

Echinofossulocactus versus *Brittonrosea*, *Echinocactus*, *Efossus*, *Ferocactus* & *Stenocactus*

or resolution of the nomenclatural problems of all these
genera

by Brice P. R. CHÉRON

e-mail : brice.cheron@laposte.net

Summary: analysis of the nomenclatural validity and problems of the following genera: *Brittonrosea*, *Echinocactus*, *Echinofossulocactus*, *Efossus*, *Ferocactus* and *Stenocactus*.

Keywords: *Echinofossulocactus* ; *Echinocactus* ; *Ferocactus* ; *Stenocactus* ; nomenclature ; status ; typification ; application of the Code.

Résumé : analyse de la validité et des problèmes nomenclaturaux des genres *Brittonrosea*, *Echinocactus*, *Echinofossulocactus*, *Efossus*, *Ferocactus* et *Stenocactus*.

Mots-clés : *Echinofossulocactus* ; *Echinocactus* ; *Ferocactus* ; *Stenocactus* ; nomenclature ; statuts ; typification ; application du Code.

I) FOREWORD AND WORKING METHODOLOGY

1) Purpose

This article analyzes and aims to solve the various problems of nomenclatural application as well as the botanical definition of the *Echinofossulocactus* Lawr. and *Stenocactus*, *sensu auct. plur.*, – already widely and for a long time discussed – as well as other taxa which are close to them for whatever reason. To do this, the current Shenzhen version of the International Code of Nomenclature for Algae, Fungi and Plants (TURLAND & al. 2018) which will be hereinafter referred to and abbreviated by “Code”, as well as its appendices (WIERSEMA & al. 2015, 2020), are used. Then, a solution for the definition of botanical entities and the concepts that each of them represents is given.

2) Working method used

As always in these cases which are consequently very largely discussed and disputed on ideas and subjective opinions, it is necessary to begin by consulting the original and diagnostic documents put in competition, without altering your own judgment by any source, different perspectives, or opinions from other authors; at least as far as possible. This



Echinofossulocactus multicostatus, San Rafael-Cienega del Toro, Nuevo-León, Mexico. © JL

working method is important to tend towards objectivity. Then we progress as we learn about the file in chronological order of the facts... as long as it is possible for us to access documents, publications, herbarium parts, vouchers or boards, etc. involved, which nowadays and fortunately the Internet allows. Once your opinion has been defined on these bases, it becomes possible to search and consult other botanical work already carried out on the studied subject. The intermediate result can then be re-evaluated if necessary, then the final result finally established.

II) THE ACTUAL, ORDINAL PUBLICATION DATES OF THE INVOLVED TAXA

1) Principle

The releases of publications are dated facts, printed (or distributed in PDF on the Internet since 1st of January, 2012) by third parties, that is to say at least one Publisher and generally also a Printer, evocable in the past tense or in the preterite. Therefore, it is not easy to challenge them on more or less fallacious grounds, and consequently they have a good objective value and scope. Moreover, the publication dates are of course essential for the application of Principle III of the Code (TURLAND & *al.* 2018): the principle of priority (or precedence) of the name of a taxon.

Here we have in competition first and foremost *Echinofossulocactus* Lawr. and *Stenocactus*, *sensu auct. plur.*, but subsequently (in second part of the work according to the above method), after taking into account the opinions and articles of other botanists, it became necessary to add to this initial list of two entries several others taxa closely or slightly related to this study. As a result, we end up with no less than nine taxa involved.

2) List of the taxa involved in this study

Herewith this starting basilar work, of course in chronological order of the publications of the taxa involved, and in which the names of the authorities are expanded:

- Nr 1: *Echinocactus* J. H. F. Link & C. F. Otto (1827) (LINK & OTTO 1827) ;
Nr 2: *Echinofossulocactus* G. Lawrence (1841) (LAWRENCE *in* LOUDON 1841) ;
Nr 3: *Echinocactus* subgenus *Stenocactus* K. M. Schumann (1898) (SCHUMANN 1897-1899¹) ;
Nr 4: *Ferocactus* N. L. Britton & J. N. Rose (1922) (BRITTON & ROSE 1922) ;
Nr 5: *Brittonrosea* C. L. Spegazzini (1923) (SPEGAZZINI 1923) ;
Nr 6: *Efossus* C. R. Orcutt (1926) (ORCUTT 1926) [*Non vidi. Bona fide* : HEATH 1989 ; HUNT 1980 ; TAYLOR 1983 ; TJADEN 1982] ;
Nr 7: *Stenocactus* A. Berger (1929) (BERGER 1929) ;
Nr 8: *Stenocactus* (K. M. Schumann) A. W. Hill (1933) (HILL 1933) ;
Nr 9: *Stenocactus* C. Backeberg & F. M. Knuth (1936) (BACKEBERG & KNUTH 1935²).

¹ Published in thirteen independent instalments from 1897 to the end of 1898. Their compilation as a book is from the early beginning of 1899.

² The actual publication of this work is established on February 12, 1936. The mentions in the book of "copyright 1935" and "copies of this book were first issued dec. 31, 1935" seem to have been backdated; or else the actual publication or printing was delayed for some reason.

III) THE NOMENCLATURE STATUTES OF THESE TAXA AND THEIR NAMES

1) Nature of nomenclature statutes and official statutes

There are two different cases of nomenclature statutes. Ours according to our understanding of the situation, and the official statutes of the International Nomenclature Committees published in the Code and its appendices, as explained in a previous nomenclature study (*cf.* CHÉRON 2019).

For the nine taxa listed above and the publications on which they depend, no official status concerning them was found, i.e. appearing in the appendices of the penultimate Code (Melbourne Code) (WIERSEMA & *al.* 2015), nor in the online annexes of the current Code (WIERSEMA & *al.* 2020), neither in the current Code itself (Shenzhen Code) (TURLAND & *al.* 2018).

However, these taxa have been discussed to great extent by professionals of botanical nomenclature, as well as among cactologists: first with this request n° 673 for the conservation of the generic name *Stenocactus* at the expense of *Brittonrosea*, *Echinofossulocactus* and *Efossus* by W. L. Tjaden *in* *Taxon* vol. 31, p. 570-573 in 1982. Since then, we can see how the Code and its specialist members are themselves confused and deadlocked with this complex situation. Proof of this, they have discussed and officially published on this issue no less than five times. In the form of "Comm. & Rev." *in* *Taxon* vol. 32, p. 641 (1983) and *in* *Taxon* vol. 33, p. 507 (1984); in the form of "Synopsis" *in* *Taxon* vol. 36, p. 272 (1987) and *in* *Taxon* vol. 42, p. 439 (1993). Finally in the form of a "Special. Comm." *in* *Taxon* vol. 36, p. 734 (1987).

