192, 1924. **Lectotype (designated here)**: coloured ill. in Vaupel (l.c.). Type locality: Argentina, Cordoba, Sierra de Cordoba, La Falda. Fig. 1.

Note. This taxon belongs to the *G. bruchii* group (see also note in *G. bruchii*) and was often included among its synonyms; however, it seems preferable to typify the name, which was used for a well defined population, in consideration of its possible use at infraspecific rank; the selected illustration refers to the original collection and closely matches the description.

Gymnocalycium lafaldense f. albispinum (Backeberg) Oehme, Cactaceae (DKG), 1941 (part I): 30, 1941. Basionym: *Gymnocalycium albispinum* Backeberg 1936.

Gymnocalycium lafaldense f. deviatum Oehme, Cactaceae (DKG), 1941 (part I): 29, 31, 1941.

Gymnocalycium lafaldense f. enorme Oehme, Cactaceae (DKG), 1941 (part I): 29, 31, 1941.

Gymnocalycium lafaldense f. evolvens Oehme, Cactaceae (DKG), 1941 (part I): 29-31, 1941.

Gymnocalycium lafaldense f. fraternum Oehme, Cactaceae (DKG), 1941 (part I): 30-31, 1941.

Note. These four names were described by Oehme for plants derived from a single collection, without any locality indication. They may be considered as selected forms which should better be treated as cultivars.

Gymnocalycium lafaldense f. bossei (Backeberg) Oehme, Cactaceae (DKG), 1941 (part I): 29-30, 1941. Basionym: *Gymnocalycium bruchii* var. *bossei* Backeberg 1936.

Gymnocalycium lafaldense f. *spinosissimum* F. Haage ex Simon nom. inval. (Art. 8.2, 37.1), Kakt. and. Sukk. 24(8): 184, 1973.

Gymnocalycium lagunillasense Cardenas, Kakt. and. Sukk. 9(2): 22-23, 1958. Type: M. Cardenas 5027, 2.1949, Bolivia, Prov. Cordillera, Lagunillas; holotype in Herbarium Cardenasianum, Cochabamba (BOLV !); isotype: US.

Gymnocalycium leeanum (Hooker) Britton & Rose, The Cactaceae 3: 154, 1922. Basionym: *Echinocactus leeanus* Hooker 1845.

Echinocactus leeanus Hooker, Curtis's Botanical Magazine 71: pl. 4184, 1845. Note. Since Britton & Rose (1922) this name was used in the "cactus literature" for a taxon of the subgenus *Macrosemineum* from South-Eastern Uruguay; an alternative interpretation was given by Metzging (1991), who suggested that the species is from Argentine and belongs to the subgenus *Gymnocalycium*. In a future revision of this group the illustration should be considered as nomenclatural type (lectotype, preferably in combination with an epitype).

Gymnocalycium leeanum* var. *brevispinum Backeberg, Cact. Succ. J. (U.S.) 23(3): 87, 1951. Previously invalidly published as *Gymnocalycium leeanum* var. *brevispinum* Backeberg nom. inval. (Art. 36.1), in: Backeberg & Knuth: Kaktus-ABC: 291, 1936

Gymnocalycium leeanum* var. *netrelianum (Monville ex F.A.C. Weber) Backeberg, in: Backeberg & Knuth: Kaktus-ABC: 290, 1936. Basionym: *Echinocactus netrelianus* Monville ex F.A.C. Weber 1853.

Gymnocalycium leeanum* var. *roseiflorum Y. Ito, Explanatory Diagram of Austroechinocactinae: 199 + 293, 1957. Previously invalidly described as *Gymnocalycium leeanum* var. *roseiflorum* Y. Ito nom. inval. (Art. 36.1), Cacti 1952: 90, 1952.

Gymnocalycium leptanthum (Spegazzini) Spegazzini, Anales Soc. Ci. Argent. 99: 138, 1925. Basionym: *Echinocactus platensis* var. *leptanthus* Spegazzini 1905. ***Echinocactus platensis* var. *leptanthus*** Spegazzini, Anales Mus. Nac. Buenos Aires 11(Ser.3a;IV): 504, 1905. Type: see Kiesling (1984: 228). Original spelling: "*leptantha*".

Gymnocalycium loricatum Spegazzini nom. illeg. (Art. 53.1), Anales Soc. Ci. Argent. 99: 140, 1925. Based on *Echinocactus loricatus* Spegazzini non Poselger 1853 nom. illeg. Note. An unnecessary substitute for *G. spegazzinii* Britton & Rose, 1922.

Echinocactus loricatus Spegazzini non Poselger 1853 nom. illeg. (Art. 53.1), Anales Mus. Nac. Buenos Aires 6 (Ser.3a;IV): 502-503, 1905. Type: see Kiesling (1984: 227)
Gymnocalycium loricatum (Spegazzini) Knuth nom. illeg. (Art. 52.1), in: Backeberg & Knuth: Kaktus-ABC: 296, 1936.

Gymnocalycium loricatum var. *cachensis* Backeberg nom. inval (Art. 36.1, 43.1), in: Backeberg & Knuth: Kaktus-ABC: 296, 1936.

Gymnocalycium lumbrerasense F. Ritter nom. inval. (Art. 34.1), Kakteen in Südamerika 2: 477, 1980. Previously listed in H. Winter's catalogue, 1960

Gymnocalycium mackieanum (Hooker) Metzger, Merregalli & Kiesling, **comb. nov.**
 Basionym: *Echinocactus mackieanus* Hooker, 1837. Curtis's Botanical Magazine, pl. 3561 + description. See fig. 2.

Note. Up to now, a valid combination of this name in *Gymnocalycium* is lacking. The nice illustration should serve as lectotype, but we prefer to abstain from any typification in consideration of the insufficient level of knowledge of this group (see also discussion in *G. leanum*).

Echinocactus mackieanus Hooker, Curtis's Botanical Magazine pl. 3561, 1837. Note. According to the description and illustration this name seems referable to plants nowadays known from Argentina, southern part of the province of Buenos Aires, belonging to the subgenus *Gymnocalycium*. The name has not been used after the original description (except for some citations in the synonymy of *G. gibbosum* in Schumann, 1898; Britton & Rose, 1922; Backeberg, 1959).

Gymnocalycium marquezii Cardenas, Kakt. and. Sukk. 9(2): 26-27, 1958. Type: M. Cardenas 5066, 3.1952, Bolivia, Dept. Tarija, Prov. Entre Rios, near Angosto de Villa Montes. Typus in Herbarium Cardenasianum, Cochabamba (now in LIL).

Gymnocalycium marquezii var. *argentinense* Backeberg nom. inval. (Art. 8.2), Kakteenlexikon: 169, 1966

Gymnocalycium marsoneri Fric ex Y. Ito, Explanatory Diagram of Austroechinocactinae: 175 + 293, 1957.

***Gymnocalycium marsoneri* ssp. matoense** (Buining & Brederoo) P.J. Braun & Esteves, Succulenta 74(3): 131, 1995. Basionym: *Gymnocalycium matoense* Buining & Brederoo 1975.

Gymnocalycium matoense Buining & Brederoo, Kakt. and. Sukk. 26(12): 265-268, 1975. Type: L. Horst & W. Uebelmann 452, 16.9.1974, Brazil, Mato Grosso, near Porto Murтинho (U !); isotype: ZSS.

Gymnocalycium mazanense (Backeberg) Backeberg, Blätt. Kakteenf. 2(2): 74/6, 1935. Basionym: *Echinocactus mazanensis* Backeberg 1932.

Echinocactus mazanensis Backeberg, Kakteenfreund 1(12): 133-134, 1932.

***Gymnocalycium mazanense* var. brevipflorum** (Backeberg) Backeberg, in: Backeberg & Knuth: Kaktus-ABC: 291, 1936. Basionym: *Echinocactus mazanensis* var. *breviflorus* Backeberg 1932.

***Echinocactus mazanensis* var. brevipflorus** Backeberg, Kakteenfreund 1(12): 134, 1932.

- Gymnocalycium mazanense* var. *ferox* Backeberg nom. inval. (Art. 37.1), Die Cactaceae 3: 1767, 1959. Previously invalidly published as *Gymnocalycium mazanense* var. *ferox* Backeberg nom. inval. (Art. 36.1) in: Backeberg & Knuth: Kaktus-ABC: 291, 1936.
- Gymnocalycium mazanense* var. *rhodantherum*** (Boedeker) Backeberg, in: Backeberg & Knuth: Kaktus-ABC: 291, 1936. Basionym: *Echinocactus rhodantherus* Boedeker, Kakteenkunde sine vol.: 13-14, 1934.
- Gymnocalycium mazanense* var. *roseiflorus*** Backeberg, Kakteenfreund 1(12): 134, 1932.
- Gymnocalycium megalothelos*** (Sencke ex K. Schumann) Britton & Rose, The Cactaceae 3: 162, 1922. Basionym: *Echinocactus megalothelos* Sencke ex Schumann 1898.
Echinocactus megalothelos Sencke ex K. Schumann, Gesamtbeschreibung der Kakteen: 415, 1898.
 Note. This name has usually been attributed to Sencke, but there is no indication that he actually provided the validating description to Schumann (Art. 46.4).
- Gymnocalycium megalothelos* var. *delaetianum*** (F. Haage) Schütz, Friciana 6(40): 11, 1966. Basionym: *Echinocactus denudatus* var. *de Laetiana* F. Haage 1898.
- Gymnocalycium megatae*** Y. Ito, Explanatory Diagram of Austroechinocactinae: 172 + 292, 1957.
- Gymnocalycium melanocarpum*** (Arechavaleta) Britton & Rose, The Cactaceae 3: 161-162, 1922. Basionym: *Echinocactus melanocarpus* Arechavaleta 1905.
Echinocactus melanocarpus Arechavaleta, Anales Mus. Nac. Montevideo 5: 220, 1905.
 Note. The description is accompanied by a good illustration; type material may exist in herbaria of Montevideo, where some of Arechavaleta's collections are preserved.
- Gymnocalycium mesopotamicum*** R. Kiesling, Cact. Succ. J. Gr. Brit. 42(2): 39-42, 1980. Type: Cutler & Lonsdale 126-552, 11.1978, Argentina, Prov. Corrientes, Mercedes (K !).
- Gymnocalycium michoga*** Fric ex Y. Ito, Explanatory Diagram of Austroechinocactinae: 175 + 292-293, 1957.
- Gymnocalycium mibanovichii*** (Fric ex Gürke) Britton & Rose, The Cactaceae 3: 153, 1922. Basionym: *Echinocactus mibanovichii* Fric ex Gürke 1905.
Echinocactus mibanovichii Fric ex Gürke, Monatsschr. Kakteenk. 15: 142, 1905.
- Gymnocalycium mibanovichii* f. *nigrum* Y. Ito nom. inval. (Art. 37.1), The Cactaceae: 409, 1981.
- Gymnocalycium mibanovichii* var. *albiflorum* (*)** Pazout, Friciana 3(17): 5-8, 1963. Note. The indication "Holotype in botanic garden of the Carolinensis University of Prague" given in the protologue probably refers to a living specimen (nom. inval. Art. 8.2).
- Gymnocalycium mibanovichii* var. *angustriatum* (*)** Pazout, Friciana 1(7): 3-4 1962.

