

Trachycarpus *oreophilus*,^{[11][14]}

"Dio Chiang Dao *Trachycarpus*" or Thai mountain windmill palm, was confused with *Livistona speciosa* in the early days. *T. oreophilus* is indigenous to the same area as *L. speciosa* and its leaves are like *Livistona chinensis* in color and texture.^[27] It was discovered in the early 1900s, on the ridge crest of steep limestone mountains in northern Thailand, but was then lost, and was only recently rediscovered. Gibbons and Spanner established it as a valid species in 1997.^[11]

The following information about *T. oreophilus* is from that protologue^[11] (the article that names and defines a species according to specific botanical protocol) and Hodel's book^[22]: Up to 39 feet tall, it has slender, mostly bare, brown trunks, four to six inches in diameter with faint, closely spaced rings. Only the juvenile plants still have persistent fibrous leaf sheaths on the entire trunk. Some have masses of exposed roots up to 20 inches high at the base of the trunk. The compact hemispherical crown consists of about 20 leaves, which soon fall off when dead, leaving bulbous persistent leaf-bases on the top 20 inches. The short, swollen and deeply split leaf sheaths are covered with brown, soft fibers that point upward as short fur-like threads at the top of the trunk, then spread horizontally on the side of the trunk, before they rapidly disintegrate. According to Spanner, Gibbons and Henderson, they do not qualify as ligules (Fig. 105).

The petioles have minute teeth, thin tomentum (fuzz) on the

edges and a yellowish line on the underside. They are stiff and robust in habitat, about 19 inches long by 0.75 inch wide, but grow much longer in cultivation, to 32 inches or more. Leaf blades are leathery, green on top, with slight to moderate glaucous underneath, about 39 inches wide, and 27 inches long from the prominent one-inch hastula. The leaves are nearly circular or sometimes three-fourths of a circle. They are divided into about 60 stiff, deeply folded segments, which are split apart from each other at a regular depth of just over half the length. Seedling leaves are erect and very finely divided into narrow leaflets. The kidney shaped fruits are yellow when ripe, then turn brown. In the wild, this species was in an exposed location where it was frequently battered by winds. Cultivated trees can look very different in protected, non-windy, locations.^[11]

From cool, damp ridge tops and limestone cliffs between 5600 and 7000 feet, it grows in full sun exposure, but is frequently shrouded in clouds and mist (Figs. 52 & 53). Therefore, it may not be as adaptable to full sun in hot, dry inland areas. It is doing fine in full sun near our southern California coast and in northern California. Surprisingly, it is quite tolerant of long periods of drought; its habitat has little rain except during the monsoon season. Remember that monsoon season is its hot season; it will be happier with plenty of water except during winter. Its soil needs are not particular since its habitat, on very steep, rocky slopes or cliffs, provides little soil.

It has not been in cultivation long. The first seeds were collected in 1997, so we do not have many reports of growing experiences. So far, the only mature trees I have heard of are in Switzerland (of all places). The small trees are growing well, with several reports of them in California breezing through temperatures in the high teens (F) and one report with success down to 14°F. Even though its habitat never has any frost, it actually has been quite hardy in European cultivation and may even live through single digits. As a seedling, it is very slow and takes several years before it forms a divided leaf, but it speeds up with age. The leaves stay green on both sides for many years before showing glaucous on the leaf underside. It sends down a deep root structure, so transplant into a tall pot until it is planted in the ground. It is not as easy to transplant as most trachys, because of the longer roots. In areas with neutral or acidic soil, it grows faster and better with dolomite lime. This could be true of all the trachys from limestone areas. However, this would not apply to

Fig. 52



Fig. 53

Figs. 52 & 53: *T. oreophilus* growing on very steep limestone cliffs in habitat, Doi Chiang Dao, northern Thailand, at 6500' elevation. (M. Gibbons & T. W. Spanner)

most of us in southern California, since we have very alkaline soil and water. We need more reports of growing experiences.

Trachycarpus oreophilus 'Manipur', *T. oreophilus* 'Naga Hills' and even *T. oreophilus* 'Ukhrul' are some of the names used for *T. ukhrulensis*, a separate and valid species. However, some experts (at least Gibbons and Spanner) think it should be put in synonymy with *T. oreophilus*. For any of these names, see *T. ukhrulensis* below.

Trachycarpus sp. 'Wilailak' is another name used for *T. oreophilus*. They are both from the same area of northern Thailand and look alike, except *T.* 'Wilailak' is said to have more circular leaves (Fig. 57).



Fig. 55

Fig. 55: A juvenile *T. oreophilus* at Gary Wood's South Coast Palms (Chris Stevens)

Figs. 56, 58 & 54, leaf in background: *Trachycarpus oreophilus* in habitat, Doi Chiang Dao, northern Thailand, at 6500' elevation (Martin Gibbons & Tobias W. Spanner)

Fig. 57: A juvenile *T. oreophilus* probably 'Wilailak', taken in Thailand (Ruud Meeldijk)



Fig. 56



Fig. 57



Fig. 58

Trachycarpus *princeps*,^[9]

the Stone Gate palm, is one of the most sought after palms in Europe because of its thin trunk and very white petioles and leaf undersides. It is spectacular looking. Normally growing to only 24 feet tall on a 20-foot trunk, some are said to occasionally get up to 33 feet tall. The trunk can be naturally clean or may retain persistent leaf-bases. When clean, it is only six inches in diameter; otherwise, it is about eight inches in diameter with a loose-weave of fibers. It has about four-inch long, dark brown ligules. These are upright at the top and reflexed farther down the trunk. Compared with those of *T. fortunei*, they are darker in color, much shorter, stiffer and more finely divided.

The crown holds 18 to 26 leaves, which eventually fall off, but the dead ones remain for a while so they need to be manually trimmed if you do not like that look. The overall width of the rather open, spherical crown is 8 to 11 feet across, with stiff leaves 4 to 5.5 feet long (2 to 2.5 feet long from the hastula, plus 2 to 3 feet of petioles). The finely toothed petiole edges have fuzz around the teeth. The whole petiole and the emerging leaf spear are covered with a white wax (Fig. 106). The slightly cup-shaped (not flat) leaves are distinct, being smaller and more finely divided than most other *Trachycarpus* species,

with 45 to 48 narrow segments that are up to 1.3 inches wide. They form half to slightly more than three-fourths of a circle, are fairly regularly divided to about half their length, and have a touch of light bluish-green color on the topside with whitish to very white undersides. As a seedling, it has a slight serration near the hastula on the edge of the strap leaf.

Its habitat is on the very steep walls of Stone Gate Gorge (Fig. 60), in China near Tibet and the top of Burma (now called Myanmar). It is at 5000 to 6100 feet elevation, where it grows on vertical bare marble cliffs, in tiny niches of humus-rich, alkaline soil.^[9]

So far, it looks like *T. princeps* will grow well in full or part sun. It needs medium water, handles high rainfall, and loves humidity, but has a moderate to high ability to handle dry heat. From alkaline soil, it thrives in southern California, but has been successfully grown in slightly acidic soil also. Unlike other trachys, it has mature leaves at a very small size. Even though it produces these divided leaves early in life, it is not fast until it gets larger. My *T. princeps* have not been fast, but they are steady and give no problems even with neglect. The white underside can be very evident even on a small plant in a one-gallon container. Ours looks great even when it had overgrown its container and has very little soil (Fig. 64).

Trachycarpus princeps has a low temperature tolerance of 5 to 10°F. Many Europeans are reporting great success at such low temperatures. It could survive lower temperatures, even below 0°F when well established in the ground. Overall, most experiences have been positive, saying that they are easy. Jeff Marcus, in Hawaii, is in love with this species, but it was the most difficult trachy for him. The one he planted suddenly turned brown. It may not make it, even though he poured peroxide down the growing point and used fungicides (since fungus is usually the problem in humid Hawaii). They were very difficult to germinate in his warm climate. Ruud Meeldijk, in Thailand, told me he has better results when he keeps them in the refrigerator the whole time they are germinating. They can take years to sprout this way, but that is better than the results he had in the heat. Now that is a switch for a palm—you do that with tulips.

Trachycarpus princeps is fairly new to cultivation. Gibbons, Spanner and Yang first described it in 1995 in *Principes*.^[9] The trees



Fig. 59

Figs. 59, 60 & 61: *Trachycarpus princeps* in habitat, on the vertical marble sides of Stone Gate Gorge, Nu Jiang, Shi Men Guan, near the borders to Tibet and Burma, NE Yunnan, China, at 5000-6100 feet elevation. (Photos by M. Gibbons & T. W. Spanner)

Fig. 60



Fig. 61



Fig. 62

in habitat are endangered. Only two small populations are known to remain. The group they saw was supposed to be safe because the palms are all on vertical cliffs along the river (Fig. 61). Unfortunately, a dam is being planned which, if built, will likely destroy that habitat.^[21] Seeds are naturally scarce and expensive. Getting more is difficult because of the steep terrain. To complicate matters, there are *T. fortunei* in the nearby villages and another trachy growing in the same area (*T. sp.* 'Nova', see below). I hope that those who are growing *T. princeps* can make a concerted effort to propagate the pure species. It could save the species if enthusiasts plant several together, make sure they do not cross-pollinate, and make an effort to distribute the seed, but only when sure that they are not hybrids.

