

Trichocereus or Echinopsis:

Do genetic differences matter?

Keeper Trout

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In 1837 Zuccarini described the genus *Echinopsis*.

His differentiating features of *Echinopsis*:

- 1) Presence of hairs on the scale axils of the flowers
- 2) The arrangement of the stamen in two groups; the upper one forming a pharyngeal ring around the opening of the throat of the funnel of the flower.

Zuccarini, Joseph Gerhard 1832–1847. *Plantarum novarum vel minus cognitarum, quae in horto botanico herbarioque regio Monacensi servantur.*

Let's look at those two characteristics of Echinopsis

1. Stamens arranged in two groups; one forming a pharyngeal ring.

Echinopsis yungasensis (Photo by Bob Schick)



Trichocereus
pachanoi

in Peru

Photograph by
Geneva photography



Trichocereus peruvianus under cultivation in California



Trichocereus scopulicola under cultivation in Australia.



2. Presence of hairs arising from the axils of the scales.

The growth of the hairs is noteworthy as arising not from areoles but from an otherwise undistinguished line above the scale axils.

“Echinopsis sp.” under cultivation at Cactus Country in Australia.



Trichocereus peruvianus under cultivation in California.



Closer view of hairs arising from the axils of scales and podaria on a *Trichocereus peruvianus* in California.



As for the question:

Echinopsis or Trichocereus?

Opinions have varied.

They still do.

Weber was the first person to report observing *Trichocereus macrogonus* flowering and prepared an herbarium specimen of the flowers at some point before his death in summer of 1903.

In 1905, his voucher was entered into the herbarium of the Muséum national d'Histoire naturelle in Paris.

It was submitted as *Echinopsis* and entered by the museum under the name *Cereus*.

Weber, A. (Frédéric Albert Constantin) 1896. *Cereus macrogonus*. Pages 280–281 in Désiré Bois 1896. *Dictionnaire d'horticulture illustré*, Partie I.

Weber 1905 from the Muséum national d'Histoire naturelle



T. macrogonus as
Echinopsis macrogona
Echinopsis macrogona

Cereus macrogona

Herbier Muséum Paris
P04919308

HERB. MUS. PARIS.
Echinopsis macrogona
Reçu le mai 1904 de M. le DOCTEUR WEBER

Weber 1896

Weber provided a short description of *Echinopsis macrogona* including his observation of a flower.

He referred to Otto as its describer. This SEEMS to be a reference to Salm-Dyck's publication?

Britton & Rose mentioned Link & Otto used this name in some earlier publication.

It has not been locatable by me.

Weber 1896

Cereus macrogonus Otto. — Homeland? —

Tall, glaucescent-green stem;

7-8 rounded ribs;

close areoles;

stiff, short, brown prickles. [Labouret 1853 similarly described the spines as being short.]

White flower, lasting 2 days, 18 cm long, large, fleshy;

thick tube, bearing bristles.

Weber, A. (Frédéric Albert Constantin) 1896. *Cereus macrogonus*. Pages 280–281 in Désiré Bois 1896. *Dictionnaire d'horticulture illustré*, Partie I.

After a 2-meter column of macrogonus flowered at La Mortola in Italy, Alwin Berger published a description in 1904.

The following year he introduced *Trichocereus* as a subgenus of *Cereus*; noting its extreme closeness to *Echinopsis*.

Alwin Berger defined *Trichocereus* as possessing:

Ovary & tube with more or less densely imbricated acute scales, with long and curled or woolly hairs arising from the axils in great profusion, but lacking bristles;

Sepaloid and petaloid perianth leaves are numerous;

Stamens are numerous, in two groups;

Style as long or longer with numerous stigmata.

Fruit uncolored, roundish, scaly and hairy, with the dried remains of the flowers more or less persistent.

Flowers showy, nocturnal, white, yellowish or red, trumpet-shaped.

Berger 1905 placed 14 species in his new subgenus.

Cereus (*Trichocereus*) *andalgalensis*

C. (*Trichocereus*) *Bridgesii*

C. (*Trichocereus*) *candicans*

C. (*Trichocereus*) *chilensis*

C. (*Trichocereus*) *fascicularis*

C. (*Trichocereus*) *Huascha*

C. (*Trichocereus*) *lamprochlorus*

C. (*Trichocereus*) *macrogonus*

C. (*Trichocereus*) *nigripilis*

C. (*Trichocereus*) *Pasacana*

C. (*Trichocereus*) *pterogonus*

C. (*Trichocereus*) *Spachianus*

C. (*Trichocereus*) *strigosus*

C. (*Trichocereus*) *thelegonus*

Alwin Berger 1905. Missouri Botanical Garden, 16th Annual Report, 57–86, with 12 plates. A Systematic Revision of the Genus *Cereus* Mill.

Berger had differentiated his new subgenus from other *Cereus* by the presence of woolly areoles.

Riccobono presented *Trichocereus* as a genus in 1909.

He too referred to Otto as the describer of *macrogonus* and cited Salm-Dyck's publication.

Riccobono included only two members:

Trichocereus macrogonus
and
Trichocereus spachianus

Riccobono, Vincenzo 1909. Bollettino delle Reale Orto Botanico di Palermo, 8: 215–266.
Studii sulle Cattede del R. Orto Botanico di Palermo.

