Chamaerops humilis 'Vulcano'

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Chamaerops humilis (Mediterranean or European fan palm) is one of the hardiest, toughest, most adaptable, and, in many instances, exceedingly handsome palms for warm-temperate, subtropical, and even tropical landscapes. Occurring around the Mediterranean basin in southwestern and south-central Europe and northwestern Africa, its clustering habit, palmate leaves, tolerance of adverse conditions, and relative ease of cultivation make it a common and popular landscape plant. A versatile subject, its slow growth and clustering nature are amenable to many landscape situations, large or small, and clump size and density can be managed for desired effect through judicious selective removal of trunks.

A variable species across its rather large and diverse range, *Chamaerops humilis* has two accepted varieties, *C. humilis* var. *argente*a, characterized by handsome, waxy glaucous blue-gray nearly white leaves, and *C. humilis* var. *humilis* (Plant List 2021), into which the multitude of numerous, distinct and sometimes not so distinct, and unnamed or informally named horticultural varieties and forms are included.

For example, in horticulture, four of the more common cultivars informally recognized for *Chamaerops humilis var. humilis* include 'Etna Star' (UK Palms 2021), 'Nana', 'Stella', and 'Vulcano' (RHS 2021). Because these cultivars mostly have not been formally described and established, much confusion surrounds their descriptive and diagnostic characters. A quick internet search turns up a multitude of sometimes conflicting information about them.

"Nana' is often applied to any small to dwarf form mostly without regard to leaf color, blade and petiole size, and degree and size of petiole armature although they mostly lack or have less silvery white indumentum on the abaxial (under) surface of the leaf blade.

'Stella' is typically applied to smaller, somewhat compact plants and has leaf blades silvery white on the abaxial surface, green on the adaxial (upper) surface with the silvery white indumentum extending on to the short ridges of the segment folds. The blades are deeply divided with the segments free nearly to the mostly unarmed petiole and with deeply bifid tips. Because of the deeply divided blade, the palmen, the undivided portion of the blade formed from the united segment bases, is unusually small.

'Vulcano' is a dwarf, compact, even miniature or *bonsai* form with small leaves and short petioles (**Fig. 1**). The leaf blade is bright, dark green adaxially, typically and distinctly densely covered abaxially with silvery white indumentum (**Fig. 2**), and moderately divided only to about half-way, making the palmen relatively large in relation to the blade. The wide, rigid segments have entire

1. Co-author Stan Davies, II provides scale for one of four of his spectacular clumps of *Chamaerops humilis* 'Vulcano', characterized by it dwarf, compact, even miniature or *bonsai* habit with small leaves and short petioles.

2. Leaf blades of *Chamaerops humilis* 'Vulcano' are bright, dark green adaxially and typically and distinctly densely covered abaxially with silvery white indumentum.

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or only briefly bifid tips. However, even the name of this rather distinctive cultivar has been applied to a variety of plants, some of which have mostly green abaxial leaf surfaces. This variability is likely because seed-grown plants more frequently do not come true to form and of simple misidentification. Indeed, Salt (2006), provided a brief description that could constitute formal naming of this cultivar: "*Chamaerops humilis* ‚Vulcano' has grown well, even a very squashed poorly specimen that we rescued from a garden centre. I love the lush green leaf and close growth habit of the ‚Vulcano'." A photograph in the same issue but by another person and labeled as *C. humilis* 'Vulcano' depicts a plant with mostly green abaxial leaf blade surfaces. Most of the plants identified on-line as *C. humilis* 'Vulcano' tend to have leaf blades silvery white on the abaxial surfaces.

3. *Chamaerops humilis* 'Vulcano' forms dense, compact clumps with small leaves.

4. The dwarf, compact, nature of *Chamaerops humilis* 'Vulcano' is clearly evident on this handsome specimen.

5. *Chamaerops humilis* 'Vulcano' is an unusually handsome plant of dwarf, compact growth and striking leaves bright green adaxially and silvery white abaxially.

We feel that "Vulcano' is the most striking, stunning, distinct, desirable cultivar of *Chamaerops humilis* var. *humilis* and here we provide a copiously illustrated, descriptive account to support our sentiments and help to identify this cultivar more clearly.

Chamaerops humilis var. humilis 'Vulcano'

Habit: clustered, mostly dioecious, dwarf to small, compact to miniature fan palm forming clumps to 2 m tall and wide (**Figs. 3–5**).