Trachycarpus princeps "Golden Lotus" is the name of *T. princeps* from one particular source (supposedly given to distinguish it from the sources with seeds of mixed species). It is said to have a very bluish-green color on the leaf top and white on the bottom.

Figs. 62, 65 & 66: *Trachycarpus princeps* in Stone Gate Gorge, China. Note the very white petioles and leaf undersides. (M. Gibbons & T. W. Spanner)

Fig. 63: *T. princeps* growing well in cultivation (John Prescott)

Fig. 64: *T. princeps* purchased from South Coast Palms, now in Valley Center at the Steven's house. Shown here removed from its half full, one gallon pot (C. Stevens)

Fig. 65: *T. princeps* in habitat. Photo supplied by James Verhaegen.

Fig. 67, next page: '*T. princeps*-cultivated variation' (Garry Tsen from coldplant.com)

Fig. 68: *T. sp.* 'Nova' incorrectly labeled *T. princeps* (C. Stevens)

Fig. 69: *T. sp.* 'Nova' being called princeps-green, being cultivated, in China (Garry Tsen from coldplant.com)

Fig. 70: *T. sp.* 'Nova' or some call it 'green-form'. Photo supplied by Meeldijk, who said that it is not special or *T. princeps*. (Stephane Ringot)



Fig. 64



Fig. 63



Fig. 65



Fig. 66

Trachycarpus sp. 'Nova' is sometimes called *T. sp. 'Jiang Nu'* or just *T. sp. 'Nu'* and already has at least one common name: Salween windmill palm. It was called the "all green princeps", *T. princeps* "green form" or *T. princeps* "green", but these are not *T. princeps* at all. It is either another ecotype of *T. fortunei*, a new, yet unnamed, species, or it could be a spontaneous cross between the *T. fortunei* cultivated in the nearby villages and the *T. princeps* in the wild. Hired to collect *T. princeps* seeds from Stone Gate Gorge, the locals apparently did not know there were different species of *Trachycarpus* growing in their area. Some *T. fortunei* seeds from the villages got mixed in with the real *T. princeps*, as did the *T. sp. 'Nova'* growing in a different neighboring habitat. So, seeds bought as *T. princeps* ended up being the real thing, *T. fortunei* and *T. sp. 'Nova'*, all mixed together in the same seed batch. I hope this problem has been rectified, but about half the plants from old seed batches, being sold as *T. princeps*, are misidentified.

To confuse matters more, there is one more trachy now being sold as "*T. princeps*—cultivated variation" (Fig. 67). It is the seeds from some trachys being cultivated by a farmer in the Stone Gate Gorge area. The parent trees were grown from seeds taken from true *T. princeps*, but seedlings from the cultivated palms appear to be different from *T. princeps*. The leaves are larger and have broader segments, but it is said to still has white on the bottom of the leaves. We do not know if this is a different strain, a new cultivar, or if the seeds are hybrids.

The following is not about this "*T. princeps*—cultivated variation" or the *T. fortunei* growing in the villages, but about the other trachy (*T. sp. 'Nova'*) incorrectly sold as *T. princeps*. Many trachy growers have ended up having these, mostly from seed batches that were mislabeled as *T. princeps*, but some might have been mislabeled as *T. nanus* also. At first, it was said to be *T. fortunei*, and those who mistakenly bought it were very disappointed. Spanner said, "DNA evidence^[49] seems to indicate that it is close to but definitely distinct from *T. fortunei*."^[47] It has proved itself different enough to be worth growing and some people actually consider it quite special.

Trachycarpus sp. 'Nova' quickly gets a skinny trunk, four to six inches in diameter when clean or six to eight inches including the leafbases and shaggy fibers. The fibers and ligules are much like *T. fortunei* only smaller (Fig. 69). So far, the wild trees grow to only 16 feet tall. The large leaves are thin, more erect than on *T. fortunei* and they have much narrower segments. They become stiffer in more light or with age. It has very deeply (80 to 95%) and evenly (regularly) split segments, which is unusual for a trachy: *T. fortunei* is very irregularly split 65 to 85% or rarely deeper; *T. princeps* is regularly split but only about half way up. *T. geminisetus* has leaves as deeply split and regular, but the leaves are thick and leathery, and it is very different in most other characteristics. From viewing the young *T. sp. 'Nova'* in cultivation (Fig. 68), it is said to have longer petioles compared with *T. fortunei* or compared with the squat looking *T. princeps*. The petioles are known to shorten when planted in sun;

however, in habitat, the petioles are still very long (three to four feet) even in full sun (Fig. 70). Considering its small, narrow trunk, the leaf-blades are quite broad (three feet across) and long. They form about a half circle, and have 45 to 50 segments, just like *T. princeps* and *T. fortunei*.^[52] The segments on *T. sp. 'Nova'* are soft and flexible, not stiff like *T. princeps*.

The clear difference between *T. sp. 'Nova'* and *T. princeps* is that all *T. princeps* have white on the petioles and a very white leaf underside, even on the first adult leaves. If the leaf undersides are green or even moderately glaucous and the petioles are not glaucous then it is not *T. princeps*.^[47] *T. sp. 'Nova'* is more like *T. fortunei* regarding the various leaf color possibilities. It does not have the bluish-green color on the top of its leaves, like *T. princeps*.

Trachycarpus sp. 'Nova' has been very easy to grow. It is faster than all other *Trachycarpus* species, "unbelievably fast" or even twice as fast as other trachys.^[27] A number of people are buying them primarily for their speed. Being generally tough, it tolerates cold extremely well, down to 5°F, with summers over 100°F. It survived below 0°F in Germany and France. They are germinating easily and most are quick. The seedlings usually develop adult leaves within one and a half years, and they show a few feet of shaggy trunk in record time for a trachy.

We need more growing experiences and to know what it really is, for someone to go to the habitat and study it.



Fig. 67



Fig. 68



Fig. 69



Fig. 70

Trachycarpus *takil*,^{[17][18]}

Kumaon palm, Kumaon mountain palm, or takil palm, has been the most controversial and mysterious species in the genus. In June 2009, Gibbons and Spanner's article in *Palms*^[18] finally shed light on the situation. After 15 years of searching for the real *T. takil*, just as a number of experts were regarding it as a variant of *T. fortunei*,^[6] they found it. The mix-up started with a cultivar of *T. fortunei* being called "*T. takil*", and this, apparently, began as far back as the description of *T. takil*.

T. takil was discovered in 1847 by Major Madden, who thought it was *T. martianus*. In 1887 seed was collected and sent to Beccari, who planted some of those seeds at Villa Beccari, his home in Italy. He waited for the resulting palms to mature, and after one flowered, he described it in 1905 (Fig. 76). Beccari did all this from Italy; he never went to India. The palm was male, so the female flowers were illustrated and described from samples that were sent to Beccari from a tree in Chaubattia's botanical garden, near Ranikhet. After finally seeing the real takil and careful observation of these trees, Spanner and Gibbons, and Lorek (independently) came to the same conclusion: the *Trachycarpus* growing in Chaubattia and the ones in Nainital town are all *T. fortunei*. There is, therefore, a strong possibility that the female flowers used in the description of *T. takil*, came from *T. fortunei* 'Naini Tal' after being mistakenly identified as *T. takil*.

In India, the British escaped the heat by living in the hill stations during the summer. They were known for planting their favorite plants wherever they lived. *T. fortunei* was brought to northern India in the 1800s, probably by Fortune himself.^[47] The habitat of *T. takil* was nearby, so the *Trachycarpus* in and around Nainital (in the Kumaon section of the Himalayas) were assumed to be *T. takil*. This assumption was practically universal and continued for over a hundred years, but they were actually *T. fortunei* 'Naini Tal' (Fig. 74). They were not recognized then as a *T. fortunei* because that cultivar was a variant and, therefore, looked different; actually, it had many similar characteristics to the *T. takil* that Beccari described. Its seeds were distributed all over India and the world as "*T. takil*". The great forest, where the real *T. takil* was first discovered, was cut for local rope making^[18], firewood^[38], etc., until none remained. Seedlings of the "false-takil", as I tend to call *T. fortunei* 'Naini Tal', were planted back into the area to reforest with what was mistakenly thought to be the indigenous species. Several scientists have mistakenly cited the *T. fortunei* 'Naini Tal' in Chaubattia as *T. takil*,^{[30][31]} including in a statistical study on the endangered status of "*T. takil*". This contributed to some erroneously claiming that *T. takil* is not threatened.^[25] Even Gibbons had it as probably only another form of *T. fortunei* in his 1993 edition of *Identifying Palms*.^[5]

