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VALIDATION of SPECIES and SUBSPECIES *in the Genera Guerreroa, Neomapuchea, and one COMB. NOV.*

Joël Lodé

RETURNING TO ERIOSYCE

Grzegorz Matuszewski

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In the Cactus-Adventures International issue Vol. 36, no. 123 of 2024, pages 134 and 139, published online, the diagnoses of the genera *Guerreroa* and *Neomapuchea* were omitted: this was corrected in the supplement October 2024.
However, all 27 taxa of the genera *Guerreroa* and *Neomapuchea* must also be validated, which is done here, as well as *Guerreroa pajonalensis* which is added here.

GUERREROA Lodé & Matuszewski (Cactoideae-Notocacteae)
Cact.-Adv. Int. 36(123): 134. 2024 (invalid), validated in Supplement October 2024, p.2
Type: *Chileorebutia aerocarpa* F.Ritter
Diagnosis. Flowers with basally widened nectaries and compressed ovaries; root system mostly a taproot.

Guerreroa aerocarpa (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Chileorebutia aerocarpa* F.Ritter, Cactus (Paris) 15(66): 8 (1960).
Type: Chili, Atacama, Freirina, 1956, Ritter 498 loc. 1 (U 097904B, SGO, ZSS).

Guerreroa atroviridis (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Pyrrhocactus atroviridis* F.Ritter, Succulenta (Netherlands) 1960: 89(90, ill.) (1960).
Type: Chile, Atacama, ca. 30 km N.W. of Vallenar, Ritter 475 loc. 1 (U 098008B, SGO, ZSS).
Lectotype: Ritter, p. 90, the illustration cited.

Guerreroa calderana (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Pyrrhocactus calderanus* F.Ritter, Succulenta (Netherlands) 1961: 13 (1961).
Type: Chile, Atacama, Caldera, on the coast, Ritter 496 (U 098136B).

Guerreroa caligophila (R.Pinto) Lodé **COMB. NOV.**
Basionym: *Eriosyce caligophila* R.Pinto, Bradleya 23: 1 (-6; illustr. 1-9) (2005).
Type: Chile, Iquique, Comuna de Iquique, Pinto & Kirberg 157665 (CONC).

Guerreroa confinis (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Pyrrhocactus confinis* F.Ritter, Succulenta (Netherlands) 1961: 4 (1961).
Type: Chile, near Copiapó, Monte Amargo, Ritter 494 (U 098080B, SGO, ZSS).

Guerreroa crispa (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Pyrrhocactus crispus* F.Ritter, Succulenta (Netherlands) 1959: 137 (1959).
Type: Chile, Atacama, Freirina, Ritter 491 (ZSS, not found, SGO, U).

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Guerreroa crispa subsp**. totoralensis** (F.Ritter) Lodé **COMB. NOV. & STAT. NOV.**
Basionym: *Pyrrhocactus totoralensis* F.Ritter, Succulenta (Netherlands) 1961: 131 (1961).
Type: Chile, Atacama, Totoral Bajo, 1956, Ritter 495 loc. 5 (U 117659B, SGO, ZSS).

Guerreroa esmeraldana (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Chileorebutia esmeraldana* F.Ritter, Taxon 12: 123 (1963).
Type: Chile, Antofagasta, Esmeralda, Ritter 518 loc. 1 (U 117795B, SGO, ZSS).

Guerreroa fulva (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Chileorebutia fulva* F.Ritter, Cactus (Paris) 66: 10 (1960), nom. inval. = *Thelocephala fulva* F.Ritter, Kakteen Südamerika 3: 1011 (1980).
Type: Chile, Copiapó, Totoral, 1956, Ritter 500 loc. 1 (U, SGO, ZSS).

Guerreroa glabrescens (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Chileorebutia glabrescens* Ritter, Cactus (Paris) 15(66): 9 (1960), incorrect name (Art. 11.3) = *Thelocephala glabrescens* (F.Ritter) F.Ritter, Kakteen Südamerika 3: 1003 (1980).
Type: Chile, Atacama, Copiapó, coastal region, 1956, Ritter 710 (U).

Guerreroa iquiquensis (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Pyrrhocactus iquiquensis* F.Ritter, Taxon 12: 32 (1963).
Type: Chile, Tarapacá, near Iquique, above the city, 1954, Ritter 201 (ZSS).

Guerreroa krausii (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Chileorebutia krausii* F.Ritter, Cactus, Paris 14(64): Suppl., p. [5] (1959); et in Cactus, Paris 15(66): 7 (1960).
Type: Chile, Atacama, Copiapó, 1956, Ritter 502 (U).