Trunks: 12–15 cm diam., densely covered with dark gray, persistent leaf bases and fibers (**Fig. 6**).

Leaves: 25–40 (per stem) (**Figs. 7–8**), stiffly ascending to drooping, old leaves persistent and forming a skirt; base 10–15 cm long, 5 cm wide; petiole 18–24 cm long, 1.2 cm wide at apex, 2 cm wide at base, densely silvery white tomentose adaxially and with tan, felt-like indumentum abaxially, margins with few, faint teeth (**Figs. 9–10**); blades 21–32 × 29–40 cm, dark green adaxially, typically silvery white abaxially, moderately divided to about half-way, palmen 8 × 12 cm (**Figs 11–12)**; segments 36–38, center ones longest, these to 29 × 3 cm but narrower and constricted due to severe folding, tips bifid to 4 cm or entire.

Inflorescences: interfoliar, short, compact, spreading, to 13 × 12 cm (**Figs. 13–14)**; peduncle to 7 cm long, exceeding prophyll; panicle branched to 2 orders, 1st branch to 6.5 cm long, longest rachilla to 6 cm long.

Flowers: yellow.

Fruits: 1.5 cm long, ellipsoid, yellowish brown to dark brown or black (**Figs. 14–15**).

Distribution: An internet search shows that this cultivar purportedly originated on Vulcano Island of the Aeolian Archipelago (ThePalmCentre 2021) in the Tyrrheniana Sea (hence, the cultivar name) about 25 km just off the northeastern coast of Sicily. *Chamaerops humilis* var. *humilis* naturally occurs in the Aeolian Archipelago but we were unable to determine if *C. humilis* 'Vulcano' originated in the wild or from cultivated plants on Vulcano Island. However, Plant Delights Nursery (2021) states that 'Vulcano' was discovered as a nursery variant in Vivai Vulcano Nursery on Sicily and named for the nearby Vulcano Island. Or, perhaps part of the nursery name, Vivai Vulcano Nursery, was used for the cultivar name. Rarepalmseeds (2021) also states that 'Vulcano' originated in a nursery on Sicily.

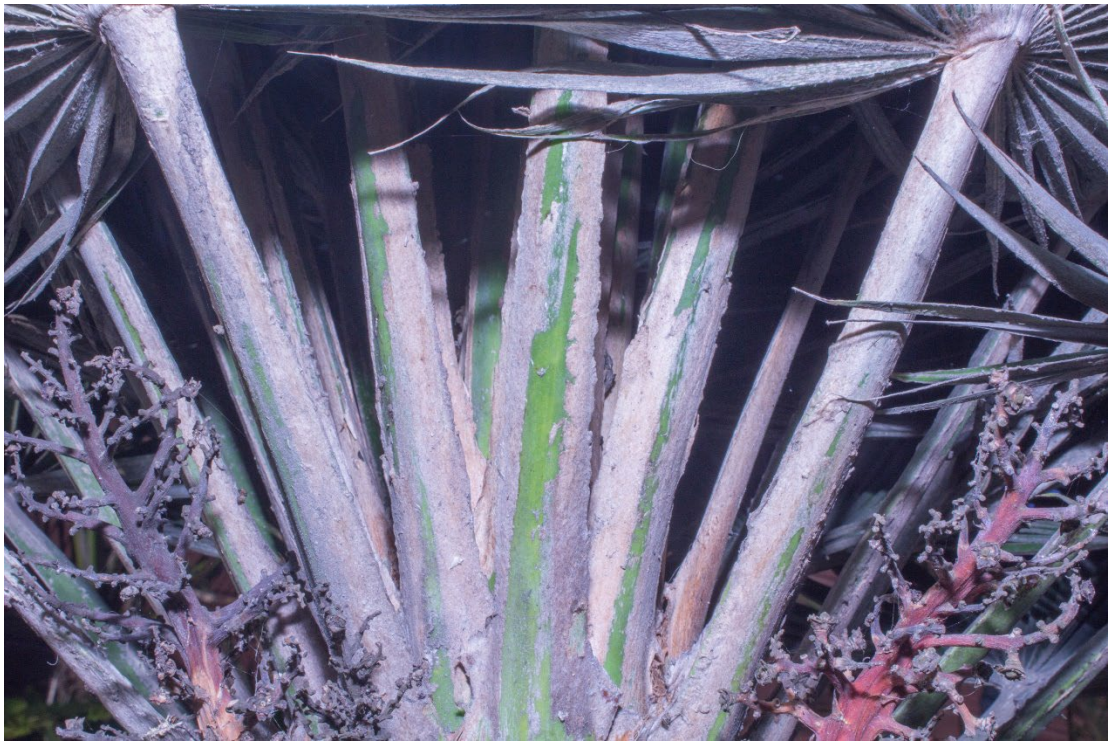
Discussion: We mostly based the description on four plants in the yard of co-author Davies in Newport Beach, California but consulted on-line sources as well. Davies had obtained his plants from Bud Bordier, former owner of Borders' Nursery in Irvine, California, which is no longer in business.

