

***Parodia allosiphon* (Marchesi) N. P. Taylor (Cactaceae – Cactoideae) – a cladistically ‘basal’ species with a restricted distribution range
(Notes towards a checklist of Cactaceae of Uruguay, 2)**

*Urs Eggli*¹ and *Reto Nyffeler*²

¹Sukkulenten-Sammlung Zürich, Mythenquai 88, CH-8002 Zürich, Switzerland (email: urs.eggli@zuerich.ch).

²Institut für systematische Botanik der Universität Zürich, Zollikerstrasse 107, CH-8008 Zürich, Switzerland (email: rnyffeler@systembot.unizh.ch).

Summary: While total cactus diversity of Uruguay is significantly less than that of the surrounding countries, Uruguay is none the less part of the diversity centre of the *Notocactus* group of the genus *Parodia*. *Parodia allosiphon* is a relatively recently described taxon with a limited distribution in the frontier region of Dept. Rivera (Uruguay) and neighbouring Rio Grande do Sul (Brazil). A recent collection made in Dept. Artigas (Uruguay) significantly extends the distribution range of the taxon. Its conservation status is evaluated as “near-threatened”.

Zusammenfassung: Obwohl die Kakteenvielfalt von Uruguay deutlich geringer ist als diejenige der umliegenden Länder, ist Uruguay doch Teil des Diversitätszentrums der *Notocactus*-Gruppe innerhalb der Gattung *Parodia*. *Parodia allosiphon* ist ein verhältnismässig kürzlich beschriebenes Taxon mit einer beschränkten Verbreitung im Grenzgebiet des Dept. Rivera (Uruguay) und des benachbarten Rio Grande do Sul (Brasilien). Eine kürzlich im Dept. Artigas (Uruguay) gemachte Aufsammlung vergrössert das bekannte Verbreitungsgebiet beträchtlich. Gemäss IUCN-Kriterien ist das Taxon als “near-threatened” einzustufen.

Resumen: La diversidad de las cactáceas de Uruguay es poco significativa en comparación con los países limítrofes, no obstante el centro de diversificación del grupo *Notocactus* del género

Parodia se encuentra en parcialmente Uruguay. *Parodia allosiphon*, taxón descrito hace pocas décadas tiene una distribución limitada a la zona fronteriza de Uruguay (Dept. Rivera) y Brasil (Rio Grande do Sul). Una colección realizada recientemente en el Dept. Artigas (Uruguay) extiende considerablemente su área de distribución, según los criterios de IUCN, el taxon es considerado como “near-threatened”.

Introduction

Cacti of Uruguay

In contrast to countries such as Argentina (372 taxa), Brazil (415 taxa) or Bolivia (330 taxa), the cactus diversity of Uruguay (53 taxa; all data from Anderson, 2005) is comparatively less diverse. No detailed study of the family at national level was ever prepared, and Arechavaleta (1905) and Osten (1941) merely cover a selection of taxa. The checklist of the cacti in the Uruguayan flora by Herter (1953–55) is mostly based on a literature survey, with the addition of a few of his own (and mostly undocumented) observations.

Hunt (1999) recorded the following genera for Uruguay: *Cereus* (2 taxa), *Echinopsis* (3 taxa), *Frailea* (6 taxa), *Gymnocalycium* (6 taxa), *Harrisia* (1 taxon), *Lepismium* (1 taxon), *Opuntia* (7 taxa), *Pereskia* (2 taxa), *Rhipsalis* (1 taxon) and by far the largest genus, *Parodia* (22 taxa). *Epiphyllum* is also indicated for Uruguay by Hunt (*l.c.*) but its occurrence is doubtful.

The genus Parodia

Parodia with 22 reported taxa is thus the most important group of cacti in Uruguay. Representatives can indeed be found at almost every suitable place in the country (i.e. rocks and rocky places, gravely places, shallow soils) and can support considerable stress through grazing animals. *Parodia* species are small to moderately sized, solitary or clustering, generally globose plants. Due to their small-growing stature and colourful flowers, they have considerable collectors' appeal and are well represented in hobby collections throughout the world. Due to this interest by hobby collectors, there is a vast amount of literature, and the group as a whole suffers from severe taxonomic over-splitting.