What happened after all these discussions, all these years of more or less conflictual debate? Not much. It followed that the genera *Brittonrosea* Speng. and *Efossus* Orcutt have to be synonymised, while *Echinofossulocactus* Lawr. remains as an unresolved taxon... Unresolved but still valid! There was no statute or official (nor final) decision concerning the latter, for lack of obtaining a majority agreement during the decision votes on this case. However, it emerged that proposal n° 673 of Mr. Tjaden was rejected by the twelve voting members: 2 for, 9 against, 1 abstention (BRUMMITT 1987). **As a result, the status of *nom. cons.* for *Stenocactus* (K. Schum.) A. Berger which would have supplanted *Echinofossulocactus* Lawr., *Brittonrosea* Speng. and *Efossus* Orcutt (which then, would have become three *nom. rej.*), was and is still officially rejected by the vote of the International Nomenclature Committee.** In fact, during this voting session in 1987, the minimum number of votes to ratify an act was eight (*ibid.* 1987). No matter the reasons which pushed the voters to refuse this proposal, in particular the fact that they considered it quite simply useless because superfluous: this refusal is validated and recorded! (BRUMMITT 1987 ; GREUTER & MC NEILL 1987 ; NICOLSON 1993).

Statutory decisions on these strongly contested and keenly discussed names of cacti are provided and explained below:

2) *Echinocactus* J. H. F. Link & C. F. Otto (1827)

→ *Genus novus et nomen validum.*

This cactus generic name is well conceived because it has a diagnosis in Latin, followed by its translation into German (in a very difficult to read Germanic typography). There follows the presentation and description of 14 related species, by the same two authors. They do not provide a nomenclatural type for their genus, but as the species are also duly described (diagnosis + Latin description + mention of location + figures), all of this is perfectly valid. In fact, considering the time of publication, their work is much more exhaustive and much better achieved than a very large number – if not the majority – of works by later authors in the field of *Cactaceae* Juss., *nom. cons.* as in others!

3) *Echinofossulocactus* G. Lawrence (1841)

→ *Genus novus et nomen validum.*

Whatever a large number of nomenclators say, especially W. L. Tjaden in his "Proposal to conserve..." (TJADEN 1982), this genus (name) is nomenclaturally valid because it was duly and fully published at the proper time by Mr. Lawrence in the "Gardener's magazine and register of rural & domestic improvement, new series", in 1841. None of the articles of the Code relating to the "effective publication" (Art. 29 to 31) (TURLAND & *al.* 2018) is trampled; nor is it because G. Lawrence published in an "amateur" journal and his article was unknown to professionals until 1916 (BRITTEN 1916), that it is invalid or obsolete. Moreover, on this date, let us remember that the code of nomenclature did not exist and that we cannot therefore reproach this author for rules and articles that he could not have known. In his publication entitled "A Catalog of the Cacti in the collection of the Rev. Theodore Williams, at Hendon Vicarage, Middlesex", p. 317, the author provides a clear precision of the taxonomic rank which he gives to his new name: "GENUS IV. ECHINOFOSSULOCACTUS." (LAWRENCE 1841). The description which defines it and which follows is rather poor, in British English, made partly by diagnostic reference to *Echinocactus* – which he defines in his own way on page 316 of his article – for flowers and fruits, but everything of this is nevertheless valid for this pre-codistic period, and still respects article 32 of the current Code relating to "General provisions for valid publications of names" (TURLAND & *al.* 2018).

Now, the numerous arguments of several botanists who have tried to discredit the name of this taxon, and the work of G. Lawrence, are refuted one after the other in what follows:

3.1) About the "old" age of the name of this taxon

The "old" age of the generic name *Echinofossulocactus* Lawr. was criticised, in particular by Messrs Hunt who made use of an unambiguous lexical field in his 1980 article, such as "re-burial", "duly exhumed", "revive their dismembered dinosaur" (HUNT 1980) and Spegazzini with "nombre resucitado" (SPEGAZZINI 1923). Let us simply recall that in the Code, the starting point for a valid publication of generic names (*Genus*) in seed plants and ferns is established on 1st of May, 1753. In the Shenzhen Code, this is specified in article 13.1 (TURLAND & al. 2018). **The name of the genus created by Mr. Lawrence dates from 1841: it is therefore totally valid on this aspect.**

3.2) About the length of the name

Yes, that is quite of a long word. So? This name is duly conceived in that it has a meaning, at least one meaning and an etymology. It is also grammatically rather well designed and without spelling mistakes. The reproaches about its length considered excessive (HUNT 1980 ; ORCUTT 1926 ; SPEGAZZINI 1923), are only subjective opinions which have nothing to do with a scientific basis. Codistically, this argument is firmly swept aside without summons by article 51.1: "A legitimate name must not be rejected merely because it is inappropriate or disagreeable [...]" (TURLAND & al. 2018). These days anyway, with computers, this is possible to simply copy and paste the name once and that name doesn't get any longer to type than *Zea* L.! As for the labels in the cactophiles' pots, everyone is free to abbreviate (or not) this name in their own way...

3.3) About the amateurism of the author and of the publishing journal

It is rather easy to read that this was George Lawrence's first publication. As I always say to those who criticize or moralize on this fact: everything needs a start and even the great Carl Linnaeus necessarily started small! Here too, Art. 51.1 preserves from these vilifying elitist attacks which are mostly found in the works of D. Hunt and W. Tjaden (HUNT 1980 ; TJADEN 1982). As for the review by the editor John Claudius Loudon, it is valid and validating, in accordance with Art. 6 (TURLAND & al. 2018), which itself refers to Art. 29 to 32, as seen above. Moreover, **the argument that this journal is only amateur / unscientific is completely false!** It is enough to read the table of contents (p. III-VI) of only volume VII (LOUDON 1841) to be convinced of it: there are indexed ten articles of scientific significance, as well as reading notes on the last works by De Candolle, Link, Koltzsch, Otto and Webb. Finally, let it be noted that the compatriot of David Hunt, J. C. Loudon, published no less than 554 Latin plant names...

3.4) About the "artificial" concept of Lawrence

The fact that George Lawrence divided and subdivided his genus into numerous infrageneric taxa is his own concern! It is his systematic concept and his plain right to express it. The United Kingdom is by its constitution, a country of free, egalitarian and democratic law, where freedom of expression is normally guaranteed... As equality of expression requires, on the contrary, one has the right to disagree with G. Lawrence, but that doesn't make his work an invalid nomenclatural act. Moreover, people (BRITTON & ROSE 1922 ; HUNT 1980 ; SPEGAZZINI 1923) who more or less evoked this argument against the *Echinofossulocactus* of George Lawrence, have confused or at least mixed nomenclature with systematic. If one were to invalidate generic names each time that their delineations or taxonomic value are changed, there would be virtually none remaining as currently valid. The taxon of Mr. Lawrence respects the whole of chapter I titled "Taxa and their ranks" of the Code (TURLAND & al. 2018). **Therefore, the systematic concept of the genus *Echinofossulocactus* Lawr. Cannot, in any event, nomenclaturally be invalidated.**

3.5) About the lectotypification

As for the principle of priority of a name, the first lectotypification validly carried out and published is the one which takes precedence, the one which is valid and which must be applied to the lecto- or neo-typified name. This is explained in Article 10.5 of the Code (TURLAND & al. 2018). This nomenclatural act is however subject to several conditions, which are required for it to be valid:

be later than the starting point of 1st of May, 1753 (Art. 7.9);

be typified from an element chosen in the context of the valid publication (of the name) (Art. 7.9);

be (the proposed lectotypification) duly published by an "effective publication" as well (Art. 7.10);

be clearly and unambiguously designated as such, and recognised as valid by the typifying author(s), with a *typus* precisely designated (Art. 7.11).

