# Two New Combinations in the genus Eulychnia (Cactaceae)

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# Two New Combinations in the genus *Eulychnia* (Cactaceae)

## Introduction

The genus *Eulychnia* Philippi contains a small number of arborescent or shrubby cacti. Ritter (1980/81) accepted 9 species and a further 5 varieties although more recent authors, Hoffmann & Walter (2004) and Hunt (2006) have accepted a more conservative 4 species.

With one notable exception, the genus is Chilean and is found over a range of 1500km from S18°40′ to S32°20′. The one exception is *Eulychnia ritteri* which grows in southern Peru at a single, disjunct locality, approximately 500 km north of the Chilean border (and nearest other *Eulychnia* populations), near the coastal town of Chala. The northern part of the Chilean range corresponds to the extremely arid Atacama Desert where *Eulychnia* is restricted to coastal localities. Rain is very infrequent and the plants survive on the coastal fogs, known locally as 'camanchaca'. At the southern end of the range, regular winter rain fall allows the plants to grow away from the coast and into the low foothills of the Andes.

*Eulychnia* is a poorly studied genus both in habitat and in cultivation. This is somewhat surprising on account of their very visible presence within many cactus habitats where large stands of the plants can dominate hillsides. However cactus explorers, with the exception of Ritter, have paid them scant attention. In cultivation they are occasionally found as small seed raised plants. They have a reputation of slow growth and rarely reach a size where flowers can be expected.

The authors have made several trips to *Eulychnia* habitats and observed all the species in habitat. It became apparent that two populations did not fit comfortably within the four species concept as defined by Hunt. Both populations were described by Ritter as varieties and we believe they are better accepted as good species and we make the two new combinations required here.

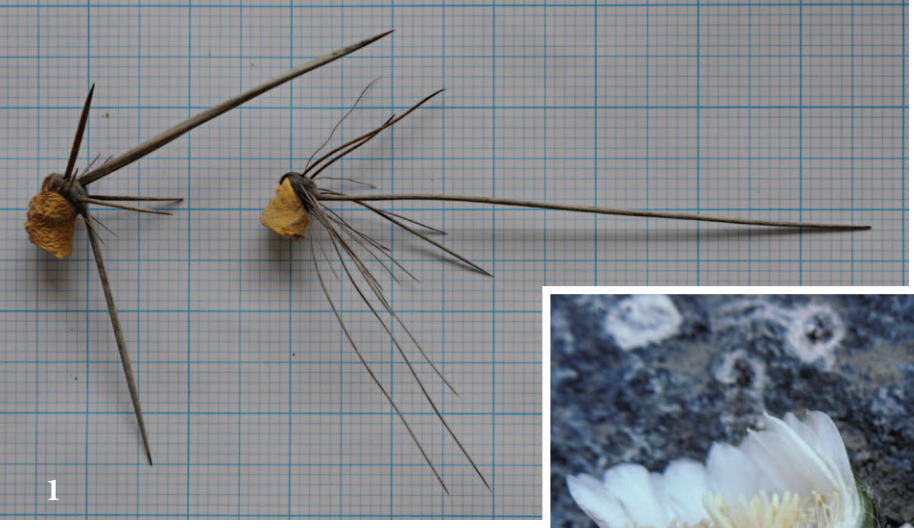
### *Eulychnia taltalensis* (F. Ritter) Hoxey comb. nov.

**Basionym**

*Eulychnia breviflora* Phil. var. *taltalensis* F. Ritter, Kakteen in Südamerika 3: 898 (1980)