Parodia in the broad sense of Hunt (1999) and Anderson (2005) includes some 65 species and has a wide distribution range on the E. slope of the Andes and in the "pampas" region, i.e. in S. Brazil, Uruguay, Paraguay, Bolivia and the northern half of Argentina.

Systematically, the genus falls into nine distinct lineages (Machado *et al.*, unpublished), of which two have previously been included in the genus *Notocactus s.str.* The Uruguayan species belong to the former segregate genera *Notocactus* and *Wigginsia*. While there is little doubt that *Parodia sensu lato* is a natural group, there is limited agreement about the taxonomic status of the formerly segregate genera. In hobby literature, they are commonly still frequently used. At species level, the degree of disagreement between various classifications is even more pronounced, as witnessed by the often lengthy synonymy for many species and infraspecific taxa, e.g. in Anderson (2005). Even if the heterotypic synonymy is small or absent, the lack of well-founded (i.e. vouchered) and detailed data is a major impediment to a better understanding. *Parodia allosiphon* is such an example, where the (though in this case less abundant) literature is in stark contrast to the very limited established facts.

Material and methods

Fieldwork

Fieldwork was carried out in Uruguay in October–November of 2004 and 2005 as part of the project to produce an annotated checklist of Cactaceae in Uruguay. A total of 138 localities

scattered over a large part of Uruguay were visited in order to sample cactus diversity in the form of herbarium vouchers and photographic documentation. Herbarium material (143 specimens) was prepared using the method of Eggli & Leuenberger (1996) and was deposited at MVJB, and a second set at ZSS. All collections were geo-coded by using a GPS receiver in the field. *P. allosiphon* was recorded twice.

Herbarium work

We studied all accessible herbarium material of cacti in the herbaria of Montevideo (MVFA, MVJB, MVM). Among a total of 76 usable (in the sense of having sufficient data or being sufficiently complete) specimens, no material of *P. allosiphon* could be found, and the type reported for MVFA could not be located either. In addition, living and herbarium material at ZSS was consulted.

Taxonomic and biogeographic studies

Collection sites reported in the literature were geo-coded (± 1 –5 geographical minutes) whenever the locality data was sufficiently detailed to allow localization of the place on available maps. Additional data were kindly supplied by several collectors (see acknowledgments). The distribution map (Figure 1) was then generated using ESRI ArcMap (version 9.1) software, hydrological data from the Digital Basemap of the Americas project (see Bletter *et al.*, 2004), and topographical data available from the United States Geological Service (<http://seamless.usgs.gov>, accessed 1. June 2006).

Descriptions

The taxon description was compiled from the protologue, our own recordings and the herbarium specimens listed in "Material examined". Supplemental data added from published literature is back-referenced to the relevant author.

***Parodia allosiphon* (Marchesi) N. P. Taylor**

History and typification

P. allosiphon was described by the Uruguayan botanist Eduardo Marchesi as *Notocactus allosiphon* in 1972 on the basis of a single collection made in February 1966 (Marchesi CHN 649, type, cited for MVFA but missing as of November

2005; pers. obs.) in the Uruguayan Department of Rivera. The type locality was given as “Valle ar. Platón” in the protologue.

Gerloff & Neduchal (2004: 52) list “L. Horst & W. Uebelmann HU 1050” as epitype (at FRP), but without stating a reason for this designation, and without indicating the holotype supported by their epitype. Their designation is thus without effect under Art. 9.7 of the ICBN (2000).

Marchesi placed his new taxon in *Notocactus* subgen. *Neonotocactus* and gives flower shape, rib shape and spine characters as differences in relation to the other species of the subgenus.