Absolutely **none of these articles are violated in the work of Britton & Rose** (BRITTON & ROSE 1922), page 109. The designation of the type, as well as the constituency they make of the genus, are written in black and white! They are the first to have lectotypified (and redefined) the valid genus of G. Lawrence: it is therefore their lectotypification which is the valid one. Both the name of this taxon and its valid typification should not have been disputed since their publication of 1922.

Yes, "but"! David Hunt must be credited with being an extremely good lawmaker. So he unearthed this "but" which remains in the Code. Therefore, there is this flaw in article 10.5 (TURLAND & al. 2018) which authorizes a right of relectotypification, permitted on the grounds of the

"largely mechanical method of selection" (of the *lectotypus*). It is in this loophole that David Hunt rushed to try to cancel the work of Lawrence and Britton & Rose. The "largely mechanical method of selection" is defined in the following two articles: 10.6 and 10.7 (*ibid.* 2018).

Mr. Heath has irrefutably demonstrated (HEATH 1989), on the one hand that the choice of D. R. Hunt was no less artificial nor more objective ("mechanical" in the sense of the Code) than that of Britton & Rose; on the other hand that the choice of *E. coptonogonus* Lemaire as *typus* does not have to be refuted for its atypism. Third, he demonstrates that the lectotypification of *Stenocactus* by a certain Mr. Byles is neither more substantiated nor less "mechanical" than that of Britton & Rose (*ibid.* 1989). To the arguments given by P. V. Heath, I personally would add the following:

- The terms of the Code confuse "mechanical" with rash. It is not because one takes the first element of a list in a presumed form of "automatism" that one has not thought about its choice. On the contrary here, the new constituency given by Britton & Rose to *Echinofossulocactus* Lawr. by limiting it to the *Gladiatores* Lawr. sectio, give evidence that they well-thought out the systematics and taxonomy of their subject!
- All the species included in a well-defined suprataxon, in the sense of its original author, are all equitable and all have the same "value", the same eligibility for lectotypification. Otherwise, the very notion of systematics and taxonomic hierarchy would be ruined and would lose almost all sense!
- *E. coptonogonus* Lem. (Lawr.) tops the list for alphabetical and practical (dichotomic key) reasons. This is found both in Britton & Rose and in Lawrence.
- The Code does not want a "mechanical" procedure in nomenclature? Then, what about the principle of the autonym?

Note that there are also these scandalous and backward-looking criteria which invalidate certain typification works on very little... scientific grounds, but which nevertheless still exist in articles 10.6 and 10.7 of the Code! Indeed, page 30 of the Shenzhen Code (TURLAND & *al.* 2018), one can read within the article 10.7 that the publications prior to 1st of January, 1921 where lectotypifications appear, are invalid if:

- an author of the publication was a signatory of the "Philadelphia Code";
- an author of the publication has publicly said that he is following the "Philadelphia Code" or the "American Code"; and worst of all:
- an author of the publication was a recognised employee or associate of the New York Botanical Garden;
- an author of the publication was an employee of the United States government [which one?].

For the author, such provisions are unworthy of a scientific approach, and – nowadays – such exclusions, not to say such segregations, no longer have their place in the Code. How can the Code claim to be "international"

in this way? We can obviously see that these old articles date from the time when the authority of the Code was challenged, and when there were attempts at dissent, at secession. It would be necessary to make a request for their deletion, but this implies doing so *in Taxon* in the form of a "General provision for governance of the Code".

Let us therefore return to the basic, rigorous and objective application of these articles 10.6 and 10.7 used by David Hunt in 1980 under Art. 8.1 of the Leningrad Code of 1978, which evokes the "mechanical method of selection" (of a *typus*). First of all, article 10.6. says that (lecto-) typifications are invalid if they can be proven to follow the "Canon 15" method of dissenting codes. However, after verifications in the three versions of the dissident code (ARTHUR & *al.* 1904 a, 1904 b, 1904 c), **nothing allows us to affirm or attest that this was the case for the lectotypification of G. Lawrence's *Echinofossulocactus* by Messrs Britton and Rose.** It's likely, but it ends there. Moreover, the authority "Britton & Rose" is not equal to "Britton". Nathaniel L. Britton was a proven dissident but Joseph N. Rose wasn't! (ARTHUR & *al.* 1904 a, 1904 b, 1904 c). Then, for the last four invalidating criteria of Art. 10.7, these take effect **before** the 1st of January, 1921. Consequently **for volume III of the *Cactaceae* (BRITTON & ROSE 1922), these criteria of invalidation are inapplicable.** There remain the first two invalidating criteria. There is the one of the evidence in the course of the work, which expressly mentions that the authority followed a dissident code. After checking the introductions, forewords, postscripts, footnotes, and bibliographies, **no such evidence was found** (BRITTON & ROSE 1919, 1920, 1922, 1923). Finally, the last invalidating criterion is based on internal deductions from the use of dissident code rules within the publication accused of "mechanical typification". The use of tautonyms is especially mentioned. However, there is no tautonym in the monograph by Britton & Rose (*ibid.* 1919, 1920, 1922, 1923).

In short: **one cannot – as D. Hunt wanted to make believe – affirm and certify that the lectotypification of N. L. Britton & J. N. Rose (BRITTON & ROSE 1922) concerning the genus of G. Lawrence, is based on a "largely mechanical method".** Even Mr. Heath seems to be saying that this might be the case (HEATH 1989), a fact which is firmly refuted here. Furthermore, **this nomenclatural act of Britton & Rose does not openly violate any of the rules of the current Code** which governs the work of (lecto-) typification of genera and higher taxonomic ranks. My conclusion therefore joins the one of P. V. Heath (*ibid.* 1989): the lectotypification of N. L. Britton & J. N. Rose is valid in all respects.

3.6) About the relectotypification

For sure, Paul V. Heath exhaustively and brilliantly denied and repealed (HEATH 1989) the fallacious relectotypification of David Hunt (HUNT

1980). We quote only the following passage, although **everything is correct in the article of P. V. Heath**: "it is clear that selecting a generic name for relectotypification merely because of its length is an invalid procedure, and such a relectotypification must be regarded as null and void." (*ibid.* 1989). This statement could not be more true. It is irrational that, following the publication of this article in 1989, the debate on the question *Echinofossulocactus* vs. *Stenocactus* can still be opened. Or rather, it is very well understandable because it can only be the result of two causes, two possibilities:

- either botanists and nomenclators did not understand the complexity of this situation nor recognised the quality of P. V. Heath's article, or simply eluded it;
- or there is a will in high places to maintain artificially correct or valid works which are not. Obviously (40 years that this situation continues), these acquaintances and collusions are most tenacious.