**Description**

**Body** tree-like, upright growing, plants to 3–5m tall, freely branching from near the base, usually without a trunk. The largest plants with 30 to 50 branches. **Stems** grass-green colour, 6–10cm in diameter and up to 4m in length. **Ribs** between 9–14, and approximately 12–20mm high, rounded. **Areoles** evenly spaced about 20mm apart, 8–14mm in diameter, usually dark brown (but occasionally grey) felt when new, fading to light grey. **Spination (sterile stems)** central spines, 3–5, straight and stout, 2mm thick at the base, brown although turning gray with age, to 8cm long. The longest downward pointing. Radial spines, 6 to 12, radiating, short, 5–10mm long, brown through to grey. **Spination (flowering stems)** central spines, 3–5, thinner, slightly flexible, 1mm thick, to 12cm long. Radial spines, 10–15, very thin and flexible and significantly longer to 6cm. **Flowers** usually emerge near the apex and open during the day, slightly fragrant, 50–65mm long and 35–40mm wide. **Flower tube** with numerous green scales which are obscured by a dense covering of dark brown (very occasionally greyish or golden yellow) hairs. The flower tube is very thick, green with large mucilaginous filled cells. The inner part of the flower tube around the ovary is white. **Petals** white, 15–20mm long, 5–9mm wide, rounded apex with a small pointed end. **Style** white, thick, 15–18mm long with 19–24 3–8mm long pale yellow stigma lobes. **Stamens**, white and numerous filling the whole of the open flower. **Anthers** light yellow. **Fruit** globular, about 6cm in diameter, covered in woolly hairs like the flower, acidic. Fruit wall thick with large cells containing colourless mucilage. **Seeds** about 1.5 mm long, 1.0 mm wide, 0.4 mm thick, black, matt.



*1* Two spine clusters from the same specimen of *Eulychnia taltalensis*, depicted in Fig. 5. On the left, robust spines from a non-flowering stem and on the right, thinner more flexible spines from the flowering stem. This feature is shared with *E. iquiquensis* and *E. ritteri*.
*2* Flower section of *Eulychnia taltalensis*, PH445.03, on the coast between Punta Plata and Paposo, 70m altitude. *3* *Eulychnia taltalensis,* PH448.03, growing on the coast north of Taltal, at 30m.

**Distribution**

The distribution of *Eulychnia taltalensis* is limited to a 100km stretch of coast from Caleta Botija, south of Antofagasta to the town of Taltal. This section of coast is characterized by steep coastal mountains and when combined with the significant sea mists extensive plant communities are formed. *Eulychnia taltalensis* is at its most impressive in the most favourable locations on ridges overlooking the coast where they form large stands of lichen covered plants. A well known population is to be found above the village of Paposo but plants are common throughout the range.

To the north and to the south of the *Eulychnia taltalensis* distribution are found populations of *Eulychnia iquiquensis.* Although both species grow within a few kilometers of each other they do not overlap and no intermediate populations or sympatric plants have been found. Both ends of the distribution have interesting geographical and climatic features which may explain the distribution. At Caleta Botija there is a natural climatic barrier and a sudden change in the climate from the hyper-arid north to noticeably wetter and more overcast skies to the south where conditions are more favourable for plant life. Taltal also lies on the Pacific coast, at the mouth of a valley at the end of the chain of high coastal hills that form a

*4* *Eulychnia taltalensis*, PH658.05, hills above Quebrada Iscuña, growing between 410 and 970m. *5* *Eulychnia taltalensis,* PH659.03, north of Caleta Oliva, north of Taltal, at 270m.

natural geographical barrier to the lower hills to the south. The region south of Taltal is noticeably drier than the hills to the north. *Eulychnia taltalensis* can be found from near level to 1200m.

**Etymology**

Named after the town of Taltal in northern Chile.

**Type Locality**

The town of Taltal, in the region of Antofagasta in northern Chile; *Ritter* 214, 1956

## Comments

Historically *Eulychnia taltalensis* has been considered to be related to *Eulychnia breviflora*. Philippi (1869) included it in *Eulychnia breviflora* along with what is now called *Eulychnia iquiquensis*. Johnson (1929) also referred *Eulychnia taltalensis* to *Eulychnia breviflora* but was the first to identity it as distinct from *Eulychnia iquiquensis*.

We believe that *Eulychnia taltalensis* is better accepted as a good species and may in fact be more closely related to *Eulychnia iquiquensis* than to *Eulychnia breviflora*. The gross body morphology of *Eulychnia taltalensis* and *Eulychnia iquiquensis* is very similar. An important character of *Eulychnia taltalensis* is the distinct spination between juvenile and mature flowering stems. Juvenile growth has much stronger spination which in mature stems becomes much weaker and more flexible, sometime almost hair-like (Fig. 1). This character is shared with *Eulychnia iquiquensis* and *Eulychnia ritteri* but with no other *Eulychnia* species.

