

Leptocereus paniculatus

A Newly Discovered Cactus in Culebra and Puerto Rico

Endemic to Dominican Republic



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Leptocereus paniculatus

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Introduction:

On **May 4, 2009**, after a visit to the **VMT Leptocereus grantianus** population in **Culebra to collect stem segments for reproduction planting of the species**, Carlos Pacheco, Technical Officer , USF&WA and by Omar A. Monsegur Rivera, Field Biologist, USF&WA continued to Punta Soldado to carry out a general site visit and review and observe the flora of the **Punta Soldado** general area. While exploring the peninsula they first discovered a new population of a **Leptocereus** cactus previously unknown to exist in **Culebra** or Puerto Rico as of then unidentified as to species. The new cactus was discovered on the top of a shoreline ridge on the **Punta Soldado** peninsula that is located at the tip of the **Playa Sardinias II Ward** of the island of **Culebra**, Puerto Rico in the southern ridge hilltop facing the Caribbean Sea. During this first visit to the new unknown cactus population, they noted the possibility of having found a different cactus that was similar in appearance and growth habit to the **Leptocereus grantianus** but was different for its stems had many spines. Its spines were smaller than the significantly larger spines of **Leptocereus quadricostatus** the other cactus of the family known to exist in Puerto Rico.



*The **Leptocereus** cacti were originally described in 1905 as a subgenus of the **Cereus** genus by Alvin Surgens. It was raised to a full independent genus status in 1920 by Nathaniel Britton and Joseph Rose. **Leptocereus** is a bushy, treelike, at times, but generally sprawling vine-like or arching shrub, with spiny areoles, thin ribbed with notched margins, many jointed segmented cacti with tubular to bell shaped flowers usually white or pale green. In the **Cactaceae** family Leptocereus is a genus of, today, some 15 known species first discovered in Cuba. It is native*

of Cuba, Hispaniola, Puerto Rico and Culebra, many native to Cuba.^{1,2} The **Leptocereus** name is derived from the Greek “*leptus*” which means thin from the ribs or slender blades of the stems and “*cereus*” meaning waxen or waxy for its luster. It is generally rare to encounter these species in cultivation.

The Geographic Location and Description of Culebra:

Culebra, Puerto Rico is a small Caribbean tropical island archipelago of the eastern platform belt of the Greater Antilles Arc in the West Indies, consisting of one inhabited main island and 23 smaller offshore cays of exceptional beauty and natural attractions. It is located 18 degrees and 19.01 minutes north of the Equator and 65 degrees and 17.24 minutes west of the Prime Meridian. The island enjoys a temperate tropical climate refreshed by the northeastern trade winds.

Culebra is volcanic in origin and its geography is characterized by steep hills, sandy beaches, reefs, small neighboring islands, bays, coves and inlets. The island is very scenic with combined views of sea, land and sky and beautiful coves and beaches. The island is located approximately 27 km (17 miles) east of the “big” island of **Puerto Rico**, approximately 19 km (12 miles) west of **St. Thomas, U.S. Virgin Islands (USVI)**, and approximately 14 km (9 miles) north of the island of **Vieques** on the *Eastern Puerto Rico geologic platform foundation* of the **Northeastern Geologic Platform Bank of the Greater Antilles Arc**. The **Puerto Rico Platform** extends from Mona Island on the western side of Puerto Rico to the USVI and British Virgin Islands (BVI) to the East. **Culebra** is approximately seven miles long by five miles wide (11 by 8 km) and occupies an area of approximately 11.6 square miles or 28 square kilometers (6,741 *cuerdas*). It has some of the most beautiful beaches of the world. However, predominantly it has shallow shoreline coastal zones behind its beaches and rapidly rises from coastal cliffs to a hilly topography. Its highest hills are **Monte Resaca** with an elevation of 650 feet (198 m) and **Cerro Balcón** with 541 feet (134 m) on the north side. The central hill of the **VMT** parcel is the highest elevation point on the southern side of the island, in the Playa Sardinias II Ward, with an elevation of 350 feet (107 m).

