

Principes, 39(2), 1995, pp. 65–74

Trachycarpus princeps, the Stone Gate Palm, an Exciting New Species from China

¹MARTIN GIBBONS, ²TOBIAS W. SPANNER AND ³CHEN SAN YANG

¹The Palm Centre, 563 Upper Richmond Road West, London SW14 7ED, U.K.;

²Tizianstr. 44, 80638 Munchen, Germany; and ³Yunnan Institute of Botany, Kunming, China

The chance sighting of a single line in a Chinese plant book led to perhaps the most exciting discovery of all along the 'Trachycarpus Trail'. The book in question was the new account of the palms of China in the Flora of China series (Pei and Chen, 1991), published in Chinese so quite incomprehensible to us (MG and TS). However, all the references were in English, or at least using the Roman alphabet, and of course all the Latin plant names were understandable. We were doing research on *Trachycarpus martianus* and, although there was no record of its occurrence in China in any of the other books, old and new, that we consulted, this book listed and described it. This seemed strange to us since it was not known to occur in China, so why should it appear in a book of Chinese plants?

We arranged to have the entry translated into English and when it was done we were able to read what the Chinese authors had to say about it. The entry began with a description of the palm—nothing strange here—and ended rather disappointingly with the paragraph, "The species is native to the central and eastern Himalayas and Burma. According to records there were some found in western and north-western Yunnan, but so far there is no specimen." And that might have been the end of it, but something nagged. What was this 'record' and how could we find out about it? It seemed an impossible task.

Then, some time later, we were re-reading the accounts for the hundredth time when a line in the references caught our eye. Amongst all the Chinese characters was this: "Hand.-Mazz. Symb. Sin. 7(5): 1360. 1936". The numbers were obviously pages or chapters and 1936 the year, but what or who was Hand. Mazz.? And could that 'Sin' stand for 'Sinica', i.e., China? Was this the old record? The answer came, as so many did, from the library at Kew. 'Hand.-Mazz.' turned out to be an abbreviation of Dr. Heinrich Handel-

Mazzetti, an Austrian botanist who made some explorations in south-east Tibet, northwest Yunnan and much of south-west China between 1914 and 1918. He published his findings in a book called "Symbolae Sinicae" in German in 1936, a photocopy of which was kindly lent to us by the Library of the Botanical Museum in Berlin. This again had to be translated, but it was less of a problem:

"*Trachycarpus martianus* . . . N.W. Yunnan. In the subtropical zone of the Burmese monsoonal forest on cliffs of crystalline limestone, in the Salween-gorge above Chamutong until below Nualo, 1725–1900 m, . . . and from here replanted in the village of Sitjitong. Flowers or fruits are not on hand. From my memory and a photograph sent by Dr. J. Rock, these approximately 7 m high trees have stems of at least 20 cm diameter after the leaf bases have fallen, which develop a short tuft only below the fresh leaves. These are wax-white below"

The trail was starting to warm up!

Then, additionally we came across another book by the same man, "Naturbilder aus Südwestchina" ('Portraits of Nature in South West China') and whereas the first was more of a scientific work, this was more of a diary and filled in the gaps in a very readable fashion. On page 242, under the title, "To the Irrawaddy Upper Course", we read:

"In the evening, I reached Nualo, a Lissu village as you can tell by the name, the most northerly of all, and I was welcomed in a friendly manner, with presents. From there it was finally not far any more to the Salween [river]. We descend, reaching the subtropical rainforest just below 2200 m and a distance on bare rock leads us to the slope of the valley itself, from where we quickly descent through sparse pine forest to Sitjitong, a scattered village, 3 km north of Chamutong. The Salween comes here from Wuli in the northeast, breaking through the band of crystalline limestone, through which, in the gorge of Chamutong, it is quickly returned towards the east, making up for this error in its NNW-SSE course. Everywhere, this hard rock shows as steep cliffs, in the lower gorge as enormous pillars, 600m high, one of which forces the path onto an artificial high wall in the river itself. At high water level, this route is flooded, and the only way to reach Chamutong is above, over the ridge. Whereas there are still xer-

ophytes, such as *Schefflera delavayi*, here brownish and felt-like, found on the sandbank stretching along the river below Sitjiong, the gorge itself is characterized by sub-tropical opulence again. Huge lianas, like the new *Mucuna coriocalpa* with thick trunks and 50 cm long pods, climb high up into the *Sloaneas* . . . between them flourishes the definitely tropical *Asplenium nidus*, developing large nests with tongue-shaped, 70 cm long leaves. Rather xerophilic again are the many small epiphytic orchids, none of which unfortunately was in flower any more, and the palm *Trachycarpus martiana*, which grows stately stems, mainly on the other side of the river, almost inaccessible on the cliffs. I crossed the flat scree of Chamutong, around which the Salween is forced towards the eastern slope in a gentle bend, via the shortest way, below the main village, as I was in a hurry, and [being delayed by] the officer there was what I needed least. That he had already gone insane and died from opium and schnapps, of which he consumed 8–10 rice bowls a day. I did not know at the time. And so I came to Dara, a village on the slope, inhabited mainly by Tibetans. . . .”

Exciting stuff! Limestone pillars 600 m high—that would be something to see indeed. After a great deal of searching, the map room at Kew provided the location of Chamutong, indeed we were delighted to find Handel-Mazzetti’s original map there. The village turned out to be in extreme north-west Yunnan, almost at the point where China, Tibet and Burma meet, a restricted or ‘closed’ area of China and certainly not open to the casual tourist. The Salween River itself rises in the Himalayas then flows south just to the east of the north/south border between China and Burma. Finally, a thousand miles later, it discharges itself into the Gulf of Martaban, in Burma, at Moulmein. So far, so good. But what of HM’s collections and—intriguingly—that photograph?