Note. The indication "Holotype in botanic garden of the Carolinensis University of Prague" given in the protologue probably refers to a living specimen (nom. inval. Art. 8.2?). Original spelling: "*angusto-striatum*". In the same publication there is an illustration titled *G. mihanovichii* var. *stenostriatum* var. nov.; it is not known whether this picture refers to *G. mihanovichii* var. *angustotriatum* and is an alternative name (which would invalidate the name *angustotriatum* according to Art. 32.4), if the caption is a typographical mistake, or if the picture depicts a different variety of the species, not described.

Gymnocalycium mihanovichii var. *chloristicum* F. Ritter nom. nud., Kakteen in Südamerika 1: 265, 1979.

Gymnocalycium mihanovichii var. *filadelfiense* Pazout nom. nud., Friciana 5(29): 10, 1965

Gymnocalycium mihanovichii var. *filadelfiense* Backeberg nom. inval. (Art. 8.2), Kakteenlexikon: 170, 1966. Based on *Gymnocalycium mihanovichii* var. *filadelfiense* Pazout 1965 nom. nud.

Gymnocalycium mihanovichii* var. *fleischerianum Pazout, Kaktusar. Listy 16(10): 158-159, 1951.

Gymnocalycium mihanovichii* var. *friedrichii Werdermann, Blüh. Kakteen and. Sukk. Pflanzen, Bd. 4, Mappe 29, pl.113, 1936.

Gymnocalycium mihanovichii* var. *melocactiforme Pazout, Kaktusar. Listy 16(10): 158-159, 1951.

Gymnocalycium mihanovichii* var. *piraretaense Blossfeld ex Pazout, Kaktusar. Listy 16(10): 159, 1951.

Gymnocalycium mihanovichii var. *roseiflorum* van den Thoon nom. inval. (Art. 36.1), Succulenta 18: 166, 1936.

Gymnocalycium mihanovichii var. *roseiflorum* Y. Ito nom. inval. (Art. 36.1), Cacti 1952: 91, 1952.

***Gymnocalycium mihanovichii* var. *rysanekii* (*)** Pazout, Friciana 5(35): 11, 19, 1965. Note. The indication "Holotypus in collection Papabolis Pragae" given in the protologue probably refers to a living specimen (nom. inval. Art. 8.2?). Often misspelled "*rysanekianum*".

Gymnocalycium mihanovichii* var. *stenogonum Fric ex Pazout, Kaktusar. Listy unnumbered vol., (3): 17-19, 1948. Type: A.V.Fric s.n. ex cult. Coll. G.Moser; (isotypus? ZSS, see Egli, 1987).

Gymnocalycium millaresii Cardenas, Cact. Succ. J. (U.S.) 38: 144-145 + 161, 1966. Type: M.Cardenas 6224, 4.1962, Bolivia, Dept. Potosi, Prov. Saavedra, near Millares, m 2600, Herbarium Cardenasianum, Cochabamba.

Gymnocalycium mirabile Cichra nom. inval (Art. 34.1), *Friciana* 3(20): 7, 11-12, 1963.

Gymnocalycium monvillei (Lemaire) Britton & Rose, *The Cactaceae* 3: 161, 1922.
Basionym: *Echinocactus monvillei* Lemaire 1838.

Echinocactus monvillei Lemaire, *Cactearum aliquot novarum ac insuetarum in horto monvilliano culturarum accurata descriptio*: 14-15, 1838. Original spelling: “*monvillii*”; the description includes a color illustration.

Note. A revision of this species was carried out by Till (1990) and Till & Neuhuber (1993); a large number of infraspecific taxa for geographical variants was described, but no typification of Lemaire’s name was given. Although the description indicates Paraguay as country of origin, the illustration (later reproduced with the addition of three flowers, Lemaire, 1847: pl. 15) clearly matches the actual interpretation of *G. monvillei* for a species distributed in the Argentine province of Cordoba (Till & Neuhuber, 1993). The typification of Lemaire’s epithet, supported by an epitype of known provenance, would be desirable to guarantee the stability of the infraspecific nomenclature of the species.

Echinocactus monvillianus Lemaire nom. illeg. (Art. 52.1), *Iconographie descriptive des Cactées*: pl. 15, 1847.

Gymnocalycium monvillei* ssp. *achirasense (H. Till & Schatzl ex H. Till) H. Till, *Gymnocalycium* 6(3): 102, 1993. Basionym: *Gymnocalycium achirasense* H. Till & Schatzl ex H. Till 1987 (see *G. achirasense*).

Gymnocalycium monvillei* ssp. *achirasense* var. *achirasense* f. *villamercedense H. Till & Neuhuber, *Gymnocalycium* 6(3): 105, 1993. Type: G. Neuhuber 88-79/197, 13.12.1988, Argentina, Prov. San Luis, prope Juan Llerena, m 900 (WU).

Gymnocalycium monvillei* ssp. *achirasense* var. *chacrasense Neuhuber, *Gymnocalycium* 6(3): 105, 1993. Type: G. Neuhuber 90-269/859, 8.12.1990, Argentina, Prov. San Luis, Las Vertientes, m 1050 (WU).

Gymnocalycium monvillei* ssp. *achirasense* var. *echinatum Neuhuber, *Gymnocalycium* 6(4): 108, 1993. Type: G. Neuhuber 91-346/1186, 5.12.1991, Argentina, Prov. San Luis, Sierra de San Luis, prope El Durazno, m 1000-1200 (WU).

Gymnocalycium monvillei* ssp. *achirasense* var. *kainradliae Neuhuber, *Gymnocalycium* 6(4): 107, 1993. Type: G. Neuhuber & A. Kainradl 88-29/47, 28.4.1988, Argentina, Prov. San Luis, Sierra de San Luis, prope Cln. Pringles, m 1300 (WU).

Gymnocalycium monvillei* ssp. *achirasense* var. *orientale Neuhuber, *Gymnocalycium* 6(3): 103, 1993. Type: G. Neuhuber 91-341/1157, 4.12.1991, Argentina, Prov. Cordoba, prope Alpa Corral, m 850 (WU).

Gymnocalycium monvillei* ssp. *brachyanthum (Gürke) H. Till, *Gymnocalycium* 6(3): 102, 1993. Basionym: *Echinocactus brachyanthus* Gürke 1907 (see *G. brachyanthum*).
Gymnocalycium monvillei var. *brachyanthum* (Gürke) Backeberg nom. inval. (Art. 34.1), *Die Cactaceae* 3: 1770, 1959. Basionym: *Echinocactus brachyanthus* Gürke 1907.

Gymnocalycium monvillei* ssp. *brachyanthum* var. *gertrudae Neuhuber, *Gymnocalycium* 6(4): 110, 1993. Type: G. Neuhuber 88-29/50, 28.4.1988, Argentina, Prov. San Luis, Sierra de San Luis, prope Cln. Pringles, m 1300 (WU).

Gymnocalycium monvillei* ssp. *horridispinum (G. Frank ex H. Till) H. Till, *Gymnocalycium* 6(3): 102, 1993. Basionym: *Gymnocalycium horridispinum* G. Frank ex H. Till 1987 (see *G. horridispinum*).

Gymnocalycium monvillei* var. *grandiflorum (Backeberg) H. Till, *Gymnocalycium* 3(3): 38, 1990. Basionym: *Gymnocalycium grandiflorum* Backeberg 1936 (see *G. grandiflorum*).

Note. No type material of *G. grandiflorum* was preserved. The new combination was proposed by Till (l.c.) without typification of the name. This interpretation, although nomenclaturally correct, seems systematically doubtful: Backeberg's descriptions (1936, 1959) may in fact represent a form of *G. mostii* (see Meregalli, 1985).

Gymnocalycium monvillei* var. *steineri H. Till, *Gymnocalycium* 3(3): 39, 1990. Type: H. Till 88-219, 1988, Argentina, Prov. Cordoba, Sierra Grande, m 1850 (WU).

Gymnocalycium moserianum Schütz nom. inval. (Art. 37.1), *Kaktusy* 2: 28-30, 1966.

Gymnocalycium mostii (Gürke) Britton & Rose, *Addisonia* 3: 5, 1918. Basionym: *Echinocactus mostii* Gürke 1906.

Echinocactus mostii Gürke, *Monatsschr. Kakteenk.* 16: 11-12, 1906.

Gymnocalycium mostii centrispina Fric nom. nud., in: Kreuzinger: 14, 1935. Note. A name frequently reported in the "cactus literature".

Gymnocalycium mostii* var. *kurtzianum (Gürke) Backeberg, in: Backeberg & Knuth: *Kaktus-ABC*: 292, 1936. Basionym: *Echinocactus kurtzianus* Gürke, *Monatsschr. Kakteenk.* 16: 55, 1906.

Gymnocalycium mucidum Oehme, *Kakt. and. Sukk. (Berlin)* 1: 197-198, 1937. Lectotype: illustration in Oehme, 1937: 197, des. Piltz, Metzling & Schweitzer, *Gymnos* 11(22): 51-60, 1994.

Gymnocalycium multiflorum (Hooker) Britton & Rose, *Addisonia* 3: 5 + pl. 83, 1918. Basionym: *Echinocactus multiflorus* Hooker 1845.

Echinocactus multiflorus Hooker, *Curtis's Botanical Magazine* 71: pl. 4181, 1845. Type: coloured plate in Hooker (l.c., Art. 9.1).