Britton & Rose 1920

Largely echoed Berger's description of Riccobono's genus *Trichocereus* but designated *Cereus macrogonus* Otto as the Type species.

Columnar plants, more or less branched;
ribs few to numerous, either low or prominent, usually very spiny;
flowers nocturnal, large, funnel-form,
perianth either persistent or separating from the fruit by abscission;
perianth-segments elongated;
stamens numerous, filiform, arranged in two groups;
stigma-lobes numerous;
ovary and flower-tube bearing numerous scales,
scale axils bearing long hairs;
dull colored fruit without bristles or spines.

Britton, Nathaniel Lord & Joseph Nelson Rose 1920. *The Cactaceae. Descriptions and Illustrations of Plants of the Cactus Family. Vol. 2.*

Berger 1929

Cereus subgenus Trichocereus

„Haarcereus“.

Stems are multi-ribbed,
often with V-shaped notches above the areoles.
Flowers are [regelmäßig], large, mostly white,
appearing at night,
with numerous curly hairs.

It was said to include 20 species in South America.

However, his presentation mentions only 13 species.

Berger, Alwin 1929. Kakteen.

Berger 1929

[- *Cereus andalgalensis*]

Cereus Bridgesii

Cereus candicans

Cereus chiloënsis

+ *Cereus coquimbanus*

Cereus fascicularis

Cereus huascha

Cereus lamprochlorus

Cereus macrogonus

[- *Cereus nigripilis* = *C. coquimbanus*]

Cereus Pasacana

[- *Cereus pterogonus* = *C. testudo*]

+ *Cereus Schickendantzii*

Cereus Spachianus

Cereus strigosus

Cereus thelegonus

+ added from Britton & Rose 1920

[- present in Berger 1905; dropped through lumping or forgotten]

Berger, Alwin 1929. Kakteen

Let's look at the Type.

We need to step a few decades backwards from Berger and Britton & Rose.

There is a problem

Britton & Rose chose *Cereus macrogonus* Otto as the Type species for the genus *Trichocereus*.

And the description of Salm-Dyck (& Otto?) 1850 was used.

Despite the plant being well represented in European horticulture there was no record of its origin.

This was respected through 'grandfathering' so the basic requirements of describing a species were not applied. Respecting deficient descriptions of early authors has generated a number of taxonomic problems.

Salm-Dyck, Jos. de 1850. *Cacteæ in Horto Dyckensi cultæ anno 1849. Secundum tribus et genera digestæ, additis adnotationibus botanicis characteribusque specierum in enumeratione diagnostica cactearum doct. Pfeifferi non descriptarum.*

This first publication of macrogonus that I could locate was in Salm-Dyck 1850.

Cereus intricatus

Cereus lamprochlorus

Cereus longispinus

Cereus macrogonus

Cereus nigricans

Cereus spachianus

Cereus tenuispina

Cereus Terscheckii

Cereus tetragonus

Cereus validus

Cereus candicans

Cereus bridgesii

Cereus candicans

Cereus chilensis

Cereus eburneus

Cereus Forbesii

Cereus fulvibarbis

Cereus fulvispinus

Cereus gladius

Cereus grandiflorus

Salm-Dyck, Jos. de 1850. Cacteæ in Horto Dyckensi cultæ anno 1849. Secundum tribus et genera digestæ, additis adnotationibus botanicis characteribusque specierum in enumeratione diagnostica cactearum doct. Pfeifferi non descriptarum.

Salm-Dyck 1850

In this work, Prince Salm-Dyck included a short and rather impoverished description of a cutting of *Cereus macrogonus* from the Berlin-Dahlen botanical gardens.

In this description, Salm-Dyck commented on never having seen a flower and not knowing its origin.

He appears to have cowritten this with Otto.

Christoph Friedrich Otto was the head gardener at Berlin-Dahlen.

