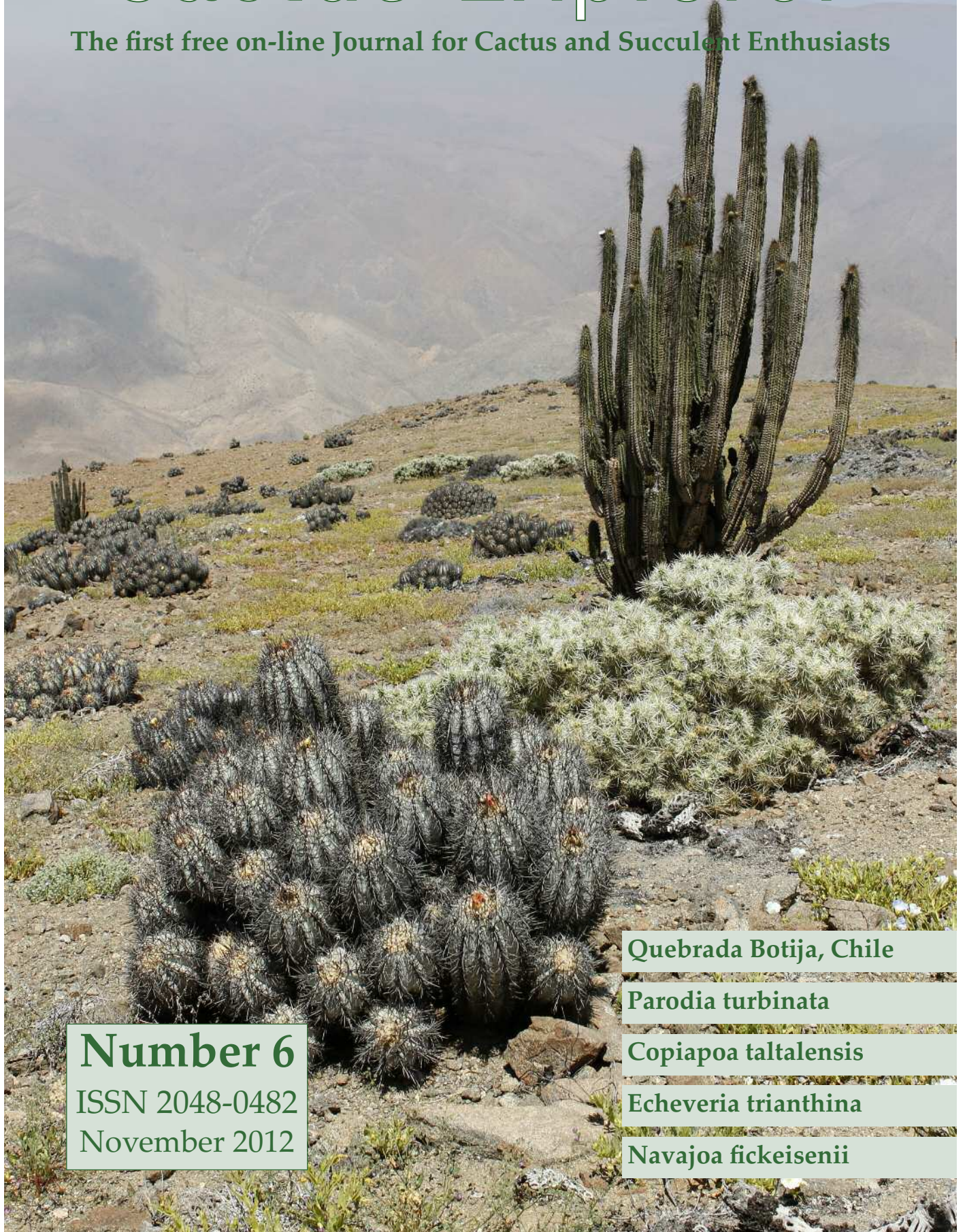


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Quebrada Botija, Chile

Parodia turbinata

Copiapoa taltalensis

Echeveria trianthina

Navajoa fickeisenii

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PARODIA TURBINATA (ARECHAVALETA) HOFACKER: A CONFUSED TAXON

Based on their habitat explorations, Giovanna Anceschi & Alberto Magli discuss the application of the name *Parodia turbinata* and compare it with its closest relatives

photos Anceschi & Magli



Fig.1 *Parodia erinacea* (*Echinocactus sellowii* var. *turbinatus*). Uruguay, Montevideo, Montevideo, 17 Feb 2011, AM 349