In conclusion, **David Hunt's relectotypification of 1980 is invalid because it is both superfluous and scientifically unfounded. This relectotypification is codistically null and void.**

3.7) About the semantics of the *fossula*

David Hunt has mentioned the mismatch of the first chosen lectotype due to a semantic matter on the word *fossula* (HUNT 1980). In Latin, *fossula* (plural, *fossulae*) is a feminine word of group I which means: "small ditch" or "furrow". Semantically, it is therefore an elongated element. The fact that it is given the meaning of "small pit/cavity on the upper part of a cactus rib, which allows the establishment of areolas and the possible production of flowers", is the very fact of Charles Lemaire, because he specified this meaning in his work (LEMAIRE 1839). But this is not the case with George Lawrence, who did not give an etymology to his newly created generic name. Contrary to what D. Hunt (HUNT 1980) said, it is not because *Echinocactus coptonogonus* (without any given authority) is cited in Lawrence's article, that the latter necessarily read, understood or especially admitted the words of C. Lemaire. The truth is that **nothing in Lawrence's article makes direct reference to the publication of Charles Lemaire** and the binomial "*E. coptonogonus*" never appeared there (LAWRENCE 1841). To the point that we can even possibly suppose that his epithet "*coptonigòna*", *orthographia originalis*, is genuine, original... The only term "Lem" used in J. C. Loudon's magazine is found in the table of abbreviations of volume VII, on page [658]. However, this abbreviation means "Lemon-colored"! (LOUDON 1841). One hypothesis is that George Lawrence was only aware of this basionym and of some other names (5 specific epithets of *Mammillaria* Haw., *nom. cons.*) attributable to Charles Lemaire (LEMAIRE 1838) only orally, otherwise, why are there these spelling errors or these discrepancies?

In other words and for conclusion on this point: **nothing allows to affirm that there is only one origin, only one meaning to the word *Echinofossulocactus***, in opposition to what D. Hunt wrote in 1980 (HUNT 1980) and contrary to what Messrs Záhora and his colleagues maintained (ZÁHORA & *al.* 2018), who were doubtlessly allowed to be influenced by the words of the former (HUNT 1980). The etymology of the genus *Echinofossulocactus* Lawr. can therefore remain equivocal: or "urchin-cactus with (strong) intercostal furrows", or "urchin-cactus with pits on the ribs". Nevertheless, on reading the diagnostic article by the creator of this genus (LAWRENCE 1841), the author's personal preference leans for the more visual, the more obvious and ultimately the more diagnostic of the two, that is to say, in accordance with the diagnosis which states: "Surface angled or furrowed" + "Angles numerous, dense, narrow, deep and acute". (*ibid.* 1841).

4) *Echinocactus* subg. *Stenocactus* K. M. Schumann (1898)

→ *Subgenus novus et nomen validum.*

Herr Schumann's work, as always, is very rigorous. There is no element that can visibly invalidate it. **This name is valid, but clearly and only at the rank of subgenus** of *Echinocactus*. There is no uncertainty about this taxonomic positioning in his work, and it is here advisable to remind to the pro-genus *Stenocactus*, that the principle of priority applies for and to each of the taxonomic ranks. At least this is true for the ranks ranging from the *subforma* to the *Familia*. (Above, it becomes more complex and exceptions appear). This is the fundamental Principle IV of the Code and the provision of Article 6.6. (TURLAND & *al.* 2018). We can even say that the lectotypification does not really matter: it does not change anything to the situation. Or, if a lecto- or neo-typification were to modify the taxonomic rank of the original subject, it is because such typification would have been badly done and the original author misunderstood.

Anyway, in all existing cases, **each *stat. nov.* based on *Stenocactus* Schum. (1898 and +) is later and predated by *Echinofossulocactus* Lawr. (1841) at the rank of genus.**

On page 359, Karl Schumann wrote: "Anmerkung: Wenn ich von der ersten Art dieser Untergattung, von *Echinocactus coptonogonus* Lem., Absehe, so ist dieselbe eine sehr natürliche und gut begrenzte, welche nach keiner anderen Übergänge aufweist." (SCHUMANN 1897-1899). Whose words translated in English mean: "Note: If I ignore the first species of this subgenus, *Echinocactus coptonogonus* Lem., this is a very natural and well defined subgenus that shows no other transition." The remark to add here is that whatever the botanical level of the authors of that time (G. Lawrence, C. Lemaire, K. Schumann, N. Britton & J. Rose, A. Berger), they all agree in subordinating *E. coptonogonus* Lemaire to their higher hierarchical taxon, despite its typism.

Echinocactus subgenus *Stenocactus* K. M. Schumann (1898) is a correct name but takes precedence if, and only if, it is used at a taxonomic rank as subgenus.

5) *Ferocactus* N. L. Britton & J. N. Rose (1922)

→ *Genus novus et nomen validum.*

After consulting the page 123 of *The Cactaceae* (BRITTON & ROSE 1922) where the protologue of this novelty is, no weaknesses, omissions, or errors were found which could be codistically fatal to this generic name. Yes, there is a description in English, but at that time it was not a crippling fault yet. The study of this genus makes it further possible to refute the alleged "automatic" or "mechanical" character of the (lecto-) typifications of Britton & Rose, which D. Hunt sought to impose on us or make us believe in his article from 1980 (HUNT 1980). Indeed, in Britton & Rose' monography volume III, the genus *Ferocactus* (n° 16) is directly the one which follows *Echinofossulocactus* (15th genus treated) (BRITTON & ROSE 1922). Now, what do we read there? A designation of the *typus* which is not the first species in the list, neither in their analytical treatment of species, nor in the dichotomous key (*clavis specierum*) (*ibid.* 1922). For this fact alone, it is impossible to affirm that Britton & Rose proceeded "mechanically" or automatically to designate their nomenclatural types. The eighth genus that they dealt with in this volume III, page 94 (*ibid.* 1922) is *Neoporteria*, a *Genus novus* created by them which also does not have for designated *typus*, the first species of their analytical treatment nor the first of their key to species.

To conclude on *Ferocactus*, it is therefore a genus recognised as nomenclaturally valid here. But for now and since its publication date, it does not correspond (or not quite exactly?) botanically to the plants that are designated under *Echinofossulocactus* Lawr.

