

Clarification of the correct application of the names *Sulcorebutia caracarensis* (Cárdenas) Donald and *S. inflexiseta* (Cárdenas) Donald, and a re-evaluation of *S. pulchra* (Cárdenas) Donald

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Three species of *Rebutia* described by Martin Cárdenas in 1970, today belonging in the genus or infrageneric taxon *Sulcorebutia*, have remained partly enigmatic because of a lack of original preserved material. The identities of *Sulcorebutia caracarensis*, *S. inflexiseta*, and *S. pulchra* are re-examined here in the light of new exploration of their habitats for the first time after forty years in the vicinity of their type localities in Province Zudañez, Department Chuquisaca, Bolivia. The presently accepted concept of *S. pulchra* is re-examined. The lost original holotypes for all three species have been replaced with freshly deposited material. Three lectotypifications and one epitypification are proposed. Photography by the author.

Prof Dr M Cárdenas (1899–1973), who lived in Cochabamba, Bolivia, made new descriptions of three *Rebutia* species (1970) towards the end of his life. John Donald transferred them into *Sulcorebutia* (1971), while Fred Brandt put them into *Weingartia* (1980). Subsequently Willi Gertel (1986) transferred them back again into *Sulcorebutia*. When *Weingartia* and *Sulcorebutia* are combined, the priority name is *Weingartia*, and Karl Augustin and Gunther Hentschel (2008) provided all the necessary name combinations for this. Some professional botanists, such as David Hunt (2006), took a broader view and placed *Sulcorebutia* and *Weingartia* beneath *Rebutia*. DNA data by the Studiengmeinschaft Sudamerikanische Kakteen eV, carried out by Dr Christiana Ritz at the University of Jena (2007), suggested that *Sulcorebutia* and *Weingartia* are an unsplittable entity, supporting the view of Augustin & Hentschel. Rowley (2009) treated both of these as subgenera of

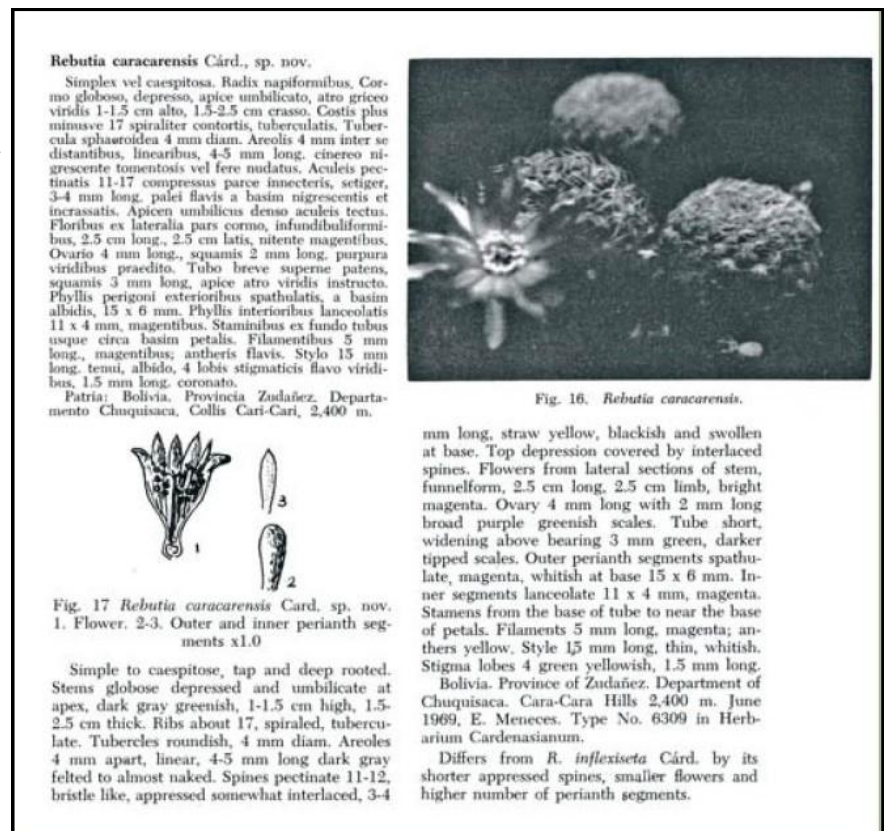


Fig. 1 The protologue of *Rebutia caracarensis*

Rebutia inflexiseta Cárđ. sp. nov.