T. takil seemed to be lost to the rest of the world until our trachy gurus, Gibbons and Spanner, took another journey into the hills of India. Before that significant search, they, and almost everyone else, thought that *T. fortunei* 'Naini Tal' was *T. takil*. Spanner wrote to me, "It was our blunder that we originally did not realize

that the cultivated trachys in the area were all *T. fortunei*." Gibbons acknowledged their partial contribution to the misinformation, and said that some of it was generated by him and Spanner, in their ignorance, though in good faith.^[40] Believing their seeds and plants to be "*T. takil*", they sold many *T. fortunei* 'Naini Tal' as "*T. takil*" to customers around the world. They cannot be blamed for doing this, since they were deceived by what had been the general belief for over 100 years. Even Lorek stated that the *Trachycarpus* around Nainital "has been [mistakenly] generally regarded as *T. takil* in all available literature."^[36]

In 2005, Spanner and Gibbons finally saw adult *Trachycarpus takil* growing in habitat on a limestone ridge at Kalamuni, near Munsyari, Uttarakhand.^[18] They found only five adult trees of *T. takil* left in the wild, and stated that the species is critically endangered.^[17] Later, Lorek found many more but gave that same critically endangered assessment.^[28] There are a few in cultivation around India and some very old ones in Italy. The one at the Botanic Garden in Rome was planted in 1897. These cultivated palms all have the originally described *T. takil* characteristic. The "*T. takil*" at Villa Beccari are currently being investigated. Otherwise nearly all in cultivation are *not* the real takil. With such a large number of *T. takil* ending up being something else, locating them in the wild was apparently necessary to verify the existence of a valid separate species.

Regarding the *Trachycarpus* at Villa Beccari, there are divergent



Fig. 71
T. takil
or a
hybrid



Fig. 72
'Naini
Tal'



Fig. 73
probably
T. takil

The figures on these two pages show the different trunks and ligules on *T. takil* and *T. fortunei* 'Naini Tal'. The ligules are the easiest way to identify *T. takil*.

Fig. 74
'Naini
Tal'

opinions whether any *T. takil* are alive there today. Carlo Morici states clearly that “none of them are left.”^[39] Spanner said, “There are plenty of very old trachys remaining at Villa Beccari, but it is unclear if one or more of these are *T. takil*.”^[47] Lorek gave a very interesting view of this subject. In his article on Villa Beccari, he states that Beccari “probably” planted five trees of *T. takil*, four of which are still alive today.^[36] He goes into detail how all of these trees fit Beccari’s description very well. It is confirmed that they are the same trees planted around the end of the 1800s by a series of pictures that show the same specimens growing taller over the century. Beccari’s great-granddaughter confirmed these facts and which particular tree was used for the description (Fig. 76).^[33]

Lorek goes on to say that the seeds Beccari planted were sent from two or three Kumaon Hills locations (Mt. Thakil and another location near Nainital and possibly from Chaubattia botanical garden); some of these could have been misidentified *T. fortunei* or hybrids.^[36] This possibility is likely since there are only *T. fortunei* ‘Naini Tal’ growing in Nainital and Chaubattia, and the palms at Villa Beccari do not look quite like the *T. takil* in habitat. The logical conclusion is that, what Beccari described might not be the same as the native trees in habitat.

At the same time Lorek emphatically insists that the trees in Villa Beccari are by definition *T. takil*, because the scientific description (protologue) gives the species and the type material to be from there.^[38] He asserts that it is a matter of taxonomic rules: the description was based on those plants, therefore that name only applies to the Villa Beccari trees and to those with the same basic characteristics as Beccari put in his description. If the ones in India’s Kumaon Hills are only a little different, a valid review could change the description of *T. takil*, since natural variation is normal. However, if the ones that were used for the description were mutants or hybrids, and if all the others from the habitat were different enough, then only those in Villa Beccari would be considered as *T. takil*. In that case, the palms in habitat would be considered an unnamed *Trachycarpus* species, and to have a name it would have to be described anew and be given a new name, which is the strict protocol of botanical nomenclature. There are many more botanical rules, which is why old accepted names sometimes suddenly change on us.

Beccari wrote the following about the *T. takil* at Villa Beccari: It grows to 49 feet tall. The petiole is about the same length as the blade, which is 24 to 33 inches long and 39 to 47 inches in diameter. It is irregularly divided down to about the middle into 45 to 50 segments which are stiff and erect, not with drooping tips.^[2] Compared with *T. fortunei*, the inflores-

cence is generally larger and *T. takil* has a taller, wider trunk, and a brighter, more graceful crown.^[38]

Gibbons and Spanner have made it very clear how to distinguish the “*T. takil*” as seen in habitat.^{[17][18]} The leaf sheath fibers are tightly clasping (Fig. 75) and form a weave, with short (about one to two inches long) shallowly triangular ligules. The small ligules fall off with age; hence the lack of a shaggy trunk. Looking at the ligules is the best way to immediately identify *T. takil*. The ligules are very distinctive (Fig. 73 & 107). Also, the leaves are more evenly split into segments, and are stiffer. The hastula has a small triangular ligule. On the plants they viewed in habitat, the crown of leaves was very open because they held only 20 or fewer green leaves at a time. They could see through it, to what is behind the crown.^[18]

Studying the palms in habitat, they noticed that

Fig. 71: A descendant of the Rome *T. takil*, which could have self pollinated, or this could be a hybrid. Shows the typical hairless trunk (Massimo Cola, a.k.a. M@x)

Fig. 72: *T. f. ‘Naini tal’* (C. Stevens)

Fig. 73: *T. takil* in the Bergstrom garden, Palo Alto (E. Bergstrom)

Fig. 74: *T. fortunei* ‘Naini Tal’ in Nainital (M. Gibbons & T. W. Spanner)

Fig. 75: In Villa Beccari, a descendant of one of the original *T. takils*. This one shows the typical trunk on a juvenile tree (M. Lorek)

Fig. 76: Villa Beccari holotype, the tree used for the description (M. Lorek)



Fig. 75
Probably
T. takil



Fig. 76
T. takil, the
holotype,
in Villa
Beccari

those *T. takil* can have more than 50 segments, split more regularly than *T. fortunei* to one-half to three-quarters, with leaves up to 50 inches wide. The ones they saw occasionally, but not necessarily, keep their old leaves, forming a long massive skirt (Fig 76), but this is not a distinguishing characteristic. It has long been said that you know it is *T. takil* when it has the curve in the lower trunk of juvenile palms, from leaning or “walking sideways” when young. Gibbons and Spanner say this is not accurate; the *T. takil* they found did not necessarily do that. Many other species have that curve as well.^[18] Another standard way to identify *T. takil* used to be that it has a twisted hastula^[16] (asymmetrical base of the leaf-blade). But this is false, because many species can have a twisted hastula, and hastulas vary too much within each species to make it a guiding factor.

Stührk's DNA work indicates that *T. takil* is most closely related to *T. ukhrulensis* and *T. oreophilus*.^[49] It is distinct from the latter because *T. oreophilus* has a smaller, especially narrower, more clean trunk, no ligules, and some differences in the seeds and flowers. The embryo on *T. fortunei* and *T. oreophilus* is at the back of the seed, whereas on *T. takil* it is on the side of the seed. It differs even more from *T. fortunei* since its first baby leaf (eophyll) is 2-plicate (has two ridges) opposed to *T. fortunei*'s 4-plicate baby leaf.^[18] According to Tomlinson the shape and size of the first eophyll is constant in palms and thus can be used to identify species.^[51]

In the 1800s, *Trachycarpus takil* was found south of Pithoragarh at altitudes over 8000 feet, where it grew mostly in damp shady glens and oak forests, although it was also seen in full sun. Snow was erroneously said to cover the ground there from November to March, which was then repeated in many articles and books.^[16] Spanner and Lorek agree on this point and say respectively: this was an exaggeration,^[47] and it was a mistake by Beccari.^[38] Apparently it does snow there, but it is rarely cold enough for it to stay on the ground. From Beccari's report, it is often touted to be more cold-hardy than *T. fortunei*; however, that may not be the case. We need experiences to know to what extent it is true or false. Rome gets into the low teens and it has lived over 100 years there.

Cultivated plants in India grow slowly at first, but then speed up, to about 10 inches a year, and then slower again when very large. The crown of leaves will be much larger, along with the individual leaves, on much older plants than on younger, yet mature, *T. takil*.

Seed did not come out of India since the 1800s, so there should be no real takils in cultivation, especially outside India and Italy. However, about



Fig. 77
T. takil



Fig. 78
T. takil in cultivation

Figs. 77: This is the real *T. takil* being cultivated in Barape, Mt. Thalkhedar, Uttaranchal, India. This is the hill where they were first discovered, once a forest of these palms. Now, this is the last adult left. It is also one of the trees found to be self-pollinating. (Tobias W. Spanner)

Fig. 78: In Palo Alto, this is Edith Bergstrom's female that gave many seeds. Spanner identified it as a *T. takil*. (C. Stevens)

Fig. 79: These two *T. takil*, in Gary Gragg's garden, Lafayette, CA, are from the same seed batch as the Bergstrom trees, all show only *T. takil* characteristics. (C. Stevens)



Fig. 79
T. takil in cultivation

the time Madden gave seed to Beccari, it was also given to some nurseries, so there is a possibility that more do exist.^[17] My friend Edith Bergstrom, in Palo Alto, CA emailed me about her three trees that look like real *T. takil*. She sent specifications and photos to Spanner. He replied by email, "I feel relatively confident that your *T. takil* are correctly identified. Your plants do indeed match the plants I observed in India down to the last detail." Since then she also had the seed verified as *T. takil*.

