

Trachycarpus *takil*

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From the article "Sorting out the Many Names of Trachycarpus" by Chris Stevens. The entire article will be available on-line at ATropicalLook.com, and the abridged form is included in the Spring 2010 'Palm Journal' of the Palm Society of Southern California.

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Fig 1: Trachycarpus takil in habitat at Kalamuni, between Girgaon and Munsyar, Uttaranchal, India. In patches of degraded oak and Rhododendron forest. (Photo by Tobias W. Spanner)

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

Kumaon 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*.

Trachycarpus takil was discovered in the Indian Himalayas 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. 77). 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 today in Chaubattia and in the town of Nainital 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 (the Kumaon Hills) were later 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. 75). They were not recognized then as *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 mistakenly 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 incorrectly 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 most 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 trachys at Villa Beccari, there are divergent 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. 77).^[33]

Lorek goes on to say that the seeds Beccari planted were sent from two or three Kumaon Hills locations, Mt. Thalkedar (once called 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 seems to be a possibility since there are only *T. fortunei* 'Naini Tal' growing in the town of Nainital and Chaubattia, and the palms at Villa Beccari do not look quite like the *T. takil* in habitat (Fig. 77). The logical conclusion is that, what Beccari described might not be exactly the same as the native trees in habitat (Fig. 76).

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 inflorescence on *T. takil* is generally larger and it 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 (Fig. 1, page 1).^{[17][18]} The leaf sheath fibers are tightly clasping and form a weave, (Fig. 71) with short (about one to two inches long) shallowly triangular ligules (Fig. 74). 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. 108, page 8). Also, the leaves are more evenly split into segments, and are stiffer. The hastula has a small triangular appendage. 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 those *T. takil* can have more

Fig. 71, previous page: In Villa Beccari, a descendant of one of the original *T. takils*. This one shows the typical trunk on a juvenile *T. takil* (M. Lorek)

Fig. 72, previous page: 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. 73, pg 26: *T. f.* 'Naini tal' (C. Stevens)

Fig. 74, page 26: *T. takil* in the Bergstrom garden, Atherton, CA (Edith Bergstrom)

Fig. 75: *T. fortunei* 'Naini Tal' in Nainital (M. Gibbons & T. W. Spanner)

Fig. 76: *T. takil* in habitat showing the variable silvery undersides (Keshow Chandra Pradhan, Kenibreedplants.com)

Fig. 77: Villa Beccari holotype, the tree used for the description (M. Lorek)



Fig. 71
Villa
Beccari
T. takil



Fig. 72
T. takil
or a
hybrid



Fig. 73
T. fortunei
'Naini
Tal'



Fig. 74
T. takil
in N. Ca.

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. 75
T. fortunei
'Naini
Tal'



Fig. 76
T. takil in
habitat



Fig. 77
T. takil, the
holotype,
in Villa
Beccari

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, retain their old leaves, forming a long massive skirt (like on Fig 77), but this is not a distinguishing characteristic. It has long been said that you know it is *T. takil* when it has the saxophone shaped curve in the lower trunk of juvenile palms, from leaning or “walking sideways” as seedlings. 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;^[47] 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. *T. takil* 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 there for over 100 years.

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 old plants than on younger adult *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 the time Madden gave seed to Beccari,

Figs. 78: This is the real T. takil being cultivated in Barape, Mt. Thalkhedar, Uttarakhand, 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. 79: In Atherton, Edith Bergstrom’s female gave many pure seeds last year. Spanner identified it as T. takil. (C. Stevens)

Fig. 80: 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. 78
T. takil*



*Fig. 79
T. takil in California*



*Fig. 80
T. takil in California*

it was also given to some nurseries, so there is a possibility that more do exist.^[17] My friend Edith Bergstrom, in Atherton (near Stanford University), 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. 79), 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. 80). 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. Thalkhedar, the original area where this species was found^[17] (Fig. 78).

Fig. 81 (faded leaf in background): T. takil in Kausani, Uttarakhand, India, at about 5000 feet. (Original photo by M. Gibbons & T. W. Spanner)

Fig. 82: T. fortunei ‘Naini Tal’ growing in the town of Nainital. It shows the hairy trunk characteristic of T. fortunei. (M. Lorek)

Fig. 83: T. fortunei ‘Naini Tal’, purchased as T. takil, in the Bergstrom’s garden, Atherton. Very fast, they were planted in 2004 from two-gallon pots. (C. Stevens)



*Fig. 82
T. fortunei
‘Naini Tal’*



*Fig. 83
T. fortunei
‘Naini Tal’*

Trachycarpus fortunei ‘Naini Tal’,^{[18][47]} or often shortened to *T. ‘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. 73 & 74, or 102 & 108 on page 8). 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 large leaves for its age, it is *T. fortunei ‘Naini Tal’*. If you are still not sure what you have, see the table on page 6 for more distinctions and 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 any *T. fortunei*, except the hairs of *T. fortunei ‘Naini Tal’* are generally weaker than on other *T. fortunei* and break down quickly, leaving a fairly hairless trunk, with the leaf-bases retained. The leaves are stiffer than the most common *T. fortunei* and do not droop at the tips (Figs. 82 & 83); 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 reliably 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: *T. f. ‘Naini Tal’* 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*.

About the Table:

This table includes the ten generally accepted species of *Trachycarpus*. Also included are two others, the subspecies *T. martianus* ssp. *khasyanus* (originally described as the 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 meantime 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

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 was originally taken 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.