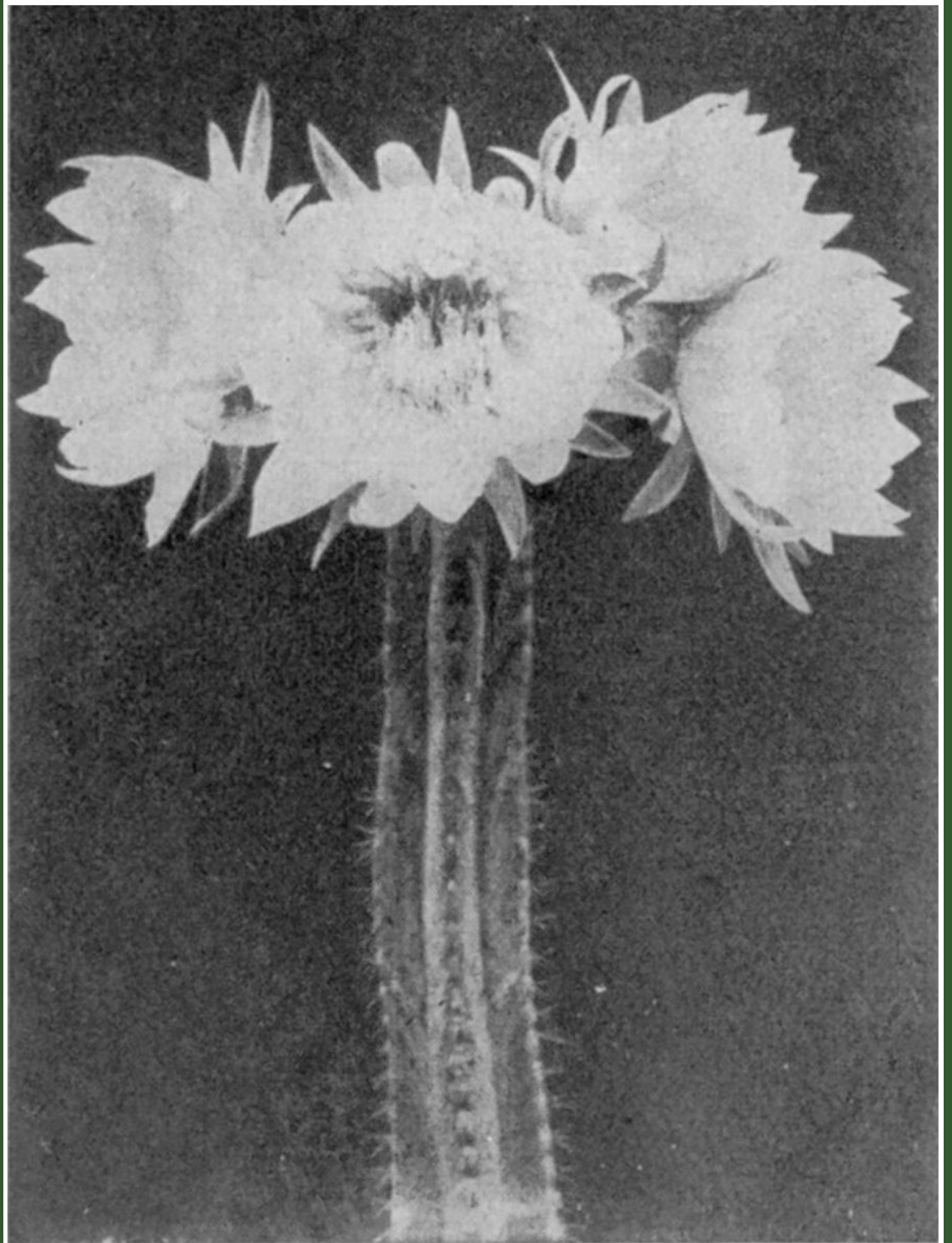
It can be found said the original macrogonus has been lost, we do have some drawings and a couple of photographs that predate Backeberg.

This is the earliest image of a macrogonus I can locate.

W. Watson 1896
Cactus Culture For Amateurs



Schelle 1926 included a useful image of a macrogonus flowering



Schelle, Ernst 1926 Kakteen

19. *Cereus macrogonus* Salm-Dyck

There is also an interesting macrogonus collection made in 1936 by Harry Blossfeld which was present at Field's cactus in Australia.

Blossfeld also collected two peruvianus from the wild in Peru he called *Trichocereus rosei*.



Curiously Curt Backeberg made comments concerning “macrogonus” that illuminates both a persistent point of confusion and some political machinations.

In 1931, during the time when his superior Erich Werdermann at BERLIN-DAHLEN was renaming columnars as *Cereus*, Backeberg respected the existance of *peruvianus* as *Cereus rosei* and never mentioned *macrogonus*.

The new name *rosei* was needed as a different *Cereus peruvianus* already existed.

It is sometimes thought Werdermann believed *Cereus macrogonus* to be the *Pilocereus* that Schumann confusedly presented within Martius's *Flora Brasiliensis*.

Despite Werdermann's omission of *Cereus macrogonus* Salm-Dyck or *C. macrogonus* Otto, his choice of epithet in *C. macrogonus* K. Schumann indicates that he did not equate them.

Trichocereus peruvianus appearing in Backeberg's 1937 cactus catalog

Mit dem **TRICHOCEREUS PACHANOI**, der dem nebenstehenden Trichoc. peruvianus ähnelt, wur-



de die beste bekannte Unterlage eingeführt: Besonders für Seltenheiten zu empfehlen.

TRICHOCEREUS PACHANOI Br. & R. aus Ecuador

ähnelt obiger Pflanze, er ist aber stachellos. Diese Pflanze hat sich in mehrjähriger Prüfung als die idealste aller Pfropfunterlagen gezeigt: Wüchsig, sehr hart, ohne Stacheln, nicht verkorkend, hart und langsam treibend. Sie ist besonders für gute und wertvolle Pfropfungen zu empfehlen. Samen und Pflanzen abgebar.

(Trichoc. Pachanoi resembles the plants above but is spineless. This plant has been tested over a number of years and proves the most suitable of all grafting stocks: free growing, very hardy, without spines, not corking, growing hard and slowly. It is specially recommended for good and valuable grafts. Seeds and plants available.)

By 1941 Backeberg was declaring he had found the “lost” macrogonus and referred to the same photo he called peruvianus in 1937.