Simplex vel caespitosa. Radices brevis, superficialis. Corno sphaerico, apice umbilicato 1-2.5 cm altus, 2-3.5 cm crassus, diluto viridis. Costis 14-17, spiralis, tuberculatis. Tubercula sphaerica depressa 4-5 mm diam. Areolis 3-4 mm remotis. Aculeis 14-18 pectinatis tenui acicularibus vel setaceis, flexilibus, apressus vel radiantes, inflexus, albo flavis a basim nigrescentes et incrassatis 5-10 mm long. Flores ex basim cornus, infundibuliformibus, 3 cm long., 2 cm latis, magentibus. Ovario globoso 4 mm long. lactucae viride, squamis obtusis, latis praedito. Tubo plus minusve 1 cm long., squamis 3 x 2 mm temperato viridis instructo. Phylla perigoni exteriora spatulata 20 x 4 mm, magenta

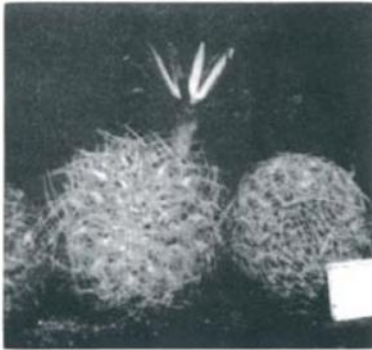


Fig. 14. *Rebutia inflexiseta*.

lilacina. Phylla interiora lanceolata 16 x 3 mm, superne magenta, inferne albidula. Stamina ex fundo tubo usque basim petalis 5 mm long. Filamenta atro magenta, Antherae dilutissime flavae. Stylo 16 mm long., temperato viridis, 7 lobis stigmaticis, brevis smaragd viridis, coronato.

Patria: Bolivia. Provincia Zudañez. Departamento Chuquisaca, vicinis Presto, 2,400 m.

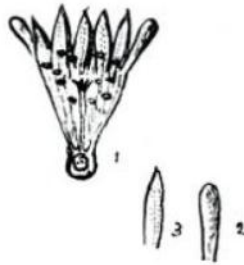


Fig. 15 *Rebutia inflexiseta* Card. sp. nov. -1. Flower-2-3 Outer and inner perianth segments x1.0

Single or caespitose, shallow rooted in vegetable debris in stone crevices. Some plants with several heads on a single root. Stems round umbilicate at apex 1-2.5 cm long, 2-3.5 cm thick, light green. Ribs spiraled, 14-17, tuberculate, Tubercles round, depressed, 4-5 mm diam. Areoles 3-4 mm apart, 2-4 mm long with little gray or whitish felt. Spines 14-18, thin acicular to setaceous, appressed or spreading, interlaced, flexible, whitish yellow, blackish and swollen at base, 5-19 mm long. Flowers from the base of stems, funnellform, 3 cm long, 2 cm, magenta. Ovary 4 mm long, light lettuce green bearing obtuse and broad scales.

Fig. 2 (left) The protologue of *Rebutia inflexiseta*

Rebutia, differentiated only by the position of the flowers at or near the apex in *Weingartia* and at or near the base of the stem in *Sulcorebutia*. For the purposes of the present article the generic name *Sulcorebutia* Backeb. in the strict sense will be applied to the species in question.

Sulcorebutia caracarensis* and *S. inflexiseta

These two names are not very well understood, and the present article attempts to clarify their application following visits to their type localities in Province Zudañez, Department Chuquisaca, Bolivia.

The few plants in cultivation under these names have never looked very reliable compared with the original descriptions, and the poor quality of the black and white photos in the Cárdenas protologues also did not help

(Figs. 1-2). Trips to Bolivia made over the years by many experienced sulco explorers have not revealed any plants that appeared to match the first descriptions well. However, clones of original propagations from Cárdenas's MC 6309 *S. caracarensis* (Fig. 4) and MC 6308 *S. inflexiseta* (Fig. 5) from the Succularium of Prof Dr Lothar Diers have appeared in limited numbers in some specialist collections.

These plants are quite a good fit with the first descriptions, and it is noteworthy that Diers stayed for some time in Cochabamba with Cárdenas and therefore had, through this personal contact, the opportunity to obtain original material.

The first thing noticed about the material of *S. caracarensis* from Diers was that one clone flowered violet, which matched the original description, and the other clone flowered red. That of course is not necessarily significant, because flower colour can vary in any species. Moreover, Cárdenas did not collect the plants himself, so was unable to see the full spectrum of variation.

WR 598 in the field number list of Walter Rausch has the Cara Cara mountains listed as its origin. However, mountains with the name

Rebutia pulchra Cárđ., sp. nov.

Globosa, depressa, umbilicata, 2-3 cm alta, 4-4.5 cm crassa, temperato viridis. Costis plus minusve 17 spiralliter dispositis, in tubercula 6 x 5 mm solutis. Areolis 5 mm remotis, linearibus, 5 mm long., parce cinerei tomentosis. Aculeis pectinatis, lateraliter apressis, tenui setaceis, 3-5 mm long., diluto cinereis a basim nigrescentes et incrassatis. Superne corno aculeis parvis et radiantibus. Flores numerosis ex basim caule, infundibuliformibus 5 cm long., 2.5 cm latis. Ovario globoso 4-6 mm diam., dilutissimo viridis, squamis 2 mm long., carnosus, praedito. Tubo curvato 12-14 mm long., roseis, squamis 2-3 mm long. instructo. Phyllis perigoni exterioribus, lanceolatis 25 x 5 mm, dilutissime magentibus a basim albidulus. Phyllis interioribus lanceolatis, mucronatis 23 x 5 mm, dilutissime magentibus a basim albidulus. Omnes segmentis extremis undulatis. Staminibus ex fundo tubo, 4-5 mm long. Filamentibus atro magentibus; antheris flavis. Stylo 2.5 cm long., albo, 4 lobis stigmaticis, temperato viridis, 2 mm long., coronato.