The **Puerto Rico Platform** forms part of the **Northeastern Geologic Platform Bank of the Greater Antilles Arc**. The **Puerto Rico Platform** has to the north the **Puerto Rico Trench**, which includes the deepest part of the **Atlantic Ocean**, with depths exceeding 8,400 meters, where the **Atlantic Plate** does in a southern movement oblique convergence-subduction under the platform with a left lateral strike slip faulting in a westerly direction of about 2 cm per year. To the south, beneath the **Caribbean Sea**, lies the **Muertos Trough**, where oblique under-thrusting in a northern movement of the **Caribbean Plate** occurs. The **Northeastern Geologic Platform Bank of the Greater Antilles Arc** boundary has active tectonics, resulting in high earthquake and daily seismic activity. The most hazardous activity is located a distance from **Culebra**.

1 Britton, N.L. and Rose, J.N., 1919-1923, The Cactaceae, 4 Vols., Carnegie Institution, Washington, D.C. n, D.C.

2 Edward F., The Cactus Family, 2001, pgs. 391-395, The Timber Press, Portland Oregon

Identification of Species:

I was first introduced to the new unknown cactus population on July 13, 2012 by Carlos Pacheco, Technical Officer, USF&WA., after he completed another visit to the **VMT *Leptocereus grantianus*** population accompanied by Ricardo Colon Merced, USF&WA Wildlife Biologist of the Culebra National Wildlife refuge to our property in **Culebra** in reference to a new **USF&WA Partner Program Cooperative Agreement. Fundación Mi Terruño** and **USF&WA** recently entered into a Cooperative Agreement to propagate two new populations of the **VMT *Leptocereus grantianus*** and to plant 1,200 native and endemic dry forest species to reestablish over a five year period the historical tropical dry forest of Culebra in the protected **VMT Ecological Corridor of the VMT property**. They invited me and my daughter Suzanne M. Dubón to observe the new cactus find in Punta Soldado. We proceed to the ridge top and were able to photograph and observed for the first time the new unknown cactus population. The new population was observed as growing on the cliff top with a mature sprawling population. It had many similar features to the ***Leptocereus grantianus*** except for its spiny content and during our conversation Carlos advanced that it might even be a subspecies or variation of the ***Leptocereus grantianus***. The ***Leptocereus quadricostatus*** was dismissed due to the significant difference in the size and location of the observed spines in the stems of the two species.

With the observation mental notes and the digital photographic record, I proceeded to carry out research on the newly observed unknown cactus species both in my flora library and in the internet. Excellent written and digital photographic material is now available in large quantities over the internet. The size and spread of features of the spine of the ***Leptocereus*** different species was a significant differentiator in the effort to classify the newly observed cactus. The extended search was further complicated by published growth habit of a number of plants since the observed unknown cactus had a sprawling growth habit although the suspect specie plant tended to be more erect and larger.

A matching picture of a young stem of the ***Leptocereus paniculatus*** was the determinant classification trigger since it completely matched the observed and photographed stem and spine features of the newly observed cactus in **Culebra**.

A second visit to the cactus population site on the top of a shoreline ridge on the **Punta Soldado** peninsula was carried out by the author to measure the population, count and estimate the number of plants and to additionally observe growth, height, spine retention and feature change with age in the older stems and base stems as well as other general growth area and features to assist in classification and description.



Figure 1: Photo A Vllardebo

*Internet Picture³ of **Leptocereus paniculatus** that assisted in Classification*

Description of Species:

Leptocereus paniculatus* (Lamark) D.R. Hunt** was discovered in **Dominican Republic** and first described by Lamark in 1785 as ***Cactus paniculatus. The Latin meaning paniculatus describes its feature of “with the panicle branched from erect or at length nodding”. It was later described by Nathaniel Britton and Rose in 1921 as *Neobottia paniculata*, and in 1955 by Backeberg as a *Neobottia paniculata var humbertii*. It was finally classified as part of the **Leptocereus genus** in 1991 by D.R. Hunt.

***Leptocereus paniculatus*⁴** has been described and photographed, in **Dominican Republic**, as a bushy, treelike, cactus known to have a much branched crown that grows 6- to 10 m. (20-33ft.) high. The habitat setting of the treelike cactus is found in flat savanna type terrain with richer and deeper soils than those found in the rocky cliff top site in Culebra. That limits both rooting, nutrients and water retention so necessary for expanded growth.