The taxon remained relatively little-known, and there are comparatively few references to it in the specialist hobby literature. Schlosser (1973) published a German translation of the first description and mentions that he independently found the taxon in November 1971 ([translated:] “I could collect about 40 specimens from

different localities, which are up to c.15 km distant from each other”), but without detailing where his localities are. Schäfer (1978) compared the new taxon with a superficially similar taxon for which he used the name *Notocactus orthacanthus* (Link & Otto) van Vliet (= *Echinocactus orthacanthus* Link & Otto, a confused name recently taken up by Hofacker (2003) as prioritable name for *Parodia mammulosa*, but treated as ‘unreferred name’ by Hunt (2006: 323)). Neut (1998) and Hofacker (2004) summarized the few known facts.

Known collections

In contrast to the relatively scant literature on the taxon, a considerable number of cactus hobbyists seem to have located *P. allosiphon*. The fieldnumber database <http://ralph.cs.cf.ac.uk/Cacti/finder.php> (accessed 25. Nov. 2005) lists no less than 18 collections. Unfortunately, most of these reports

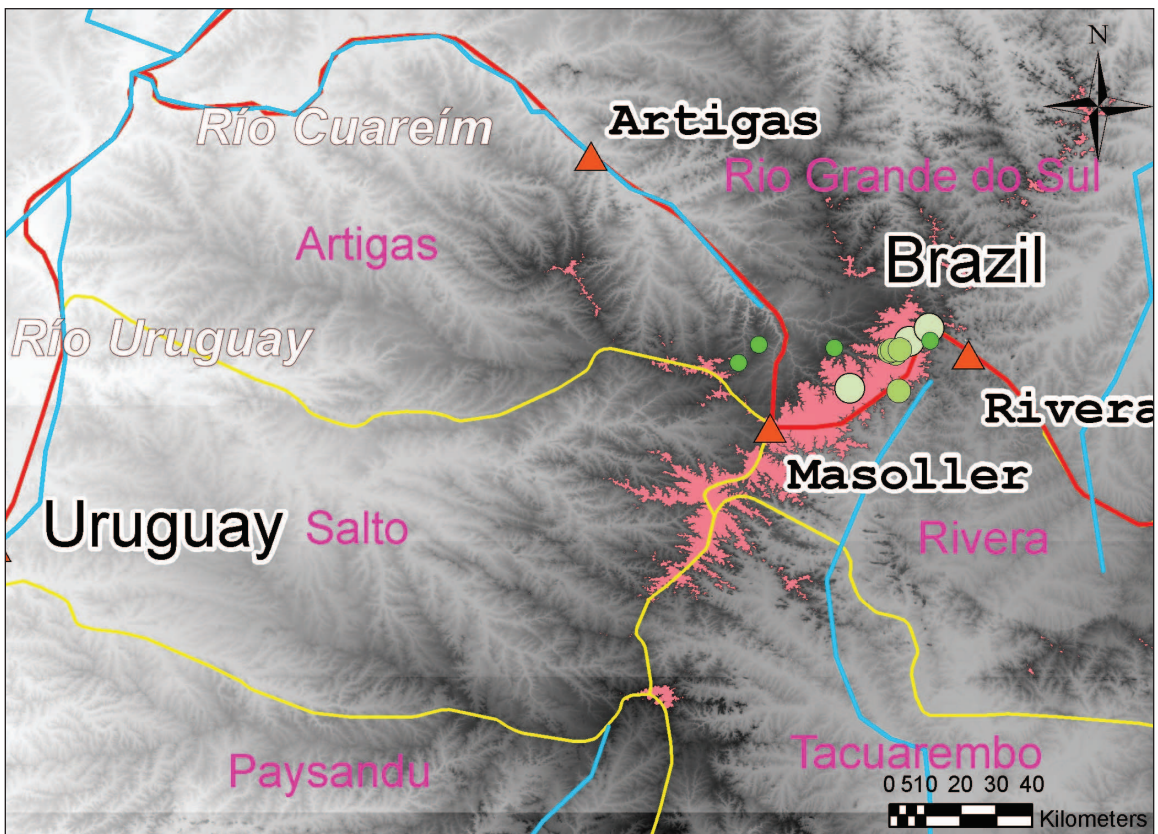


Figure 1. Known distribution of *P. allosiphon*. Localities shown in green (dark green = high accuracy, pale green = low accuracy); land above 300 m a.s.l. shown in brickred. (Map generated with ESRI ArcMap and USGS data; international frontier between Rivera and Masoller under dispute.) Compiled and produced by U. Eggli.