6) *Brittonrosea* C. L. Spegazzini (1923)

→ *Nomen (Genus) novum et nomen illegitimum.*

The nomenclatural work of Sr. Spegazzini consists of a new name replacing an already existing taxon name (*Genus*), which the Code designates by "substitute" or "replacement name". This author clearly indicates his intention to replace the *Echinofossulocactus* by G. Lawrence ("avowed substitute" in the Code) on the pretext of the latter's too long orthographic spelling (SPEGAZZINI 1923). This argument has nothing scientific and is not even clearly reprehensible by the current Code (TURLAND & *al.* 2018), which simply advises nomenclators, by a recommendation, to avoid making "names that are very long or difficult to pronounce in Latin" (Rec. 20A.1). Note also that Carlo Spegazzini considered the genus *Echinofossulocactus* as a hybrid (SPEGAZZINI 1923), which nevertheless did not prevent him from

taking *verbatim* all the names of species that G. Lawrence placed there in 1841, to place them under his new *Brittonrosea* Spegazzini! If this is of course the right of this author to do so, yet this is not scientifically admissible.

***Brittonrosea* Spegazzini is illegitimate** because it is a later homotypic synonym or *nomen superfluum*, hence a *nomen illegitimum*. It falls under the fundamental Principle III (Priority) of the Code on the first hand, and Articles 52.1 and 52.2 (TURLAND & al. 2018) on the other hand.

7) *Efossus* C. R. Orcutt (1926)

→ ***Nomen (Genus) novum et nomen illegitimum.***

Like the previous work, the one of C. R. Orcutt follows the same procedure, the same intentions. It therefore has the same defects. It is a *nom. superfl.* as well, both subsequent to *Echinofossulocactus* G. Lawrence which he claims to replace, but also three years younger than *Brittonrosea* Spegazzini. It is therefore illegitimate twice. This name is an "illegitimate later synonym" which breaks the Principle III and Articles 52.1 and 52.2 of the Code (TURLAND & al. 2018). ***Efossus* Orcutt is illegitimate (nom. illeg.) and is a later homotypic synonym of *Echinofossulocactus* Lawr.**

8) *Stenocactus* A. Berger (1929) OR *Stenocactus* (K. M. Schumann) A. Berger (1929)

→ ***Genus "novus possibile" et nomen nudum* OR *status novus et nomen invalidum.***

In his 1929 book, Alwin Berger wrote too many taxonomic ambiguities (used ranks or unspecified ranks) for us to allow accepting as unambiguous and without any doubt its presumed nomenclatural novelty. At the beginning, page VII and page 244, he clearly cites his source indicating the abbreviation of Herr Schumann and the date of publication after the name *Stenocactus* as follows: "*Stenocactus* K. Sch. (1898). *)" (BERGER 1929). The note at the bottom of this page, denoted by the sign "*" says, after criticism / rejection of the works of Britton & Rose, Lawrence and Spegazzini, "that there is no reason to put aside the very significant name of *Stenocactus*, created by Schumann" (*ibid.* 1929). Note that A. Berger acknowledged the paternity of this name to Schumann but that he did not specify its taxonomic rank. Therefore, we can suppose that for A. Berger, it is understood as such everywhere in his work. But above all, **we find twice that he understood and indeed considered this taxon of K. Schumann to be at the rank of subgenus** – "Untergattung" in the text – (*ibid.* 1929)! This is understood by the typography and the formatting of his writings, from page 198 where the first line dealing with the genus *Echinocactus* is found (which

he attributed to Link alone in his speech), to page 244 where stands "*Stenocactus* K. Sch." which is an "Untergattung" of *Echinocactus* (BERGER 1929), just as the creator of *Echinocactus* subg. *Stenocactus* defined it (SCHUMANN 1897-1899). Also, it should be noted that the names of taxa that Herr Berger considered to be true genera (*Genus*) were duly numbered in his work. Thus *Echinocactus* carries the number 24 (the twenty-fourth genus treated in his book), but *Stenocactus* is **not numbered**. Finally, you only have to read the page VII of the table of contents of his work, where is written in black and white:

"Untergattung: *Stenocactus* K. Sch. 244" (BERGER 1929).

Things become far much complicated at the very end of the book, in the index of names or "Sachregister" located on pages 337 to 348. Because on page 337, a sentence says that: "Die mit * versehenen Namen werden hier zum ersten Mal genannt." (BERGER 1929). In English: "Names marked with an asterisk are mentioned here for the first time." Of course we find several *a priori* specific epithets provided with an asterisk, placed under the name "*Stenocactus*" (*ibid.* 1929) which is without any specified author and without any asterisk. Contrary to what the IPNI says, which takes it for granted (IPNI 2020), it is clear that this index was not limited to generic and specific names only, since there are also names at the rank of tribe, sub-tribe, one or two cultivar names and even some vernacular names such as "Rainbow cactus". **Therefore, this index cannot by any way used as evidence of disambiguation for the taxonomic rank of "his" "*Stenocactus*".** It sounds a lot like a last-minute turnaround before the press release, or a last-minute attempt to try to get personal nomenclatural novelties. In addition, in his treatment on page 244 and following ones, we find the *Echinocactus* species in bold type as follows: "***Echinocactus coptonogonus* Lem. (1838). — *Stenocactus Berger***" (BERGER 1929). Here, clearly, he put himself into synonymy his own proto-concept of *Stenocactus*! But more significant, Berger's description of *Stenocactus* (which could have served as a "diagnosis" for his presumed genus) is defined and linked to "*Stenocactus* K. Sch. (1898)" and not his, that is to say, not to "*Stenocactus* Berger". Therefore in conclusion, if Alwin Berger really tried to create the genus *Stenocactus* Berger, this does not comply with the requirements of the Code because it is without a diagnosis, without a description, without a complete unmistakable name, and finally without a precise and unambiguous taxonomic rank. This undeniably constitutes a *nomen nudum*.

In summary: ***Stenocactus* A. Berger (1929) is a *nom. nud.*** A statute which is further supported by the fact that in almost all of his book, Herr Berger uses each time the taxon and the concept (subgenus) of Karl Schumann and not his own. Moreover, all recombinations of the epithets under this hypothetical "*Stenocactus* Berger" are invalid: they are not duly or completely formulated, except perhaps for *Stenocactus tetraxiphus* [unranked]. **If, however, it is conceded to him that he based his name on the**

basionym of K. Schumann, one would obtain then and at best: *Stenocactus* [unranked] (K. Schum.) A. Berger (1929), *stat. nov.* and *nomen invalidum*. However, we will never really know what Alwin Berger tried to do here, but in his book, when he was creating a nomenclatural novelty, he was specifying it... (cf. page 246 with "Echinocactus boedekerianus Berger *n. sp.*") (BERGER 1929). Ultimately, the status of this name does not matter, because **in all cases, it is and remains younger than *Echinofossulocactus* Lawr. the latter of which, keeps its "birthright"**.