Hers are growing in partial shade at a rate of about seven inches of trunk per year, but were probably slower when seedlings. For some reason the female (Fig. 78), which is on a little mound, is faster than the males. She gives them plenty of water, and regular applications of compost and manure. During the winter of 2007, they breezed through a low of 17°F with no damage. She bought them from nurseryman Gary Gragg, who has three from the same batch planted in his yard. Those palms also have only *T. takil* characteristics (Fig. 79). That makes the case even stronger for them all being the real takil. Six out of six look identical to *T. takil*, which would be very improbable if they were hybrids. Hybrid seedling usually all end up with different features.

There is one more interesting fact about *T. takil*, which could also answer the question of where Edith's palms came from, since the trees grown from seeds gathered in the 1800s were probably dispersed far and wide. According to B.S. Kholia, "Gender expression in this species is not stable".^[28] Of the seven reproductive trees he found in Kumaon, five were discovered to become hermaphrodite (they change gender). In palms, females are known occasionally to make male flowers, but these Kumaon palms have gone from female to bisexual, and some started as males and produced female flowers, or even changed to all female. The type of flower on *T. takil* lends itself to do this relatively easily; all female flowers have latent male parts, and all male flowers have latent female parts. Both are rather similar. Spontaneous gender changes appear to happen mostly where trees are too far apart to pollinate each other, presumably instinctually to help preserve the species. These lone palms are not producing as much seed as other trachys normally make, but they are viable. This explains the production of fertile seed on the one adult *T. takil* still alive (probably because it is cultivated) on Mt. Thakil, the original area where this species was found^[17] (Fig. 77).

Trachycarpus sp. 'Naini Tal'^{[18][47]}

or more properly called *T. fortunei* 'Naini Tal', is the false takil. It is now confirmed that almost all "*T. takil*" in cultivation are really *T. wagnerianus* or *T. fortunei* 'Naini Tal'. Identifying what you have is simple. If your plant labeled "*T. takil*" has long ribbon- or strap-like ligules clustered at the top of the stem, then it is without a doubt *T. fortunei* or *T. wagnerianus*.^[18] (Compare Figs. 72 & 73, or 101 & 107). That is the easiest way to tell that your "*T. takil*" is not the real takil. Next, if it has small, stiff leaves that do not bend as you push down on the tip, and possibly has fuzzy edges on new growth, it is *T. wagnerianus*. If it looks like *T. fortunei*, other than being taller and more vigorous, and has larger leaves, it is *T. fortunei* 'Naini Tal'. If you are still not sure what you have, see the table on page 34 for more distinctions and leaf measurements.

In 2006, Stührk made it clear that *Trachycarpus fortunei* 'Naini Tal' was really a cultivar of *T. fortunei*.^[49] It is robust and cold-hardy. The trunk and ligules are like *T. fortunei*. The hairs of *T. fortunei* 'Naini Tal' are generally weaker than those on *T. fortunei* and break down quickly, leaving a fairly hairless trunk, but the leaf-bases are still retained. The leaves are stiffer than the most common *T. fortunei* and do not droop at the tips (Figs. 81 & 82); they are divided to about half their length. Cultivated plants in Europe, grown under the same conditions as "regular" *T. fortunei*, are distinctly larger and more robust in appearance. Also, young plants are more vigorous, fast and reliable, plus they have wider, stiffer segments.^[47] It can definitely handle down to at least 5°F, possibly below 0°F. It has proved itself more cold-hardy than most *T. fortunei*.

If you are reading this and feel disappointed learning that your "*T. takil*" is really "just a *T. fortunei*", don't dismay: The plant has a bolder, more distinguished look than most *T. fortunei*. You normally have to pay a premium to get special cultivars of any species, and this is an exceptional cultivar — faster, larger, nicer and more cold-hardy than the average *T. fortunei*.



Fig. 81
T. fortunei
'Naini Tal'



Fig. 82
T. fortunei
'Naini Tal'

Fig. 80: Background silhouette of a *T. takil* leaf, taken in Kausani, Uttarakhand, India, at about 5000'. (M. Gibbons & T. W. Spanner)

Fig. 81: *T. fortunei* 'Naini Tal' growing in the town of Nainital. It shows the hairy trunk characteristic of *T. fortunei*. (M. Lorek)

Fig. 82: *T. fortunei* 'Naini Tal', purchased as *T. takil*, in the Bergstrom's garden, Palo Alto, CA. (C. Stevens)

Trachycarpus *ukhrulensis*^[34]

had the interim names *T. sp. 'Manipur'* and *T. sp. 'Naga Hills'* before it was officially described. Its common name is Saramati palm. It is from the extreme eastern part of northern India, in Ukhrul District (hence the botanical name), in the Naga Hills area of Manipur State (hence the two interim names). This is right next to the border of Burma (Myanmar).

Growing straight, 30 to 50 feet tall, it is topped with an eight-foot wide crown. Its 12-inch diameter trunk can be clean and bare on the older parts, or it can have a turtle-back pattern. This interesting pattern is made from extremely dense persistent leaf bases that are mostly clear of fibers (Fig. 87). They are very broad, short and asymmetrically triangular. Further up the trunk

they are covered with coarse fibers that are much like those of *T. martianus*; the fibers form a weave, not a shaggy look (Fig. 89). In cultivation, it can lean as a young plant creating a curve at the base of the trunk when it gets older.^[27]

The 4-foot leaves have a thick



Fig. 83

Fig. 84

Fig. 85

Fig. 87

Fig. 86

Fig. 88

Figs. 83-91: All pictures on this and the next page are of *T. ukhrulensis* in habitat, in the Naga Hills area of Manipur State, the most remote northeastern corner of India.

Fig 83: (Photo by James Verhaegen)

Figs. 84, 85 & 90: (Keshow Chandra Pradhan, from Kenibreedplants.com, who found, described and named this species with M. Lorek)

Figs. 86: (M. Lorek)

Figs. 87: A large number of the trees in habitat have this turtle-back pattern (M. Lorek)

Figs. 88: *T. ukhrulensis* is seen along the tree line in this shot of its steep habitat (M. Lorek)

Figs. 89 & 91 (next page): *T. ukhrulensis* as seen at the PACSOA website: pacsoa.org (Photo by Haripada Roy)

texture, and a darker green color on their top surface than any other trachy, with very white, powdery undersides. This has been especially noted with seedlings labeled *T. sp. 'Manipur'*, but all have varying amounts of glaucous. The species has 16-inch petioles in habitat, but in cultivation they have grown to 30 inches long. They have harmless spines, and are 0.6 to 1 inch wide in the middle and 2 to 2.5 inches wide by the trunk. It holds 6 to 12 leaves when in exposed windy locations in habitat, but up to 28 in protected areas, with 64 to 70 segments.^[34] It tends to start flowering after it is 10 feet tall.^[45] The ripe fruit is yellow, but then becomes blackish-brown when older, with a reniform (kidney-shaped) seed. The seedlings have two ridges on the first leaves.

Seed has been exported since 2004 (as "*Trachycarpus sp. Manipur*" or "*T. sp. Naga Hills*"). In 2006, Michael Lorek and K. C. Pradhan validly published it as a new species.^[34] Already there is dispute over whether it should be considered as an accepted species. Spanner thinks it should be considered synonymous with *T. oreophilus*.^[47] However, Kew has it listed as a valid and accepted species on its web-site. Kembrey thinks it should be accepted since he has field grown both species side by side and found them to look distinctly different.^[27] Stührk has it listing as a species in his DNA study, which showed that *T. ukhrulensis* is as closely related to *T. takil* as it is to *T. oreophilus*.

Lorek found *T. ukhrulensis* most closely related to *T. takil*, and listed the differences that make *T. ukhrulensis* distinguished as a separate species: the number of leaf segments, color of the fruit flesh (pulp color phases), and the longer ligules. These same distinctions differentiate it from *T. oreophilus*. Additionally, on a large number of trees *T. ukhrulensis* has the persistent leaf-bases with no fibers making that unusual "turtle-back pattern". Also, according to Mike Papay, the inflorescence hangs down more on *T. ukhrulensis*, than on *T. oreophilus*.^[42] *T. ukhrulensis* has whiter undersides than any other trachy besides *T. princeps*, but Lorek does not consider it a determining factor. The whitish underside is a variable trait and can be found, more or less, in all species of the genus.