³ www.cactus-succulents.com, Photo a.villardebó

⁴ Edward F., *The Cactus Family*, 2001, p. 393, The Timber Press, Portland Oregon

The mature population of the species recently found in *Culebra* in a rocky ridge is more sprawling vine like cactus, with ascending and erect stem branches both at the base and above, showing growth to about 3 to 4 meters in height with stems 3 to 6 centimeters (1.2 to 2.4 in.) in diameter. The new population was observed as growing over a rectangular extension of some thirty feet square on the cliff top with a population of around forty plants of different ages. Many are mature other seem much younger. Young shoots develop from mature rooted stems. The cactus bases of mature specimens are rounder and light gray-brown in appearance 6 to 12 centimeters (2.4 to 4.8 in.) in diameter at the base. It has no aerial roots.



The many jointed elongated stems without leaves are thin ribbed or angled and at times appear square. The stems have generally 4 prominent ribs and add height with new stems, distinctly notched and with broadly rolling scalloped edges. Ribs of the young joints are thinner and appear pointed at the tip. At the base of the rolling scalloped edges, small brown-felted areoles bear spines when young. At this stage, areoles, are dark- brownish tipped and yellowish when young and become grayish as the stem matures. They are persistent, needle like spines that are .5 to 1 cm long. Some spines disappear on more mature thicker ribs that have been gnawed by birds and animals.



Leptocereus paniculatus

Leptocereus grantianus

Leptocereus paniculatus

The cacti plants appear vine-like but closer observation shows most plants independently support their stem structure. It has been observed free standing to at least up to three to four meters (10 to 13 feet) in this Culebra population.

The upper tips of the younger stems have spiny brown areoles up to the stem tip that are closer in distance and curved in the tip edges from where flower cephalia tubes develop.



Cephalia flower tubes have been observed and photographed but actual open flowers have not been yet observed by the author on the *Leptocereus paniculatus*. The specie's similar features of the cephalia tubes to those of the *Leptocereus grantianus* and **description by others in the research literature**, permits us to contingently describe the flowers as being of similar habit and feature as that of the *Leptocereus grantianus* including digital photographs of cephalia tubes with observed dry flowers on seeds as well as internet pictures.

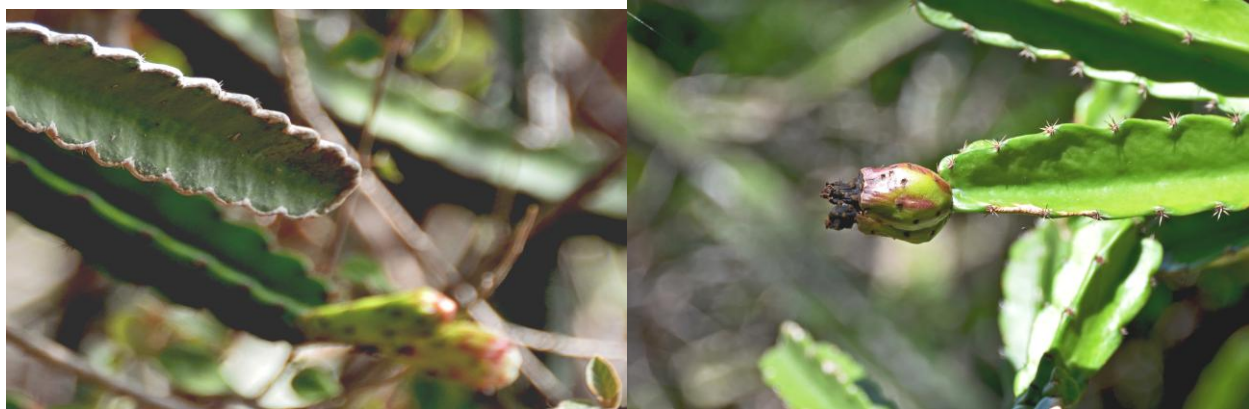
Flowers are borne singly on terminal cephalia tubes. The tubes are three 3 to 6 cm long and about 1 to 1.5 cm wide. The terminal cephalia can be singly borne or form part of several flower stems borne at the edges of the tips of the rib stems. More than one flower tube can be borne from a single rib. The outer perianth segments of the flower tube are yellow-green, linear, and have similar small areoles-like scales notches like those of the rolling scalloped-edged top of the ribs. The flower tube opens to a campanulate ovary crown corolla that also displays the areoles-like scales notches around the crown.