Patria: Bolivia. Provincia Zudañez. Departamento Chuquisaca, 2,400 m.

Globose, depressed at apex, umbilicate, 2-3 cm high, 4-4.5 cm broad, light green. Ribs about 17, spiraled, broken in roundish 6 mm high, 5 mm broad tubercles. Areoles 5 mm apart, linear, 5 mm long scarcely gray felted. Spines pectinate laterally appressed, thin setaceous 3-5 mm long light gray, swollen and blackish at base. Upper umbilicus spines much shorter and spreading. Flowers several, from the base of stem, funnellform, 5 cm long, 2.5 cm limb. Ovary globose 4-6 mm diam. very light green with 2 mm long broad, fleshy scales. Tube curved 12-14 mm long pinkish with 2-3 mm long scales. Outer perianth segments 25 x 5 mm, very light magenta, whitish at base. Inner segments lanceolate, mucronate 23 x 5 mm pale magenta, whitish at base. All segments somewhat undulate at the edges. Stamens from the bottom of the tube to the base of petals 4-5 mm long. Filaments dark magenta; anthers yellow. Style 2.5 cm long, white. Stigma rays 4, light green, 2 mm long.

Bolivia. Province of Zudañez. Department of Chuquisaca. Between Rio Grande and Presto, 2,400 m. June 1969, E. Menezes Type in Herbarium Cardenasianum, No. 6310.



Fig. 19 *Rebutia pulchra* Card. sp. nov. 1. Flower. 2-3. Outer and inner perianth segments. x1.0

This pretty cactus is characterized by its long flowers, its broad depressed stems, its setaceous appressed spines and the slightly undulate perianth segments.



Fig. 18. *Rebutia pulchra*.

Fig. 3 (left) The protologue of *Rebutia pulchra*



Fig. 4 *S. caracarensis* MC 6309, original material supplied by Diers. The lectotype prior to preservation



Fig. 5 *S. inflexiseta* MC 6308, original material supplied by Diers. The lectotype prior to preservation

Cara Cara can be found everywhere in Bolivia. This single clone is red-flowered, and there is a strong possibility that Rausch might also have obtained his clone from Cárdenas. Indeed it is indistinguishable from the red-flowered clone from Diers. There is also a false clone in circulation under the number WR 598, known as the ‘Kruppelklon’.

Augustin et al (2000: 73–74) claimed that Gertel had rediscovered the long lost *S. caracarensis* from the

south of Zudañez, assigning to it the field number G 204. However, Gertel and de Vries (Fritz et al, 2008: 32) later re-evaluated this plant as a form of *S. hertusii* Halda & Horaček.

The original Cárdenas material of *S. inflexiseta* from Diers consists of only one clone and this also flowers red. The so-called Rausch clone of *S. inflexiseta* probably also originated from Cárdenas. This clone also looks very much like the one from Diers and also has



Fig. 6 Presto and the Rio Presto, which flows into the Rio Grande



Fig. 7 *S. pasopayana* VZ 062a in habitat



Fig. 8 *S. pasopayana* VZ 062a/4 in culture



Fig. 9 *S. sp.* VZ 566/1 with very strong central spines. Note the juvenile head in the middle

red flowers. These two cultivated clones differ mainly from *S. caracarensis* in having longer, more flexible and interlaced upper spination.

Of the sulcorebutias that we now know from the area north of Presto (Fig. 6), as far as the Rio Grande, is a very well known one, present in many collections, *S. pasopayana* (F.Brandt) Gertel (Figs. 7–8). The name, of course, derives from the little Estancia Pasopaya, situated quite a distance north of Presto. The plants stay very small in habitat as well as in collections, making a lot of offsets, and they normally flower dark red. Some field numbers are EH 6235–6237, G 162–163, Lau 387 (type), our numbers VZ 62–65, WR 593, and no doubt more from other explorers. Some other discoveries are from Karl-Heinz Muller, who once travelled with Andreas Wessner in the area north of the locations of *S. pasopayana*. Not far from Pasopaya is the entrance to a national park. Once past the entrance, Muller and Wessner found sulcorebutias that quickly form rather long, straight and stiff central spines when past their juvenile stage. These bear the field numbers KHM 0236–0238 and AW 133, our numbers VZ 566–567 and 636–637 (Figs. 9–10). In habit of growth, these plants are quite different from *S. pasopayana* and do not agree with *S. caracarensis* because of the prominent central spines that are absent in the juvenile forms and possessing dark red flowers. Regrettably these have also been called *S. caracarensis* by some.

To the far north of Presto, and as far as the Rio Grande (more or less north-east of Pasopaya) (Fig. 11), is still relatively unexplored with respect to *Sulcorebutia*. I am attracted to such areas, so organised a field trip to that region accompanied by John Carr. At the entrance (Fig. 12) to the National Park known as Area Nacional de Manejo Intergado EL PALMAR, there was a little house with a barrier that was open. Because it was 6.30am, we thought that it would not be manned so early, so we entered the park. The entrance was also the way out, so if there was any entry fee to pay we thought we could do so later on leaving.