9) *Stenocactus* (K. M. Schumann) A. W. Hill (1933)

→ *Status (Genus) novus et nomen validum.*

In this enumerative work which was not necessarily set up for a validating purpose, this is the way in which the English people of that time actually proceeded to edit their works, which means that nowadays, according to the latest nomenclature codes, their contents are to be considered as validating. First of all in this document, there is a citation of a basionym: that of the subgenus of K. Schumann from 1898. Therefore, it should be specified in the authority of the name of the taxon. Second, in this publication, as there are only genera and species cited, then, *Stenocactus* which is attributed there to "A. Berger, Kakteen, 244 (1929)" (HILL 1933), can by deduction only be a taxon understood here at the rank of genus. So, A. W. Hill finally validated (involuntarily) at the rank of *Genus*, the name *Stenocactus*. Insofar as in this eighth supplement to the *Index kewensis*, Alwin Berger is credited for the genus *Stenocactus* and the specific combinations (*ibid.* 1933), this should be made clear in the full authority of the name. So, we would get: *Stenocactus* (K. M. Schumann) A. Berger ex A. W. Hill (1933), nothing less than that. On the other hand, if we consider that the *Stenocactus* of A. Berger is a *nom. nud.*, then Sir A. W. Hill simply becomes the very first botanist to promote to the rank of genus the well known subg. *Stenocactus* by Herr Schumann, which gives: *Stenocactus* (K. M. Schumann) A. W. Hill (1933). After which, all the (henceforth new) combinations of species seem to be written as follows: *Stenocactus species* (author of the basionym) A. Berger ex A. W. Hill (1933); for example we would have: *Stenocactus coptonogonus* (C. Lemaire) A. Berger ex A. W. Hill (1933) [*basionymum: Echinocactus coptonogonus*]. But the rule for the use of the "ex" in the Code is still just as confusing; there is no certainty to the exact and extended quotation here. A personal request about this very case addressed to the International Committee for Nomenclature did not yield any answer.

In short: **here again in all cases, this taxon** – although valid this time – despite a double possibility for its complete exact citation (with "ex" or without), **remains a later synonym in the face of the precedence of *Echinofossulocactus* Lawr.**

10) *Stenocactus* C. Backeberg & F. M. Knuth (1936)

→ *Nomen novum et nomen illegitimum.*

This name (BACKEBERG & KNUTH 1935) constitutes a homonym. It was mentioned in various works before that of Sir Arthur William Hill from 1933 was found. Thus, more recent and superfluous, it is a *nom. illeg.* which is worth being treated as a namesake of the previous one. Chiefly, because of the priority principle of the Code, it is a synonym and is illegitimate when confronted to the prevalence of *Echinofossulocactus* Lawr.

IV) WHICH NAME TO CHOOSE TO DEFINE OUR “STRONGLY AND DEEPLY FURROWED CACTI”?

In matters of taxonomy and systematics, everyone is free to think what he wants. But in terms of nomenclature, this is far much stricter. For example, one reads that Joël Lodé has maintained against all odds the use of *Echinofossulocactus* Lawr. in his Taxonomy of *Cactaceae* (LODÉ 2015), but also for a long time in a species sheet of *Echinofossulocactus multicostatus* var. *zacatecasensis* (Britton & Rose) J. Lodé, published in 1995 where it was already specified, in a note, that the use of G. Lawrence's taxon prevailed for precedence reasons over *Stenocactus* (LODÉ 1989-2001).

At the end of this study carried out here, the author of this article confirms that the use of the name *Echinofossulocactus* Lawr. is the one which is currently (and since 1841) the only correct to designate these cacti. Joined here are the opinions or studies on this subject by C. Glass & R. Foster 1981; J. Lodé 1995, 2015; P. V. Heath 1989; and recently, the superbly illustrated study by J. Záhora, P. Najéra Quezada, J. L. Flores Flores & J. Morales from 2018.

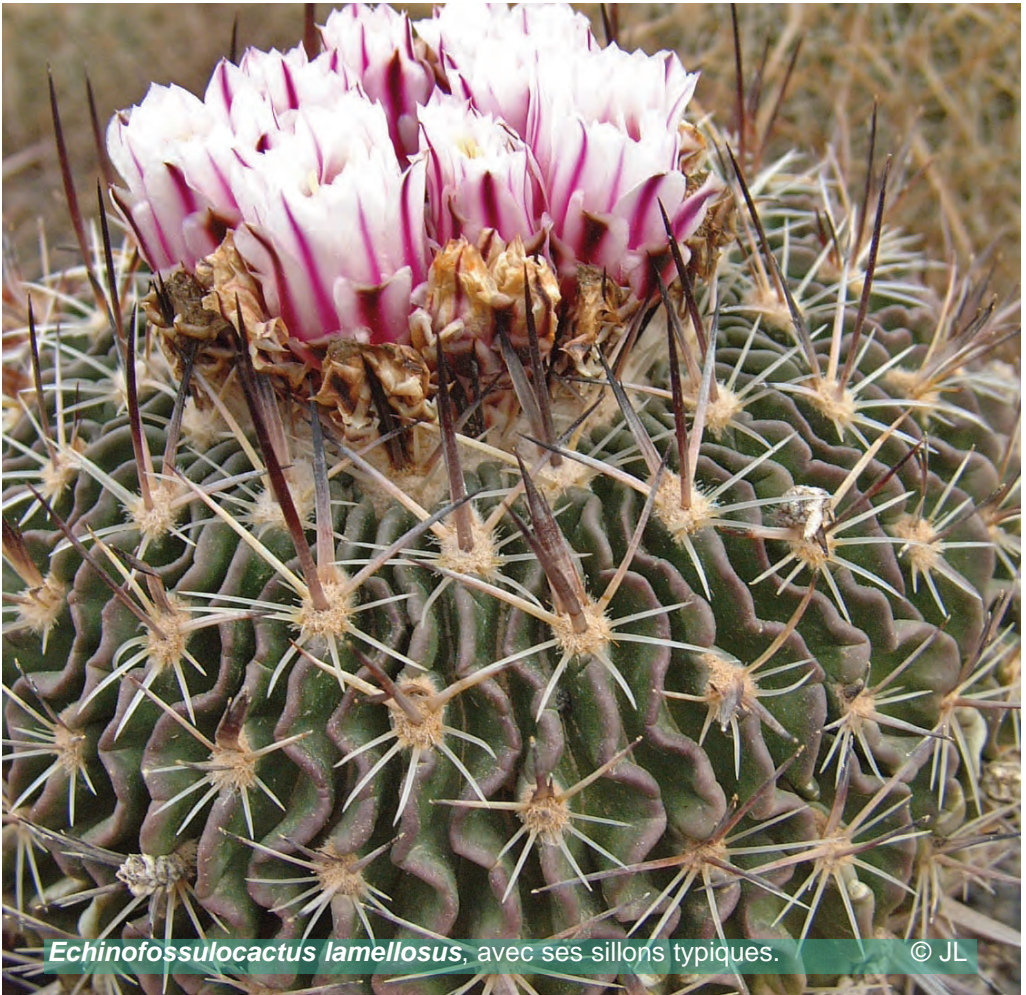
Moreover, if future, exhaustive and above all objective phylogenetic work on the question, were to confirm that the members of *Echinofossulocactus* are very close to those of *Ferocactus* Britton & Rose, then the genus *Echinofossulocactus* as defined by G. Lawrence would take even more meaning, and would see its current delimitation widened, for example by reintegrating its second section, the *Latispineae* Lawr. (which are currently species of *Ferocactus*). In other words, not only *Echinofossulocactus* Lawr. is well and actually published [the Code experts themselves admit it (*cf.* BRUMMITT 1987)], not only is it valid and legitimate, but it also constitutes a taxon of a good potential in the future. In fact, the systematics and conception of this genus by George Lawrence, which were strongly criticised in the past, are therefore not so mediocre as one wanted to say.