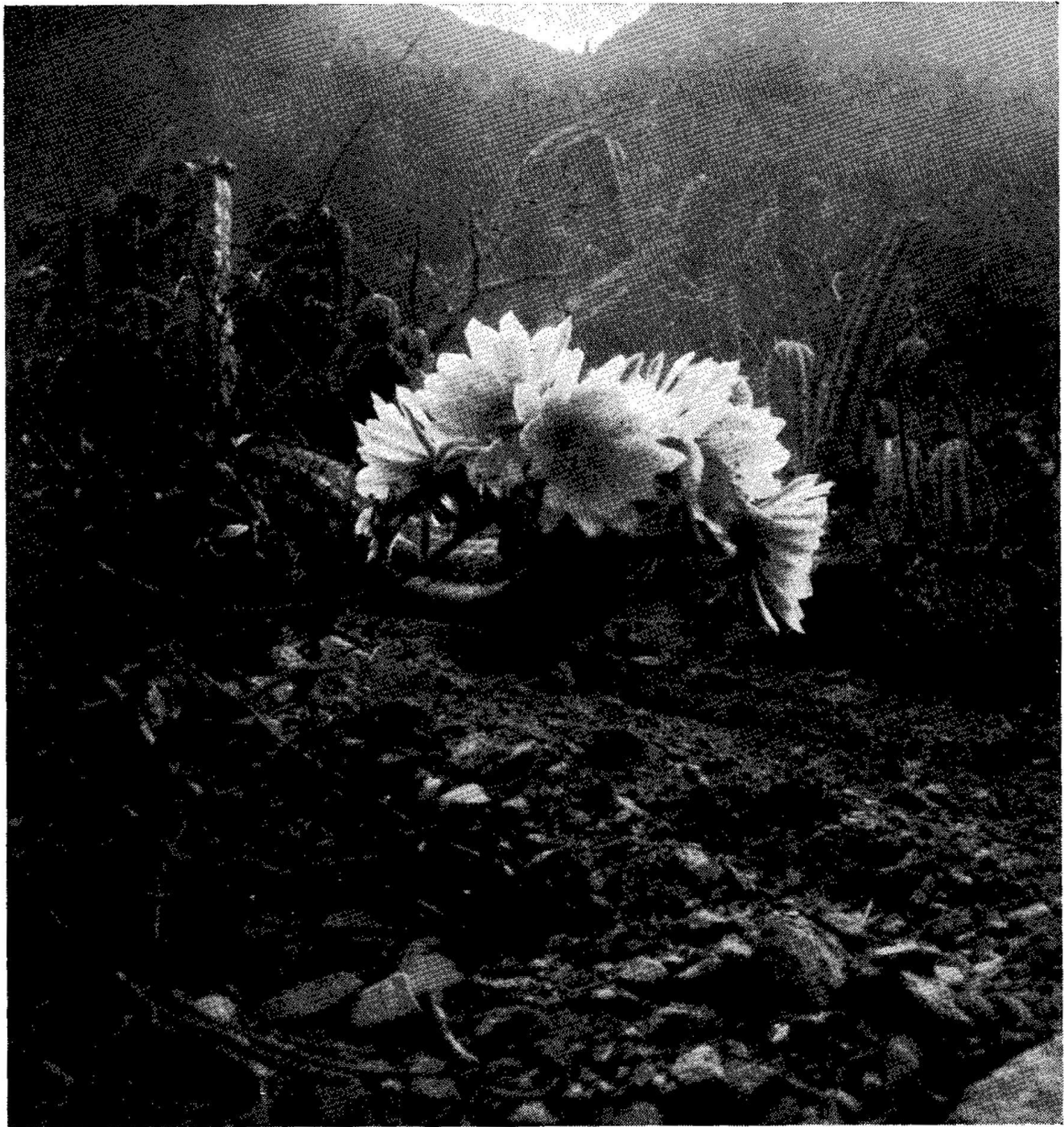
Synonyms:

= Trichocereus

peruvianus Br & R

- Cereus rosei

Werdermann



Backeberg, Curt 1941 Seltene Cereen des Westandinen Suedamerica.

Trichocereus macrogonus, Standortsaufnahme

Backeberg's *Die Cactaceae* includes an impoverished description for both taxa as well as photographs.

Early depictions of *macrogonus* strongly resembles a *peruvianus* with shorter spines; as can be common in cultivation.

In 1974 Heimo Friedrich introduced the supergenus *Echinopsis*

His revised Genus *Echinopsis*

Subgenus *Trichocereus*

Section *Trichocereus*

Section *Soehrensia*

Subgenus *Echinopsis*

Section *Echinopsis*

Section *Pseudoechinopsis*

Section *Hymenorebutia*

Subgenus *Acanthocalycium*

In this Friedrich lumped Trichocereus & more into Echinopsis

Acanthocalycium (presented as questionable
and needing study)

Chamaecereus

Helianthocereus

Hymenorebutia

part of Lobivia; in particular the larger,
northerly species.

Pseudolobivia

Soehrensia

Trichocereus

Also:

Possibly some of the Rebutia species

Gordon Rowley 1974 provided a list to accompany the commentary by Friedrich.