lack usable locality data and thus cannot be placed on a distribution map. It is highly probable, though, that the high number of reports is misleading, and that the majority refer to the same or nearly the same place (N. Gerloff, pers. comm., March 2006). According to Gerloff, the collections *Gerloff* 917, *Horst & Uebelmann* 1050 (see also below) and *F. Stockinger* 266 have all been made close to Espinilho to the west of Santana do Livramento, Rio Grande do Sul, Brazil.

The collection *Rausch* 372a is, with the exception of the type, the only collection reported from Uruguay, but without further data. The remaining collections have all been made in Rio Grande do Sul, and if data are at all available, this is given as “Livramento” or “southwest of Livramento”. Since the frontier between Brazil and Uruguay is not very conspicuous in the region concerned, and since it appears that the minor road connecting Santana do Livramento (Brazil) to Masoller (Uruguay) runs more or less on the frontier, there is insufficient certainty as to whether these collections were indeed made in the country stated.

The collections *Horst & Uebelmann* 1050 and *Horst & Uebelmann* 1051 are a good example. Uebelmann (1996) cites “Rivera” for both of these, but according to available information (W. Uebelmann, pers. comm., March 2006), they were made slightly to the west of the international border, i.e. in Rio Grande do Sul, and most probably near Espinilho (N. Gerloff, pers. comm. March 2006). The collection *Horst & Uebelmann* 1208, also cited from “Rivera”, is most probably also from Rio Grande do Sul.

The lack of sound and precise data concerning the origin of many of the known collections of *P. allosiphon* are a good example of the “pseudo-knowledge” generated by ill-documented collections made by cactophiles. It is to be feared that many other taxa are similarly affected, and it cannot be stated clearly enough that any collection or observation must be accompanied by fairly detailed locality information to be of scientific value. We are well aware that a balance must be found between too vague data on the one hand, and too detailed data on the other hand, which would allow unscrupulous devastation of populations by commercial and semi-commercial collec-

tors. The amount of detail necessary for most biogeographic studies is in the order of 10–20 km accuracy.

Description of Parodia allosiphon (Figures 4–6)

Body globose or more frequently clavate with slender basal portion, usually to 12 cm diam. and 15 cm tall (incl. slender basal body part) but exceptionally reaching 25–30 cm diam. and 20 cm tall (Schlosser, 1973), apex slightly depressed, epidermis dull dark green, interior tissue without mucilage, chlorenchyma layer well-defined; ribs 15–16, quite narrow and deep, 1–2 cm tall, hardly crenate but with a distinct low and prominent “chin” below each areole; areoles when young with some white wool, later almost naked, 0.7–0.9 cm distant; radial spines 2–6 (–8), all similar to the central spines but more slender and shorter, 0.4–0.8 cm long, horizontally spreading in all directions; central spines 1–4, often difficult to distinguish from the longer radial spines, 0.9–1.9 cm long, straight or rarely slightly curved, rigid, needle-like, young dark purple, old reddish grey with blackish tips, 1 upper erect, 1 lower when present declinate, 2 laterally when present spreading. Flower buds appearing on youngest areoles at the stem apex, often several together, densely brown-woolly, later with ferruginous erect bristles; flowers diurnal, 5.5 cm long and 5–6 cm diam., pericarpel pale green; pericarpel and perianth tube with dense cover of greyish brown to white wool, perianth tube short and widening abruptly immediately above the pericarpel, with linear scales, scales dirty pink with darker tips, 0.3–0.4 cm long, and with 0–3 straight or slightly curved bristles in their axils, bristles of lower axils to 0.7 cm long, bristles from upper axils to 1.3 cm long; perianth segments pale yellow (or very rarely reddish, Hofacker, 1993), the outer ones linear-oblong, obtuse with small reddish mucro and dorsal reddish to greenish-red midline, inner segments pale sulphur-yellow, oblong to elliptic-lanceolate, rounded and slightly erose, narrowing towards the base, c.3 cm long and 0.8–1.2 cm wide, perianth tube 1.2–1.4 cm long, inside white to pale cream, outside greenish yellow with greenish cast below the areoles; nectariferous zone pale pink at the bottom of the perianth tube; stamina 0.4 cm shorter than the stigma, inserted along the bottom 6 mm