Guerreroa kunzei (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Echinocactus kunzei* C.F.Först., Handb. Cacteenk. [Förster] 2: 293 (1846).
Type: Chile, at high altitudes, Pöppig, cult. hort. Senke, not pres. Neotype: Chile, Antofagasta, Copiapó, Paipote, 1955, Ritter 220 loc. 2 “Paipote” (SGO No. 121487).

Guerreroa malleolata (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Chileorebutia malleolata* F.Ritter, Taxon 12: 123 (1963).
Type: Chile, North of Chañaral, 1956, Ritter 517 (U 0007625).

Guerreroa occulta (Kattermann) Lodé **COMB. NOV.**
Basionym: *Eriosyce occulta* Katt., Succ. Pl. Res. 1: 119 (1994).
Type: (neotype) Chile, Antofagasta, Taltal, Breas, Kattermann 391 (DBG).

Guerreroa odieri (Lem. ex Salm-Dyck) Lodé **COMB. NOV.**
Basionym: *Echinocactus odieri* Lem. ex Salm-Dyck, Cact. Hort . Dyck. (1849). 174 (1850).
Type: not des. Neotype: Chile, Atacama, S. of Caldera, base of Morro Copiapó, Kattermann 802 (DBG).

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Guerreroa paucicostata (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Horridocactus paucicostatus* F.Ritter, Succulenta (Netherlands) 1959: 113 (1959).
Type: Chile, Antofagasta, 20 km N. of Paposo, Ritter 521, loc. 1 (U097984B, SGO, ZSS).

Guerreroa paucicostata subsp. **echinus** (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Pyrrhocactus echinus* F.Ritter in Taxon 12: 33 (1963).
Type: Chile, Antofagasta, S. of Antofagasta, Cerro Coloso, Ritter 537, loc. 1 (U 116948B, SGO, ZSS).

Guerreroa paucicostata subsp**. floccosa** (F.Ritter) Lodé **COMB. NOV. & STAT. NOV.**
Basionym: *Pyrrhocactus floccosus* F.Ritter, Taxon 12: 32 (1963).
Type: Chile, Antofagasta, coastal hills, 1956, Ritter 545 loc. 1 (U 117835B, SGO, ZSS).

Guerreroa recondita (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Pyrrhocactus reconditus* F.Ritter, Succulenta (Netherlands) 1962: 27 (1962).
Type: Chile, Antofagasta, mountains N. of town, Apr 1954, Ritter 204 (loc. 1 (ZSS, SGO, U).

Guerreroa sociabilis (F.Ritter) Lodé **COMB. NOV.**
Basionym: *Neoporteria sociabilis* F.Ritter, Succulenta (Netherlands) 1963: 3 (1963).
Type: Chile, Atacama, Totoral Bajo, Ritter 655 (U 116972B).

Guerreroa spectabilis (Helmut Walter & J.C.Acosta) Lodé **COMB. NOV.**
Basionym: *Eriosyce spectabilis* Katt., Helmut Walter & J.C.Acosta, Cact. Succ. J. (Los Angeles) 83(5): 198 (-201; illustr. 1-11) (2011).
Type: Chile, Atacama, Huasco, highest mountains in the vicinity of Quebrada Carrizal. December 2009, Juan Acosta 704 (CONC).

Guerreroa taltalensis (Hutchison) Lodé **COMB. NOV.**
Basionym: *Neoporteria taltalensis* Hutchison, Cact . Succ. J. (Los Angeles) 27(6): 181, illustr. 167 (1955).
Type: Chile, Antofagasta, Dept . Taltal, Sierra Esmeralda, ca. 3 miles north of Planta Esmeralda and ca. 1 mile inland from the coast on a road to the shoreline, on sides of shallow ravines, P. C. Hutchison #420, ex hort. University of California Botanical Garden #52.592-1 (UC).

Guerreroa taltalensis subsp**. pygmaea** (F.Ritter) Lodé **COMB. NOV. & STAT. NOV.**
Basionym: *Pyrrhocactus pygmaeus* F.Ritter in Taxon 12: 32 (1963).
Type: Chile, Atacama, 20 km N. of Chañaral, on the coast, Ritter 519, loc. 1 (U 117858B, SGO, ZSS).

NOT PREVIOUSLY INCLUDED in Cact.-Av. Int. 123:
Guerreroa pajonalensis (I.Schaub & Keim) Matuszewski & Lode **COMB.NOV.**
Basionym: *Eriosyce napina* subsp. *pajonalensis* I.Schaub & Keim, Cactus & Co. 15(1): 47(-50; illust.) (2011).