In October 2010, a few days after the launch of cactusinhabitat.org, we received an email from Norbert Gerloff urging us to reconsider the idea we had about *Notocactus turbinatus* (Arechavaleta) Krainz. His useful observation led us to re-examine a case that, even during our first surveys in habitat, had highlighted some difficulties in interpretation.



Fig.3 *Parodia erinacea* (*Echinocactus sellowii* var. *turbinatus*). Uruguay, Montevideo, Montevideo, 17 Feb 2011, AM 349



Fig.2 *Parodia erinacea* (*Echinocactus sellowii* var. *turbinatus*). Uruguay, Montevideo, Montevideo, 17 Feb 2011, AM 349

This article is our attempt to clarify this matter.

With "Further nomenclatural adjustments in *Frailea* and *Parodia*" in Cactaceae Consensus Initiatives 6: 11-12(1998) Andreas Hofacker completed his taxonomic proposal on the two genera, in view of the forthcoming second edition of Cites Cactaceae Checklist (Hunt 1999). Page 12 lists *Parodia turbinata* (Arechavaleta) Hofacker, of which the following is the full text.

***Parodia turbinata* (Arechavaleta) Hofacker comb. et stat. nov.** Basionym: *Echinocactus sellowii* var. *turbinatus* Arechavaleta, Anal. Mus. Nac. Montevideo 5: 235-237 (1905). *Comment*: *P. turbinata* differs from *P. sellowii* in its flat body and less and shorter spination. No hybrids or intermediates are known. Seed-grown plants always show the distinctive markings of their parents.

In 1905 *Echinocactus sellowii* var. *turbinatus* was described by Arechavaleta. Today, this taxon does not differ at all (see Table 1) from



Fig.4 *Parodia (Notocactus) calvescens*. Brazil, Rio Grande do Sul, Barra do Quaraí, 9 Nov 2008, AM 275



Fig.5 *Parodia (Notocactus) calvescens*. Brazil, Rio Grande do Sul, Barra do Quaraí, 9 Nov 2008, AM 275



Fig.6 *Parodia (Notocactus) calvescens*. Brazil, Rio Grande do Sul, Barra do Quaraí, 9 Nov 2008, AM 275



Fig.7 *Parodia erinacea*. Uruguay, Maldonado, Piriapolis, 2 Jan 2007, AM 54 (cactusinhabitat.org 2010)

the concept that we currently have of all the populations forming the species known as *Parodia erinacea* (Haworth) N. P. Taylor (Fig.1). This species also currently includes *Parodia sellowii* (Link & Otto) D. R. Hunt (Hunt et al. 2006, text: 219, 223-224, 309; atlas: 307, fig. 307.4, 308, fig. 308.4).

Parodia erinacea is one of the dominant

species (i.e. more opportunistic and therefore better at adapting to different habitats, resulting in a greater numerical progression of individuals and populations, and higher variability) of the genus *Parodia* Spegazzini, in the eastern part of its distribution range, consisting essentially of the Pampa biome and its rocky outcrops. The range of this species is

	<i>Parodia erinacea</i>	<i>Echinocactus sellowii</i> var. <i>turbinatus</i>
habit	simple	simple
stem	depressed-globose, globose or short cylindric 15 (-20) x 6-30cm (length x diameter)	deep seated, discoid above ground
ribs	12-30, shaply acute, areoles situated in notches	12-20, acute but dilated around the areoles
spines	straight to strongly curved, subulate, <2cm, central: 0-1; radial: 2-12, mostly appressed to stem	central: (0-)1, 1-1,5cm, straight; radial: 5-10
flowers	glossy yellow, 3-5 x 4-7cm	chrome yellow, about 5cm diameter

Table 1 Comparison of original descriptions of *Parodia erinacea* and *Echinocactus sellowii* var *turbinatus*.