Close to the entrance we found the aforementioned sulcorebutias with the long stiff central spines, matching those found by Muller and Wessner. While studying these plants and taking pictures, we were astonished when two park rangers in uniforms (Fig. 13) arrived on motorcycles. They ordered us to accompany them to see the Alcalde (Mayor). The Alcalde kept us waiting for hours (Fig. 14), and we were not the only ones, but after a while we were escorted from the park



Fig. 10 S. sp. VZ 567/2 also with very strong spines

by the rangers. The entry guard had taken up his position at the entrance and we tried to speak to him. He actually lived there and had been asleep at the time we

entered the park. But he had heard us moving around, and it was he who had alerted the rangers with his walkie talkie. There is no fooling these people!

The park itself extends to almost 60 hectares and is a part of the Servicio Nacional de Areas Protegidas (SERNAP). It is mainly a protected area because of an endemic palm tree species, *Parajubaea torallyi*, which can be found at 2400–3200m altitude (Fig. 15). It is these palm trees that lend their name to the park. We had already seen this particular palm at other places in Bolivia, at about the same sort of altitudes, but never in such great numbers. Here 350mm of rain falls annually as we learned from the road sign at the entrance (Fig. 12). Topographically the park is completely encircled by natural barriers so that it can be accessed only through the official entrance.

We were told that entry to the park was possible only by means of a special permit, so we decided to try to get one. However it was not possible in Presto where the rangers were stationed. Back in Sucre, we found the local official, who was in charge of a small office. He sent a fax to the Ministerio de



Fig. 11 Pasopaya and mountains, facing north in the direction of the Rio Grande



Fig. 12 A sign at the entrance of El Palmar

Agricultura in La Paz, after much cajoling, but promised us nothing and told us to come back later on the next day. Much to our surprise, the permit was there! I asked for two days' permission and whether we could fill in the dates ourselves, because we needed the sun for photography and did not know exactly when it would be suitable. We had been told that at the entrance to the park we would need to wait for a guide to accompany us, but after showing our permit, we were allowed to drive on unaccompanied without any problems. The guard recognised us and told us that our guide could not be there because of a meeting in Sucre. We assured him that that would not be a problem!

There were not many people in the park (Fig. 16), and the authorities aim to reduce the numbers even further, in the interests of protecting the wildlife. We saw hardly any people, and were told that they dislike any disturbance by visitors. Condors (Fig. 17) can often be seen because it is a good area for thermals, with the Rio Grande so close by. We were told that there might also be bears, pumas and seven species of snakes, although we never saw any.

Quite soon we found *sulcorebutias* that we were unable to identify at first sight. There were many populations growing in the neighbourhood of the

palm trees, a very unusual sight.

Adjacent to populations with mainly red flowers there were also smaller groups with yellow and/or orange flowers, while many other populations had plants with red flowers growing next to others with violet flowers. There was also one group with longer spination growing on rocks, totally covered in moss (Fig. 28). Everything looked very healthy, unlike in other areas that we visited, and much regeneration was taking place in the form of seedlings growing beside the more mature plants (Fig. 27), probably also as a result of the high annual precipitation.

The whole area looked extraordinarily green.

A close look at old military maps (USA, 1956) reveals a small track going over the Rio Zudañez in the direction of Villa Redencion Pampa, best known as a



Fig. 13 Emblem on the sleeve of a park ranger



Fig. 14 Waiting in the shade for the Alcade in Rodeo



Fig. 15 Endemic palm *Parajubaea torallyi* at El Palmar

habitat for *S. gemmae* Mosti & Rovida, *S. naunacaensis* de Vries and *S. elizabethae* de Vries. This track petered out in the middle of the park close to a small graveyard and does not carry on any further. Through the park we were able to go to the north of Pasopaya, in the direction of the Rio Grande.

Later on I realised, and am not the only one to think so, that we had almost certainly found here several populations of *S. caracarensis* and one of *S. inflexiseta*.

From the habitat seed that we collected we grew plants which look similar in every way to the Cárdenas plants from Diers. The range of the flower colours is, however, wider than in the descriptions of Cárdenas.

The weight of evidence and the similarity is so close that I strongly believe that we had rediscovered the mystery species *S. caracarensis* and *S. inflexiseta*! The field numbers involved here for *S. caracarensis* are: VZ 568–570, 639–640 and 643 (Figs. 18–27), and for *S. inflexiseta*: VZ 638 (Figs. 28–31).

Worthy of note is an article written by Nigel Taylor (2008). During that year Taylor was on tour with John Wood (Kew Gardens), and they also obtained a permit and went to El Palmar. Nigel saw *sulcorebutias* there, but did not have a clue what species they might be and

came up with several speculations. The picture however, in the Taylor article shows a somewhat old and elongated *S. caracarensis*. Next to it he showed a plant in the juvenile state. In a postscript Hunt supposes that in this way inexperienced taxonomists might not realise that they are different states of maturity of a single species, already mentioned above in relation to KHM 0236–0238, AW 133, VZ 566–567, 636 and 637 (Figs. 9–10). Note the juvenile head in the middle (Fig. 9).

For those who are interested in the nature reserve at El Palmar, there is a very good account of it, along with other national parks in Bolivia, at: www.kew.org/science/tropamerica/bolivialeaflets.htm Unfortunately there are no cacti depicted.