Note. Hooker (l.c.) clearly stated that he had only one plant, which was illustrated in the plate ("... sent one specimen [the one here figured] ..."). This should be considered the holotype according to Art. 9.1 (& note 1). The name was used for plants from the Argentine province of Cordoba, and is now considered a synonym of *G. monvillei* (see Lambert, 1993a). It has recently been suggested (Till & Till, 1994) that *E. multiflorus* may refer to a Paraguayan species, but no plant matching Hooker's illustration is known from that area; this opinion is based on cultivated material of undetermined origin, which, anyway, does not particularly match the original illustration. This is a quite common case in cactus taxonomy, where many old descriptions were vague and incomplete, did not report the geographical origin of the taxon (or these data were wrong), seldom had illustrations and no type material was preserved. In all these cases the principle of stability in nomenclature should be carefully considered before any change in the current interpretation of a name is proposed (for remarks regarding the

concepts of the ICBN in respect to the problem of stability in nomenclature see Smith & Hawksworth, 1994).

Gymnocalycium multiflorum* var. *albispinum (K. Schumann) Backeberg, in: Backeberg & Knuth: Kaktus-ABC: 293, 1936. Basionym: *Echinocactus multiflorus* var. *albispinus* K. Schumann 1898.

Echinocactus multiflorus* var. *albispinus K. Schumann, Gesamtbeschreibung der Kakteen: 405, 1898. Original spelling: “*albispina*”.

Gymnocalycium multiflorum* var. *hybopleurum (K. Schumann) P. Fournier, Cactées & Plantes Grasses: 44, 1935. Basionym: *Echinocactus multiflorus* var. *hybopleurus* K. Schumann 1898.

Echinocactus multiflorus* var. *hybopleurus K. Schumann, Gesamtbeschreibung der Kakteen: 405, 1898. Original spelling: “*hybopleura*”.

Gymnocalycium multiflorum* var. *parisiense (K. Schumann) Backeberg, in: Backeberg & Knuth: Kaktus-ABC: 293, 1936. Basionym: *Echinocactus multiflorus* var. *parisiensis* K. Schumann 1898.

Echinocactus multiflorus* var. *parisiensis K. Schumann, Gesamtbeschreibung der Kakteen: 405, 1898.

Gymnocalycium neocumingii (Backeberg) Hutchison, Cact. Succ. J. (U.S.) 29: 14, 1957. Basionym: *Weingartia neocumingii* Backeberg, Kakt. and. Sukk. 2(1): 2, 1950. Note. Now ascribed to the genus *Rebutia* K. Schumann (Hunt, 1992).

Gymnocalycium netrelianum (Monville ex Labouret) Britton & Rose, The Cactaceae 3: 154, 1922. Basionym: *Echinocactus netrelianus* Monville ex Labouret 1853.

Echinocactus netrelianus Monville ex Labouret, Monographie de la famille des Cactées: 248, 1853.

Note. Although there is no illustration, the original description is quite detailed; this is probably the oldest name for the yellow flowering taxa of the subgenus *Macrosemineum* (with which it is usually associated) and its use could be fixed with designation of a neotype.

Gymnocalycium neuhuberi H. Till & W. Till, *Gymnocalycium* 5(1): 59-60, 1992. Type: G. Neuhuber 88-077/179, 12.1988, Argentina, Prov. San Luis, south of Sierra de San Luis, m 1300 (WU).

Gymnocalycium neumannianum (Backeberg) Hutchison, Cact. Succ. J. (U.S.) 29: 11, 1957. Basionym: *Echinocactus neumannianus* Backeberg, *Kakteenfreund* 2: 90-91, 1933. Note. Now referred to the genus *Rebutia* K. Schumann (Hunt, 1992).

Gymnocalycium nidulans Fric ex Backeberg, in: Backeberg & Knuth: Kaktus-ABC: 293 + 417, 1936.

Gymnocalycium nigriareolatum Backeberg, *Blätt. Kakteenf.* 1(5): 74/1, 1934. Note: Backeberg's description was also published in *Kaktusar* 5: 80-81, 1934.

Gymnocalycium nigriareolatum var. *densispinum* Backeberg nom. inval. (Art. 37.1), *Die Cactaceae* 3: 1759, 1959. Previously invalidly published as *Gymnocalycium nigriareolatum* var. *densispinum* Backeberg nom. inval. (Art. 36.1), *Katalog 10 Jahre Kakteenforschung*: 16, 1937.

- Gymnocalycium obductum*** Piltz, Succulenta 69(4): 74-78 + title plate, 1990. Type: Piltz 121, 1980, Argentina, Prov. Catamarca, Salinas Grandes (U!).
- Gymnocalycium occultum* (*)** Fric ex Schütz, Friciana 1(7): 4-5 + 8, 1962. Previously invalidly published as *Gymnocalycium occultum* Fric ex Schütz, nom. inval. (Art. 36.1), Friciana 1(6): 5, 1962.
Note. The indication "Holotype in the Municipal succulent collection of Brno", given in the protologue, probably refers to a living specimen (nom. inval. Art. 8.2?).
- Gymnocalycium ochoterenae*** Backeberg, in: Backeberg & Knuth: Kaktus-ABC: 293 + 417, 1936.
Note. The original spelling "*ochoterenae*" must be corrected to "*ochoterenae*" according to Art. 60.11. The species was recently revised (Till & Neuhuber, 1992; Papsch, 1993), with description of infraspecific taxa, but without typification of Backeberg's name. See note in *G. bodenbenderianum*.
- Gymnocalycium ochoterenae* ssp. *herbsthoferianum*** H. Till & Neuhuber, Gymnocalycium 5(4): 75-76, 1992. Type: G. Neuhuber 88-100/250, Argentina, Prov. San Luis, near Lujan, m 650 (WU).
- Gymnocalycium ochoterenae* ssp. *vatteri*** (Buining) W. Papsch, Gymnocalycium 6(1): 79, 1993. Basionym: *Gymnocalycium vatteri* Buining 1950 (see *G. vatteri*).
- Gymnocalycium ochoterenae* ssp. *vatteri* var. *altautinense*** W. Papsch, Gymnocalycium 6(1): 79-80, 1993. Type: H. Amerhauser & F. Strigl 90-412/6, 14.10.1991, Argentina, Prov. Cordoba, near Altautina, m 720-950 (WU). Isotypus: H. Amerhauser & F. Strigl, 90-412/2, 14.10.1991, Argentina, Prov. Cordoba, near Altautina, m 720-950 (WU).
- Gymnocalycium ochoterenae* var. *cinereum*** Backeberg, in: Backeberg & Knuth: Kaktus-ABC: 417, 1936.
- Gymnocalycium ochoterenae* var. *polygonum* Backeberg nom. inval. (Art. 8.2), Kakteenlexikon: 171 + 618, 1966.
- Gymnocalycium ochoterenae* var. *scoparium*** H. Till & Neuhuber, Gymnocalycium 5(4): 74, 1992. Type: G. Neuhuber 88-98/242, Argentina, Prov. San Luis, near Lujan, m 650 (WU).
- Gymnocalycium ochoterenae* var. *tenuispinum* Backeberg nom. inval. (Art. 8.2), Kakteenlexikon: 171 + 618, 1966.
- Gymnocalycium ochoterenae* var. *variispinum* Backeberg nom. inval. (Art. 8.2), Kakteenlexikon: 172 + 618, 1966.
- Gymnocalycium oenanthemum*** Backeberg, Blätt. Kakteenf. 1(9): 74/4, 1934.
Note. Backeberg's description was also published in Kaktusar 5: 105, 1934.
- Gymnocalycium onychacanthum*** Y. Ito, Explanatory Diagram of Austroechinocactinae: 173 + 292, 1957.
- Gymnocalycium ourselianum* (Cels ex Salm-Dyck) Y. Ito, nom. inval. (Art. 41.3b), Cacti

1952: 87, 1952. Basionym: *Echinocactus ourselianum* Cels ex Salm-Dyck 1850, nom. nud. *Echinocactus ourselianus* Cels ex Salm-Dyck nom. nud, Cacteeae in Horto Dyckensi Cultae: 34, 1850.

Note. A name only listed as synonym of *G. multiflorum*, but often cited in the “cactus literature” (i.e., Backeberg, 1959; Schütz, 1986).

Gymnocalycium paediophilum F. Ritter ex Schütz, Kaktusy 13(5): 100-101, 1977. Type: F. Ritter 1179, 1963, Paraguay, Cerro Leon (PZ). The original spelling “*paediophylum*” was a typographical error and was later corrected by Schütz (1986: 104-105). *Gymnocalycium paediophilum* F. Ritter nom. illeg. (Art. 52.1), Kakteen in Südamerika 2: 707, 1980. Type: F. Ritter 1179, 1963, Paraguay, Cerro Leon (U!).

Gymnocalycium paraguayense (K. Schumann) Schütz, Friciana 6(40): 11, 1966. Basionym: *Echinocactus paraguayensis* K. Schumann 1903.

Echinocactus paraguayensis K. Schumann, Bull. Herb. Boissier 2, 3: 252, 1903. Type: E. Hassler 6693, Paraguay, inter rupes prope Chololo, in valle fluminis Y-aca; cultivado Vallertes, 3-IV-1902 (G!).

Gymnocalycium paraguayense* var. *roseiflorum (Hildmann ex K. Schumann) Schütz, Friciana 6(40): 11, 1966. Basionym: *Echinocactus denudatus* var. *roseiflorus* Hildmann ex K. Schumann 1898.

Gymnocalycium paraguayense* var. *scheidelianum (F. Haage) Schütz, Friciana 6(40): 11, 1966. Basionym: *Echinocactus denudatus* var. *scheidelianus* F. Haage 1898.

Gymnocalycium paraguayense* var. *wagnerianum (F. Haage) Schütz, Friciana 6(40): 11, 1966. Basionym: *Echinocactus denudatus* var. *wagnerianus* F. Haage 1898.

Gymnocalycium paraguayense* var. *wieditzianum (F. Haage) Schütz, Friciana 6(40): 11, 1966. Basionym: *Echinocactus denudatus* var. *wieditzianus* F. Haage 1898. Note. See entries under *G. denudatum* for the bibliographical references of the basionyms of these last four names.

Gymnocalycium parvulum (Spegazzini) Spegazzini, Anales Soc. Ci. Argent. 99: 141, 1925. Basionym: *Echinocactus platensis* var. *parvulus* Spegazzini 1905. ***Echinocactus platensis* var. *parvulus*** Spegazzini, Anales Mus. Nac. Buenos Aires 11(Ser.3a;IV): 505, 1905. Type: see Kiesling (1984: 228).