Type: Chile, Atacama Region, North of Caleta Pajonales, 10 Sep 2010, Ingrid Schaub & Ricardo Keim (SGO 159376).
Synonyms: *Eriosyce napina* subsp. *pajonalensis*, *Horridocactus napinus* subsp. *pajonalensis*.
Comments: according to Matuszewski (pers. comm. 2024), *Eriosyce napina* subsp. *pajonajensis* has nothing in common with ***Horridocactus napinus*** and should be included in ***Guerreroa***.
This taxon was not evaluated in the molecular work of H.Walter *et al*. (2024).

NEOMAPUCHEA Matuszewski & Lodé (Cactoideae-Notocacteae)

Cact.-Adv. Int. 36(123): 139. 2024 (invalid), validated in Supplement October 2024, p.2
Type: *E. marksiana* (F.Ritter) Katt. (≡ *Pyrrhocactus marksianus* F.Ritter).
Diagnosis. Flowers markedly campanulate; flower and fruit areoles nearly naked; root system fibrous.

Neomapuchea marksiana Matuszewski & Lodé **COMB. NOV.**
Basionym: *Pyrrhocactus marksianus* F.Ritter, Succulenta (Netherlands) 1960: 2 (1960).
Type: Chile, Maule, Villa Prat, S.W. of Curicó, 1954, Ritter 234 (ZSS, SGO).

Neomapuchea marksiana subsp**. lissocarpa** Matuszewski & Lodé **COMB. NOV. & STAT. NOV.**
Basionym: *Pyrrhocactus lissocarpus* F.Ritter, Succulenta (Netherlands) 1960(2): 17 (1960).
Type: Chile, Coquena, 34°15'S, 1955, Ritter 466 loc. 1 (U097936B, SGO, ZSS).

Neomapuchea marksiana subsp. **gracilis** (F.Ritter) Matuszewski & Lodé **COMB. NOV. & STAT. NOV.**
Basionym: *Pyrrhocactus lissocarpus* var. *gracilis* F.Ritter, Succulenta (Netherlands) 1960: 17 (1960).
Type: Chile, Maule, Cauquenes ("Cauguenes"), 34°15', W. San Francisco de Mostazal, Ritter 466a (ZSS).

*

Bibliographical References:

Guerrero Pablo C., Helmut E. Walter, Mary T.K. Arroyo, Carol M. Peña, Italo Tamburrino, Marta De Benedictis & Isabel Larridon. 2019. *Molecular phylogeny of the large South American genus **Eriosyce** (Notocacteae, Cactaceae): Generic delimitation and proposed changes in infrageneric and species ranks*. Taxon 68(3): 557-573.

Lodé Joël. 2024. *New Combinations, Changes and Clarifications in Cactaceae*, Cact.-Adv. Int. vol.36(123): 130-145.

Lodé Joël. 2024. *Addenda to the Genera Guerreroa, Neomapuchea and Comb. Nov.* Cact.-Adv. Int. Supplement October to vol.36(123): 2. 2024

Returning to *Eriosyce*.

Grzegorz Matuszewski

Returning to the topic of *Eriosyce* sensu lato, I would like to present several arguments for the need to reject such a classification.

The research work of Pablo C. Guerrero, Mary T. K. Arroyo, Ramiro O. Bustamante, Milén Duarte, Thomas K. Hagemann & Helmut E. Walter's team was published in Plant Syst. Evol. (2011) 297:113–128 under the title "Phylogenetics and predictive distribution modeling provide insights into the geographic divergence of *Eriosyce* subgen. *Neoporteria* (Cactaceae)" . This article presents the results of DNA studies of a group of Chilean cacti in the form of a family tree as shown below.