Fig. 16 One of the small communities, with grass-covered roofs



Fig. 17 A condor over El Palmar



Fig. 18 *S. caracarensis* VZ 568 in habitat



Fig. 19 *S. caracarensis* VZ 568/3 with a red flower in cultivation



Fig. 20 *S. caracarensis* VZ 569/2 with a red flower in cultivation

For the benefit of those who wish to label their plants as correctly as possible I will mention here some field numbers represented in my own collection that have been erroneously assigned to *S. caracarensis* or *S. inflexiseta*. Mostly these represent material collected in the last few years by Czech explorers and originating to the east of Presto, well known as the habitat of *S. patriciae* Halda & Horaček, along with *S. pasopayana* (larger form), and/or a form of *S. gemmae*.

From Pavel Heřtus are PHA 178, PHA 255, and from the same habitat the field number PHA 499. From Ladislav Horaček are LH 885, 888 and 1122, from separate trips, although all from the same habitat. Finally, there are the field numbers from Vladimír Šorma: VS 423 and 427, the latter one being identical to LH 1122.

It would not be surprising if there are other numbers for the same plants, as these collectors often travelled together in organised tours. According to information from Heřtus at ELK 2010 they got the false names from tour guides who had accompanied many of them on their trips. Sadly, on the internet and via Heřtus (for instance at the ELK), these wrongly labelled plants are frequently offered and sold. So beware!

Finally, *S. inflexiseta* has been offered with the field numbers KK 2005 and JD 330. This confusion has occurred due to the long hair-like spination and seems increasingly prevalent. These field numbers represent *S. hertusii* Halda & Horaček (syn. *S. gerosenilis*) at their habitat just south to south east of Zudañez.

Sulcorebutia pulchra

Turning now to the third rebutia description of Cárdenas, published simultaneously with those of *S. caracarensis* and *S. inflexiseta* in the same issue of the American journal (Cárdenas, 1970: 38–39). It was published as *Rebutia pulchra* Cárdenas, nowadays known by the corrected spelling *Sulcorebutia pulchra* (Cárdenas) Donald.

In taxonomic respects this taxon has a similar history to the other two. Most sulco-lovers will immediately tell you that they know this one, but beware! No original material exists, alive or preserved (personal information from Diers, who never received any live plants from Cárdenas). For some time it was assumed that WR 593, *S. pasopayana*, from directly north of Presto could be the long lost *S. pulchra*. Rausch himself said as much. However, that cannot be correct because it does not correlate with the description of Cárdenas. It was Willi Gertel (1991) who cleared up this misunderstanding when he wrote:

“Without going into too much detail, it is possible to note the following very obvious visual difference between the described plants and the so-called ‘Rausch pulchras’. Cárdenas wrote that the body colour of *Rebutia pulchra* was **light green**. It is very difficult for me to characterise the clones of WR 593 known to me as being remotely light green. The colour of its epidermis is more of a grayish-green to violet-red, almost like the several clones of *S. rauschii* Frank.”

How persistent such misunderstandings can be is reflected by the number of plants in collections that are still wrongly labelled today. Later on, in 1983, Heinz Swoboda found HS 78 (Fig. 32) and HS 78a (Fig. 33), and once again one hoped and believed that these plants would represent the correct *S. pulchra*. Willi Gertel (1991: 174–175) wrote:

“Turning now to *S. pulchra*. Until today, we still do not know exactly which cactus this name should be applied to, and perhaps this will never change because the original material of Cárdenas is no longer extant. At least no one knows of any. For a while everyone had accepted that the plants Swoboda collected as HS 78a could be *S. pulchra*. The flower of these plants does perfectly match the description, but vegetatively there are many differences. The description is a better match for **some** individual clones of HS 78 in the neighbouring population of HS 78a. Because of the unbelievable variability of HS 78, one can usually find some clones that match the description of Cárdenas exactly. Assuming the habitat location is **more or less correct**, I presume that *S. pulchra* sensu Cárdenas originated from this or a neighbouring population and that we can therefore name HS 78 as *S. pulchra*. HS 78a is then, because of the taxonomic rules, a variety or a very pronounced form of this taxon.”

Yet the presumed connection of the name *S. pulchra* with the later discovered HS 78 is only a possibility justified by personal opinions and assumptions. There is more wishful thinking, as explained below.

Undoubtedly, Gertel did not invent all this by himself. Karl Augustin, while travelling with Swoboda, was probably the first to come up with the idea. Then in conversation with others, just as John Donald did in his day, the notion became the established ‘truth’. HS 78, the **false** *S. pulchra*, does not actually originate from the area between Presto and the Rio Grande, but from along the pipeline from Chuqui Chuqui, which runs as far as Presto. As Gertel said: “habitat more or less correct”. There are some clones of HS 78 that possess a dark, olive green body colour, but most of them



Fig. 21 *S. caracarensis* VZ 570 with a yellow flower in habitat



Fig. 22 *S. caracarensis* VZ 570 with an orange flower in habitat



Fig. 23 *S. caracarensis* VZ 570/1 with a yellow flower in cultivation



Fig. 24 *S. caracarensis* VZ 570/4 with an orange flower in cultivation



Fig. 25 *S. caracarensis* VZ 639, an old plant in habitat



Fig. 26 *S. caracarensis* VZ 640, another old plant in habitat

are violet-reddish, or covered with a bluish cast.