Fig.8 *Parodia erinacea*. Uruguay, Rivera, Tranqueras, Valle del Lunarejo, 21 Nov 2006, AM 75 (cactusinhabitat.org 2010)

between Argentina (provinces of Buenos Aires, Córdoba, Corrientes, La Pampa and Rio Negro), Brazil (state of Rio Grande do Sul) and Uruguay.

It is clear that differences such as those



Fig.9 *Parodia erinacea*. Brazil, Rio Grande do Sul, São Gabriel, 23 Oct 2011, AM 786



Fig.10 *Parodia erinacea* (*Echinocactus sellowii* var. *turbinatus*). Montevideo, 17 Feb 2011, AM 349

given by Hofacker (i.e. flat body, less and shorter spination) are insufficient in taxonomically distinguishing populations which are so similar to widespread and variable species such as *P. erinacea*.

Considering *N. turbinatus*, Gerloff et al. (1995, 169) also emphasize that in recent years *Notocactus* enthusiasts have split into two groups. Those who claim that the taxon should be attributed to *Notocactus sellowii* (Link & Otto) S. Theunissen, for the shape of the flower, and those who want to see it assigned to *Notocactus erinaceus* (Haworth) Krainz, because of the short spines. In other words, this supports the hypothesis that *E. sellowii* var. *turbinatus* is just a form of *P. erinacea*. Moreover, Arechavaleta had already correctly identified the plant he described as a variety of *Echinocactus sellowii* Link & Otto.

The type of *E. sellowii* var. *turbinatus* is not preserved, but the “penascales del Cerro” in the author’s description, are very likely to be referable to the Cerro de Montevideo, 135m above sea level, i.e. the only Cerro dominating the city. The hypothesis that this “Cerro” is located in Montevideo has also been put forward by Hunt et al. (2006, text 224).

Our last trip to South America (in 2011) began on February 17th, starting with the study of the cactus populations living in this Cerro. In this rather deteriorated habitat, we found that the population of the genus *Parodia* Spegazzini which lives on the Cerro of Montevideo can be assimilated into the current concept of *P. erinacea*; and that the majority of individuals of which it is comprised show characteristics similar to those in Arechavaleta’s 1905 description (Figs.2-3).

In the light of these observations, i.e. considering *E. sellowii* var. *turbinatus* only as a further group of populations of *P. erinacea*, Hofacker’s comment on the absence of intermediates or hybrids between the two taxa appears meaningless.

We also emphasize that regarding the assertion “Seed-grown plants always show the distinctive markings of their parents”, phyletic distinctions on such similar taxa, based on



Fig.11 *Parodia erinacea* (*Echinocactus sellowii* var. *turbinatus*). Montevideo, 17 Feb 2011, AM 349

morphological features of a few pot-grown plants, are likely to bring us back to a typological and not biological concept of species.

In the subsequent Cites Cactaceae Checklist. Second Edition (Hunt 1999), we still find *P. erinacea* (ibid.: 248) and *P. sellowii* (Ibid.: 253) as separate taxa, while *P. turbinata* is introduced (ibid: 254).

Synonyms of the latter are: *Notocactus calvescens* Gerloff & Nilson, *Wigginsia schaeferiana* Abraham & Theunissen, *Notocactus schaeferianus* (Abraham & Theunissen) Havlicek, *Wigginsia turbinata* (Arechavaleta) Porter and *Notocactus turbinatus* (Arechavaleta) Krainz.