*Eulychnia taltalensis* can be distinguished from *Eulychnia iquiquensis* by the dark brown areole felt and complete absence of wool or hair from the areoles. There is dark brown wool on the flower tube and fruit (Figures 1 & 2). In comparison *Eulychnia iquiquensis* has light coloured wool on the flower tube and fruits and extensive white areole wool. Sometimes on extremely dehydrated plants in habitat, these features are hard to see, but if vigorously growing material can be found distinguishing the two species is easy.

The way that the distribution of *Eulychnia taltalensis* is enclosed by *Eulychnia iquiquensis* is very curious and we can only speculate why. Possibly *Eulychnia taltalensis* is a more vigorous plant more



*6* A seedling of *Eulychnia taltalensis*, PH255.02, from the coast between Punta Plata and Paposo, at 40m, in cultivation, displaying the brown areole felt. *7* Taken on 21 October 2004 in the Llanos de Choros, this picture captures the first time that the author (PK) observed *Eulychnia taltalensis* in habitat and started the search for its identity.

suited to higher levels of moisture availability and has displaced *Eulychnia iquiquensis* (Figures 3, 4). *Eulychnia iquiquensis* is the most drought resistant member of the genus and perhaps less suited to wetter condition. An alternative theory is that *Eulychnia taltalensis* is of hybrid origin between *Eulychnia iquiquensis* and *Eulychnia breviflora* and it has hybrid vigour.

In cultivation, seedlings of *Eulychnia taltalensis* are easily to distinguish from other *Eulychnia* species. They grow more rapidly than any other species and form taller but thinner columns with fewer ribs. There is no areole wool but dark areole felt forms at a young age (Fig. 5).

Illustration 11.2 from the *New Cactus Lexicon* Atlas (2006) is *Eulychnia taltalensis* but is erroneously captioned as *Eulychnia iquiquensis*.

## *Eulychnia chorosensis* P. Klaassen nom. et comb. nov.

**Basionym**

*Eulychnia acida* Phil. var. *procumbens* F.Ritter, Kakteen in Südamerika 3: 895 (1980)

**Description**

**Body** shrubby, prostrate growth, with upward pointing stem tips, spreading to form clumps 3m wide and no more than 1m high. **Stems** greyish-green in colour, 5–8cm in diameter and up to 2m in length. Ribs between 8–13, and approximately 15mm wide and 5–8mm deep, rounded. Sometimes with a weak groove above the areole. **Areoles** round, large, about 10mm in diameter and 7–10mm apart, with light grey or white felt. **Spination** centrals, 1–3 , very long, straight and porrect, 4–15cm long. Radials, as many as 12 but sometimes few or absent, short, of unequal lengths, 10–30mm long. **Flowers** emerge anywhere on the upper part of the stem and are not restricted on the apex. They open during the day, odourless, 65–70mm long and 40–60mm wide. **Flower tube** with numerous green scales which are partially obscured by dark brown wool which is somewhat variable in density. The flower tube is very thick, green with large mucilaginous filled cells. The inner part of the flower tube around the ovary is white. **Petals** white sometimes with a weak pink mid-stripe, 15–20mm long and 8–14mm wide, rounded top. **Style** white, thick, 20mm long with 15–20 yellowish stigma lobes. **Stamens**, white

*8* The sprawling stems are only found in the genus for *E. chorosensis* and *E. castanea*, which grows farther south, from Los Molles to Tongoy. Picture taken on 5 November 2007, on Isla Chañaral, just south of the Llanos de Choros, and part of the Humboldt Penguin National Reserve. ***Inset*** The large felted areoles and the 'more bristly than *E. acida* - less woolly than *E. breviflora* or *E. iquiquensis*' buds.

and numerous filling the whole of the open flower. Anthers light yellow. **Fruit** globular, about 5cm in diameter, initially green turning brownish-green at maturity and retaining scales and dark brown wool.Pulp translucent white and acidic, containing numerous seeds. Fruit wall thick with large cells containing colourless mucilage. **Seeds** about 2 mm long, 1.2 mm wide, 0.5 mm thick, black-brown, matt.

**Etymology**

Named for the Llanos Choros in Chile; the centre of distribution of this species.

**Type Locality**

Freirina in the region of Atacama, Chile; *Ritter* 650 (1963).