Trachycarpus takil, also in India, is the next reniform-seed trachy to the west of *T. ukhrulensis*, and to its east is *T. oreophilus* in Thailand, with Myanmar in between. Because Myanmar's borders are virtually inaccessible it is unconfirmed, but Spanner suspects that *T. oreophilus* may grow across that country reaching over

to *T. ukhrulensis* on the Indian side, making it more likely to be two climatic variations of one species.^[47] Lorek explained that between Thailand and the area of Myanmar near Manipur, there is a great plain — a huge, hot tropical barrier where trachys would not grow.^[38] He has given plenty of distinctions to qualify *T. ukhrulensis* as an accepted species. However, in a future date, if stands of the missing link between *T. ukhrulensis* and *T. oreophilus* are found, and if they show transitional characteristics, then lumping could be justified. It would be unfortunate since Lorek has expressed that if that happens then the same logic could lump both into *T. takil*,^[38] and that would prove disastrous for the conservation of endangered *T. takil*.

Trachycarpus ukhrulensis occurs at 4000 to 6000 feet elevation. Growing on limestone or sand-stone steep rocky hills, it has very poor soil quality with low levels of nitrogen, phosphorus, potassium and magnesium. The soil layer is thin, slightly acidic (6 to 6.5 pH) sandy clay with many small hard rocks. Being in open grassland areas of temperate evergreen forests (Fig. 88), the plants are in full sun with temperatures up to 100°F.^[32] They receive rain during their six to eight warm, or hot, months of the year. The remaining cool, to cold, months are rather dry, with a few occasional cold rains passing through. Their habitat normally goes down to 30°F, sometimes less.

Trachycarpus ukhrulensis grows well in coastal full sun, or in part shade. It needs medium water and well drained soil, preferring more water with heat, and less in cool weather. It likes neutral to slightly acid loamy soil, does not need fertilizer, but it is faster with it. It is slow growing, and will probably have a good ability to handle dry heat. Being more finicky than most other trachys, they have had bud rot in some cool wet conditions when small. They send down a deep root structure, so transplant into a tall pot until they are planted in the ground. The longer roots make it not as easy to transplant as most trachys. They appear to be quite cold-hardy; it withstood down to 5°F in Holland. We need more information from experiences of many growers before we can come to a firm conclusion about low tolerance or any of the growing conditions.



Fig. 89



Fig. 90

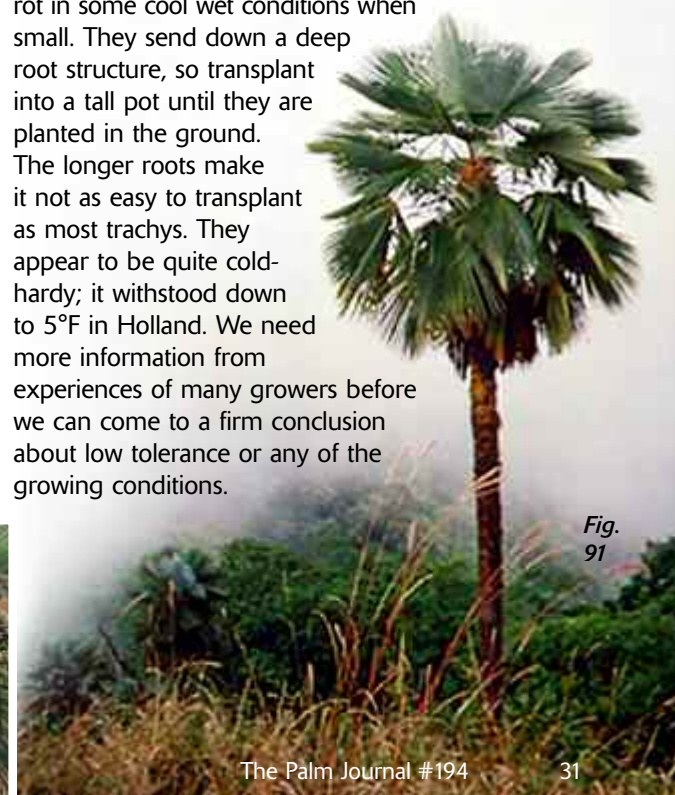


Fig. 91

Trachycarpus *wagnerianus*^[43]

may be called *T. fortunei* 'Wagnerianus' by those who no longer accept it as a species. It has probably over a dozen common names, including miniature Chusan palm, Waggie, and Wagner's windmill palm. It was named after Albert Wagner, the horticulturalist who discovered it.

T. wagnerianus is extremely variable. Its maximum height can be as little as 10 feet for the very small leafed strains, or up to 30 feet for the normal kind, or anything in between. The width can range from three to four feet. Its trunk can be less than six inches in diameter, or up to 10 inches, but looks larger with all its retained leaf-bases and coarse hairy fibers that look just like *T. fortunei*, including the ribbon-like ligules at the top (Fig. 96). Both species are equally variable; most have a thick wooly trunk like sheep fleece (Fig. 95) or even like a long hair goat; on others the hairy shag is thin or falls off (Fig. 96).

T. wagnerianus is a compact, stiff-leaved palm with small leaves 18 to 30 inches wide on 12 to 24-inch petioles. The glossy deep green leaves, with paler slightly glaucous undersides, can be flat or cup upwards. The leaves can be anything from a full circle to half or fan shaped (Figs. in background); these are more common on the larger strains. Thick tomentum, a pale wooly fuzz, often rims the new leaves and petioles. This gives a very distinctive and pretty look. The segment divisions are very irregular from half to more than three-quarters deep.

Many *T. wagnerianus*, probably half of the ones in southern California, are mislabeled *T. takil* (Fig. 95). This mix-up seems to have started in 1960 from a typo in James McCurrach's *Palms of the World*, which had a lovely dwarf *T. wagnerianus* captioned as a *T. takil*.^[10]

Never found in the wild, it is only known from cultivation, which started in Japan. It is generally thought of as a valid species; many botanists still accept it as such, including Lorek and Hodel, who told me that he accepts it even though he knows the Kew Checklist does not. He said that besides the different leaves, the flowers also make it distinct. The inflorescences on his *T. wagnerianus* are greenish, never turning the bright yellow like those on *T. fortunei*.^[24] Gibbons also mentioned that there are subtle floral differences.^[16] Otherwise, it is similar to *T. fortunei*, the same trunk and ribbon-like ligules, but the leaves are quite distinct because of their size, texture, tomentum and divisions. All books and websites that I found still have it as *T. wagnerianus* except Henderson's^[21] and the Kew Checklist^[20]; both regarded it as a synonym of *T. fortunei*. I wondered if that is only

because it was never found in habitat. Lorek agreed with me, but Spanner said, "No, it is because apart from the stout leaf it does not have anything to really set it apart from *T. fortunei*. DNA results are inconclusive, so the jury is still out on *wagnerianus*, however."

One of the ways to easily identify *Trachycarpus wagnerianus* is to push down on the tips of a leaf. It is so stiff that the whole leaf will push down. Other species' leaves will bend when you do that. Once you have felt a few, you can also tell by the feel of the leaves; they are thicker and more leathery. It often has a sharply pointed appendage (another ligule) on the hastula of young leaves. *T. fortunei* does not have this same growth.

Unlike *Trachycarpus fortunei*, which really suffers with wind, *T. wagnerianus*' tough leaves tolerate wind very well. *T. wagnerianus* prefers full sun or part shade, tolerates hot, dry conditions and can handle occasional drought or low water situations, but does better with regular watering. This species does not like too much shade and can even die from it. Often believed to be very slow, when bigger, it can produce one foot of trunk per year; then it slows down as it gets larger yet. The speed depends on the variety; the ones that stay small grow very slowly and the larger forms grow faster.

While it is known to be very cold-tolerant down to 20°F, it has lived through cold as low as 1°F. On the flip side, it does not prefer hot humid climates where the nights remain warm. But there is one doing fine in Costa Rica, as well as in southern Florida. Jeff Marcus said the ones he has in the ground are fabulous, even



Fig. 94



Fig. 95



Fig. 96

though his Hawaiian home is in an extremely rainy and humid area. It handles these conditions much better than *T. fortunei*.

Even though *T. wagnerianus* has been cultivated in the western world since the 1800s, pure seed is not as easy to get as one would think. The adult trees do not set seed reliably and are prone to hybridization with *T. fortunei*. But it is arguably the easiest trachy to germinate, with a 95% success rate when done at room temperature in temperate climates. Marcus has not had good success germinating these; 25% is considered a good batch in his hot climate. So, make sure to use no bottom heat when germinating. Transplanting usually gives no set-back or leaf loss, and it has excellent disease and pest resistance. What

more can I say; it is even more bullet proof than *T. fortunei*.

Trachycarpus 'takaghii' is the name given to two very different palms. One is a cross, female-*T. wagnerianus* x male-*T. fortunei*. Most of these look and grow pretty much just like *T. fortunei*. The one I got from Jungle Music seems to be in this category because it is already seven feet wide after being in the ground for five years. It looks like the *T. fortunei* next to it (Fig. 99). The other *T. 'takaghii'* is said to be a random mutation of *T. wagnerianus*, and is the one J.D. Andersen was selling. It is a very small dwarf palm, more like a tiny *T. wagnerianus*. As little as two feet tall and wide, it has the same growing requirements. Now that is a very cute palm.