To better understand the attribution of these taxa as synonyms of *P. turbinata*, we must go back to 1997 when Reto Nyffeler in "Further referrals of 'limbo' species in CCC1 "Notocactus" in Cactaceae Consensus Initiatives 4: 8-9, took on the job of reviewing the about 60 "limbo" species in *Notocactus* (K. Schumann) Frič still present in CCC1, concluding that the majority of them could be referred as synonyms.

Among the taxa reviewed, those that concern this discussion are the following:

Notocactus calvescens = *P. sellowii*

Notocactus schaeferianus = *P. sellowii*
[*turbinata*]

Notocactus turbinatus = *P. sellowii*



Fig.12 *Parodia* (*Notocactus*) *calvescens*. Barra do Quaraí, 9 Nov 2008, AM 275



Fig.13 *Parodia* (*Notocactus*) *calvescens*. Barra do Quaraí, 9 Nov 2008, AM 275

If the assimilation of *N. schaeferianus* and *N. turbinatus* into *P. sellowii* (i.e. *P. erinacea*) is possible, and in our judgement it is correct (i.e. the holomorphology of the third taxon overlaps and includes the holomorphology of the first two), the holomorphological (i.e. morphological, physiological, ecological and chorological) characters of *N. calvescens* are distinct and cannot be assimilated into *P. sellowii*.

First of all, *N. calvescens* is distinguished from all other *Notocactus* (i.e. *Parodia*) by the display of a delicate spination only as a juvenile, which comprises 3-6 whitish radial spines, 2-5mm long (Fig.4).

Once at puberty, the old areoles lose their spines, and the new ones cease to produce them (Gerloff & Nilson 1994, 15 (3): 76-77, 83), leaving the plant completely bare. Hence the epithet 'calvescens' (Fig.5).



Fig.14 *Parodia (Notocactus) calvescens*. Barra do Quaraí, 9 Nov 2008, AM 275



Fig.16 Habitat of *Parodia (Notocactus) calvescens*. Parque Estadual do Espinilho, Brazil, Rio Grande do Sul, Barra do Quaraí, 9 Nov 2008

Upon seeing a population of *N. calvescens* in habitat, we can confirm that it is a completely glabrous taxon (Fig.6), not taking into account small plants (i.e. less than 5cm in diameter). This absence of spines is something unique in the genus *Parodia* Spegazzini, even taking into consideration the Andean species.

On the other hand, the description of *P. erinacea* (Anderson 2001, 542; Hunt et al. 2006, text: 219) takes us back to a plant with a clear spination. The plant has, as already been mentioned, subulate spines, straight or strongly curved, < 2cm in length (finding spines of this kind on *N. calvescens* is completely unlikely), in a quantity of 0-1 central, and 2-12 radial, often flattened against the stem surface (Fig.7).

Also the photos that illustrate the taxon in The New Cactus Lexicon (Hunt et al. 2006,



Fig.15 *Parodia erinacea*. Uruguay, Maldonado, Piriapolis, 2 Jan 2007, AM 54 (cactusinhabitat.org 2010)

atlas: 307, fig. 307.4, 308, fig. 308.4) show very spiny plants. The same evidence can be collated by studying the populations of *P. erinacea* in habitat (Figs.8-9). They all show more or less clear spination, and even when some populations have shorter spines, as in the case of the Cerro de Montevideo, they are however strong spines (Fig.10), within a population where some individuals may also have longer and tougher spines (Fig.11).

The normal evolutionary progression of the spines from the juvenile phase to adulthood in *P. erinacea* populations, strongly contrasts with the unique feature of *N. calvescens* to definitively "block" the growth, once the age of reproduction is reached. In the comparative holomorphology of the two taxa, we believe that the difference highlighted in this character is very important for their assignment to two distinct lineages.

Another distinctive element between *N. calvescens* and *P. erinacea* is illustrated by the fact that the description of *N. calvescens* (Gerloff & Nilson 1994, 15 (3): 75-78) shows a plant with slightly sharpened ribs, and again only in juveniles (Fig.12), to become then rounded and divided by the typical serpentine shape in adulthood (Fig.13). Instead, the description of *P. erinacea* and the images that illustrate it (Hunt et al., 2006, atlas: 307, fig. 307.4, 308, fig. 308.4), highlight a taxon with acute ribs *tout-court*. This difference is confirmed by the populations of the two taxa in habitat (Figs.14-15).