Figure 2. Typical habitat of *P. allosiphon* (Nyffeler & Eggli 1627). **Figure 3.** *P. allosiphon* usually grows in open stony meadows (Nyffeler & Eggli 1627). **Figure 4 (a–b).** Two individuals of *P. allosiphon* to show variability (Nyffeler & Eggli 1627). **Figure 5.** *P. allosiphon* in flower (Nyffeler & Eggli 1627). **Figure 6.** *P. allosiphon* from a Brazilian population (Gerloff 917). Photos: Figures 2–4, R. Nyffeler; Figure 5, M. Machado; Figure 6, N. Gerloff.

of the perianth tube, outer stamina recurved, inner stamina placed against the style, filaments apricot-yellow to pale golden-yellow, the lowermost 0.6–0.8 cm long, the intermediate 1.1–1.2 cm long, the uppermost 0.9–1 cm long; anthers pale sulphur-yellow, 2.5 mm long; style white, slightly longitudinally grooved, 2–2.1 cm long, 2 mm diam.; stigma dark wine-red, lobes 11–13, blunt, 3–4 mm long, ascending or slightly spreading; fruit indehiscent, 2.5–3 cm long, hollow, greenish yellow, with tufts of white wool, crowned with the dry perianth remains; seeds truncate-globose, 1–1.1 mm long and diam., dull black, densely tuberculate with enlarged white hilum. Floral scent not recorded.

Geographical range and ecology of *Parodia allosiphon*

Geographical range (Figure 1)

Taking all known facts into consideration, *P. allosiphon* seems to have a very restricted range in the upper reaches of the Río Cuareím (Río Quaraí), which forms the border between Dept. Rivera (Uruguay) and the state of Rio Grande do Sul (Brazil). Available evidence suggests that the taxon is completely confined to this water-shed and does not extend beyond, despite the very insignificant topography of the region. Our recent collections in Dept. Artigas constitute a significant enlargement of the known range towards the west, but the sites are located within the same water-shed. Within its range, the taxon seems to be quite widespread, however, and A. Hofacker (pers. comm., April 2006) reports that the taxon can be found along a considerable stretch of the road running along the international frontier from Santana do Livramento to Masoller. It is also plentiful at the two sites in Artigas.

Ecology

From our own observations and data received from A. Hofacker (pers. comm., April 2006), it seems that *P. allosiphon* is confined to rocks or rocky terrain (Figures 2, 3). At the localities visited by us in Uruguay, it grows sympatrically with *Frailea* sp., *Gymnocalycium uruguayense*, *Parodia mammulosa*, *Cereus hildmannianus* (Nyffeler & Eggli 1627), or with *Parodia ottonis*, *Frailea pumila* cf., *Frailea* sp. and *Parodia*

buiningii (Nyffeler & Eggli F05037B). Both sites are more or less level to slightly sloping overgrazed pastures with abundant basaltic rocks and very stony basaltic ground. The plants are abundant at both sites and do not seem to suffer significantly from grazing. This might be due to the fact that seedlings are usually growing in the shelter of larger stones, and at the time when they are more prominent, their spination is already well-developed and deters grazing animals. Trampling does not seem to be an issue.