Figs. 92, top left leaf in background: *Trachycarpus wagnerianus* growing in Oceanside at Victor Ehrlich's home. This and the next leaf show the great variation in shapes. (C. Stevens)

Fig 93, lower right leaf in background: From the tree in Fig. 96. (E. Bergstrom)

Figs. 94: *T. wagnerianus* growing in Vancouver, B.C., Canada. (Mike Davy)

Figs. 95: This lovely little *T. wagnerianus* is mislabeled *T. takil* at the Catamaran Hotel in San Diego. (C. Stevens)

Figs. 96: These three *T. wagnerianus* in the Huntington Library and Gardens shows how different the trunks can look. (C. Stevens)

Figs. 97: Two *T. wagnerianus* growing in the Bergstrom's garden in Palo Alto. This is one of many palm pictures on their website dedicated to facilitate palm identification: www.palmgardensbergstrom.com (E. Bergstrom)

Figs. 98: *T. wagnerianus* at the Westminster home of Ralph Velez. We assume it is multile seeds planted together. It is tiny like the small *T. 'takaghii'*. (C. Stevens)

Fig. 99: *T. 'takaghii'* at the Stevens home. It must be the one that is a hybrid because it looks just like a *T. fortunei*. (C. Stevens)

Fig. 100:
Typical ligules of *T. wagnerianus* (C. Stevens)

Fig. 98



Fig. 99



Fig. 100

About the Table:

This table includes the ten generally accepted species of *Trachycarpus*. Also included are two others, the valid subspecies *T. martianus* ssp. *khasyanus*, (originally described as a valid species *T. khasyanus*), and *T. fortunei* 'Naini Tal' (a cultivar of *T. fortunei*), included to help identify mislabeled "*T. takil*", and because many enthusiasts have or want it.

When people write books on palms, they tend to give facts as if they are absolute. Over the years, I have found that all palms are variable. Many of the "facts" found in publication are proven "wrong" (the "fact" was actually an unusual variable trait, a typo, etc.). In the mean time others quote them. Characteristics given in scientific descriptions are based on full grown, mature trees and are usually based on trees in one particular location, which can consist of a very limited number of adults. Leaf size and shape often change with age. The palmate leaves get more segments when older. Botanists describe the species according to what they happen to find in habitat. Other habitats can give different results, within limits, for the same species.

Most palms perform very differently in cultivation. Palms from the tropics or subtropics tend to grow much slower here, in California, and they end up considerably smaller before they die. *Trachycarpus* often do as well here as in habitat, or even better. Our weather is generally close enough and most get more regular water and fertilizer. They can end up taller with wider trunks, and more leaves that are larger. Many in habitat get buffeted by frequent high winds that leave them with leaflets split further than we get, and with cleaner trunks. Or it goes the other way when they get no wind and we do. Manually cutting off the leaves can prevent the leaf-bases from falling off as soon as they would when the dead leaves fall off on their own.

Many of the attributes that we think of as characteristic are actually variable. For example, glaucous undersides of the leaves is usually considered a distinguishing characteristic, but every *Trachycarpus* species can have some varying amounts of this white coating on the down-side of the leaves. Curves at the base of the trunk, leaf size and shape, yellowish lines on the petioles, how fuzzy they are, and the shape of

Genus & Species (other names)	Max Overall H x W	Clean Trunk HxDia	About Trunk (ligules refer to appendages on new leaf sheaths)	Leaf & Petiole Size	About Leaves
<i>Trachycarpus fortunei</i>	44 x 6-12'	25-39' x 4-10"	wide, tan ribbon-like ligules 10-15" long; shaggy, with long hairs & tight web around persistent leaf bases	4-6', quite variable; leaf with petiole 4-6' long by 36" wide	40-50 leaves (up to 100); variable shape and colors; droopy or stiff ; cross veinlets barely visible; short hastula; first baby leaf has 4 ridges
<i>Trachycarpus geminisectus</i>	11 x 10'	3-6' (9') x 10"	persistent, dark brown leaf sheaths with stiff, short & coarse threads forming ligules and then a densely furry trunk	4-5' long (33" petiole plus 33" leaf from hastula), 51" wide	10-12, nearly flat, thick, durable, leathery , glossy dark green leaves with whitish wax on bottom; leaflets very wide (1.6") , plus 2-3 stuck together
<i>Trachycarpus latisectus</i> (or <i>T. martianus</i> ssp. <i>latisectus</i> ; was <i>T. 'sikkimensis'</i>)	45 x 14'	26-39' x 6"	no real ligules; coarsely fibrous trunk with a weave & no shag for top 2-6', then clean, light gray; rings not prominent	4-7' long (up to 55" petiole plus 33" leaf from hastula), 53" wide	¾ to fully circular, corrugated, bright green with glaucous undersides; not all segments split ; sometimes undulating; small ½" hastula
<i>Trachycarpus martianus</i> 'Nepal form' (or <i>T. martianus</i> ssp. <i>martianus</i>)	55 x 14'	30-49' x 6"	no ligules; top 1-2' (or more) leaf sheath fibers tightly clasping in a weave, then clean , dark gray or brown with distinct rings	4-6' long including the 36-42" petiole, 24-42" wide	thin texture but stiffer than Khasia form , semi to nearly circular leaves with glaucous bottoms; cross veinlets clearly visible; hastula prominent
<i>Trachycarpus martianus</i> ssp. <i>khasyanus</i> ('Khasia form' or <i>T. khasyanus</i>)	55 x 14'	30-49' x 6"	top 1-2' (or more) leaf sheath fibers tightly clasping in a weave, then clean , dark gray or brown with distinct rings ; no ligules	4-7' long including the 4' petiole, 24-48" wide	fan, kidney-shaped or circular leaves , glaucous leaf undersides; segments less than 1½" wide; cross veinlets clearly visible; hastula prominent
<i>Trachycarpus nanus</i>	2-3 x 4'	0-2" (2') x 2"	small wiry, ligules that are usually too low to see; almost all trunkless , or with a small shag of fibers on persistent leaf sheaths	1½-2' long with petiole and up to 24" wide	6-20 stiff, bluish gray glaucous leaves with very thin, deeply folded segments. In another habitat: 1-3 soft, green leaves with flat segments
<i>Trachycarpus oreophilus</i>	30-39 x 8'	20-34' x 4-8"	short thin fibers but "not forming ligules" , top 1-2' below crown has soft, brown weave; then clean, brown trunk ; obscure close rings	4' long (19-30" petiole + 27" leaf from hastula), 39" wide	20-25 leathery, stiff, ridged, green on top, green-glaucous bottom; full to ¾ circle; cross veinlets barely visible; prominent hastula up to 1¼" long
<i>Trachycarpus princeps</i>	25 (-33) x 10'	20' (-28') x 6"	dark brown thin ligules, about 4" long , upright at top, reflexed further down; covered with shaggy fibers, or some have clean trunks	4-5' long (up to 31" petiole + 31" long leaf-blade) 45" wide	18-26, up-shaped (not flat), semi to ¾ circle, stiff leaves with a bluish-green cast on top & white-wax undersides
<i>Trachycarpus takil</i>	35-55 x 9-12'	33-40' (to 49') x 8-10"	leaf sheath fibers fine, tightly clasping and wrapping around the trunk with no shag; short (1-2") triangular ligules	4½-5½' long (16-36" petiole + 26-32" blade) by 39-47" wide	open crown, ~20 green leaves, pale bluish, waxy bottom side; heart shaped, not drooping; form ¾ circle; cross veinlets barely visible; .6-1" hastula
<i>Trachycarpus fortunei</i> 'Naini Tal' (a cultivar of <i>T. fortunei</i> , falsely called "takil")	44 x 12'	~40' x 8-11"	like <i>T. fortunei</i> : long shaggy hairs on trunk & long wide, tan ribbon-like ligules , except hairs may fall off more easily	about 4-6' long with petiole by about 36-42" wide	leaves like <i>T. fortunei</i> only larger and stiffer, not droopy, has a large crown even when young
<i>Trachycarpus ukhrulensis</i> (<i>T. sp. 'Manipur'</i> or <i>T. sp. 'Naga Hills'</i>)	32 (to 50) x 7'	26 (to 45') x 12"	fine deciduous ligules 4-7"; top trunk fibers in a weave, then clean, obscurely ringed or hairless turtle-back pattern of leaf sheaths	3½-4½' (39" wide x 24" long blades on 16-30" petioles)	6-28 thick, flat, stiff leaves with slight glaucous to bluish white powdery undersides; hastula slightly asymmetric, 1" wide by .84" long
<i>Trachycarpus wagnerianus</i> (some put with <i>T. fortunei</i>)	12-30 x 4-7'	10-28' x 4-7"	shaggy like <i>T. fortunei</i> , including the ribbon-like ligules but are proportionately smaller especially on the smaller trees	2-4' long (includes short petiole) by 19-30" wide	circular to half circle, cupped, all green, pale fuzz on new growth, thick & very stiff even when tip pushed down ; hastula sometimes has appendage

the hastula are all inconsistent features so cannot be used as main distinguishing characteristics.