Fig.17 *Parodia (Notocactus) calvescens*. Barra do Quaraí, 9 Nov 2008, AM 275

Finally, even the geographical distribution is different. The vast range covered by *P. erinacea* has already been discussed, whilst we would emphasize the much smaller range of territory occupied by the few known populations of *N. calvescens*. These are concentrated in the area of Parque Estadual do Espinilho at Barra do Quaraí, Rio Grande do Sul (Brazil), and in the neighbouring province of Corrientes in Argentina.

Even the topology of the habitat occupied by *N. calvescens* is quite specific. The taxon seems to prefer phytogeographic areas, populated by various arboreal members of the Leguminosae family, such as the Espinilho (*Acacia caven*), the Inhanduvai (*Prosopis affinis*) and the Algarrobo (*Prosopis nigra*) (Fig.16). It grows between herbs, in a sandy soil with a strong chalky component (Fig.17).

We don't know of any populations that are adapted to live on rocky outcrops, something that is rather common in *P. erinacea* (Fig.18).

The specificity of the phytogeographical distribution area, the small number of populations and the low numerical progression inside them, plus the only slight variability of *N. calvescens*, identify it as a non-dominant species in the genus *Parodia* Spegazzini, in contrast to the very dominant character of *P. erinacea*.

Moreover, even if the latter can adapt to territories similar to those of *N. calvescens*, for example in the "blaqueales" of the Rio Negro in Uruguay (Fig.19), there are no known cases