Gymnocalycium parvulum* var. *amoenum H.Till, *Gymnocalycium* 7(2): 125-126, 1994. Type: H. Till 88-199/1736, 16.10.1988, Argentina, Prov. Cordoba, Las Palmas, m 1100-1200 (WU).

Gymnocalycium pflanzii (Vaupel) Werdermann, Blüh. Kakteen and. Sukk. Pflanzen, Bd. 3, Mappe 24, pl.94, 1935. Basionym: *Echinocactus pflanzii* Vaupel 1923.

Echinocactus pflanzii Vaupel, Z. Sukkulantenk. 1: 83, 1923.

Note. This species has a wide distribution and is fragmented in many populations, often described as self-standing species but now more properly considered at infraspecific rank. The original description was based on plants collected in Southern Bolivia, near Villa Montes. The typification of this name seems necessary to guarantee the stability of the infraspecific nomenclature.

Gymnocalycium pflanzii* ssp. *argentinense H. Till & W. Till, Kakt. and. Sukk. 39(12): 273-277, 1988. Type: ex cult. H. Till 684, Anonymus, Argentina, Prov. Salta, near Gonzalez, Rio Juramento (WU).

Gymnocalycium pflanzii var. *albipulpa* F. Ritter nom. illeg. (Art. 52.1), Kakteen in Südamerika 2: 660, 1980. Type: F. Ritter 397, Bolivia, isotypus in (ZSS) [Holotypus cited for (U), but not found there in 1991].

Note. Ritter explicitly stated that this taxon also included *G. zegarrae*, which had previously been reduced to varietal status of *G. pflanzii* by Donald.

Gymnocalycium pflanzii* var. *eytianum (Cardenas) Donald, Natl. Cact. Succ. J. 26: 100, 1971. Basionym: *Gymnocalycium eytianum* Cardenas 1958.

Note. Although Donald wrongly attributed *G. eytianum* to a taxon belonging to *G. pflanzii* s.l., this is a correct name according to Art. 7.4. *G. eytianum* Cardenas is in reality referable to *G. marsoneri* Ito *sensu lato*. Donald's error was caused by an unclear photo in Cardenas (1960, see also Keßler, 1981).

Gymnocalycium pflanzii* var. *izozogsii (Cardenas) Donald, Natl. Cact. Succ. J. 26: 100, 1971. Basionym: *Gymnocalycium izozogsii* Cardenas 1966.

Gymnocalycium pflanzii* var. *izozogsii* f. *chuisacanam (Cardenas) Donald, Natl. Cact. Succ. J. 26: 100, 1971. Basionym: *Gymnocalycium chuisacanam* Cardenas 1966.

Gymnocalycium pflanzii* var. *lagunillasense (Cardenas) Donald, Natl. Cact. Succ. J. 26: 100, 1971. Basionym: *Gymnocalycium lagunillasense* Cardenas 1958.

Gymnocalycium pflanzii* var. *millaresii (Cardenas) Donald, Natl. Cact. Succ. J. 26: 100, 1971. Basionym: *Gymnocalycium millaresii* Cardenas 1966.

Gymnocalycium pflanzii* var. *riograndense (Cardenas) Donald, Natl. Cact. Succ. J. 26: 100, 1971. Basionym: *Gymnocalycium riograndense* Cardenas 1958.

Gymnocalycium pflanzii* var. *zegarrae (Cardenas) Donald, Natl. Cact. Succ. J. 26: 100, 1971. Basionym: *Gymnocalycium zegarrae* Cardenas 1958.

Note. See respective entries for the bibliographical references of the basionyms of these varieties.

***Gymnocalycium piltziorum* (*)** Schütz, Kakt. and. Sukk. 33(7): 144-145, 1982. Type: Piltz 38, 1976, Argentina, Prov. La Rioja, Sierra Velasco (PZ). Isotypes (?) in (ZSS). Note. Although the protologue reported that the type had been deposited in (PZ), one of the authors (DM) was shown the living "holotype" by Schütz himself in 1989. At that time Schütz stated that he would give it to an Austrian herbarium (pers. comm.), but we don't know whether this plant was deposited or anyway preserved. In the original description there is no reference to isotypes. See also discussion in the chapter about typification (nom. inval. Art. 8.2').

Gymnocalycium platense (Spegazzini) Britton & Rose, The Cactaceae 3: 163-164, 1922. Basionym: *Echinocactus platensis* Spegazzini 1896.

Echinocactus platensis Spegazzini, Contribucion al Estudio de la Flora de la Sierra de Ventana: 28-29, 1896. Neotype: R. Kiesling 3356, 30.12.1981, Argentina, Buenos Aires, Sierra de la Ventana, hills after Estancia las Vertientes (des. Kiesling, 1982: 441).

- Echinocactus gibbosus* var. *platensis*** (Spegazzini) Spegazzini, *Anales Mus. Nac. Buenos Aires* (Ser.3,2): 7, 1902. Basionym: *Echinocactus platensis* Spegazzini, 1896.
- Gymnocalycium platense* var. *baldianum* (Spegazzini) Y. Ito nom. inval. (Art. 33.2), Saboten no saibai to kansho, 1971. Basionym: *Echinocactus* var. Speg. 1905 [sic!].
- Gymnocalycium platense* var. *leptanthum* (Spegazzini) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 194, 1957. Basionym: *Echinocactus* var. Speg. 1905 [sic!].
- Gymnocalycium platense* var. *parvulum*** (Spegazzini) Y. Ito, *Cacti* 1952: 89, 1952. Basionym: *Echinocactus platensis* var. *parvulus* Speg. 1905.
- Gymnocalycium platense* var. *queblianum* (Spegazzini) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 194, 1957. Basionym: *Echinocactus* var. Speg. 1905 [sic!].
- Gymnocalycium platense* var. *ventanicola*** (Spegazzini) R. Kiesling, *Darwiniana* 24(14): 437-442, 1982. Basionym: *Echinocactus gibbosus* var. *ventanicola* Spegazzini 1903. ***Echinocactus gibbosus* var. *ventanicola*** Spegazzini, *Anales Mus. Nac. Buenos Aires* (Ser.3,2): 7, 1903. Type: see Kiesling (1984). *Gymnocalycium gibbosum* var. *ventanicolum* (Spegazzini) Y. Ito nom. inval. (Art. 33.2), Explanatory Diagram of Austroechinocactinae: 190, 1957. Basionym: *Echinocactus* var. Speg., 1903 [sic!].
- Gymnocalycium polyanthum* Y. Ito nom. illeg. (Art. 52.1), Saboten no saibai to chishiki, 1954. Note. Unnecessary substitute for *Gymnocalycium multiflorum* (Hooker) Britton & Rose.
- Gymnocalycium polyanthum* var. *albispinum* Y. Ito nom. illeg. (Art. 52.1), Saboten no saibai to chishiki, 1954. Note. Unnecessary substitute for *Gymnocalycium multiflorum* var. *albispinum* (K. Schumann) Backeberg.
- Gymnocalycium polyanthum* var. *parisiense* Y. Ito nom. illeg. (Art. 52.1), Saboten no saibai to chishiki, 1954. Note. Unnecessary substitute for *Gymnocalycium multiflorum* var. *parisiense* (K. Schumann) Backeberg.
- Gymnocalycium proliferum*** (Backeberg) Backeberg, in: Backeberg & Knuth: *Kaktus-ABC*: 294, 1936. Basionym: *Echinocactus prolifer* Backeberg 1932. ***Echinocactus prolifer*** Backeberg, *Kakteenfreund* 1(12): 132-133, 1932. Note. The original description includes photos of two plants but no precise locality data are given; this name can be typified only in a revision of the whole complex of related taxa (see comments in *E. calochlorus* Boedeker).
- Gymnocalycium proliferum* var. *calochlorum* (Boedeker) Backeberg nom. inval. (Art. 11), in: Backeberg & Knuth: *Kaktus-ABC*: 295, 1936. Basionym: *Echinocactus calochlorus* Boedeker 1932.
- Gymnocalycium pseudocalochlorum* Schütz nom. illeg. (Art. 52.1), *Friciana* 3(16): 8, 1963. Note: Superfluous name for *Gymnocalycium proliferum* (Backeberg) Backeberg.

Gymnocalycium pseudomalacocarpus Backeberg nom. inval. (Art. 8.2), Kakteenlexikon: 172, 1966.

Gymnocalycium pseudoragonesei nom. nud.

Note. This name was first used for traded material, but was subsequently reported in the "cactus literature" (i.e., Strigl, 1983).

Gymnocalycium pugionacanthum Backeberg ex H. Till, Kakt. and. Sukk. 38(8): 191, 1987. Type: H. Fechner s.n., ex cult., Argentina, Prov. Cordoba (WU). Previously invalidly published as *Gymnocalycium pugionacanthum* Backeberg nom. inval. (Art. 8.2), Kakteenlexikon: 172, 1966.

Gymnocalycium pulquinense (Cardenas) Hutchison, Cact. Succ. J. (U.S.) 29: 13, 1957. Basionym: *Weingartia pulquinensis* Cardenas, Revista Agric. Cochabamba 7(6): 26-29, 1951.

Note. Now attributed to the genus *Rebutia* K. Schumann (Hunt, 1992).

Gymnocalycium pulquinense* var. *corroanum (Cardenas) Hutchison, Cact. Succ. J. (U.S.) 29: 13, 1957. Basionym: *Weingartia pulquinensis* var. *corroana* Cardenas, Revista Agric. Cochabamba 7(6): 26-29, 1951.

Note. Now attributed to the genus *Rebutia* K. Schumann (Hunt, 1992).

***Gymnocalycium pungens* (*)** Fleischer, Fricana 1(7): 1 + 8, 1962

Note. The indication "Holotype in the Municipal Collection of Brno" probably refers to a living specimen (nom. inval. Art. 8.2?).

Gymnocalycium queblianum (F. Haage ex Quehl) Vaupel ex Hosseus, Revista Centro Estud. Farm. Cordoba 2(6): 22, 1926. Basionym: *Echinocactus queblianus* F. Haage ex Quehl.