Genus & Species (other names)	Max Overall H x W	Clean Trunk HxDia	About Trunk & Ligules (appendages on new leaf sheaths)	Leaf & Petiole Size	About Leaves	Leaflets Divided	Segments	Fruit Shape / Color	Habitat / Horticultural Considerations/ When Cultivation Started Outside of Its Native Country	Conser- vation Status	Temps °F Tol erated	Species (closely related to)
							on Mature Trees					
<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	leaf with petiole 4-6' long by 36" wide; quite variable	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	irregular ½ to ¾ or more	45 to 50 (70); center 20-35" long	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)
<i>Trachycarpus geminisetus</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	regular & deep , ¾ or more	40 (looks like 20); 1.5" by 33", stiff	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> (close to <i>nanus</i> & <i>fortunei</i>)
<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	regular ½ or less than ½	65-75; 1½-2" wide; bifid or notched tips	coffee / yellow to blueblack	from India, steep rocky cleared rainforest to 8000' / partshade best, esp. if young or inland; give plenty of water; best try for tropics / cultivated in 1990s	endangered immediate threat	15-20 or less	<i>T. latisectus</i> (closely related to <i>martianus</i>)
<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	regular to nearly half	75-80; less than 1½" wide	coffee / greenyellow-brownblack	from Nepal / more cold hardy & handles less water than 'Khasia-form'; both forms less robust than other trachys / culti. in late 1800s (1960s in CA)	unknown, appears unthreatened	15-20	<i>T. martianus</i> 'Nepal-form'
<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; cross veinlets clearly visible; hastula prominent; tips shallowly bifid & acute	regular to nearly half	65-70; less than 1½" wide	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> or 'Khasia-form'
<i>Trachycarpus nanus</i>	2-3 (5) x 4' (to 8' in cult.)	0-2' (3') x 2" (to 4" cult.)	small, wiry ligules that are usually under debris; almost all trunkless , or with a small shag of fibers on persistent leaf sheaths	1½-2' long (4' in cult.) with petiole and 24" wide (48" in cult.)	6-20 stiff, bluish gray glaucous leaves with very thin, deeply folded segments. In another habitat: 1-3 soft, green leaves with flat segments	fairly even & deep ¾ to ¾+	20-30; tips blunt	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>)
<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	regular to ½ - ¾ or more	55-60; 1'-1½" wide; deep folds	kidney / yellow to brown	from Thailand in temperate mountains covered in mist; on limestone cliffs / may not like full sun in high heat; drought tolerant / cultivated since 1997	rare: securely inaccessible	12-17	<i>T. oreophilus</i> (close to <i>takil</i> & <i>ukhrulensis</i>)
<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; very white waxy undersides & petioles	fairly regular to about half	45-48; 1¼" wide	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 <i>nanus</i> & <i>fortunei</i>)
<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	slightly irregular ½ to ¾+	45-50 (60); 1.2-2.2" w; tips blunt	kidney / bluish black	from up to 8000' on steep limestone ridges in Indian Himalayas / as of '09 only a few real ones in cultivation / culti. briefly in 1800s & again in 2009	threatened / critically endangered	5-18 or less; untried	<i>T. takil</i> (close to <i>oreophilus</i> & <i>ukhrulensis</i>)
<i>Trachycarpus fortunei</i> 'Naini Tal' (a cultivar of <i>T. fortunei</i> , falsely called " <i>takil</i> ")	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 trunk more easily	about 4-6' long with petiole by 36-42" wide	leaves like <i>T. fortunei</i> only larger and stiffer, not droopy, has a large crown even when young	irregular , mostly ½ to ¾	~40-45	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>)
<i>Trachycarpus ukhrulensis</i> (<i>T. sp. 'Manipur'</i> or <i>T. sp. 'Naga Hills'</i>)	32 (-50) x 7'	26 (-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	slightly irregular to ½ - ¾	64-70; width irregular , .8-1.3" wide	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; stasis ok if more hiding	15-20 likely, or less	<i>T. ukhrulensis</i> (close to <i>takil</i> & <i>oreophilus</i>)
<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 can have appendage	irregular ½ to ¾ + a few deeper	40+; 12-18" long at center	kidney / bluish black	from Japanese cultivation only / easy like <i>T. fortunei</i> only more cold tolerant and very wind tolerant, even hot & dry / in West since 1800s	never found in habitat	1-15	<i>T. wagnerianus</i> (very close to <i>fortunei</i>)

Acknowledgements

and Summary: I want to express my sincere appreciation for the corrections and additions made by Donald R. Hodel, Nigel Kembrey, Michael Lorek and especially Tobias W. Spanner. The latter two made this article what it is. I also thank them for the many photos each provided, particularly Spanner who sent the great shots by Martin Gibbons and himself. He identified, as misinformation, many source's opinions that I initially included, and he gave far more important information than I was able to credit him for. Lorek additionally sent many articles that would have been difficult for me to get otherwise, and he insisted on the proper use of botanical terms. Since both are *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. As Lorek said, "Disputes are always the basics of development. And in botany you will not find one systematic topic without disputes."^[38]

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] So, 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. Therefore, the only conclusion I could come to is that, 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. 102-109: 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. 101) is like T. fortunei. (Fig. 102 at the home of & by C. Stevens; Figs 103-108 by M. Gibbons & T. W. Spanner; Fig. 109 by M. Lorek)

Fig. 110, next page: T. martianus in habitat, Khasia Hills, near Cherrapunji (M. Gibbons & T. W. Spanner)



Fig. 102 *T. fortunei*



Fig. 103 *T. geminisectus*



Fig. 104 *T. latisectus*



Fig. 105 *T. nanus*



Fig. 106 *T. oreophilus*



Fig. 107
T. princeps



Fig. 108
T. takil



Fig. 109 *T. ukhrulensis*

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Fig. 110