6. Trunks of *Chamaerops humilis* 'Vulcano' are short, 12–15 cm diam., and densely covered with dark gray, persistent leaf bases and fibers.

7. *Chamaerops humilis* 'Vulcano' holds 25 to 40 stiffly ascending to spreading, dark green leaves per trunk.

8. The numerous leaves of *Chamaerops humilis* 'Vulcano' are typically stiffly ascending to show of their silvery white abaxial surface to best advantage.

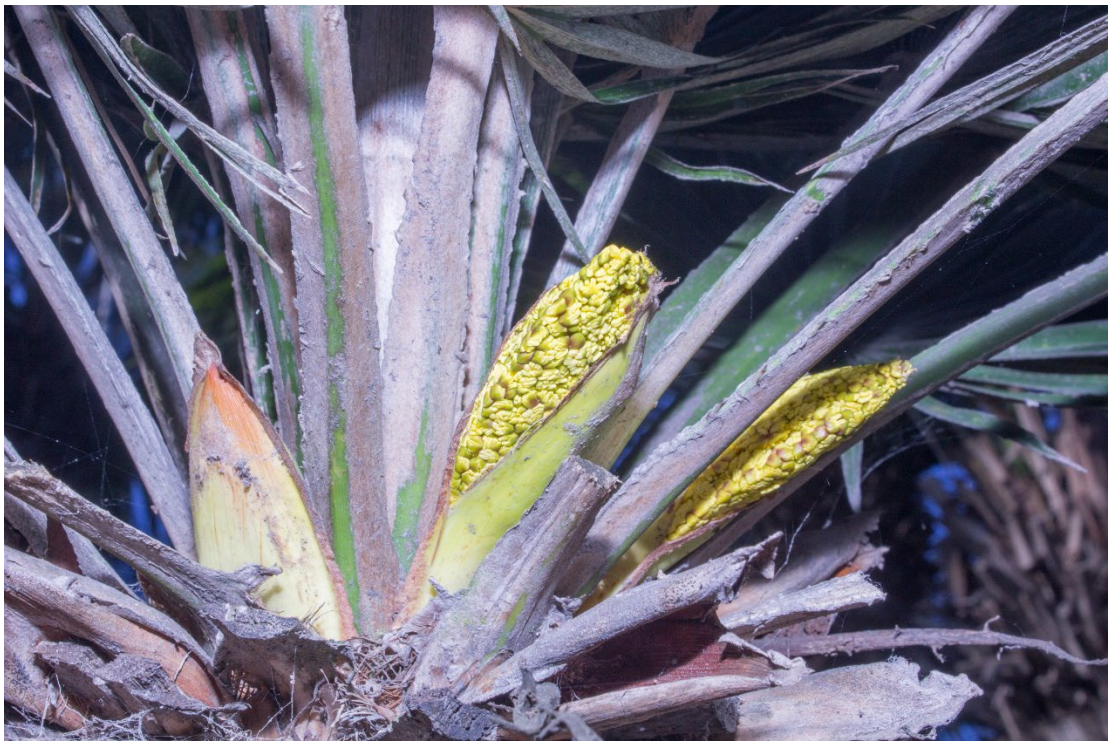
9. Petioles of *Chamaerops humilis* 'Vulcano' are typically densely clothed with silvery white, elongate scales adaxially.



10. The abaxial surface of petioles of *Chamaerops humilis* 'Vulcano' are covered with tan, felt-like indumentum.

11. Leaf blades of *Chamaerops humilis* 'Vulcano' are bright green adaxially. Here and in Figure 12 note the relatively large palmen and the only briefly bifid segment tips.