Cárdenas, however, was specifically talking about a **light green** body colour. Gertel stated, “matches some individual clones”. I must say that I personally have a rather different concept of the colour light green. It is very difficult for me to accept, as Gertel stated for WR 593, because **none** of the clones of HS 78 (about eighty) known to me can be described as light green in colour. The colour of the epidermis is, as stated before, dark olive green, mostly flushed with reddish-violet to bluish, similar to many clones of *S. rauschii* or *S. pasopayana*. The latter was even mentioned by Gertel, as we saw above, when dismissing *S. pasopayana* as being *S. pulchra*.

For that reason, when only a few green plants exist among all the reddish-violet or bluish tinted ones, one might think that the author would not choose one of the rare greenish plants to describe. We don't know how many clones Cárdenas had received. He illustrated only one, which does not necessarily mean that he had not seen others. He also did not tell us if the stem was solitary or branching! The description of *S. pulchra* as having a flower with a white throat does not fit HS 78. At least I do not know of any, and only HS 78a has some flowers with a white throat. I am therefore convinced that HS 78 has nothing in common with *S. pulchra* Cárdenas and should be viewed as a distinct taxon, or perhaps as related to *S. canigueralii* (Cárdenas) Buining. What bothers me most is that nobody made any comments about this and that everything had been accepted without one word of protest. The only one who made a comment that was probably missed by all of us, was – yes, there he is again – Diers. In his sales lists of 2005 and 2010, he offered HS 78 named as *S. pulchra* (Cárdenas), with the additional pointed remark: “**inappropriate**”! Bear in mind that he was probably the only person to have seen the original, long ago when staying with Cárdenas in Cochabamba. When Gunther Fritz translated the *S. pulchra* description for an article he was writing, he put a question mark next to the name *S. pulchra* and HS 78 in his collection list. In this way he made it clear that he also had some doubts. It is a very sad fact that descriptions are read so poorly. Moreover, when ‘authorities’ present a particular view, there are no sceptics to be heard. For instance, Mats Hjertson, the main contributor on *Rebutia* sens. lat. in Hunt (2006: 245–252), does not cite the Cárdenas description for *S. pulchra* but the one fitting HS 78: body “dark green to violet”. Further on, *S. caracarensis* and *S. inflexiseta* are declared to be

synonyms of *S. pulchra*. In addition, *S. crispata* (WR 288, from the type locality at 10 km from Padilla) and *S. rauschii* (WR 289, from the type locality around Zudañez), both far away from the Rio Grande, are said here to be synonyms of *S. pulchra*. There is no explanation or justification, and these combinations show little understanding.

So I am convinced that it is wrong to apply the name *S. pulchra* to HS 78 and all the other corresponding field numbers, because they are not in agreement with the Cárdenas protologue.

It is recorded that in 1969 Meneces collected *S. inflexiseta* (in May) and *S. caracarensis* (in June) from the same area. Cárdenas subsequently described them with types under the herbarium numbers MC 6308 and MC 6309 respectively. Theoretically it is even possible that there was only one day between the collections of both taxa, not uncommon in those days, considering the poor road conditions and the means of transport. It is noteworthy that Meneces also collected *S. pulchra* in 1969, and coincidentally also in June. Cárdenas labelled that specimen as MC 6310. That all three species were collected by the same person and published simultaneously in 1970 suggests that Cárdenas received all three from Meneces, originating from one restricted area. Moreover, the altitude of 2400m is the same for all three, although it is difficult to be sure whether these data are correct. Other measurements of altitudes stated by Cárdenas with other taxa have proven to be incorrect when his type localities have later been revisited. The instruments used in those days were far from accurate, and of course there was no GPS yet. However, in citing the same altitude for all three, it suggests that they had come from the same area. My own localities for what I believe to be these taxa are located at around 3000m. No doubt it may be possible to find places in the area at 2400m, but can one still find sulcorebutias there? Most likely not. Another plausible hypothesis could be that Meneces had no equipment at all and just estimated the altitudes by looking at the maps available to him.

Far to the north-east of Presto in the direction of the Rio Grande, north-east of the various populations of *S. caracarensis* and the one population of *S. inflexiseta*, we found a population (my field number VZ 642) that matched Cárdenas's description of *S. pulchra* MC 6310 rather well – indeed, much closer than anything that has hitherto been proposed for this species in the past (Fig. 34). The violet filaments are quite eye-catching, comparing well with Cárdenas's description of the filaments of *S. pulchra* as being “dark magenta”, which



Fig. 27 *S. caracarensis* VZ 643 in habitat, with many seedlings



Fig. 28 *S. inflexiseta* VZ 638 on mossy rocks in habitat



Fig. 29 *S. inflexiseta* VZ 638, a clone with violet flowers in habitat

does not occur so obviously in HS 78. Most significant of all, the plants really are **light green!** Moreover, there are some clones that have a flower with a white throat (Fig. 35). Thus, there is a strong case for believing that this is the true *S. pulchra*, in comparison with the morphological features as described by Cárdenas. Unfortunately, the exact itinerary of Meneces is, as far as is known, unrecorded, so we cannot be certain that we have found the type locality. There are also some variations in the flower colour spectrum, but that is of minor importance given that sulcorebutias are well



Fig. 30 *S. inflexiseta* VZ 638/1, a clone with red flowers in cultivation



Fig. 31 *S. inflexiseta* VZ 638/4, a young plant with violet flowers

known to be prone to flower pigment plasticity, and Cárdenas would probably not have been aware of such variation because of the paucity of material given to him by Meneces.