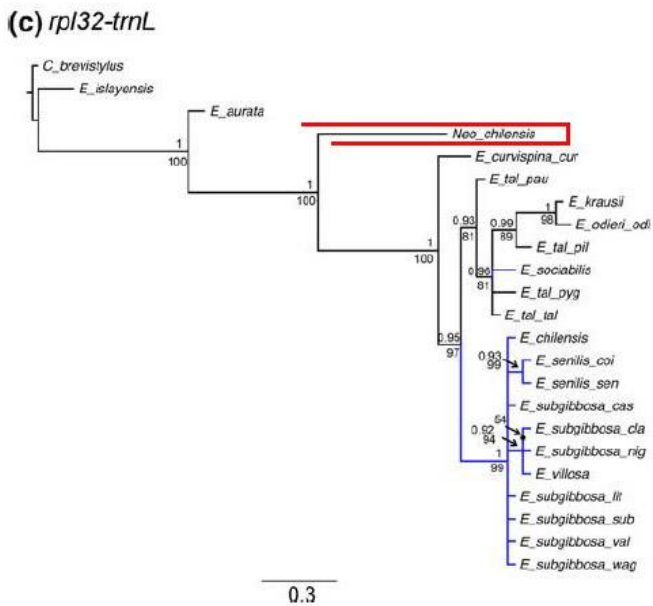

Fig. 2 Phylogeny of *Eriosyce* subgen. *Neoporteria* based on separate Bayesian analysis of morphology, and separate Bayesian and maximum likelihood analyses of molecular data based on trn*L*-trn*F* and rpl32-trn*L* (chloroplast DNA). *Numbers above branches* indicate a posteriori Bayesian support; *numbers below branches* indicate ML bootstrap support. *Filled black circles* indicate nodes that were supported with >50% of bootstrap support in ML analyses

Neowerdermannia chilensis was included in the study, the participation of which was not significant for the *Neoporteria group.* We can see *that Neowerdermannia chilensis* is in the *Eriosyce* sensu lato group, between *Eriosyce aurata*, *Eriosyce islayensis* and the remaining studied species of *Eriosyce* sensu lato.
On the pages of *Systematics and Biodiversity* (2018), 0(0) 1-15 an article was published by a team of researchers: Isabel Larridon, Helmut E. Walter, Marcelo Rosas, Viki Vandomme and Pablo C. Guerrero under the name "Evolutionary trends in the columnar cactus genus Eulychnia (Cactaceae) based on molecular phylogenetics, morphology, distribution, and habitat". This article presents the results of DNA studies of a group of South American cacti in the form of a family tree as shown below.

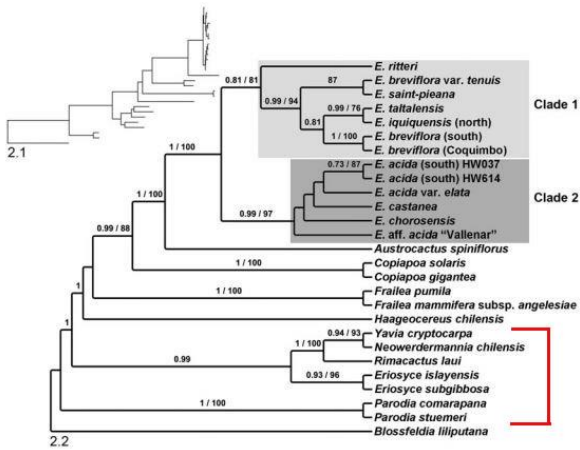

Fig. 2. 50% majority-rule consensus tree based on BI analysis of the six-locus plastid dataset. 2.1. Phylogram showing branch lengths. 2.2. Dendrogram showing Bayesian posterior probabilities (PP) and ML bootstrap support values (BS) above branches; PP >0.70 and BS >70 are given.

I was interested in the location of *Neowerdermannia chilensis*, whose participation did not interfere with the overall results of the study. It is closest to *Yavia cryptocarpa* and *Rimacactus laui*, which share a common ancestor with *Eriosyce subgibbosa* and *E. islayensis*, but are not in the same group with *Parodia*.

In the TAXON 2019 journal, a team of researchers, Pablo C. Guerrero, Helmut E. Walter, Mary T. K. Arroyo, Carol M. Peña, Italo Tamburrino, Marta De Benidictis & Isabel Larridon published an article "Molecular phylogeny of the large South American genus *Eriosyce* (Notocacteae, Cactaceae): Generic delimitation and proposed changes in infrageneric and species ranks". In this article, the focus is on the arrangement of species, taking as a basis the genus *Eriosyce* in Kattermann's concept. Images of cladogram trees for individual markers are included. For rpL32-trnL, the cladogram looks as follows.