**Distribution**

*Eulychnia chorosensis* is restricted to a relatively small area of coastal Chile centred around the flat coastal plain "Llano de Choros" on the border area of the Coquimbo and Atacama regions. The plants are abundant and consistent in appearance throughout the plain. It continues into the hills that are found to the north and east, but here it becomes less plentiful and shares its habitat with the tall and upright growing *Eulychnia acida*. It has been found as far north as the Río Huasco. The range from north to south is approximately 90km. The plants are most abundant at lower altitudes but has been found as high as 1000m. It is also known from Isla Chañaral and Isla Damas, where the procumbent stems provide the ideal shelter for the burrows of the Humboldt Penguin. Together with Isla Choros and Isla Gaviota (not visited) these islands comprise the Reserva Nacional Pingüino de Humboldt.

## Commentary

Ritter erected the name *Eulychnia acida* var. *procumbens* in 1980 for a small growing plant found in the Río Huasco region. He considered it a small growing variant of *Eulychnia acida* with black hairs on the flower tube. In the description Ritter suggests that this taxon may turn out to be a good species in its own right, as at the time he could not be sure if the differences he had noted with *Eulychnia acida* were just part of the variability that occurs generally within that species.

In 1963, seventeen years earlier, Backeberg had already used the epithet *procumbens*, this time at


9 These images of *Eulychnia chorosensis* were taken on 6 November 2006 at Punta Choros, and show the bristly hypanthium.

the rank of species, when he described *Eulychnia procumbens* for a quite different plant. Backeberg (1977, Fig. 114) reproduces a good photo of his *Eulychnia procumbens*. It is believed to be a small growing form of *Eulychnia breviflora* similar to those found near Bahía Inglesa and illustrated by Leuenberger & Eggli (2000, Fig. 12). It was dismissed by Ritter as a synonym of *Eulychnia breviflora*.

Although we do not usually favour a change of epithet with a change of rank, we are proposing the new name *Eulychnia chorosensis* for Ritter's *Eulychnia acida* var. *procumbens* to avoid confusion with Backeberg's *Eulychnia procumbens*.

Ritter quotes Freirina as the type locality for his *Eulychnia acida* var. *procumbens* and we assume this refers to the village of that name in the Río Huasco valley which is close of the northern extent of the species. Ritter records 4 further localities under the field number FR650, all in the Río Huasco but illustrates the species (Ritter 1980 Abb.746) on a wide open expanse which is likely to be the Llano de Choros. It is possible the reference to Freirina refers to the commune of Freirina, (Huasco Province, Atacama Region) that stretches south to the Pacific Ocean and includes the Llanos de Choros.

The amount of hair / wool found on the hypanthium of *Eulychnia* has been used since Britton & Rose as the most significant characteristic to distinguish between the species.

The core population of *Eulychnia chorosensis* is found in the Llanos de Choros where it forms low growing clumps on the windswept sandy plain (Fig. 7). This taxon is clearly closely related to *Eulychnia acida* and it shares with it large white felted areoles, strong spination and flower position on the stem (Fig. 8). However they differ in stature and the flower tube on *Eulychnia chorosensis* is consistently covered in dense dark brown hairs. This is not a typical feature of Eulychnia *acida* but some *Eulychnia acida* populations do have a degree of wool on the flower tube. *Eulychnia chorosensis* grows as far north as the Río Huasco and inland from the Llanos de Choros. In these inland localities some intergradation with *Eulychnia acida* occurs and *Eulychnia chorosensis* genes may be the source of the dark wool on the flower tube (Figures 9, 10).

*10* One of the pollinators of *E. chorosensis*, a solitary ground bee. *11* A young seedling of *E. chorosensis* from seed collected by Brendan Burke (BJB6) near Caleta Sarco, at 150m.

*Eulychnia chorosensis* geographical range is interesting and worthy of comment. It is centred on the coastal Llano de Choros, but it extends up into the hills south of the Río Huasco. Throughout this range *Eulychnia breviflora* is absent and it appears *Eulychnia chorosensis* completely replaces this species and splits *Eulychnia breviflora* into two disjunct populations separated by approximately 90km. At the northern boundary of the two species on hills adjacent to the Río Huasco both species have been seen together but the overlap is very small. The Río Huasco appears to be a natural boundary between *Eulychnia chorosensis* and the northern population of *Eulychnia breviflora*.

Seedlings of *Eulychnia chorosensis* (Fig. 11) are very similar-looking to *Eulychnia acida* and they cannot be separated at that stage.

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