Echinopsis antezanae	Echinopsis glauca f. pendens	Echinopsis puquiensis
Echinopsis atacamensis	Echinopsis glaucina	Echinopsis purpureopilosa
Echinopsis aurantiaca	Echinopsis grandis	Echinopsis randallii
Echinopsis bertramiana	Echinopsis herzogiana	Echinopsis rivierei
Echinopsis brevispina	Echinopsis huascha var. auricolor	Echinopsis rowley
Echinopsis camarguensis	Echinopsis huascha var. rubriflorus	Echinopsis rubinghiana
Echinopsis candicans var. gladiata	Echinopsis ingens	Echinopsis santaensis
Echinopsis candicans var. tenuispina	Echinopsis knuthiana	Echinopsis santiaguensis
Echinopsis cephalomacrostibas	Echinopsis lagenaeformis	Echinopsis schoenii
Echinopsis chalaensis	Echinopsis litoralis	Echinopsis skottsbergii
Echinopsis chiloensis	Echinopsis macrogona	Echinopsis spachiana
Echinopsis chiloensis var. eburnea	Echinopsis manguinii	Echinopsis strigosa
Echinopsis conaconensis	Echinopsis narvaecensis	Echinopsis tacaquirensis
Echinopsis coquimbana	Echinopsis nigripilis	Echinopsis taquimbalensis
Echinopsis courantii	Echinopsis orurensis	Echinopsis taratensis
Echinopsis cuzcoensis	Echinopsis orurensis var. albiflorus	Echinopsis tarijensis
Echinopsis deserticola	Echinopsis pachanoi	Echinopsis tarmaensis
Echinopsis escayachensis	Echinopsis pasacana	Echinopsis terscheckii
Echinopsis friedrichii	Echinopsis pecheretiana	Echinopsis terscheckii var. montana
Echinopsis fulvilana	Echinopsis peitscheriana	Echinopsis thelegona
Echinopsis glaucus	Echinopsis peruviana	Echinopsis thelegonoides
	Echinopsis poco	Echinopsis trichosus
	Echinopsis poco var. albiflorus	Echinopsis tulhuayacensis
	Echinopsis poco var. friciana	Echinopsis tunariensis
		Echinopsis uyupampensis
		Echinopsis volliana
		Echinopsis werdermanniana

Hunt 1997

David Hunt presented a list of a few new names and combinations that included the rejection of 5 *Trichocereus* as invalid names, the listing of 3 more as *Echinopsis* species, and the lumping of 4 into other *Echinopsis* species.

David Hunt 1997. *Cactaceae Systematics Initiative*, 4: 5–6. New Names and Combinations in Various Genera.

Hunt 2000

David Hunt kept *Echinopsis* as a supergenus lumping the former genera:

Acanthocalycium

Helianthocereus

Leocostele

parts of *Lobivia*

Neolobivia

Pseudolobivia

one member of *Weberbauerocereus*

Soehrensia

Trichocereus

David Hunt 2000. *Cactaceae Checklist*, 2nd edition.

Bob Schick had some agreement with Rowley 1974 but took issue with his assertion that there was no consistent and discernible difference in flowers.

Echinopsis is below.

Trichocereus



Albesiano & Kiesling 2012

This was responsible for successfully restoring the genus *Trichocereus*.

At least in the eyes of David Hunt and a few other people.

And at least for some of the former *Trichocereus* members.

There were some problematic aspects to their work that are part of why not all cactus experts respect their conclusions.

One of which involved not simply using *macrogonus* as the Type but choosing a Peruvian collection made under that name; collected near Tarma in 1982 (David N. Smith 2456) as their Neotype. Their defense of its synonymy with the original *macrogonus* in Europe was at best specious and superficial causing many experts to completely ignore them.

Albesiano, Sofia & Roberto Kiesling 2012. *Haseltonia*, 17: 24-34. Identity and Neotypification of *Cereus macrogonus*, the Type Species of the Genus *Trichocereus* (Cactaceae).

Albesiano & Terrazas 2012

This paper presented the molecular work that accompanied Albesiano & Kiesling.

One of their trees includes *macrogonus* but nowhere is it made clear what was analyzed under that name.

Both Albesiano & Kiesling stonewalled a request for clarification made during the peer review process.

Albesiano, Sofia & Teresa Terrazas 2012. *Haseltonia*, 17: 3-23. Cladistic Analysis of *Trichocereus* (Cactaceae: Cactoideae).

Problems worth mentioning:

Albesiano, Kiesling & Terrezas did not include any peruvianus from Peru in their analysis; only Bolivia.

Albesiano & coworkers' morphological study of any Peruvian peruvianus was limited to Rose's NYBG herbarium sheet.

There is no indication as to what specimen of macrogonus was used in their molecular analysis.

Kiesling was disingenuous when queried about this deficiency during the process of peer review.

Trichocereus peruvianus Britton & Rose

Disappeared into *Trichocereus macrogonus* subs. *macrogonus* in
Albesiano's publications

AKA

Cereus rosei Werdermann

Synonyms mentioned:

Echinopsis peruviana subsp. *puquiensis*

Echinopsis peruviana

Trichocereus pachanoi forma *peruvianus*

Trichocereus peruvianus

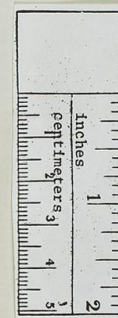
Their choice of a peruvianus for cladistic analysis was limited to two specimens at LA PAZ that had been submitted (and confirmed) as *T. bridgesii*.

One was renamed *T. peruvianus* by Albesiano in the herbarium records while the other is still labeled *T. bridgesii*.

This taxa was later restored when published as *Trichocereus macrogonus* subsp. *peruvianus* by Joël Lode.