Echinocactus platensis* var. *queblianus (F. Haage ex Quehl) Spegazzini., Anales Mus. Nac. Buenos Aires 11(Ser.3a;IV): 504, 1905. Basionym: *Echinocactus queblianus* F. Haage ex Quehl 1899. Original spelling: "*Quebliana*".

Echinocactus queblianus F. Haage ex Quehl, Monatsschr. Kakteenk. 9: 43-44, 1899. Note. Since the first half of this century this name has been attributed to a species native to the Argentine province of Córdoba, belonging to the subgenus *Trichomosemineum*. However, a discussion has recently arisen (Meregalli, 1993; Lambert, 1993b; Schmidt, 1993; Till, 1993), in which Till (l. c.) suggested that alternatively it could be referred to a taxon in the subgenus *Gymnocalycium* (*G. leptanthum*) over which it would have priority. The two species are morphologically very similar, only seeds often allowing a sure distinction. The description however does not mention the seed and thus it does not allow a sure identification between the two species; no herbarium type material is known to exist and no illustration was originally included; a photo subsequently published (Quehl, 1900) was claimed to represent the type specimen, but it does not match the original description, thus adding more confusion. We strongly recommend to preserve the current usage of the name for the taxon in the subgenus *Trichomosemineum* by selecting a neotype.

Gymnocalycium queblianum var. *albispinum* Bozsing ex Backeberg nom. inval. (Art. 37.1), Die Cactaceae 3: 1722, 1959.

Gymnocalycium queblianum var. *caespitosum* Kreuzinger nom. inval. (Art. 36.1), Verzeichnis amerikanischer und anderer Sukkulente mit Revision der Kakteen: 14, 1935.

- Gymnocalycium queblianum* var. *flavispinum* Bozsing ex Backeberg nom. inval. (Art. 37.1), Die Cactaceae 3: 1722, 1959.
- Gymnocalycium queblianum* var. *rolfianum*** Schick, Sukkulantenkunde 2: 26, 1948. Type: Schick s.n. ex cult. (ZSS)
- Gymnocalycium queblianum* var. *stellatum*** Dölz, Sukkulantenkunde 6: 30-31, 1957. Published as *Gymnocalycium queblianum* var. *stellatum* (Spegazzini) Dölz [sic!], based on *Echinocactus stellatus* Spegazzini 1905, which was an illegitimate name. Therefore this has to be considered a new name published by Dölz.
- Gymnocalycium queblianum* var. *zantnerianum*** Schick, Sukkulantenkunde 2: 25-26, 1948. Type: Schick 731 ex cult. (ZSS, seeds, according to the original description, but not mentioned by Egli, 1987).
- Gymnocalycium ragonesei*** Castellanos, Lilloa 23: 5-13, 1950. Type: Ragonese 16.120, 13.12.1949, Argentina, Prov. Catamarca, Salinas Grandes, between km 969 and Totoralejos (LIL 16120). Note. Sometimes wrongly spelled “*ragonesii*”.
- Gymnocalycium rauschii*** H. Till & W. Till, Succulenta 69(2): 27-31, 1990. Type: ex cult. H. Till 408, W. Rausch 350 pro parte, Uruguay, Ansina (WU).
- Gymnocalycium reductum*** (Link) Pfeiffer ex Mittler, Taschenbuch für Cactusliebhaber 2ed.: 48 + 124, 1844. Basionym: *Cereus reductus* (Link) DC. 1828.
Cereus reductus (Link) DC., Prodromus systematis naturalis regni vegetabilis 3: 463, 1828. Basionym: *Cactus reductus* Link 1822.
Cactus reductus Link, Enumeratio 2: 21, 1822.
- Gymnocalycium rbodantherum*** (Boedeker) Backeberg, in: Backeberg & Knuth: Kaktus-ABC: 291, 1936. Basionym: *Echinocactus rbodantherus* Boedeker 1934.
Echinocactus rbodantherus Boedeker, Kakteenkunde: 13-14, 1934.
- Gymnocalycium riograndense*** Cardenas, Kakt. and. Sukk. 9(2): 24-25, 1958. Type: M.Cardenas 5064, 3.1955, Bolivia, Dept. Santa Cruz, Prov. Valle Grande, at banks of Rio Grande between Higuera (Santa Cruz) and Ocampo (Chuquisaca), in Herbarium Cardenasianum, Cochabamba (BOLV !).
- Gymnocalycium riojense*** Fric ex H. Till & W. Till, *Gymnocalycium* 4(2): 48-49, 1991. Type: H. Till 88-122, 29.9.1988, Argentina, Prov. La Rioja near Bazan (WU). Previously invalidly described as *Gymnocalycium riojense* Fric ex Pazout nom. inval. (Art. 37.1), in Pazout, Valnicek & Subik: Kaktusy: 132, 1960.
- Gymnocalycium riojense* ssp. *kozelskyanum*** H. Till & W. Till, *Gymnocalycium* 4(3): 52-53, 1991. Type: H. Till 87-90, 21.10.1987, Argentina, Prov. La Rioja, Dept. Independencia (WU). Paratypus: H. Fehser s. n., 1963, Argentina, Prov. La Rioja (WU).
- Gymnocalycium riojense* ssp. *kozelskyanum* var. *mirandaense*** H. Till & W. Till, *Gymnocalycium* 4(3): 53-54, 1991. Type: H. Till 87-89, 20.10.1987, Argentina, Prov. La Rioja, Dept. Grl. Lavalle (WU).

Gymnocalycium riojense* ssp. *kozelskyanum* var. *sanjuanense H. Till & W. Till, *Gymnocalycium* 4(3): 54, 1991. Type: G. Neuhuber 88/14, 10.12.1986, Argentina, Prov. San Juan, m 800 (WU). Paratypus: W. Rausch 548a, 1972, Argentina, Dept. Jachal, between San Jose de Jachal and Niquivil (WU).

Gymnocalycium riojense* ssp. *paucispinum H. Till & W. Till, *Gymnocalycium* 4(4): 55-56, 1991. Type: H. Till 87-8, 11.10.1987, Argentina, Prov. La Rioja, Sierra Brava (WU). Paratypus: U-2176, Argentina, ex coll. K.-H. Uhlig (WU).

Gymnocalycium riojense* ssp. *paucispinum* var. *guasayanense Strigl, *Gymnocalycium* 4(4): 57, 1991. Type: F. Strigl 89-273, 14.10.1989, Argentina, Prov. Santiago del Estero, Sierra de Guasayan (WU).

Gymnocalycium riojense* ssp. *paucispinum* var. *platygonum H. Till & W. Till, *Gymnocalycium* 4(4): 56-57, 1991. Type: H. Till 87-7, 11.10.1987, Argentina, Prov. Catamarca, north of Salinas Grandes (WU).

Gymnocalycium riojense* ssp. *piltziorum H. Till & W. Till, *Gymnocalycium* 4(3): 51-52, 1991. Type: H. Till 88-174, 10.10.1988, Argentina, Prov. La Rioja, Dept. Castro Barros (WU).

Gymnocalycium riojense* ssp. *riojense* var. *gutbrianum H. Till & W. Till, *Gymnocalycium* 4(2): 49-50, 1991. Type: H. Till 87-16, 13.10.1987, Argentina, Prov. La Rioja, Dique Los Sauces, m 550-600 (WU).

Gymnocalycium riojense* ssp. *riojense* var. *pipanacoense H. Till & W. Till, *Gymnocalycium* 4(2): 50, 1991. Type: H. Till 87-43, 16.10.1987, Argentina, Prov. Catamarca, between Salar de Pipanaco and Sierra de Manchao (WU).

Gymnocalycium ritterianum Rausch, *Kakt. and. Sukk.* 23(7): 180-181, 1972. Type: W. Rausch 126, Argentina, La Rioja (cited for WU, but, according to Eggl, 1987, deposited in ZSS).

Gymnocalycium rosae H. Till, *Gymnocalycium* 8 (3): 159-162, 1995. Type: H. Till 93-639, 22.02.1993, Argentina, Prov. Salta, Dept. Candelaria, in fruticetis collium prope El Erete, m 850 (WU).

Gymnocalycium saglionis (Cels) Britton & Rose, *The Cactaceae* 3: 157, 1922. Basionym: *Echinocactus saglionis* Cels 1847. Original spelling: *G. saglione*. ***Echinocactus saglionis*** Cels, *Portefeuille des Hort.* 1847. [not seen] Note. The original publication was not available to us. It could be a gardener textbook including some descriptions or a simple index of plants and we cannot ascertain whether this name was validly published.

Gymnocalycium saglionis var. *bolivianum* Cardenas nom. inval. (Art. 34.1), *Revista Agric.* 7, 1952 (?), according to Cardenas 1958: 22).

Gymnocalycium saglionis* var. *juyuyense Backeberg, *Kaktusar* 5: 106, 1934.

Gymnocalycium saglionis var. *rubrispinum* Backeberg nom. inval. (Art. 34.1), *Kakteen-*

lexikon: 173, 1966. Listed as nomen nudum.

Gymnocalycium saglionis var. *tilcarensis* Backeberg nom. inval. (Art. 36.1), in: Backeberg & Knuth: Kaktus-ABC: 295, 1936.

Gymnocalycium sanguiniflorum (Werdermann) Werdermann in: Köhler, Kakteenkunde, unnumbered vol. (10): 182-184, 1936. Basionym: *Echinocactus sanguiniflorus* Werdermann 1932.

Note. In the paper published by Köhler (l.c.) an illustration is titled "*G. sanguiniflorum* Werd. nov. comb. *". The asterisk is explained: "ex litt. E.W. (D. Schriftleiter)". This is a valid combination (Art. 46.2).

Echinocactus sanguiniflorus Werdermann, Feddes Repert. 30: 56-57, 1932.

Gymnocalycium schatzianum Strigl & W. Till, Kakt. and. Sukk. 36(12): 250-253, 1985. Type: W. Rausch 541, 1972, Argentina, Prov. Buenos Aires, near Balcarce (WU).

Gymnocalycium schickendantzii (F.A.C. Weber) Britton & Rose, The Cactaceae 3: 164-165, 1922. Basionym: *Echinocactus schickendantzii* F.A.C. Weber 1896.

Echinocactus schickendantzii F.A.C. Weber, in: Bois: Dictionnaire d'Horticulture: 470, 1896.

Gymnocalycium schickendantzii* var. *delaetii (K. Schumann) Backeberg, in: Backeberg & Knuth: Kaktus-ABC: 196, 1936. Basionym: *Echinocactus delaetii* K. Schumann 1901 (see *G. delaetii*).