Within a species some unnamed cultivars or ecotypes can handle more cold than others. Death or damage from cold can also depend on many other factors besides genes and the temperature (cold duration, watering, health, age, other weather conditions, even misidentifying the plants). If you look at the description of *T. fortunei*, it certainly does not look like it would include *T. wagnerianus*, but these are not enough differences for Govaerts and Dransfield to accept it a separate species.^[19]

With all these considerations, the botanists have relied heavily on the reproductive system to identify distinct species. It is more accurate. Enthusiasts usually buy plants too small to use this method and it is excessively complicated for most. Anyone can see if a seed looks more like a kidney bean or a coffee bean, so that is about as far as the following table goes. It was primarily made as a guide for the gardener or enthusiast.

Since the 1990s I have been collecting information about palms and putting it on my own list, which I print up and carry with me when I go to palm meetings, member's homes

or nurseries. I refer to this list when I plan our landscaping, decide which pots go in the greenhouse over winter, etc. It and the longer version of this article will be available on the web at: www.ATropicalLook.com. This table is taken primarily from the information on that list, except I have omitted most of the cultural information; it was too redundant.

Regarding the lows that each species can tolerate, it is a range. At the higher temperatures there could be damage to the palm, depending on the origins of that plant's lineage. Other contributing factors can make it worse or even die, but that is rare. At the lower numbers the palms are probably unsafe and can easily die. Large, healthy, well established plants are known to have lived through the lower temperatures but sometimes just barely, with total loss of leaves. Drought tolerant (dr. tol.) here means it can survive limited periods of drought or with less water than most other palms.

I have highlighted the parts that help make that species or cultivar unique: red for in general and different colors when comparing to other specific species in the same column. All characteristics are for mature, established plants.


Leaflets Divided	Segments on Mature Trees	About Petioles	Fruit Shape / Color	Habitat / Horticultural Considerations; When Cultivation Started Outside of Its Native Country	Conservation Status	Temps °F Tolerated	Species (closely related to)
irregular ½ to ¾ or more	45 to 50 (70), center 20-35" long	fine teeth (spines barely visible) on edges; some have yellow-green stripe on bottom of petiole near trunk	kidney / bluish black	from central and eastern China / a little dr. tol., but better with lots of water; sun or part shade, easy but damaged by wind; cultivated since mid-1800s	extinct in wild; but naturalized	5-10; some to -4F	<i>T. fortunei</i> (the type species)
regular & deep, ¾ or more	40 (looks like 20), 1.5" by 33", stiff	broad yellow stripe on bottom of ½" wide petioles; extend slightly forming weak costas; minute teeth on edges	kidney / black + whitish	from steep limestone slopes at 3300-4800' in North Vietnam, near China, in a wet cloud forest ; cultivation started in 2005	at risk: scattered & hybridizing	?12-20?; untried	<i>T. geminisetus</i> (related to nanus and fortunei)
regular ⅓ or less than ½	65-75; 1½-2" wide; bifid or notched tips	arching, no teeth, 1" or more wide petioles (1" at middle) with white fuzz on petiole & unopened leaf edge	coffee / yellow to blueblack	from India, steep rocky cleared rainforest to 8000' / cult. since 1990s; partshade best , esp. if young or inland; give plenty of water; best try for tropics	endangered immediate threat	15-20 or less	<i>T. latisetus</i> (closely related to martianus)
regular to nearly half	75-80; less than 1½" wide	petioles not arching; narrow, less than 1" wide; unarmed; tan fuzz on petiole & unopened leaf edge	coffee / greenyellow-brownblack	than Khasia form; both forms less robust than other trachys ; cult. since late 1800s (1960s in USA)	unknown, appears unthreatened	15-20	<i>T. martianus</i> ssp. <i>martianus</i>
regular to nearly half	65-70, tips shallowly bifid & acute	arching petioles less than 1" wide; irregular tiny teeth & lots of whitish fuzz on petiole & unopened leaf	coffee / yellow to blueblack	from India at lower elevations; some from rainy sheer cliffs with very acidic soil / heat tolerant, slow, needs regular water ; culti. since late 1800s	appears stable since inaccessible	19-25	<i>T. martianus</i> ssp. <i>khasyanus</i>
fairly even & deep ⅔ to ¾+	20-30, tips blunt	minutely armed, very short 4-8" long by ½" wide petioles	kidney / on erect clusters	from China, in acidic, heavy clay, to neutral sandy loam / does well in dry heat, drought, excellent drainage ; prefers sun; slow; cultivated since 1993	threatened, especially gray ones	5-10 or much less	<i>T. nanus</i> (related to <i>geminisetus</i>)
regular to ½ - ¾ or more	55-60; 1'-1½" wide; deep folds	robust, variable length 18-32" long & about ¾" wide; have minute teeth and thin tomentum on edges	kidney / yellow to brown	from Thailand in temperate mountains covered in mist; on limestone cliffs / doesn't like full sun in high heat; drought tolerant ; cultivated since 1997	rare: securely inaccessible	12-17	<i>T. oreophilus</i> (close to takil & ukhrulensis)
fairly regular to about half	45-48, 1¼" wide	narrow petioles, ½" wide; strongly glaucous ; very finely toothed	kidney / black with whitish	from China at 6100' on vertical, marble cliffs, or humus-rich, alkaline soil / ok in slightly acid soil; grows well in small pots ; culti. since mid-1990s	endangered critically if damn built	1-10	<i>T. princeps</i> (close to fortunei & nanus)
slightly irregular ½ to ¾+	45-50 (60); 1.2-2.2" w; tips blunt	same length or slightly longer than blade; about ¾-1" wide in center; small, sharp teeth on the edges	kidney / bluish black	from up to 8000' on steep limestone ridges in Indian Himalayas / as of '09 almost all named this in cultivation are misidentified	threatened / critically endangered	5-18 or less; untried	<i>T. takil</i> (close to oreophilus & ukhrulensis)
irregular, mostly ½ to ¾	~40-45	fine teeth (spines barely visible) on petiole edges; some have yellow-green stripe on back near stem	kidney / bluish black	seeds from Nainital, India at 6350' / faster than, but easy like <i>T. fortunei</i> since that is what it is; cultivated outside India since 1990s	cultivars are never from the wild	0-10	<i>T. f. 'Naini Tal'</i> (a cultivar of <i>T. fortunei</i>)
slightly irregular to ⅓ - ⅔	64-70; width irregular, .8-1.3" wide	narrow petioles, .6" wide by 16-30" long, margins rough with irregular harmless spines	kidney / yellow to dark brown	from eastern tip of India in clay or on steep limestone or sandstone with summer rain; 100-30°F / sun or shade; heat tolerant ; cultivated since 2004	unknown; statis ok if more hiding	15-20 likely, or less	<i>T. ukhrulensis</i> (close to takil & oreophilus)
irregular ½ to ¾ + a few deeper	40+, 12-18" long at center	very fine teeth on petiole edges, but more smooth than <i>T. fortunei</i> , fuzz on edges of new growth	kidney / bluish black	from Japanese cultivation only / in West in 1800s; easy like <i>T. fortunei</i> only more cold tolerant and does not get damaged by winds, even hot & dry	never found in habitat	1-15	<i>T. wagnerianus</i> (closely related to fortunei)

Acknowledgements

and Summary: I want to express my sincere appreciation for the corrections and additions to this article, made by Tobias W. Spanner and Dr. Michael Lorek. They were invaluable in making this article what it is. I also thank them for the many photos they each provided. Spanner sent the great shots by Martin Gibbons and himself, plus he gave far more information than I was able to credit him for. Lorek additionally sent many articles that would have been difficult or impossible for me to get otherwise, and he insisted on the proper use of botanical terms and nomenclature. Since both are great *Trachycarpus* authorities, they naturally did not always give the same opinions, or actually gave opposite comments. It has been very difficult, but I am trying my best to report both views equally. As Lorek said in one email to me, "Disputes are always the basics of development. And in botany you will not find one systematic topic without disputes."

Botanical names and their descriptions are established in publication according to set rules. If done properly it is a valid species name even if no one else accepts it. All names, both in bold and regular fonts, on the Kew Checklist are "valid" because they were validly published. That is why you never see names like *Trachycarpus* 'Naga Hills' or *T. sp.* 'Sikkimensis', on that list. Accepting each name is left to the individuals. Kew has the ones they accept in bold and they sometimes tell who else accepts it or not. The Kew Checklist is a great authority on the subject, but definitely not the last word. Other botanists often have legitimate different opinions. Also, it should be taken into consideration that Kew can run up to a year behind on updating their database.^[47] Even they may not agree with what their list currently says.

The lay gardener looks to the experts to say what is accepted. But, because it is very rare for all botanists to agree on new names or changes, we have to choose which authority to follow. Most gardeners simply wait to see what the labels or books say.