Regrettably there is no known surviving live material of Cárdenas's *S. pulchra*, while the preserved material is either lost or perhaps never even deposited, as it was close to the end of his career and indeed his life (d. 14 Feb 1973). On the other hand, for *S. caracarensis* and *S. inflexiseta* surviving living original material still exists, although the preserved material appears to

be missing. The final chapter of his autobiography in 1973 ends with his activities in March 1971, and his last mention of a *Sulcorebutia* was that of *Rebutia tuberculatochrysantha*, collected by himself in October 1970 and published in 1971, but whose preserved type also happens to be missing. The introduction to his autobiography was Dated 12 November 1971, suggesting that he had completed the manuscript between March and November 1971 as a final record of his life's work for posterity.

A summary of the history of these three taxa is shown below, together with updates to their typification in order to fix the application of these names. New specimens of all three have been deposited at the Herbario Nacional de Bolivia, La Paz (LPB) and duplicates at the Institut für Botanik, University of Vienna (WU).

S. inflexiseta

Rebutia inflexiseta Cárdenas, New Bolivian *Cactaceae*, Part XII, *Cactus and Succulent Journal* (Amer.) **42**(1): 36–37. (Jan–Feb) 1970.

Sulcorebutia inflexiseta (Cárdenas) Donald, In defense of *Sulcorebutia* Backeberg, *Cactus and Succulent Journal* (Amer.) **43**(1): 38. (Jan–Feb) 1971.

Weingartia inflexiseta (Cárdenas) F.H.Brandt, *Kakteen- und Orchideen-Rundschau* **5**(1): 5. 1980.

Etym: A compound adjective formed from the Latin *in-*, which often means not but here means inwards, *flexus*, the passive participle of *flectere*, to bend, and *seta*, bristle. Refers to the inwardly curving, flexible spines.

Incurving-bristly[-spined] *Rebutia*.

T: Bolivia, Dept. Chuquisaca, Prov. Zudañez, in the Cara Cara mountains near Presto, alt. 2400m; May 1969, *E MENECEs* in CÁRDENAS 6308.

HT: Herbarium Cardenasianum. Not found by Eggl & Leuenberger (2005).

LT(design. here): Bolivia, Dept. Chuquisaca, Prov. Zudañez, in the Cara Cara mountains near Presto, alt. 2400m; May 1969, *E MENECEs* in CÁRDENAS 6308 (LPB, lectotype, WU, isolectotype).

S. caracarensis

Rebutia caracarensis Cárdenas, New Bolivian *Cactaceae*, Part XII, *Cactus and Succulent Journal* (Amer.) **42**(1): 37–38. (Jan–Feb) 1970.

Sulcorebutia caracarensis (Cárdenas) Donald, In defense of *Sulcorebutia* Backeberg, *Cactus and Succulent Journal* (Amer.) **43**(1): 38. (Jan–Feb) 1971.

Weingartia caracarensis (Cárdenas) F.H.Brandt, *Kakteen- und Orchideen-Rundschau* **5**(1): 5. 1980.

Etym: Named for the Cara Cara range of mountains in which it was found, with the geographical adjectival suffix *-ensis*. Cara Caran *Rebutia*.

T: Bolivia, Dept. Chuquisaca, Prov. Zudañez, in the Cara Cara mountains near Presto, alt. 2400m; Jun 1969, *E MENECEs* in CÁRDENAS 6309.

HT: LIL (Herbarium Cardenasianum). Not found by Eggl & Leuenberger (2005).

LT(design. here): Bolivia, Dept. Chuquisaca, Prov. Zudañez, in the Cara Cara mountains near Presto, alt. 2400m; Jun 1969, *E MENECEs* in CÁRDENAS 6309 (LPB, lectotype, WU, isolectotype).

S. pulchra

Rebutia pulchra Cárdenas, New Bolivian *Cactaceae* Part XII, *Cactus and Succulent Journal* (Amer.) **42**(1): 38–39. (Jan–Feb) 1970 (“pulchra”).

Sulcorebutia pulchra (Cárdenas) Donald, *Cactus and Succulent Journal* (Amer.) **43**(1): 39. (Jan–Feb) 1971.

Weingartia pulchra (Cárdenas) F.H.Brandt, *Kakteen- und Orchideen-Rundschau* **3**(5): 95. (15 Nov) 1978.

Rebutia canigueralii ssp. *pulchra* (Cárdenas) Donald ex Hunt. New combinations in *Rebutia* derived from a manuscript by John Donald (d. 1996), *Cactaceae Consensus Initiatives* **3**: 6. (May) 1997.