TRICHOCEREUS PERUVIANUS

Holotype of ROSE at
NYBG



Echinopsis pachanoi (BRITTON & ROSE)
FRIEDRICH & G. ROWLEY
det. J. E. MADSEN 1987



UNITED STATES NATIONAL MUSEUM

CARNEGIE INSTITUTION OF WASHINGTON
NEW YORK BOTANICAL GARDEN
EXPLORATIONS IN SOUTH AMERICA

No. 18658
Trichocereus peruvianus
J. E. M.

Vicinity of Matucana, Peru
Mr. and Mrs. J. N. ROSE, Collectors

July 9, 1914

Holotype of
Trichocereus peruvianus BRITTON & ROSE
Cactaceae 2: 136 (1920).
J. E. MADSEN 1987

Jyffe
Examined for
THE CACTACEAE
Carnegie Institution
of Washington.

Isotypes of pachanoi (Br & R) and peruvianus (R & R)

Echinopsis pachanoi (BRITTON & ROSE)
FRIEDRICH & G. ROWLEY
det. J. E. MADSEN 1987

Echinopsis pachanoi (BRITTON & ROSE)
FRIEDRICH & G. ROWLEY
det. J. E. MADSEN 1987

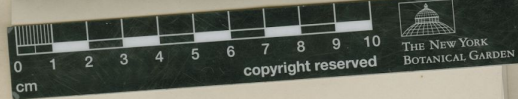
ISOTYPE OF:
Trichocereus pachanoi Britton & Rose
Cactaceae 2:134, 1920.
E.K. Schofield 1976

ISOTYPE OF:
Trichocereus peruvianus Britton & Rose
Cactaceae 2:136, 1920.
E.K. Schofield 1976

UNITED STATES DEPARTMENT OF AGRICULTURE
GRAY HERBARIUM OF HARVARD UNIVERSITY
UNITED STATES NATIONAL MUSEUM
NEW YORK BOTANICAL GARDEN
EXPLORATIONS IN SOUTH AMERICA
Trichocereus paschei Britton & Rose
On the outskirts of Cuenca
Photograph by George Rose
No. 104

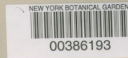
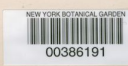
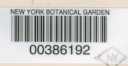
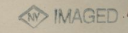
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GRAY HERBARIUM OF HARVARD UNIVERSITY
UNITED STATES NATIONAL MUSEUM
NEW YORK BOTANICAL GARDEN
EXPLORATIONS IN SOUTH AMERICA
No. 22806 *paschei*
Trichocereus paschei
Vicinity of Cuenca, Ecuador
J. N. ROSE, Collector
A. PACHANG, J. ASSISTANTS
GEORGE ROSE
September 17 to 24, 1918

CARNEGIE INSTITUTION OF WASHINGTON
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No. 18658
Trichocereus peruvianus
Vicinity of Maticucana, Peru
Mr. and Mrs. J. N. ROSE, Collectors
July 9, 1914



Examined for
THE CACTACEAE
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18658

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235

Trichocereus summary in Eggli & Nyffeler 2012

Trichocereus atacamensis ssp. pasacana	Trichocereus faundezii
Trichocereus camarguensis ssp. caulescens	Trichocereus formosus ssp. bruchii
Trichocereus candicans ssp. pseudocandicans	Trichocereus hahnianus
Trichocereus chiloensis ssp. australis	Trichocereus huascha ssp. robusta
Trichocereus chiloensis ssp. eburneus	Trichocereus macrogonus var. pachanoi
Trichocereus chiloensis ssp. panhoplites	Trichocereus macrogonus var. peruvianus
Trichocereus crassicaulis	Trichocereus pectinifer
	Trichocereus serpentinus
	Trichocereus tacaquirensis ssp. taquimbalensis
	Trichocereus undulosus

former *Trichocereus* in Egli & Nyfeller 2012

<i>Leucostele atacamensis</i>	<i>Soehrensia angelesiae</i>	<i>Soehrensia quadratumbonata</i>
<i>Leucostele bolligeriana</i>	<i>Soehrensia arboricola</i>	<i>Soehrensia schickendantzii</i>
<i>Leucostele chiloensis</i>	<i>Soehrensia camarguensis</i>	<i>Soehrensia spachiana</i>
<i>Leucostele coquimbana</i>	<i>Soehrensia candicans</i>	<i>Soehrensia strigosa</i>
<i>Leucostele deserticola</i>	<i>Soehrensia caulescens</i>	<i>Soehrensia tarijensis</i>
<i>Leucostele terscheckii</i>	<i>Soehrensia crassicaulis</i>	<i>Soehrensia thelegona</i>
<i>Leucostele tunariensis</i>	<i>Soehrensia fabrisii</i>	<i>Soehrensia thelegonoides</i>
<i>Leucostele werdermanniana</i>	<i>Soehrensia grandiflora</i>	<i>Soehrensia vasquezii</i>
	<i>Soehrensia hahniana</i>	<i>Soehrensia volliana</i>
	<i>Soehrensia lobivioides</i>	<i>Soehrensia walteri</i>

Notice a couple of problems.

hahniana appears both in *Soehrensia* and in *Trichocereus*.

atacamensis is in *Leucostele* but *atacamensis* var. *pasacana* is in *Trichocereus*

Schlumpberger & Renner 2012

Echinopsis was noted to be preserved due to the problematic boundaries between the assorted former genera defying any clean resolution into monophyletic groups.