12. Leaf blades of Chamaerops humilis 'Vulcano' silvery white abaxially.



13. Inflorescences of *Chamaerops humilis* 'Vulcano' are interfoliar, short, compact, spreading, and have yellow flowers.

14. This short, compact infructescence of *Chamaerops humilis* 'Vulcano' holds mature but not-yet-ripe, yellow-orange fruits.

15. Mature, ripe fruits of *Chamaerops humilis* 'Vulcano' are about 1.5 cm long, ellipsoid, yellowish brown to dark brown or black.

According to Plant Delights Nursery (2021), calling it a plant "of architectural beauty," *Chamaerops humilis* 'Vulcano' is a relatively new arrival in the horticultural trade that is hugely popular in Europe. They speculated that it is a tetraploid because of its slow growth, compact habit, and short, stiff leaves, characters often associated with polyploidy or doubling of the chromosome number.

Plant Delights Nursery (2021) stated that *Chamaerops humilis* 'Vulcano' comes "somewhat true from seed, but keep in mind that each plant will be slightly different" and that it can take "three years to know for sure if the plant is true *C. humilis* 'Vulcano'." The qualifier "somewhat" in the preceding statement might be overly generous because the websites of nurseries that sell and or propagate 'Vulcano' and internet discussion groups point out that a wide variety of offspring, from plants identical to the parent to plants that look like regular, unadulterated *C. humilis* var. *humilis*, arise from seed propagation of this cultivar.

Palmatier Meg (2019) planted 20 to 25 seeds of *Chamaerops humilis* 'Vulcano' from a knowledgeable palm friend in Italy who said that 40% would come true but later learned, after carefully monitoring the resulting offspring for two to three years, that only one or perhaps two

showed the classic 'Vulcano' look, which means only about four to ten percent came true. Most turned out to be the normal *C. humilis* var. humilis and the remainder were intermediate between it and 'Vulcano'.

Palmsforpleas . . . (2020), a collector in New South Wales, Australia, lamented that "trying to get small compact versions [of Vulcano] can be a real challenge, not all seed . . . are compact." A photograph of at least four plants in the Wollongong Botanic Gardens in Brisbane, Queensland, Australia, all grown from the same lot of seeds, and labeled *Chamaerops humilis* 'Vulcano', range from a 'Vulcano' type to the normal *C. humilis* var. *humilis* type.

UK Palms (2021), responding to the post from the preceding paragraph, noted that the Italian nursery that produces most of the *Chamaerops humilis* 'Vulcano' plants has refined its seed-producing mother blocks so that their seed-grown plants are mostly true 'Vulcano'.

Vivai Vulcano Sicily, the nursery that is the apparent originator and perhaps most prominent supplier of *Chamaerops humilis* 'Vulcano', has developed a marketing plan for European sales that personalizes each plant with a unique registration number guaranteeing its authenticity. They sell their plants under the registered name Vulcano® (Vivai Vulcano Sicily 2021). They note that Lorenzo Vigo, after 25 years of careful selection, developed *C. humilis* 'Vulcano'. Their plants typically have leaves with blades silvery whites on the abaxial surface.

Propagation

Unless one has access to dedicated seed-producing mother blocks, which were developed through careful and judicious selection over many generations through a process taking many years and known to produce mostly true-to-form plants, seed propagation of *Chamaerops humilis* var. *humilis* 'Vulcano' is unreliable, producing true-to-form offspring from only 4 to 40 percent of the time. Thus, vegetative propagation is the only method to ensure production of true-to-form plants. Because *C. humilis* and its various varieties and forms, including *C. humilis* var. *humilis* 'Vulcano' naturally produce suckers of offshoots from the base of the trunks, these can be carefully removed and established to make new plants. However, in most cases, especially for plants in the ground, vegetative propagation of *C. humilis* is a slow, tedious, and rather exacting process, and care must be taken during the removal and establishment period to ensure a high rate of success.