Etym: A Latin adjective, *pulcher*, pretty. The original spelling is taken to be a grammatical error, and therefore correctable. Pretty *Rebutia*.

T: Bolivia, Dept. Chuquisaca, Prov. Zudañez, between Rio Grande and Presto, 2400m; Jun 1969, *E MENECEs* in CÁRDENAS 6310.



Fig. 32 *S. sp.* VZ 119/1, from the same habitat as HS 78, incorrectly referred to as *S. pulchra*



Fig. 33 *S. sp.* HS 78a, a neighbouring population to HS 78, incorrectly referred to as *S. pulchra* var. *longispina*



Fig. 34 *S. pulchra* VZ 642 in habitat, in agreement with the Cárdenas protologue sub MC 6310

HT: LIL (Herbarium Cardenasiense). Not found by Egli & Leuenberger (2005).

LT (design. here): *Cactus and Succulent Journal* **42**(1): 38, fig. 18. (Jan–Feb) 1970. Not readily identifiable, so epitypification required, as follows.

ET (design. here): Bolivia, Dept. Chuquisaca, north-east Pasopaya–Rio Grande, 3030m; Oct 2007, *J DE VRIES* VZ 642/2 (LPB, epitype, WU isoeptype), (Fig. 35).

A form of this article was first published in *Succulenta* (de Vries 2010), and repeated in a translated and updated form in the German Journal, *Die Echinopse* (de Vries 2011). This English version is now substantially revised and updated to take account of new habitat and typification data. Three lectotypifications and one epitypification are proposed. This account will hopefully stimulate further discussion among *Sulcorebutia* specialists, and I welcome any feedback resulting from these notes.

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LITERATURE CITED:

- Augustin, K, Gertel, W, & Hentschel, G (2000) *Sulcorebutia*, *Kakteenzwerge der bolivianischen Anden*. Eugen Ulmer Verlag, Stuttgart.
- Augustin, K, & Hentschel, G (2008) *Weingartia*, *Sulcorebutia* und *Cintia*, eine untrennbare Einheit, *Gymnocalycium* **21**(2): 767-782.
- Brandt, F H (1978) Die Gattung *Weingartia* Werdermann: combinationes novae, *Kakt. Orchid. Rundschau* **3**(5): 95.
- (1980) Die Gattung *Weingartia* Werdermann, *Kakt. Orchid. Rundschau* **5**(1): 5.
- Cárdenas, M (1970) New Bolivian Cacti Part XII., *Cact. Succ. J. (Amer.)* **42**(1): 30-39.



Fig. 35 *S. pulchra* VZ 642/2, in cultivation, the epitype of *S. pulchra* prior to preservation

- (1973) *Memorias de un naturalista*. Editorial Don Bosco, Cochabamba.
- de Vries, J (2010) De standplaatsen van *Sulcorebutia catacarensis* en *Sulcorebutia inflexiseta* en mogelijk ook nog die van *S. pulchra* na bijna 40 jaar teruggevonden, *Succulenta* **89**(2): 56-67.
- (2011) Die Fundorte von *Sulcorebutia caracarensis* (Card.) Donald, *Sulcorebutia inflexiseta* (Card.) Donald und wahrscheinlich auch von *Sulcorebutia pulchra* (Card.) Donald nach 40 Jahren wiedergefunden! *Die Echinopse* **8**(1): 1-17. AG Freundeskreis "Echinopse", Arbeitsgruppe der DKG, Germany.
- Donald, J D (1971) *Sulcorebutia caracarensis* (Cárdenas) Donald, *Cact. Succ. J. (Amer.)* **43**(1): 38.
- Egli, U & Leuenberger, B E (2005) The Cárdenas type specimens of *Cactaceae* names in the herbarium of the Instituto Miguel Lillo, Tucuman, Argentina, *Willdenowia* **35**: 179-192. Botanische Garten & Botanisches Museum Berlin-Dahlem, Berlin.
- Fritz, G, Gertel, W, & Vries J de (2008) *Kompendium der Feldnummern der Gattung Sulcorebutia*, ed 6. Privately published, Ingelheim.
- Gertel, W (1986) Ein rätselhafter Kaktus: *Sulcorebutia caracarensis* (Cárdenas) Donald, *Kakt. and. Sukk.* **37**(1): 18-20.
- (1991) Neues zu *Sulcorebutia pulchra*, *Kakt. and. Sukk.* **42**(7): 174-176.
- Gertel, W & Latin, W (2010) *Sulcorebutien, Kleinode aus Bolivien*, Sonderausgabe der Deutsche Kakteen-Gesellschaft e.V., Pforzheim.
- Horaček, L (2008) *Sulcorebutia 2008*. Privately published, Kmsko.
- Hunt, D R (2006) *The new Cactus Lexicon*. dh books, Milborne Port.
- Ritz, C M (2007) Phylogeny of south american cacti, *Amer. J. Bot.* **94**(8): 1321-1332.
- Rowley, G D (2009) *Rebutia* reappraised. *CactusWorld* **27**(2): 88-90.
- Taylor, N P (2008) *Sulcorebutia*: Fools step in where angels fear to tread, *Cact. Syst. Init.* (24): 38-40.

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