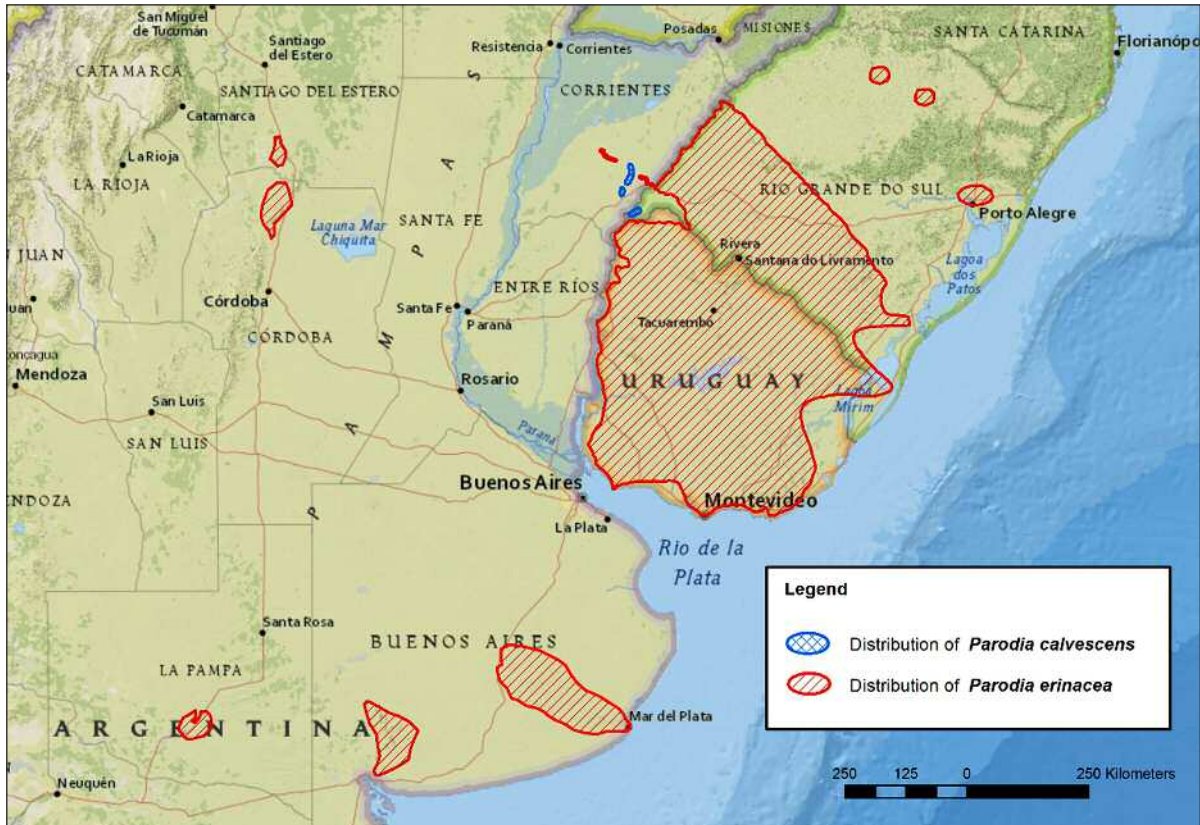


Fig.18 *Parodia erinacea*. Uruguay, Cerro Largo, Aceguá, 5 Nov 2008, AM 272 (cactusinhabitat.org 2010)

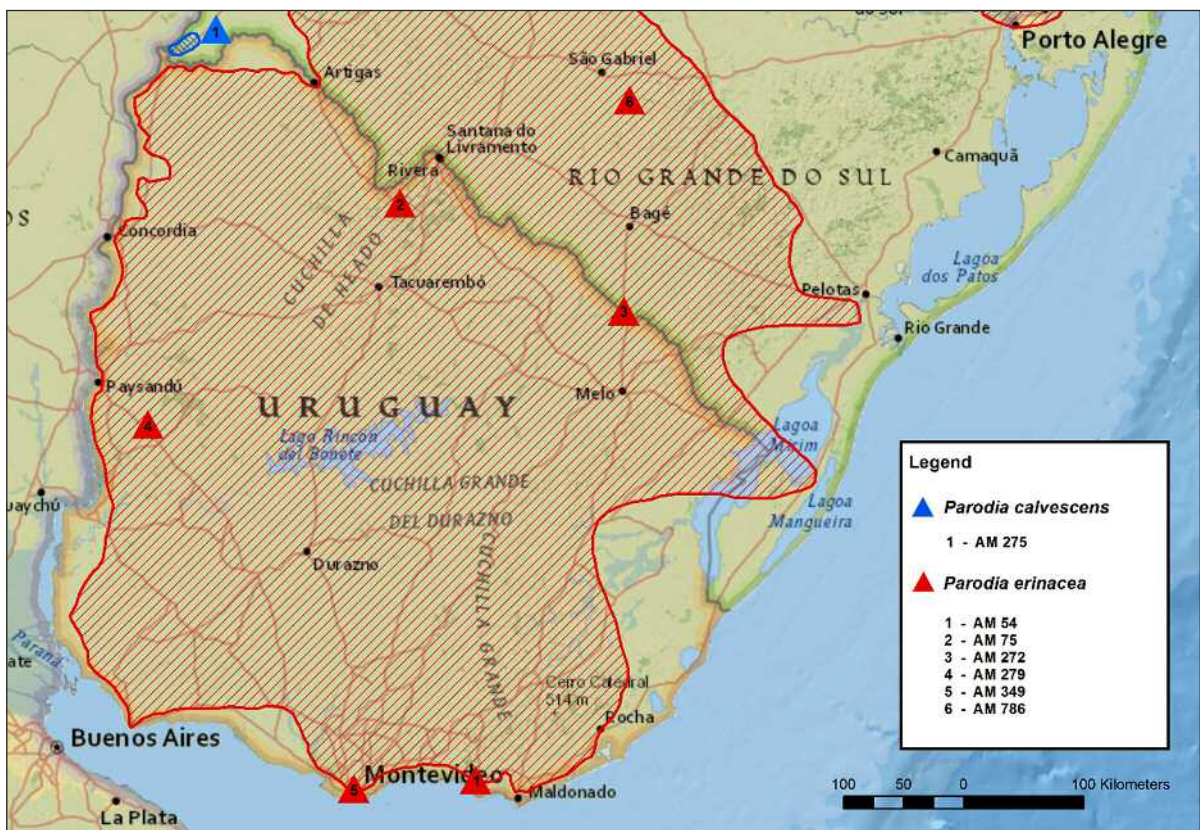
of sympatry, an element that considering the extreme diffusion of *P. erinacea* gives further evidence for distinct phyletic lines for the two taxa.