Schlumberger, Boris O. & Susanne S. Renner 2012. *American Journal of Botany*, 99(8): 1335–1349. Molecular phylogenetics of *Echinopsis* (Cactaceae). Polyphyly at all levels and convergent evolution of pollination modes and growth forms.

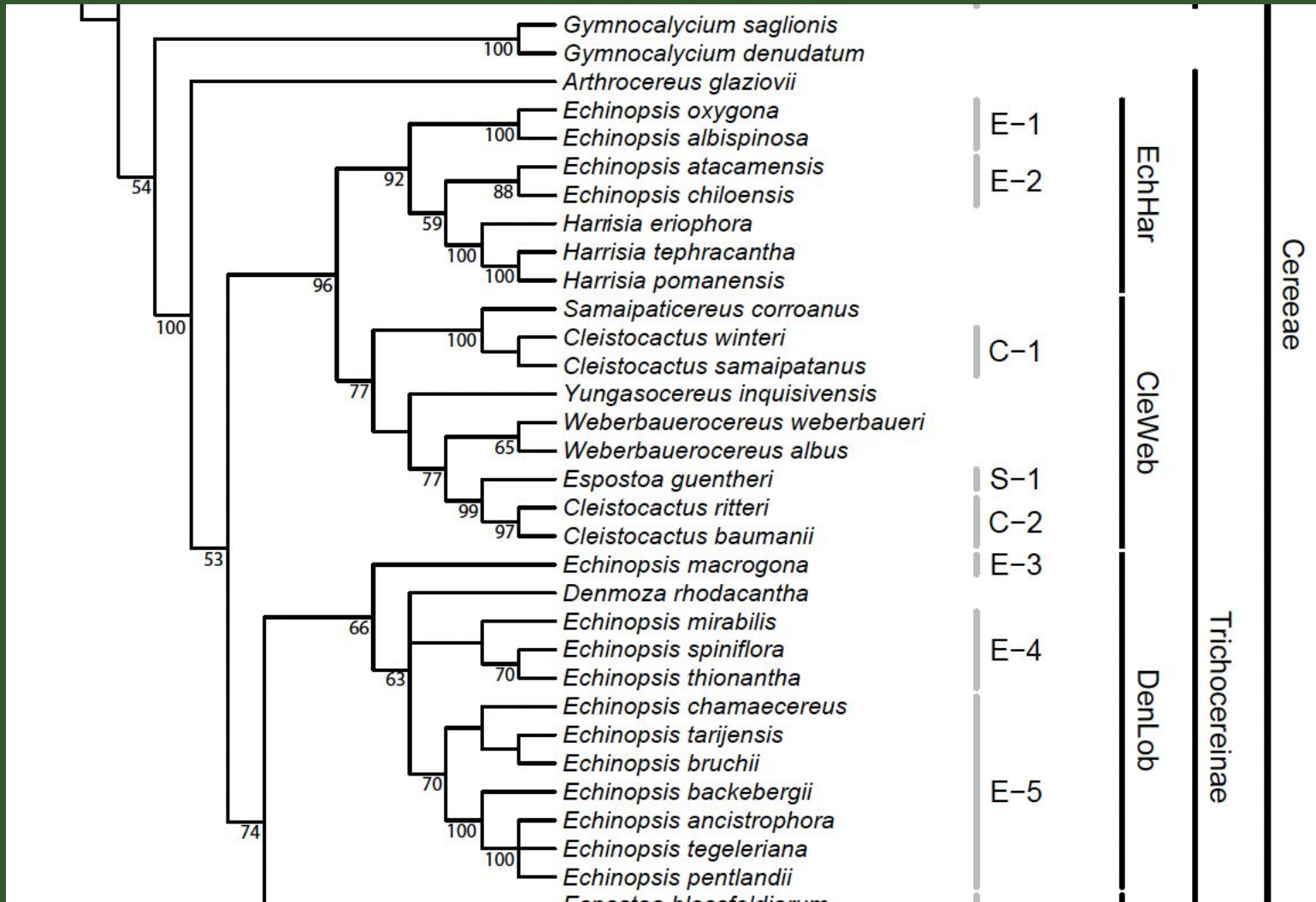
Lendell 2013

Friedrich's wide circumscription of the genus *Echinopsis* was rejected by all of their statistical tests as resulting in a "completely artificial polyphyletic taxon".

Lendel suggested recognition of *Acanthocalycium*, *Leucostele*, *Lobivia*, *Setiechinopsis*, *Soehrensia* and *Trichocereus* in addition to *Echinopsis* s.s.

Lendel, Anita 2013. South American Cacti in time and space: studies on the diversification of the tribe Cereeae, with particular focus on subtribe Trichocereinae (Cactaceae).

Lendell 2013



Lendel, Anita 2013. South American Cacti in time and space: studies on the diversification of the tribe Cereeae, with particular focus on subtribe Trichocereinae (Cactaceae).