As for Nigel P. Taylor's treatment which reduced *Echinofossulocactus* Lawr. under *Ferocactus* Britton & Rose (TAYLOR 1980),

this is not followed here. In reality, this is exactly the opposite which could occur if there was an extensive molecular confirmation on it. However, for the time being, these two genera are recognised in this study as both valid.

The only thing that could undo *Echinofossulocactus* is a fine, accurate genetic study that would make its *typus*, *E. coptonogonus*, "something else" than an *Echinofossulocactus* or a *Ferocactus*.

To conclude, I would like to end on a point that nobody, in forty years of controversy, seems to consider, not even the officials of the Code: the respect for the thoughts of an author. How could we accept to publish a relectotypification which synonymizes one genus of an author with another genus that he described – and yet distinguished differently – in his work on the page just above? It is shocking and indecent that botanists with the soul of jurists, proceed to annihilate the works of previous authors by rewriting



Echinofossulocactus lamellosus, avec ses sillons typiques.

© JL

them because they merely consider them not conforming to a code that said authors have never known. The odious is even reached when these same botanists or their close relationships, then attribute to themselves the paternity of a new concept (or a name) presented by a previous author, and finally bring a discredit to them.

V) CONCLUSION

Echinofossulocactus Lawr. (1841) respects much more the Code's principles, articles and recommendations than did D. R. Hunt in his 1980 article with *Stenocactus* and its relectotypification. The same for *Echinocactus* Link & Otto and *Ferocactus* Britton & Rose, both of them are nomenclaturally valid but concern and represent plants which – to this day – are not botanically those that we wish to designate correctly and unanimously here.

In 2020, at the taxonomic rank of Genus (genera), *Echinofossulocactus* Lawr. (1841) is nomenclaturally valid, legitimate in every respect and is botanically correct. Furthermore, the Proposal to conserve the name *Stenocactus* at the expense of *Echinofossulocactus* Lawr. has been officially rejected.

Echinofossulocactus G. Lawrence (1841), *nom. legit. & nom. val.*

Brittonrosea Spegazzini (1923) is a homotypic synonym and an illegitimate name.

Efossus Orcutt (1926) is another homotypic synonym and an illegitimate name.

Stenocactus, *sensu auct. plur.* (1929, 1933, 1936) are homotypic or untypified, or mis-typified, or ill-defined synonyms (unranked), but are anyway illegitimate names.

To be exhaustive, the expanded writing of George Lawrence's genus as it is currently understood can be written as: *Echinofossulocactus* Lawr. *emend.* Britton & Rose.

Finally, these possible relectotypification allowed under the guise of "mechanical method or procedures" are a codistic archaism whose only purpose was to rule out the birth or the rise of another dissident code in the 1900s! In short, it was a matter of a conflict of interest and a struggle of opinions which have nothing of scientific intentions, of which it would be necessary to remove the remaining residues from the Code of the 21st Century (Art. 10.5 *pro parte*, Art. 10.6 & 10.7). If a publication or a nomenclatural act do not please, they should be studied on criteria that are more scientific and less discriminating, then accepted or rejected on a case-by-case basis in the form of a vote, by the Committees specializing in nomenclature.



Echinofossulocactus crispatus, El Tokio, Nuevo León, Mexico.

© JL

VI) REFERENCES

1) Bibliography

ARTHUR J. C. & *al.* (1904 a) : Code de la nomenclature botanique. [French version]. Bulletin of the Torrey botanical club, vol. 31, n° 5, p. 263-276.

ARTHUR J. C. & *al.* (1904 b) : Code of botanical nomenclature. [English version]. Bulletin of the Torrey botanical club, vol. 31, n° 5, p. 249-261.

ARTHUR J. C. & *al.* (1904 c) : Kodex der botanischen Nomenklatur. [German version]. Bulletin of the Torrey botanical club, vol. 31, n° 5, p. 277-290.

BACKEBERG Curt & KNUTH Frederik M. (1935³) : Cactus-A B C. København [Copenhagen] : Gyvendalske Boghandel & Nordisk Forlag. 432 p.

BERGER Alwin (1929) : Kateen. Stuttgart : Verlagsuchhandlung von Eugen Ulmer. VII + 346 p.

BRITTEN James (1916) : An Overlooked paper on *Cactaceæ*. The Journal of Botany, British and foreign, vol. LIV, p. 338.

BRITTON Nathaniel L. & ROSE Joseph N. (1919) : The Cactaceae. Volume I. Washington : The Carnegie Institution. VII + 236 p. + XXXVI tab.

BRITTON Nathaniel L. & ROSE Joseph N. (1920) : The Cactaceae. Volume II. Washington : The Carnegie Institution. VII + 239 p. + XL tab.

BRITTON Nathaniel L. & ROSE Joseph N. (1922) : The Cactaceae. Volume III. Washington : The Carnegie Institution. VII + 257 p. + XXIV tab.

BRITTON Nathaniel L. & ROSE Joseph N. (1923) : The Cactaceae. Volume IV. Washington : The Carnegie Institution. VII + 318 p. + XXXVII tab.

BRUMMITT Richard K. (1987) : Report of the Committee for Spermatophyta: 33. Taxon, vol. 36, n° 4, p. 734-739.

CHÉRON Brice P. R. (2019) : *Consolea vel Opuntia microcarpa versus picardae*. [English, French or Spanish versions]. Cactus-Aventures International, n° 1-2019, p. 56-67.

GLASS Charles E. & FOSTER Robert (1981) : What's new. Cactus and Succulent Journal (U.S.[A.]), vol. 53, p. 61.

GREUTER Werner & Mc NEILL John (1987) ; Synopsis of proposals on botanical nomenclature, Berlin 1987. Taxon, vol. 36, n° 1, p. 174-281.

HEATH Paul V. (1989) : The question of *Echinofossulocactus* (Cactaceae). Taxon, vol. 38, n° 2, p. 281-288.

³ The actual publication of this work is established on February the 12th, 1936. *Vide* : Mats Hjertson & Urs Eggli *in* Taxon vol. 45, n° 3, p. 513-514 (1996).

HILL Arthur W. (1933) : *Index Kewensis plantarum phanerogamarum. nomina et synonyma omnium generum et specierum ab initio anni MDCCCCXXVI usque ad finem anni MDCCCCXXX complectens ; Supplementum octavum.* Oxonii [Oxford, U.K.] : e prelo Clarendoniano. III + 256 p.