Conservation

P. allosiphon has a restricted range but appears to be at least locally common over part of its range, which spans about 50 km from east to west, with at least four populations, of which at least the two in Uruguay number several 100 individuals. It does not appear to be affected by current grazing practices, and no other threats are currently identified. It is not presently endangered, but in view of the limited range, the situation could change rapidly. An IUCN criterion of 'Near-Threatened' (NT) seems most appropriate (IUCN 2001 Categories & Criteria, version 3.1, as available from www.iucnredlist.org/info/categories_criteria).

Systematic placement of *Parodia allosiphon*

When the taxon was described, it was placed in *Notocactus* subgen. *Neonotocactus* by Marchesi, and this is supported by the general appearance of the plants as well as by flower shape. Gerloff *et al.* (1995) classify it as "transitional species" between *Notocactus* "section *Notocactus*" and section *Neonotocactus*, and Hofacker (2004) follows their decision at the subgeneric level, i.e. between "*Notocactus* subgen. *Notocactus*" [correctly subgen. *Gymnocephalus* for nomenclatural reasons] and subgen. *Neonotocactus*, while Gerloff & Neduchal (2004) put it in *Notocactus* subgen. *Gymnocephalus*.

Preliminary analyses based on *trnS-trnG* sequence data (Machado *et al.*, unpublished) indicate that *P. allosiphon* is closely related to *P. buiningii*, and the two form a clade that is cladistically basal to the remaining "neonotocacti".

Material examined

Herbarium material and photographic records
Nyffeler & Eggli F05037B: Uruguay; Artigas; NW of Ruta 30 in the drainage of the Río Cuareím, 280 m, 22. 10. 2005 (photographs only); *Nyffeler & Eggli* 1627, ditto., 275 m, 22. 10. 2005 (MVJB!, ZSS 26452!; Figures 4, 5); *Gerloff* 917: Brazil; Rio Grande do Sul; c. 30 km W of Santana do Livramento (photographs only; Figure 6); *Rausch* 372a: Uruguay; sine loco (ZSS 23551!, ex cult. ZSS).

Living material

Abraham 200: Brazil, Rio Grande do Sul; between Santana do Livramento and Espinilho (pers. comm.) (ZSS 89 2984).

Other references included in the distribution map (Figure 1)

For the following collections, neither material nor photographs have been seen. They are, however, included in the study and the distribution map as bona fide records for the taxon:

Abraham 463, 464: Brazil; Rio Grande do Sul; between Santana do Livramento and Espinilho (pers. comm.); *Horst & Uebelmann s.n.*: Brazil; Rio Grande do Sul; near the airport of Santana do Livramento (pers. comm.); *Horst & Uebelmann HU* 1050: Brazil; Rio Grande do Sul; c. 15 km SW of the airport of Santana do Livramento (pers. comm.); *Horst & Uebelmann HU* 1208: Brazil; Rio Grande do Sul; c. 50 [?] km SW of the airport of Santana do Livramento (pers. comm.); *Stockinger* 266: Brazil; Rio Grande do Sul, Espinilho (<http://ralph.cs.cf.ac.uk/Cacti/finder.php> (accessed 25. Nov. 2005).

Collections with insufficient data

The following additional collections, as listed in the database <http://ralph.cs.cf.ac.uk/Cacti/finder.php> (accessed 25. Nov. 2005), all lack sufficient data in that source, and attempts to get more details were without result. They are here listed for the sake of completeness:

Brazil: *Bercht* 778, 788 (“SW of Livramento”); *Bercht* 781 (“Livramento”); *Bueneker* 474 (“Rio Grande do Sul”); *Prestlé* 234 (“Rio Grande do Sul”, as “*Notocactus allosiphon* var. *pulchellus*”, *nom. nud.*); *Stockinger* 320 (“Santana do

Livramento”). No country: *Prestlé* 57 (“= *Schl* 196”).

The following collections reported as *P. allosiphon* in the source cited have turned out to represent another taxon, most probably extreme forms of *P. mammulosa* cf.: *Abraham* 207; *Gerloff* 298 (= *Stockinger* 339) (*Gerloff*, pers. comm. Nov. 2006).

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