Gymnocalycium schroederianum Osten, Anales Mus. Hist. Nat. Montevideo 2, 5(1): 60-63 + pl. 49-50, 1941. Type: J. Schröder, 04.1922, Uruguay, Distr. Rio Negro, Nueva Melhem, Herb. C. Osten 16-873.

Gymnocalycium schroederianum* ssp. *bayense R. Kiesling, Cact. Succ. J. (U.S.) 59: 44-49, 1987. Type: R. Kiesling & A. G. Lopez 4323, 07.1981, Argentina, Prov. Buenos Aires, Sierras Bayas (SI !).

Gymnocalycium schroederianum* ssp. *paucicostatum R. Kiesling, Cact. Succ. J. (U.S.) 59: 44-49, 1987. Type: A. Schinini & al. 21678, 12.11.1981, Argentina, Prov. Corrientes, Arroyo Mocoreta (SI !).

Gymnocalycium schuetzianum H. Till & Schatzl, Kakt. and. Sukk. 32(10): 234-236, 1981. Type: Friedrich Ritter 430, Argentina, Cordoba, Cruz del Eje (WU, Holotype + Isotype).

Gymnocalycium sigelianum (Schick) Hosseus, Revista Centro Estud. Farm., Cordoba 2(6): 16, 1926. Basionym: *Echinocactus sigelianus* Schick 1923

Echinocactus sigelianus Schick, Möller's Deutsche Gärtner-Zeitung 38(26): 201, 1923. Note. An illustration is provided; see note in *E. sutterianus* Schick about typification of this name.

Gymnocalycium spegazzinii Britton & Rose, The Cactaceae 3: 155, 1922. New name for *Echinocactus loricatus* Spegazzini 1905 non Poselger 1853.

Gymnocalycium spegazzinii var. *horizonthalonium* Backeberg nom. inval. (Art. 34.1), Kakteenlexikon: 174, 1966.

Gymnocalycium spegazzinii var. *longispinum* Anda & Yam Na nom. inval. (Art. 36.1), Succulentarium Japonia 4(23): 19, 1961.

Gymnocalycium spegazzinii* var. *major Backeberg, Cact. Succ. J. (U.S.) 23: 88, 1951. Previously invalidly published as *Gymnocalycium spegazzinii* var. *mayor* Backeberg nom. inval. (Art. 36.1), Blätter für Kakteenforschung 4 (74): 10, 1936.

Gymnocalycium spegazzinii* var. *punillense H. Till & W. Till, *Gymnocalycium* 7(1): 119, 1994. Type: H. Till, 93-605, 12.02.1993, Argentina, Prov. Salta, in valle fluminis Rio de Las Conchas, prope pagum La Punilla, m 1670 (WU).

Gymnocalycium spegazzinii var. *tortispinum* Y. Ito nom. inval. (Art. 37.1), The Cactaceae: 391, 1981.

Gymnocalycium stellatum Spegazzini, Anales Soc. Ci. Argent. 99: 142-143, 1925. Previously illegitimately published as *Echinocactus stellatus* Spegazzini non Scheidweiler 1840, nom illeg. (Art. 53.1, see Strong, 1975), Anales Mus. Nac. Buenos Aires 11 (Ser.2;4): 505, 1905. Type (?): LPS 14338 "*Echinocactus stellatus* ex Cordoba (I-99)" (see Kiesling, 1984: 228)

Gymnocalycium stellatum var. *minimum* (Pazout) Strong nom. inval. (Art. 33.2), Natl. Cact. Succ. J. 30(2): 49-50, 1975. Based on *G. asterium* var. *minimum* Pazout nom. inval.

Gymnocalycium stellatum var. *paucispinum* (Backeberg) Strong nom. inval. (Art. 33.2), Natl. Cact. Succ. J. 30(2): 49-50 1975. Based on *G. asterium* var. *paucispinum* Backeberg nom. inval.

Gymnocalycium stenopleurum F. Ritter, Kakteen in Südamerika 1: 265-268, 1979. Type: F. Ritter 1176, Paraguay, Cerro Leon (U !).

Gymnocalycium striglianum Jeggel ex H. Till, Kakt. and. Sukk. 38(8): 191, 1987. Type: W. Rausch s.n., Argentina, Prov. Mendoza (WU). Previously invalidly published as *Gymnocalycium striglianum* Jeggel nom. inval. (Art. 8.2), Kakt. and. Sukk. 24(12): 267-268, 1973.

Gymnocalycium stuckertii (Spegazzini) Britton & Rose, The Cactaceae 3: 165, 1922. Basionym: *Echinocactus stuckertii* Spegazzini 1905.

Echinocactus stuckertii Spegazzini, Anales Mus. Nac. Buenos Aires 11(Ser.3a;IV): 502, 1905. Type: (Isotypus ?) Stuckert 14, 22.1.1899, Argentina, Prov. Cordoba (LPS: 23054 & LPS: 23088) (see Rant & Zöllner 1989).

Gymnocalycium sutterianum (Schick) Hosseus, Revista Centro Estud. Farm., Cordoba 2(6): 16, 1926. Basionym: *Echinocactus sutterianus* Schick 1923.

Echinocactus sutterianus Schick, Möller's Deutsche Gärtner-Zeitung 38(26): 201, 1923. Note. The description is accompanied by an illustration, but any typification of this name should be associated with an epitype and made in a revision which should also

take into account the two other names simultaneously described (*E. capillaensis* Schick and *E. sigelianus* Schick).

Brachycalycium tilcarensis Backeberg, Cactaceae, 2.Teil, 1941 (publ. June 1942): 78, 1942. Note. No valid combination in *Gymnocalycium* exists; this taxon, however, is actually included in *G. saglionis*, at infraspecific level at most.

Gymnocalycium tillianum Rausch, Kakt. and. Sukk. 21(4): 66, 1970. Type: W. Rausch 227, Argentina, Prov. Catamarca, Sierra Ambato (WU).

Gymnocalycium tobuschianum Schick, Cact. Succ. J. Gr. Brit. 15: 36 (ill.) + 44, 1953.

Gymnocalycium tortuga Blossfeld ex Backeberg nom. inval. (Art. 8.2, 37.1), Die Cactaceae 3: 1784, 1959.

Gymnocalycium triacanthum Backeberg nom. inval. (Art. 8.2, 37.1), Die Cactaceae 3: 1730, 1959

Gymnocalycium tudae Y. Ito, Explanatory Diagram of Austroechinocactinae: 172+292, 1957.

Gymnocalycium tudae* var. *bolivianum F. Ritter, Kakteen in Südamerika 2: 663, 1980. Type: F. Ritter 1133, 1963, Bolivia, Prov. Cordillera, Boyuibe (U !).

Gymnocalycium tudae var. *pseudomalacocarpus* (Backeberg) Donald nom. inval. (Art. 8.2, 32.1), Natl. Cact. Succ. J. 26(4): 100, 1971. Based on *Gymnocalycium pseudomalacocarpus* Backeberg nom. inval.

Gymnocalycium uebelmannianum Rausch, Succulenta 51(4): 61-64, 1972. Type: W. Rausch 141, Argentina, Prov. La Rioja, Sierra de Velasco (W !) [isotypes in ZSSJ].

Gymnocalycium uruguayense (Arechavaleta) Britton & Rose, The Cactaceae 3: 162, 1922. Basionym: *Echinocactus uruguayensis* Arechavaleta 1905.

Echinocactus uruguayensis Arechavaleta, Anales Mus. Nac. Montevideo 5: 218, 1905. Note. The description is accompanied by a good illustration; type material may exist in Herbaria of Montevideo, where some of Arechavaleta's collections are preserved.

Gymnocalycium uruguayense* f. *depressum Osten, Anales Mus. Hist. Nat. Montevideo 2, 5(1): 59 + pl. 48, 1941. Alternative name (Art. 34.2) for *Echinocactus uruguayensis* f. *depressum* Osten 1941. Original spelling: "*depressa*".

Echinocactus uruguayensis* f. *depressum Osten, Anales Mus. Hist. Nat. Montevideo 2, 5(1): 59 + pl. 48, 1941. Type: J. Schröder, 01.1922, Uruguay, Maldonado, Sierra de Valdivia. Herb. C. Osten 16.868. Original spelling: "*depressa*".

Gymnocalycium uruguayense* var. *roseiflorum Y. Ito, Explanatory Diagram of Austroechinocactinae: 198 + 293, 1957. Previously invalidly published as *Gymnocalycium uruguayense* var. *roseiflorum* Y. Ito nom. inval. (Art. 36.1), Cacti 1952, 1952. Based on *Gymnocalycium uruguayense* fl. *rosea* Fric nom. nud. 1929.

Gymnocalycium valnicekianum Jajo, Kaktusar 5: 73-74, 1934.

Gymnocalycium valnicekianum* var. *polycentralis Schütz, Kaktusar. Listy: 41, 1949.

Gymnocalycium vatteri Buining, Succulenta 29(5): 65-67, 1950.

Note: A doubtful type is reported for ZSS by Eggli (1987: 41).

Gymnocalycium velenowskyi Spegazzini, in: Marshall & Bock: Cactaceae: 152, 1941. = *Notocactus velenowskyi* n.n.

Note. A name erroneously included in *Gymnocalycium* in Marshall & Bock (l.c.) for a taxon presently attributed to the genus *Parodia* Spegazzini.

Gymnocalycium venturianum Fric ex Backeberg, Kaktusar 5: 61-63, 1934.

Gymnocalycium venturianum Backeberg ex Y. Ito nom. illeg. (Art. 52.1), The Cactaceae: 409, 1981.

Gymnocalycium villamercedense F. Ritter nom. inval. (Art. 34.1), Kakteen in Südamerika 2: 477, 1980. Cited as nomen nudum.

Gymnocalycium vorwerkii (Fric) Hutchison, Natl. Cact. Succ. J. 14: 38, 1959. Basionym: *Neowerdermannia vorwerkii* Fric, Kaktusar 1(11): 85-87, 1930.

Note. Now attributed to the genus *Neowerdermannia* Fric (Hunt, 1992).

Gymnocalycium weissianum Backeberg, in: Backeberg & Knuth, Kaktus-ABC: 296 + 417, 1936.