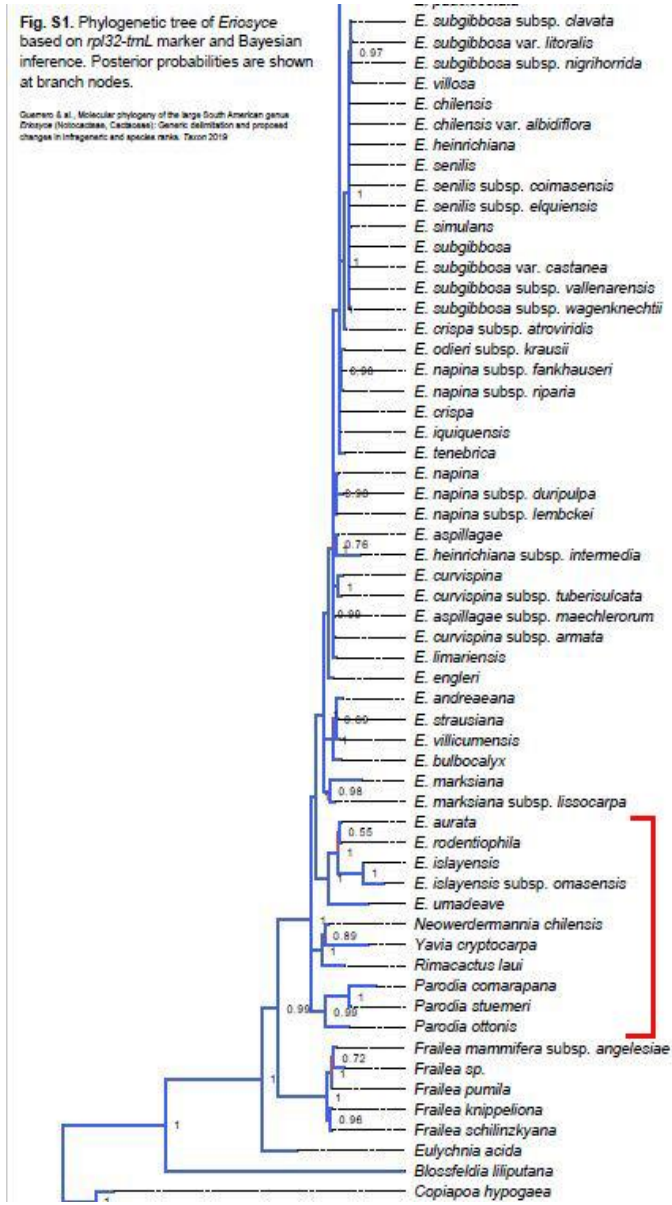

Fig. S1. Phylogenetic tree of *Eriosyce* based on *rpl32-trnL* marker and Bayesian inference. Posterior probabilities are shown at branch nodes.

Guerrero & al., Molecular phylogeny of the large South American genus *Eriosyce* (Notocactaeae, Cactaceae): Generic delimitation and proposed changes in infrageneric and species ranks. Taxon 2019

As you can see in the studies of the same chloroplast rpl32-trnL *Neowerdermannia chilensis* was thrown out of the *Eriosyce* tree, and yet the same markers were tested as in point 1.

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It would seem that different studies using identical markers should give the same results. But this is not the case and if scientific studies are to be believed, this leaves me perplexed. Naturally, other markers were also analyzed. A cladogram with the PHYC marker is also included, in which *Neowerdermannia chilensis* is not included. Perhaps this was necessary to remain in agreement with the genus *Eriosyce* in Kattermann's understanding. This only means that the computer results were manipulated to confirm the assumed thesis. However, taking into account the cladograms in which the participation of *Neowerdermannia chilensis* was rather accidental and did not serve to prove anyone's point, we must conclude that this plant causes the genus *Eriosyce* to be not monophyletic in Kattermann's understanding, and therefore it is necessary to divide it into separate genera, in accordance with the final version of the cladogram of the Guerrero team, i.e. *Eriosyce, Pyrrhocactus, Horridocactus, Neoporteria, Diaguita* and two genera unnamed by the Guerrero team.

I believe that DNA research is extremely necessary, but taxonomy cannot be based solely on this research, especially since the results are based on algorithms that are influenced by the researchers, so the subjective approach of the people involved is often influential. Such research must certainly be conducted with the participation of a botanist experienced in fieldwork, and not just an expert in algorithms and a mechanical approach to computer processes. Nature is not easy to pigeonhole. There are situations where, through evolution, plants that have a common ancestor have taken a completely different path of evolution and not only have a different appearance, but also thorns, areoles, flowers, fruits and seeds. In such a case, they cannot be classified as one genus. As an example, I will give the human *Homo* and the chimpanzee *Pan*. They also have a common ancestor.

I have great respect for what professors Guerrero, Larridon, Walter are doing, but they should not limit themselves to previously imposed patterns. Many thanks to them for dividing the *Horridocactus curvispinus* group into individual species. I wish you continued fruitful work, because many surprises await us.

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