Schick 2013 Echinopsis portrait

ECHINOPSOID GENERA

1. Genus Echinopsis (e.g. bridgesii, oxygona)
2. Mamillosa genus (kermesina, mamillosa) new *
3. Genus Pseudolobivia* (ancistrophora, polyancistra, obrepanda-rojasii cpx.) *

LOBIVIOID GENERA

4. Genus Lobivia (e.g. aurea, calorubra, densispina, pentlandii)
5. Marsoneri genus (marsoneri, caspalasensis) new *
6. Maximiliana genus, new (caespitosa, maximiliana, westii)

TRICHOCEREROID GENERA

7. Genus Helianthocereus (e.g. bruchii, huascha, grandiflora B+R) *
8. Genus Trichocereus (e.g. candicans, thelegonus, werdermannianus)
9. Leucanthus genus (leucanthus, rhodotricha) new *

DOUBTFUL ECHINOPSIS S.L. GENUS

10. Genus Acanthocalycium (spiniflorum, klimpeliana)

VERY DOUBTFUL ECHINOPSIS S.L. GENUS

11. Genus Chamaecereus (saltensis, silvestrii)

* = probable hybrid origin

David Hunt 2015

Hunt commented that Albesiano & Kiesling's neotypification "based on their application of the dubious name *Cereus macrogonus*" limited the generic name to *Trichocereus pachanoi* and close relatives occurring in Peru and Bolivia.

Other *Trichocereus* species from Chile or Argentina became *Leucosteles* or *Soehrensia*.

He also alluded to general acceptance of this scheme still being forthcoming.

Pablo C. Guerrero et al. 2019.

“Tribe Trichocereae harbors dozens of genera and hundreds of species, but phylogenetic relationships in this group have been extremely difficult to elucidate [...] molecular phylogenies show this group to be polyphyletic.”

Guerrero, Pablo C. et al 2018. *Journal of Heredity*, 2018, 1–18. Phylogenetic Relationships and Evolutionary Trends in the Cactus Family.

Korotkova et al. 2021.

Trichocereus is given with 6 species and 4 subspecies.

Trichocereus bridgesii

Trichocereus chalaensis

Trichocereus clavatus

Trichocereus cuzcoensis

Trichocereus macrogonus var. macrogonus

Trichocereus macrogonus var. pachanoi

Trichocereus tacaquirensis subsp. tacaquirensis

Trichocereus tacaquirensis subsp. taquimbalsis

Korotkova, Nadja et al. 2021. Willdenowia, 51: 251–270. Cactaceae at Caryophyllales.org – a dynamic online species-level taxonomic backbone for the family.
See also Electronic supplement.

Korotkova et al. 2021.

In this work,

crassicostatus is lumped into *lageniformis*

glaucus, *glaucus* f. *pendens* and *uyupampensis* are lumped into *chalaensis*

deflexispinus, *knuthianus*, *puquiensis*, *tarmaensis* and *tulhuayacensis* are lumped into *cuzcoensis*

huanucoensis, *peruvianus*, *tacnaensis*, *tortacensis* and *trichosus* are lumped into *macrogonus*

tacaquirensis and *schoenii* are lumped into *pachanoi*

Other familiar columnars once in *Trichocereus* are now in *Leucostele* or in *Soehrensia*.

Korotkova, Nadja et al. 2021. *Willdenowia*, 51: 251–270. Cactaceae at Caryophyllales.org – a dynamic online species-level taxonomic backbone for the family.
See also Electronic supplement.

No details are required for lumpers if done by respected botanists.

Taxa lumped within *Trichocereus macrogonus* var. *macrogonus* (Britton & Rose) Albesiano & R. Kiesling in Jørgesen.

Trichocereus huanucoensis H. Johnson

Trichocereus peruvianus Britton & Rose

Trichocereus puquiensis Rauh & Backeb. [Considered to be a variety of *T. cuzcoensis* by Korotkova and by workers such as Carlos Ostolaza.]

Trichocereus santaensis Rauh & Backeb.,

Trichocereus trichosus Cárdenas,

Trichocereus tacnaensis F. Ritter,

Trichocereus torataensis F. Ritter

There was also a second variety:

Trichocereus macrogonus var *pachanoi* (Britton & Rose) Albesiano &
R. Kiesling

formerly *Trichocereus pachanoi* Britton & Rose

Considering Jørgesen et al 2015 was a work on Bolivian flora, it
oddly ignored the Bolivian *T. riomizquensis* & *T. scopulicola*.

A WORD ABOUT CACTUS CONSERVATION INSTITUTE

- FOCUSED ON TAUMAULIPAN THORNSCRUB
- ORIGINALLY BEGAN WITH A DESIRE TO PROTECT THE HABITAT OF *Astrophytum asterias* AND *Lophophora williamsii*
- NOW INCLUDES OTHER PLANT SPECIES SUCH AS *Echinocereus fitchii* var. *albertii* AND THE ZAPATA BLADDERPOD
- ANTICIPATE INCREASING GEOGRAPHIC RANGE SOON TO INCLUDE WEST TEXAS HABITATS

- GREATEST ACCOMPLISHMENTS:
- LONGITUDINAL HARVESTING STUDY THAT HAS RESULTED IN THE WIDESPREAD ADOPTION BY MANY INDIGENOUS GROUPS THAT UTILIZE SACRED CACTI IN THEIR CEREMONIES
- OBTAINED GRANTS IN PARTNERSHIP WITH NATURE CONSERVANCY AND US FISH & WILDLIFE TO ESTABLISH A PRESERVE FOR ZAPATA BLADDERPOD AND OTHER SPECIES
- CURRENTLY WORKING ON ANOTHER POTENTIAL PRESERVE

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PAYPAL, AMAZON SMILE, AND OTHERS.



Q&A

Not enough time today?

More questions or comments?

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