Gymnocalycium weissianum var. *atoroseum* Backeberg nom. inval. (Art. 37.1), Die Cactaceae 3: 1763-1764, 1959. Previously invalidly published as *Gymnocalycium weissianum* var. *atoroseum* Backeberg nom. inval. (Art. 36.1), in: Backeberg & Knuth, Kaktus-ABC: 297, 1936.

Gymnocalycium weissianum var. *cinerascens* Backeberg nom. inval. (Art. 37.1), Die Cactaceae 3: 1764, 1959. Previously invalidly published as *Gymnocalycium weissianum* var. *cinerascens* Backeberg nom. inval. (Art. 36.1), in: Backeberg & Knuth, Kaktus-ABC: 297, 1936.

Gymnocalycium westii Hutchison, Cact. Succ. J. (U.S.) 29(1): 11-14, 1957. Type: J. West 6367, 21.3.1936, Bolivia, Dept. Potosi, near Cuchu Ingenio, 40 km south of Potosi (UC Holotype, US Clonotype).

Note. Now attributed to the genus *Rebutia* K. Schumann (Hunt, 1992).

Gymnocalycium zegarrae Cardenas, Kakt. and. Sukk. 9(2): 21-22, 1958. Type: M. Cardenas 5019, 10.1947, Bolivia, Prov. Campero, between Perez and Mairana (Holotype in Herbarium Cardenasianum, Cochabamba, now in LIL; isotype: US).

Catalogue names.

The following specific epithets of *Gymnocalycium* mainly appeared in trade- and name-lists and are *nomina nuda*. Some were spelled in different ways, and we report the most common form. More probably exist, and also several more names were used at infraspecific level.

albiflorum, *albifructum*, *andalgalensis*, *antherosacos*, *azureum*, *blossfeldiorum*, *bolivia-*

num, brevispinum, brevistylum, buiningii, bustoensis, cactiformis, caespitosum, carrizalensis, castanoides, cbloranthum, cblorostictum, citriflorum, cordobensis, depressum, deviatum, dominguezianum, doppianum, elubilton, esposteo, eurispinum, famatimense, fiadelfiense, frankianum, fucarocense, gensei, griseum, herteri, intermedium, karvinskyanum, knollii, kroenleinii, longiflorum, longispinum, marayes, microspermum, mistiensis, nickeri, nigrispinum, odoratum, oebmeanum, pallidum, pampagrlandensis, pazoutianum, pentacanthum, pilcomayoense, piricarpum, pirquitense, polycephalum, pseudocastellanosi, pseudonobile, pseudoquehlianum, pseudovatteri, rosanthemum, roseicanthum, rotundicarpum, rubriflorum, saipinense, sauerei, seminudum, smueldersii, stenocarpum, straussianum, subgibbosum, taratensis, tominense, vallegrandensis, williamsii, zantnerianum.

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**An annotated checklist of the genus *Gymnocalycium* Pfeiffer
ex Mittler – Addenda et Corrigenda**

Detlev Metzging

AG Pflanzenökologie, FB 7, Universität Oldenburg,
D-26111 Oldenburg, Germany

Massimo Meregalli

Dip. Biologia Vegetale, Università di Torino, Viale Mattioli 25,
I-10125 Torino, Italy

Wolfgang Borgmann

Forsthaus Haarhof, D-59757 Arnsberg-Vosswinkel, Germany

Three years ago a list of *Gymnocalycium* names was published by Metzging et al. (1995). Meanwhile some new names were published and it became obvious that some additions and corrections to the nomenclatural checklist are necessary. Therefore we submit here a supplement in which new names published up to the end of November 1998 are considered. The new entries, published after 1995 or missed in the list are marked with a ¶ here, and corrections or additions are underlined. For further explanation, including the use of the asterisk (*), see Metzging et al. (l.c.).

Names in and below the rank of species

Gymnocalycium asterium var. *minimum* Pazout, Friciana 1(6): 7 (1962), nom. inval. (Art. 43.1). Based on *G. stellatum* var. *minimum* Pazout (1960) nom. nud.

¶**G. berchtii** Neuhuber, *Gymnocalycium* 10(3): 218–220 (1997). Type: Argentina, Prov. San Luis, Los Chañares, 690 m, 16 Dec 1989, *G. Neuhuber* 89-158 (WU, hol.).

¶*G. bruchii* var. *spinosissimum* [sic!] (Haage f.) Ito, *Cacti* 1952: 91 (1952), nom. inval. (Art. 36.1).

G. eytianum Cárdenas, *Kakt. and. Sukk.* 9(2): 25–26 (1958). Type: Bolivia, Dept. Santa Cruz, Prov. Cordillera, near Eyti, Mar 1949, *M. Cárdenas* 5065 (Herb. Card., now at LIL). Note: In *Kakt. and. Sukk.* 11(3): 46 (1960) a supplement to the description (fruit and seed) was published. A correction of the wrong caption was given in *Kakt. and. Sukk.* 12(10): 159 (1961).

G. friedrichii (Werdermann) Pazout, Friciana 4(23): 12 (1964), nom. inval. (Art. 34.1). Based on *G. mihanovichii* var. *friedrichii* Werdermann (1936).

G. friedrichii var. *angustostriatum* (Pazout) Pazout, Friciana 4(23): 12 (1964) nom. inval. (Art. 33.2, 43.1).

G. friedrichii var. *moserianum* Pazout, *Succulenta* 45: 99–100 (July 1966), nom. inval. (Art. 43.1, 37.1). Also published in Friciana 6(37): 19–20, Ills. 1–4. (August 1966).

¶**G. gibbosum** f. ***cerebriforme*** (Spegazzini) Papsch, *Gymnocalycium* 9(4): 201 (1996). Basionym: *Echinocactus gibbosus* var. *cerebriformis* (1899). Note: This name of Spegazzini is based only on a cristate. The combination as a forma of *G. gibbosum* is formally correct, although quite superfluous from a taxonomic view. Papsch (l.c.) designates an epitype [Argentina, Prov. Buenos Aires, near Carmen de Patagones, embankment of Rio Negro, 7 Oct 1989, *W. Papsch* 89-54/67a (WU)], although the supposed type (LPS 23055) was not studied by him. The concept of the epitype is to

achieve certainty in the application of a name, when the original material is demonstrably ambiguous. This may be contravened, when the original material will not be studied carefully to check that epitype and original material are really not heterogeneous.

- ¶*G. gibbosum* ssp. **ferox** (Labouret ex Rümpler) Papsch, *Gymnocalycium* 9(4): 201 (1996). Basionym: *Echinocactus gibbosus* var. *ferox* Rümpler (1885). Note. Papsch (l.c.) designates an epitype [Argentina, Prov. Chubut, Ruta 1, Cantera Namuncura, 6 Feb 1992, *W. Papsch* 92-136/196 (WU)], although original material is not known and neither a lecto- nor a neotype has been designated already; this contravenes ICBN Art. 9.7.
- ¶*G. gibbosum* var. **brachypetalum** (Spegazzini) Papsch, *Gymnocalycium* 9(4): 201 (1996). Basionym: *Echinocactus gibbosus* var. *brachypetalum* Spegazzini (1902). Note: Papsch (l.c.) designates an epitype [Argentina, Prov. Rio Negro, Ruta 2, 30 km N of San Antonio de Oeste, Barrancas de Gualichos, 1 Oct 1989, *W. Papsch* 89-37/47 (WU)], although a supposed type (LPS 23048), cf. Kiesling (1984), was not studied by him.
- ¶*G. gibbosum* var. **chubutense** (Spegazzini) Papsch, *Gymnocalycium* 9(4): 201 (1996). Basionym: *Echinocactus gibbosus* var. *chubutensis* Spegazzini (1925). Note: Papsch (l.c.) designates an epitype [Argentina, Prov. Chubut, S of Camarones, 7 Feb 1992, *W. Papsch* 92-139/205 (WU)], although no original material is known and neither a lecto- nor a neotype has been designated previously; this contravenes ICBN Art. 9.7.
- G. gibbosum* var. **leucodictyon** (K. Schumann) Y. Ito nom. inval. (Art. 33.2) Explanatory Diagram of Austroechinocactinae: 190 (1957). Basionym: *Echinocactus* var. K. Sch., 1898 [sic!]. *Echinocactus gibbosus* var. *leucodictyus* Salm-Dyck, *Cact. Hort. Dyck.* 1849: 34, 171 (1850).
- ¶*G. gibbosum* var. **platense** (Spegazzini) Castellanos & Lelong, *Cact. Succ. J. (US)* 12: 51 (1940). Basionym: *Echinocactus platensis* Spegazzini (1896).
- ¶*G. horridispinum* var. **achirasense** (H. Till & Schatzl) Lodé, *Cact. Aventures* (27): 29 (1995). Basionym: *G. achirasense* H. Till & Schatzl (1987).
- G. lafaldense* f. **deviatum** Oehme, *Cactaceae* (DKG) 1941(1): 29, 30/2 (1941). Note: In this volume the leaves were numbered, not the pages, so that every leaf number corresponds to two pages.
- G. lafaldense* f. **enorme** Oehme, *Cactaceae* (DKG), 1941(1): 29, 30/2 (1941).
- G. lafaldense* f. **evolvens** Oehme, *Cactaceae* (DKG) 1941 (1): 29–30/2 (1941).
- G. lafaldense* f. **fraternum** Oehme, *Cactaceae* (DKG), 1941(1): 30/1–2 (1941).
- G. mazanense* var. **rhodantherum** (Boedeker) Backeberg in Backeberg & Knuth: *Kaktus-ABC*: 291 (1936), nom. illeg. (Art. 52.1). Basionym: *Echinocactus rhodantherus* Boedeker, *Kakteenkunde* [1934]: 13–14 (1934).
- ¶*G. mazanense* var. **roseiflorum** (Backeberg) H. Till in H. Till & W. Till, *Gymnos* 4(8): 79 (1987), nom. inval. (Art. 33.1). Basionym: *Echinocactus mazanensis* var. *rosiflorus* Backeberg (1932).
- Echinocactus mazanensis* var. *rosiflorus* Backeberg, *Kakteenfreund* 1(12): 134 (1932). Note: In Metzging et al. (1995: 210) we erroneously cited Backeberg (1932) as the author of the combination in *Gymnocalycium*. The spelling "rosiflorus" may be an error for "roseiflorus" as the flower is of pink colour and not similar to the flower of a rose. However, Backeberg (1936: 291; 1959: 1767) retained this spelling.
- G. mihanovichii* var. **angustostriatum** (*) Pazout, *Friciana* 1(7): 3–4 (1962). Note: The indication "Holotype in botanic garden of the Carolinensis University of Prague"

given in the protologue probably refers to a living specimen (nom. inval., Art. 8.2?). Original spelling: "angusto-striatum". In the same publication there is an illustration titled *G. mihanovichii* var. *stenostriatum* var. nov.; this was a typographical mistake and corrected in *Fricana* 1(12): i. (1962).