In confirming the misconception that supports *P. turbinata*, we would point out that in N.C.L. (Hunt et al. 2006), the two figures that illustrate the taxon show plants that are glabrous with rounded ribs (Hunt et al., 2006, atlas: 308, fig. 308.5, 309, fig. 309.1), while the description is fundamentally the same as Arechavaleta's *E. sellowii* var. *turbinatus* from 1905 (ibid.: text, 224), i.e. of a plant with spines, sharply acute ribs, etc., which as we saw does not include that of *N. calvescens* (Gerloff & Nilson 1994, 15 (3): 75-78). Indeed, both figures illustrate *N. calvescens*, the first of which (HU 1564) is in one of the areas known for the taxon, in the province of Mercedes, Corrientes, Argentina; neither illustrate the plant described.

The distribution (ibid.: text 224) is also unclear. Only AR (Corrientes) and UY have been reported. We remind you that in CCC 2 (Hunt 1999), the distribution of *P. turbinata* was UY (ibid. 254) and that Hofacker (2000, 10: 12) added AR, with this comment: "*Notocactus calvescens*, treated as a synonym, was from Argentina on the border with Brazil. One field number is for example HU 1564. Piltz found it also in the province of Entre Rios". However, we know that the populations of *N. calvescens*, even the type locality, are living in Parque Estadual do Espinilho, N of Barra do Quaraí.



Map 1 (above) The distribution of *Parodia calvescens* and *P. erinacea*.
 Map 2 (below) Detail of Map.1 showing the AM locations mentioned in the text.
 The data are gathered from: Ralph Martin's [field number search](#); Christophe Ludwig's [C & S field number search](#); Norbert Gerloff (Gf) field number list; Anceschi & Magli's [cactusinhabitat.org](#) and the literature cited.



Synonymy to be transferred to *Parodia erinacea*

- Echinocactus sellowii* var. *turbinatus*
- Notocactus schaeferianus*
- Wigginsia schaeferiana*
- Notocactus turbinatus*
- Parodia turbinata*
- Wigginsia turbinata*

Names whose current application is debatable

- Parodia turbinata* sensu N.C.L.

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[Giovanna Anceschi & Alberto Magli](#)



Fig.19 *Parodia erinacea*. Uruguay, Rio Negro, Young, 16 Nov 2008, AM 279 (cactusinhabitat.org 2010)

Therefore, a distribution of *P. turbinata* that would include *N. calvescens* as a synonym should also consider BR (Rio Grande do Sul). In short, it seems that the ideas on the ranges of *P. turbinata* also have always been a bit confused.

Implications of this article for the genus *Parodia* Spegazzini:

New Combination

Parodia calvescens (N. Gerloff & A. D. Nilson) Anceschi & Magli **comb. nov.**
Basionym: *Notocactus calvescens* N. Gerloff & A. D. Nilson, *Internoto* 15 (3): 78 (1994).
Type: BR, Rio Grande do Sul, N of Barra do Quaraí, AN 384 (JBPA 32.896, holo.).

Distribution of *Parodia calvescens*

AR (Corrientes), BR (Rio Grande do Sul)

Synonymy in *Parodia calvescens*

- Notocactus calvescens*
- Wigginsia calvescens*

Conservation status of *Parodia calvescens*

Endangered, EN B2ab(ii,iii,v)