The flowers greenish white-yellow or cream colored, oblong-ovate, obtuse to about 5 cm almost 2 inches long with many stamens and yellow anthers. The stigma lobes are several and small. The inner perianth segments of the flower have a circular row of numerous white short corona filament hairs that radiate around the ovary crown and additional cream pollen anthers at the perianth's central base with the two white taller styles having three radiating stigma all joined together in the ovary and surrounded in the corolla by two light yellow, cream-white concentric rows of 8 to 10 wider petals and about 8 to 10 petaloid sepals calyx of the same color that combine around the crown at full flower opening.



The solitary flower is referenced as nocturnal with an extended early diurnal period of daily flowering. The flower emerges from the obconic (about 1 cm wide) ovary tube and opens at night from about 10 p.m. and remains open to about 10 a.m. This nocturnal flowering mechanism of the young flower, as well the brown-felted spot areoles around the crown, less than 1 millimeter long,. Bees and other insects provide the fertilization functions to the flower and ovary.

The green fruits develop as an oblong, subglubose to ellipsoid pod in the ovary of the flower-tube as the fertilized ovary shrinks the campanulate flowering crown, and grows and expands inside the cephalia tube to about 4 to 5 centimeters (1.5 to 2 inches) in diameter with a few of the original spine areoles of the flower-tube remaining around the fruit. The fruit produces numerous black seeds.



The VMT Ecological Corridor:

Villa Mi Terruño is a *model sustainable project of advanced master planning*, proposed on a **104 cuerdas⁵** land site. It is located on three hills at the center of the **Playa Sardinias II Ward**

⁵ One (1) *cuerda* = 0.971 acres.

extension in the southeastern peninsula of the island of **Culebra**. The **Punta Soldado** is the southeastern tip of the peninsula.

VMT is a sustainable development that sponsors a non-profit foundation, **Fundacion Mi Terruño Inc. ("FMT")** dedicated to sustainable community development and improvement and the ecological, scientific and educational research and conservation of the local marine and land flora and fauna. The proposed project will only *gradually develop 33.7 cuerdas of land over a period of 15 years and due to its sustainable and conservation goals will set aside 70 cuerdas to protect the tropical Caribbean island dry forest.* Included in the 70 non-developed cuerdas is a **38 cuerda contiguous corridor** setting aside the most undisturbed dry tropical forested areas of the site to protect and conserve for future generations significant endemic vegetation referred to as the **VMT Ecological Corridor** which includes the ***Leptocereus grantianus*** cactus habitat areas.

VMT is not a 104-cuerda development, as incorrectly alleged by some. **As a matter of fact, the 28-cuerda portion of the site where the *Leptocereus grantianus* cactus grows is currently zoned R0-1-C, which permits the construction of two (2) homes per cuerda or 56 homes in total. All but three (3) of these 56 homes were "relocated" from the Playa Cascajo drainage basin to the less sensitive areas of the property, thereby extending the **VMT Ecological Corridor** to protect the endangered cactus species and the **Cascajo Beach** coastal area drainage basin.**

Propagation of Plants:

The **VMT Ecological Corridor** protected habitat area will be used to plant new populations of the newly discovered ***Leptocereus paniculatus*** to propagate new population growth areas in perpetuity within the conservation corridor.

FMT personnel will be carrying out the establishment of two ***Leptocereus grantianus* and one *Leptocereus paniculatus*** populations in the **38 cuerda contiguous reserve corridor of the VMT Ecological Corridor** in collaboration with the USF&WA pursuant to a cooperative agreement under the Partners Program. In addition 1,200 new trees will be planted over five (5) year period to reestablished the original dry tropical forest of **Culebra** in the **VMT Ecological Corridor.**