HUNT David R. (1980) : Decent re-burial for Echinofossulocactus Lawr. Cactus and Succulent Journal of Great Britain, vol. 42, n° 4, p. 105-107.

LAWRENCE George (1841) : A Catalogue of the Cacti in the collection of the Rev. Theodore Williams, at Hendon Vicarage, Middlesex. In LOUDON John C. [Editor] : The Gardener's Magazine and register of rural & domestic improvement, new series, vol. VII⁴ [vol. 17], p. 313-321.

LEMAIRE [A.] Charles (1838) : *Cactearum aliquot novarum ac insuetarum in horto Monvilliano cultarum accurata descriptio.* Lutetiæ parisiiorum [Paris] : Chez F. G. Levrault et chez Eudem Argenteorati. XIV + 42 p. + 1 tab.

LEMAIRE [A.] Charles (1839) : *Cactearum genera nova speciesque novae et omnium in horto Monvilliano cultarum ex affinitatibus naturalibus ordinatio nova indexque methodicus.* Lutetiis parisiiorum [Paris] : Chez L'Éditeur et chez J. Loss. XVI + 115 p.

LODÉ Joël (1989-2001) : Fichier encyclopédique des cactées et autres succulentes. Aix-en-Provence : Édisud. Series 16, sheet n° 1462.

LODÉ Joël (2015) : Taxonomie des *Cactaceae*. Volumes I & II. [French version]. Cuevas del Almanzora : Éditions Cactus-Aventures. 1388 p. + XLIV p.

NICOLSON Dan H. (1993) : Report on the status of proposals to conserve and/or reject names (nomina conservanda et rejicienda proposita) published by the end of 1992. Taxon, vol. 42, n° 2, p. 435-446.

ORCUTT Charles R. (1926) : Cactography. 5. [cf. : HEATH 1989 ; HUNT 1980 ; TAYLOR 1983 ; T]ADEN 1982].

SCHUMANN Karl M. (1897-1899) : Gesamteschreibung der Kakteen. (*Monographia Cactacearum*). Neudamm : Verlag von J. Neumann. XI + 832 p.

SPEGAZZINI Carlo[s] L. (1923) : Breves notas cactológicas. Anales Soc. Cient. Argentina, tome XCVI, p. 61-113.

TAYLOR Nigel P. (1980) : Ferocactus and Stenocactus united. Cactus and Succulent Journal of Great Britain, vol. 42, n° 4, p.108.

TAYLOR Nigel P. (1983) : Comments on proposal 673 to conserve 5408 Stenocactus (Schumann) Berger (1929) over various generic names (Cactaceae). Taxon, vol. 31, n° 4, p. 641-643.

⁴ We find this volume cited as "17" in each of the papers which discussed about this topic. The title-page from 1841 reads : "VOL. VII. NEW SERIES.", which corresponds to the seventeenth volume without considering the serialisation.

TJADEN William L. (1982) : (673) Proposal to conserve 5408 *Stenocactus* (K. Schum.) Berger (1929) over *Echinofossulocactus* Britton & Rose (1922) and other generic names (Cactaceae). *Taxon*, vol. 31, n° 3, p. 570-573.

TJADEN William L. (1984) : Comment on proposal 673 to conserve 5408 *Stenocactus* (Cactaceae). *Taxon*, vol. 33, n° 3, p. 507.

TURLAND Nicholas J., WIERSEMA J. H., BARRIE F. R., GREUTER W., HAWKSWORTH D. L., HERENDEEN P. S., KNAPP S., KUSBER W.-H., LI D.-Z., MARHOLD K., MAY T. W., Mc NEILL J., MONRO A. M., PRADO J., PRICE M. J. & SMITH G. F. (2018) : International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code). Glashütten : Koeltz Botanical Books. XXXVIII + 254 p.

WIERSEMA John H., Mc NEILL J., TURLAND N. J., BARRIE F. R., BUCK W. R., DEMOULIN V., GREUTER W., HAWKSWORTH D. L., HERENDEEN P. S., KNAPP S., MARHOLD K., PRADO J., PRUD'HOMME VAN REINE W. F. & SMITH G. F. (2015) : International Code of Nomenclature for algae, fungi, and plants (Melbourne Code) ; Appendices II-VIII. Königstein : Koeltz Scientific Books. 492 p.

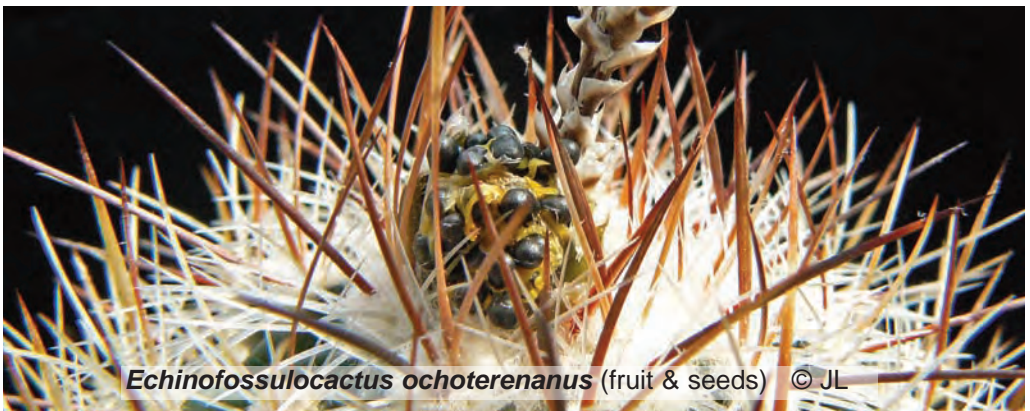
2) Webography

IPNI [collective] (2004-2020) : The International Plant Names Index. <https://www.ipni.org/n/1011609-2>. [Accessed in August 2020].

LOUDON John C. (1841) : The Gardener's Magazine and register of rural & domestic improvement, vol. VII, new series. <https://www.biodiversitylibrary.org/page/32384292>. [Accessed in August 2020].

WIERSEMA John H., TURLAND N. J., BARRIE F. R., GREUTER W., HAWKSWORTH D. L., HERENDEEN P. S., KNAPP S., KUSBER W.-H., LI D.-Z., MARHOLD K., MAY T. W., Mc NEILL J., MONRO A. M., PRADO J., PRICE M. J. & SMITH G. F. (2020) : International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) ; Appendices I-VII. <https://naturalhistory2.si.edu/botany/codes-proposals/>. [Accessed in August 2020].

ZÁHORA J., NAJÉRA QUEZADA P., FLORES FLORES J. L. & MORALES J. (2018) : *Echinofossulocactus* or *Stenocactus*. *Xerophilia*, vol. VII, n° 1 [24], p. 43-58. <https://xerophilia.ro/> [Accessed in August 2020].



Echinofossulocactus ochoterenanus (fruit & seeds) © JL