- G. mihanovichii* var. *rysanekii* (*) Pazout, *Fricana* 5(29): 11 + ills (1965). A different spelling – *G. mihanovichii* var. *rysanekianum* – was used by Pazout in *Fricana* 5(35): 19 (1965).
- G. mostii* (Gürke) Britton & Rose, *Addisonia* 3: 5–6, pl. 83, (1918). Basionym: *Echinocactus mostii* Gürke (1906).
- ¶*G. nigriareolatum* fa. *carmineum* H. Till, *Gymnocalycium* 11(3): 255 (1998). Type: Argentina, Prov. Catamarca, W Sierra Ancasti, 8 Oct 1989, H. Amerhauser HA 255-2 (holo BA, iso WU).
- ¶*G. nigriareolatum* var. *densispinum* Backeberg ex H. Till, *Gymnocalycium* 11(3): 255 (1998). Type: Argentina, 1963, H. Fehser s.n. ex cult. in coll. H. Till (holo BA, iso WU).
- ¶*G. nigriareolatum* var. *simoi* H. Till, *Gymnocalycium* 11(3): 256 (1998). Type: Argentina, Prov. Catamarca, Palo Labrado, 1972, H. Borth BO 126 ex cult. in coll. H. Till (holo BA, iso WU).
- G. paediophilum* F. Ritter ex Schütz, *Kaktusy* 13(5): 100–101 (1977). Type: Paraguay, Cerro León (PZ), 1963, F. Ritter 1179. Note: The original spelling "*paediophylum*" was a typographical error and was later corrected by Schütz (1986: 104–105).
G. paediophilum F. Ritter nom. illeg. (Art. 52.1), *Kakteen in Südamerika* 1: 269, Ill. 215, (1979) (cf. note in l.c. 2: 707 (1980)). Type: Paraguay, Cerro León, 1963, F. Ritter 1179 (U!).
- G. paraguayense* (K. Schumann) Hosseus, *Arch. Esc. Farm. Fad. Cienc. Med. Cordoba* 9: 106 (1939). Basionym: *Echinocactus paraguayensis* K. Schumann (1903).
- ¶*G. pflanzii* ssp. *dorisiae* Amerhauser, *Gymnocalycium* 11(4): 267–268 (1998). Type: Bolivia, Dept. Tarija, Rio Paichu, H. Amerhauser HA95-1004-2 (holo LPB, iso WU).
- G. platense* (Spegazzini) Britton & Rose, *The Cactaceae* 3: 163–164 (1922). Basionym: *Echinocactus platensis* Spegazzini (1896).
Echinocactus platensis Spegazzini, *Contribucion al Estudio de la Flora de la Sierra de Ventana*: 28–29 (1896). Neotype (designated by Kiesling, 1982: 441): Argentina, Buenos Aires, Sierra de la Ventana, hills after Estancia las Vertientes, 30 Dec 1981, R. Kiesling 3356.
Echinocactus gibbosus var. *platensis* (Spegazzini) Spegazzini, *Anales Mus. Nac. Buenos Aires ser. 3, 2*: 7–8 (1903). Basionym: *Echinocactus platensis* Spegazzini (1896).
- ¶*G. platense* var. *hyptiacanthum* (Lemaire) Backeberg in Backeberg & Knuth, *Kaktus-ABC*: 294 (1936). nom. inval. (Art. 11). Basionym: *Echinocactus hyptiacanthus* Lemaire (1839).
- ¶*G. platygonum* (H. Till & W. Till) Pilbeam, *Gymnocalycium – a collector's guide*, 123 (1995), nom. inval. (Art. 33.2). Basionym: *G. riojense* var. *platygonum* H. Till & W. Till (1991).
- ¶*G. reductum* var. *leucodictyon* (Salm-Dyck) Papsch, *Gymnocalycium* 10(4): 230 (1997). Basionym: *Echinocactus gibbosus* var. *leucodictyus* Salm-Dyck (1849).
- ¶*G. rhodantherum* (Bödeker) Backeberg in Backeberg & Knuth, *Kaktus-ABC*: 291 (1936). Basionym: *Echinocactus rhodantherum* Boedeker (1934). Note: This was an erroneous entry by Metzger et al. (1995) and should be deleted from the list. For the correct

entry see *G. mazanense* var. *rhodantherum* (Bödeker) Backeberg (1936).]

- ¶ *G. saglionis* ssp. *tilcarensis* (Backeberg) H. Till & W. Till, *Gymnocalycium* 10(2): 215 (1997). Basionym: *Brachycalycium tilcarensis* Backeberg (1942). Note: Till & Till (l.c.) accept the combination *G. tilcarensis* (Backeberg) Schütz, *Monografie der Gattung Gymnocalycium*, 134 (1992). This was not accepted by us (Metzing & al. 1995: 224) and this judgment has to be maintained. Schütz wrote the manuscript for his "Monografie rodu *Gymnocalycium*" in the German language, but the publication was in Czech (Schütz 1986). Neither in this original publication nor in the subsequently published supplement (Schütz 1988) was the combination *Gymnocalycium tilcarensis* published. The late Dr Schütz gave the German manuscript to G. Hold and W. Papsch, who made copies and distributed them to some cactus friends. In this "edition" (Hold & Papsch 1992: 134) the combination *G. tilcarensis* (Backeberg) Schütz was printed. Although in the original manuscript this name was listed, it was deleted by Schütz in the final publication of the book (Schütz 1986) and is missing also in the supplement (1988). This we have to consider as the real intention of the author; the later publication of a draft or manuscript cannot be accepted as valid publication (ICBN Art. 34.1).
- G. schickendantzii* var. *delaetii* (K. Schumann) Backeberg in Backeberg & Knuth, *Kaktus-ABC*: 296 (1936). Basionym: *Echinocactus delaetii* K. Schumann (1901). See entry under *G. delaetii*.
- G. spagazzinii* Britton & Rose, *The Cactaceae* 3: 155 (1922). New name for *Echinocactus loricatoris* Spegazzini (1905) non Poselger (1853). Lectotype (designated by Kiesling & Metzing in Darwiniana 34: 403. 1996): Britton & Rose, l.c. fig. 162 (1922).
- ¶ *G. spagazzinii* ssp. *cardenasianum* (F. Ritter) Kiesling & Metzing, *Darwiniana* 34: 404 (1996). Basionym: *G. cardenasianum* F. Ritter (1964).
- G. stellatum* Spegazzini, *Anales Soc. Ci. Argent.* 99: 142–143 (1925). Previously illegitimately published as *Echinocactus stellatus* Spegazzini non Scheidweiler (1840), nom. illeg. (Art. 53; see Strong, 1975); *Anales Mus. Nac. Buenos Aires* 11 (ser. 2, 4): 505 (1905). Lectotype (designated by Till in: *Gymnocalycium* 8: 166 (1995): Illustration in Spegazzini, *Anales Soc. Ci. Argent.* 99: 143 (1925).
- ¶ *G. stellatum* ssp. *occultum* H. Till & W. Till, *Gymnocalycium* 9(2): 176 (1996). Type: Argentina, Prov. Catamarca, between San Fernando de Valle de Catamarca and Miraflores, 600 m, 18 Dec 1991, *G. Neuhuber* 91-461/1478 (WU). Based on *G. occultum* Fric ex Schütz (1962), nom. inval.
- ¶ *G. stellatum* var. *flavispinum* H. Till & W. Till, *Gymnocalycium* 9(1): 172 (1996). Type: Argentina, Prov. Cordoba, between Carlos Paz and Villa La Serranita, 800–900 m, 22 Oct 1988, *H. Till* 88-225/2350 (WU, holo.). Based on *G. quehlianum* var. *flavispinum* Bozsing, nom. inval.
- ¶ *G. stellatum* var. *kleinianum* H. Till & W. Till, *Gymnocalycium* 9(1): 171 (1996). Type: Argentina, Prov. Cordoba, between La Cumbre and Cosquin, 800 m, 28 Sep 1988, *H. Till* 88-116/1710, (WU). Based on *G. quehlianum* var. *kleinianum* Rausch, nom. nud.
- G. stellatum* var. *minimum* Pazout in Pazout, Valnicek & Subík, *Kaktusy* :131 (1960). nom. inval. (Art. 37.1).
G. stellatum var. *minimum* (Pazout) Strong, *Natl. Cact. Succ. J.* 30(2): 49–50 (1975), nom. inval. (Art. 33.2). Based on *G. asterium* var. *minimum* Pazout nom. inval.
- ¶ *G. stellatum* var. *obductum* (Piltz) H. Till & W. Till, *Gymnocalycium* 9(1): 174 (1996). Basionym: *G. obductum* Piltz (1990).
- ¶ *G. stellatum* var. *zantnerianum* (Schick) H. Till & W. Till, *Gymnocalycium* 9(1): 169

(1996). Basionym: *G. quehlianum* var. *zantnerianum* Schick (1948).

G. stenopleurum F. Ritter, Kakteen in Südamerika 1: 265–266, ills. 212, 213 (1979). Type: Paraguay, Cerro León, *F. Ritter* 1176 (U!).

¶***G. tanningaense*** Piltz, Kakt. and Sukk. 41(2). 22–26 (1990). Type: Argentina, Prov. Cordoba, near Tanninga, 950 m, Jul 1980, *Piltz* 212/6, (KOELN). Note: This entry was erroneously omitted by Metzinger et al. (1995)

¶***G. terweemeanum*** (Teuq ex Duursma) Borgmann & Piltz, *Gymnos* 13(25/26): 47 (1997). Basionym: *Echinocactus platensis* var. *terweemeanus* Teuq ex Duursma (1930).

Echinocactus platensis var. *terweemeanus* Teuq ex Duursma, *Succulenta* 12(7): 137–139 (1930). Lectotype (designated by Borgmann & Piltz l.c.): Illustration in Duursma (l.c.: 138).

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