Although we can learn a great deal by trying, there are no definitive answers when it comes to sorting out the many names of *Trachycarpus*. 

Figs. 101-108: Comparing ligules on the different species of Trachycarpus. All taken in habitat except for T. fortunei. T. martianus (see Fig. 42) is like T. latisectus, and T. wagnerianus (see Fig. 100) is like T. fortunei. (Fig. 101 at the home of & by C. Stevens; Figs 102-107 by M. Gibbons & T. W. Spanner; Fig. 108 by M. Lorek)

Fig. 109, next page: T. martianus in habitat, Khasia Hills, near Cherrapunji (M. Gibbons & T. W. Spanner)



Fig. 101 *T. fortunei*



Fig. 102 *T. geminisectus*



Fig. 103 *T. latisectus*



Fig. 104 *T. nanus*



Fig. 105 *T. oreophilus*



Fig. 106 *T. princeps*



Fig. 107 *T. takil*



Fig. 108 *T. ukhrulensis*

Literature Cited:

(The footnotes placed after the title, in each individual species section, refer to the source(s) most used for that species.)

- [1] Aslan, Sam (2007). Helping People Help the Land: Increase Your Soil Health. *California Fresh Fruit and Raisin News* 23(10): 18.
- [2] Beccari, Odoardo (1931). Asiatic palms: Corypheae. Ann. Royal Bot. Gard., Calcutta. 13: 1-356. Quoted from Wikipedia's *Trachycarpus takil* page, retrieved July 2009.
- [3] Dhar, Sri (1994). Hunting Out the *Trachycarpus martianus*. *Palm Journal* 118: 26-30.
- [4] Dransfield, J. et al (2009). *Genera Palmarum II*. Kew Publishing, Kew, England. pp. 251-253.
- [5] Gibbons, Martin (1993). *Identifying Palms*. Chartwell Books, Inc., New Jersey. pp. 73.
- [6] Gibbons, M. & W. Karmelk (1993). Trekking on the *Trachycarpus* Trail. *Principes* 37(1): 19-25.
- [7] Gibbons, M. & T. Spanner (1993). In Search of *Trachycarpus nanus*. *Principes* 37(2): 64-72.
- [8] Gibbons, M. & T. Spanner (1994). *Trachycarpus martianus*. *Principes* 38(2): 89-94.
- [9] Gibbons, M., T. Spanner, & C. S. Yang (1995). *Trachycarpus princeps*, the Stone Gate Palm. *Principes* 39(2): 65-74.
- [10] Gibbons, M. (1996). A timely summary of this popular genus. . . *Chamaerops* 24.
- [11] Gibbons, M. & T. Spanner (1997). *Trachycarpus oreophilus*—The Thailand *Trachycarpus*. *Principes* 41(4): 201-207.
- [12] Gibbons, M. & T. Spanner (1998). Palms for Southern California, Part 30: *Trachycarpus*. *Palm Journal* 138: 9-17.
- [13] Gibbons, M. & T. Spanner (1998). *Trachycarpus latisectus*: The Windamere Palm. *Principes* 42(1): 24-29.
- [14] Gibbons, M. (2002). The Thailand *Trachycarpus*. *Chamaerops* No. 9. Published online 2002, retrieved July 2009.
- [15] Gibbons, M. & T. Spanner, N. V. Du, & P. Anh (2003). *Trachycarpus geminisectus*: the Eight Peaks Fan Palm, a New Species from Vietnam. *Palms* 47(3): 143-148.
- [16] Gibbons, M. (2003). *A Pocket Guide to Palms*. Chartwell Book Inc., New Jersey.
- [17] Gibbons, M., T. Spanner & B. S. Kholia (2008). *Trachycarpus takil* Becc. in Kumaon. *Current Science* 94 (4): 444-446.
- [18] Gibbons, M. & T. Spanner (2009). *Trachycarpus takil*—Lost and Found, for Now. *Palms* 53(2): 96-101.
- [19] Govaerts, R. & J. Dransfield (2005). *World Checklist of Palms*. Royal Botanic Gardens, Kew, UK. pp. 211-212.
- [20] Govaerts, R. et al (2009). World Checklist of Selected Plant Families. <http://apps.kew.org/wcps/monocots>, the web-site of the Royal Botanic Gardens, Kew, retrieved July 2009.
- [21] Henderson, Andrew (2009). *Palms of Southern Asia*. The New York Botanical Garden. Princeton University Press, Princeton. pp. 166-169.
- [22] Hodel, Donald, ed. (1998). *The Palms and Cycads of Thailand*. Kampon Tansacha, Thailand. pp. 164-166.
- [23] Hodel, Donald (2007). Recent Palm Horticultural Research at the University of California. *Palm Journal* 187: 39-44.
- [24] Hodel, Donald (2009). Personal communications via telephone.
- [25] Husain, T. & A. Garg (2004). *Trachycarpus takil* Becc. is not a 'rare' palm. *Current Science* 86 (5): 633-634.
- [26] Kembrey, Nigel (2004). Trachy Troubles. *Chamaerops* 48, published online 2004, retrieved July 2009.
- [27] Kembrey, Nigel (2009). Personal communications via email.
- [28] Kholia, B. S (2009). Gender variation in a threatened and endemic palm *Trachycarpus takil* Becc. *Current Science* 96 (1): 144-148.
- [29] Kimnach, Myron (1977). The species of *Trachycarpus*. *Principes* 21(4): 155-160.
- [30] Kulkarni, A. R. & B. S. Pawar (1996). *Current Science* 70: 19-20.
- [31] Kulkarni, A. R. & R. M. Mulani (2004). Indigenous Palms of India. *Current Science* 86 (12): 1598-1603.
- [32] Lorek, Michael (2004). *Trachycarpus ukhrulensis*, The Survivor Palm. *Palmateer* 24 (2): 13, 22-23.
- [33] Lorek, M (2006). Aktueller Bestand der Arecaceae im Garten der Villa Beccari. *Hortus Exoticus* 2: 10-22.
- [34] Lorek, M. & K. C. Pradhan (2006). A new species of *Trachycarpus* (Arecaceae), with remarks on its unusual habitat. *Botanische Jahrbücher für Systematik* 126(4): 419-426.
- [35] Lorek, M (2007). A taxonomic review of *Trachycarpus martianus* (Wall.) H. Wendl. *Current Science* 92(12): 1678-1679.
- [36] Lorek, M (2007). The Indian species *Trachycarpus takil* in the garden of Villa Beccari. Florence, Italy. *Current Science* 93(3): 295-297.
- [37] Lorek, M (2008). *Trachycarpus takil* in Uttarakhand. *Hortus Exoticus* 13-29 (German).
- [38] Lorek, M (2009). Personal communications via email.
- [39] Morici, Carlo (2008). Villa Beccari—One Century Later. *Palms* 52(4): 175-179.
- [40] Northwest Palms Discussion Board (May 23, 2006). <http://www.cloudforest.com/northwest/forum/24278.html>, retrieved 8/09.
- [41] Oakes, George (2005). My *Trachycarpus* Palms. *Chamaerops* 50: 13.
- [42] Papay Mike (2006). *Why Not Palms!* Published on-line at <http://www.pacsoa.org.au/palms/Coldhardypalms/index.html>, retrieved August 2009.
- [43] Riffle, R. L. & P. Craft (2003). *An Encyclopedia of Cultivated Palms*. Timber Press. Portland, OR. pp. 465-467.
- [44] Riffle, Robert Lee (2008). *Timber Press Pocket Guide to Palms*. Timber Press, Portland, OR. pp. 216-218.
- [45] Roy, Haripada (2009). Palms *Trachycarpus* sp. 'Manipur'. Palm & Cycad Societies of Australia, retrieved October 2009: www.pacsoa.org.au/palms/Trachycarpus/spManipur.html
- [46] Spanner, Tobias W. (1997-2008). Published online at <http://www.rarepalmseeds.com/archive.shtml>, retrieved Dec. 2009.
- [47] Spanner, Tobias W. (2009). Personal communications via email.
- [48] Stein, Osborne, et al (2005). *Palms for Southern California* (abbreviated as *Palms4SoCal*). Palm Society of Southern California, CA.
- [49] Stührk, Chris (2006). *Molekularsystematische Studien in der Subtribus Thrinacinae, mit besonderer Berücksichtigung der Gattung Trachycarpus H. Wendl. (Arecaceae)*. Diplomarbeit Department of Biology, University of Hamburg. Not Published.
- [50] Sullivan, Pauleen (1998). Experiences with *Trachycarpus*. *Palm Journal* 138: 32.
- [51] Tomlinson, P. B. (1960). Seedling leaves in palms and their morphological significance. *Journal of the Arnold Arboretum* 41: 414-428.
- [52] Tsen, Garry (2009). Personal communications via email, and from his website: www.coldplant.com, plus his various forum contributions.
- [53] Unknown author (1933). *Style Manual, A Guide for Authors*. The Herb Society of America.