In removal of suckers or offshoots of in-ground *Chamaerops humilis* var. *humilis* 'Vulcano', the key to fast and successful establishment is rapid root and shoot growth. In palm root growth studies, Broschat and Donselman (1990) showed that palm root regeneration of the pygmy date palm *Phoenix roebelenii* depended on the presence of a root initiation zone, which does not

16. For vegetative propagation of *Chamaerops humilis* 'Vulcano', select suckers or offshoots that have a developed, above-ground trunk.

develop fully until the stem or trunk has reached its maximum diameter and begins to elongate vertically. Similarly, Hodel and Pittenger (2003) found that offshoots of the date palm *Phoenix dactylifera* 'Deglet Noor' established best when removed from the mother plant if they were 10 to 35 cm in diameter (trunk has begun to elongate vertically) because they will have more roots when initially removed, have more stored carbohydrates to provide energy for root growth, and have increased levels of naturally occurring, root-promoting substances. Thus, when removing suckers of *C. humilis* var. *humilis* 'Vulcano', it is best to select suckers where the trunk is developed and has begun to elongate vertically (**Fig. 16**).

In a palm root growth study, Hodel et al. (2005) showed that *Chamaerops humilis* var. *humilis* was a low root generator, producing fewer than 25 primary roots annually and this amount varied from year to year. They also showed that *C. humilis* var*. humilis* lacked distinct seasonality in root growth although it tended to have higher quantities of root and shoot growth in the summer and fall. Thus, while suckers of *Chamaerops humilis* var. humilis 'Vulcano' could probably be removed and established any time of year in a subtropical climate, doing so in late spring or early summer at the beginning of the long, warm growing season might provide the best root growth.

In the same study, Hodel et al. (2005) found that root balls with a 15 to 30 cm radius from the trunk are more than adequate when digging and transplanting most palms because they capture well over half the roots, many of which could resprout and regrow, and they protect the root initiation zone from which new roots will emerge (**Figs. 17–19**).

Root pruning suckers one to two months prior to removal from the mother plant is a somewhat common yet mostly unproven theory that lacks researched-based data to support it (Hodel et al. 2005). Nonetheless, Broschat and Meerow (2000) noted that it might be useful in some instances (**Fig. 20**).

Leaf removal and tie up are other practices that can affect growth of severed palm roots although results were mixed in several studies (Broschat 1991; Hodel et al 2003, 2006, 2013). The practice appeared to be mostly beneficial when palm root systems were cut, and palms transplanted in extremely hot arid conditions.

In summary, for in-ground plants, select suckers with visible trunk, sever them from the mother trunk in late spring or early summer, and maintain a root ball at least 30 cm out from the sucker. In extremely hot, arid inland regions remove the lower third of the leaves and tie up the remainder for 30 days; this practice is unnecessary in cooler, more humid coastal conditions. Severing the sucker from the mother trunk 30 to 60 days prior to digging might be beneficial but no research-based data support this practice.

17. For vegetative propagation of *Chamaerops humilis* 'Vulcano', co-author Larry Black takes a root ball from 15 to 30 cm out from the trunk.

18. For vegetative propagation of *Chamaerops humilis* 'Vulcano', suckers or offshoots with a well developed trunk will have a root initiation zone and sufficient root growth. Leaves will be untied once potted up.

19. For vegetative propagation of *Chamaerops humilis* 'Vulcano', suckers or offshoots with a well developed trunk typically have sufficient root growth.

20. Co-author Larry Black severs the sucker or offshoot of Chamaerops humilis 'Vulcano' several months prior to digging, which might be beneficial but no research-based data support this practice.

21. Just removed and potted up sucker or offshoot of *Chamaerops humilis* 'Vulcano.

22. After 18 months, this sucker or offshoot of *Chamaerops humilis* 'Vulcano' in Figure 21 is fully established.

In contrast to vegetative propagation of in-ground plants, vegetative propagation of containerized *Chamaerops humilis* var. *humilis* 'Vulcano' is relatively easy and establishment typically quick and successful because position of the sucker or offshoot on the mother trunk and its root system are usually easily visible once the plant is removed from the container, readily enabling a well placed cut to sever the sucker from the mother trunk with minimal damage to its root system. The severed sucker and attached root system can then be potted up immediately and will establish quickly. Because root damage is minimal in this instance, vegetative propagation of containerized plants can be done any time of year with successful and quick establishment nearly guaranteed.

Whether originating in-ground or in containers, pot up severed suckers and attached roots in a porous, well aerated and drained medium (**Fig. 21**), keep it evenly moist but not excessively wet, and place the plant in morning sun and afternoon shade in hot, inland conditions and in all day sun in cooler, coastal conditions. One to two years might be required for full establishment (**Fig. 22**).

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