Dr. Dransfield suggested that as Handel-Mazzetti was Austrian, his herbarium collections were likely to be in Vienna, and this indeed proved to be the case. Our friend there, Thomas Baumgartner, discovered them, in good condition, at the Institute of Botany where they had been gathering dust for 70 years. An official request kindly made by Dr. Dransfield brought them to England and it was with great excitement that we visited him at Kew to see them for ourselves.

A glance at the leaves was enough to make one thing immediately very clear. Though they were certainly *Trachycarpus* they were certainly not *T. martianus*. Most exciting of all was the photograph, taken by Dr. Rock, and referred to by Handel-Mazzetti. It was a habitat photograph (Fig. 1) and although at first glance it appeared not to show any palms at all, closer examination under a microscope revealed dozens of them growing on a sheer cliff face on the far side of a fast flowing

river—the Salween, or as it is called in China, the Nu Jiang (‘Angry River’). They looked like big trees, with thick trunks and with big crowns of fan-shaped leaves, not unlike *T. fortunei* but for one thing—they seemed to have bare trunks, and as they were growing on such inaccessible sites it was inconceivable that they had been stripped by man, as are the vast majority of *Trachycarpus* in China, for their useful fibres. The whole thing was becoming very intriguing indeed, and we began to suspect that we were looking at a new, undescribed, species of *Trachycarpus*. As is so often the case, the only way to solve this puzzle was to visit the palms, and this we resolved to do.

You have to have a good and valid reason to visit ‘closed’ areas of China, and even then, it’s not always possible to get permission to do so. We were told that because our interest was botanical, we would have to apply first to the Institute of Botany in Kunming, who, on our behalf, would apply to the relevant authorities to try to obtain permission to visit the area where our palms grew. Our contact at the University was Professor Chen Sanyang, the self-same person who had written the *T. martianus* entry in the palm volume of the Chinese Flora and something of an authority on the palms of China. He was as intrigued as us by the possibility of a field trip to this remote area with a view to re-locating this ‘lost’ *Trachycarpus*.

We applied without delay but it took 10 months before the permission finally came through. In the intervening period we exchanged dozens of faxes and letters, and as well sent photocopies of our passports together with full details about ourselves and our purpose. It was arranged that the professor would accompany us, and we would travel to our destination in a rented jeep.

In October 1994 we flew to China, staying in Kunming, the capital city of Yunnan Province. On arrival we checked into an hotel, and the professor and his interpreter (‘David’) called round to introduce themselves. We were due to leave early the following morning and accordingly we were up and ready at 7 am when we were collected by the small jeep in which we were to spend many hours and to travel many miles. First, however, there were more permissions and travel documents to obtain so we spent an hour or two driving around Kunming from this office to that. Finally, we were off!

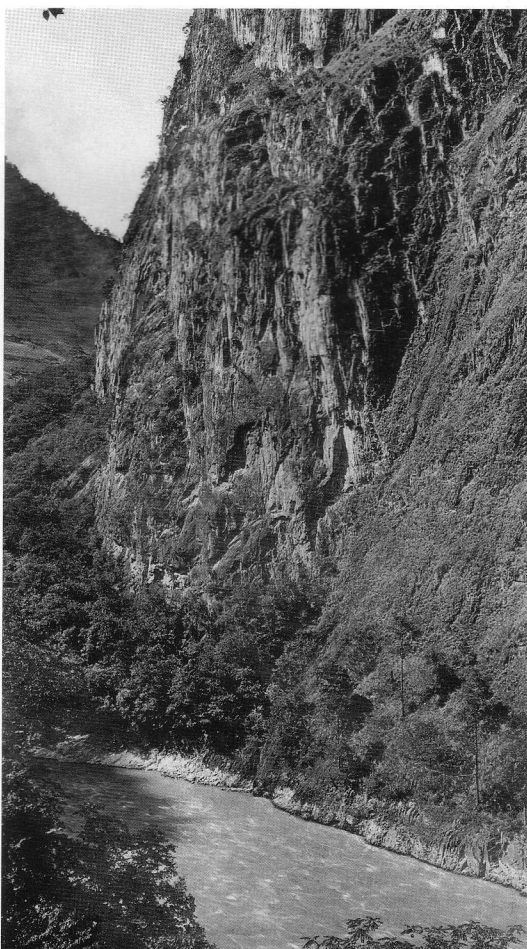
We travelled along a good road for about 45 miles (80 kms) to begin with. After that it deteriorated somewhat but was still not too bad. The

driver was fast, but careful and confident and we kept up a good speed. We stopped for lunch (chicken with ginger, noodles, pork and rice) and arrived about 6.30 pm at Xiaguan where we would spend the night. An early start the next morning, lunch at Wayao, then through Liuku, across the Salween bridge where we turned north and on up to Lubenzhuo. Finally we arrived at Fugong as it was getting dark, and we stopped for the night. Early the next morning we set off once more, continuing north along the Salween.

The entire journey was along the river, sometimes high above it, sometimes perilously close to the rushing water, but it was almost never out of sight. We arrived at Gongshan at 10.30 am and stopped for an early lunch. At 1.30 we set off again and by 3 pm had arrived at the village of Binzhongluo, some 600 miles (1,000 kms) from Kunming. On the way we travelled along deep gorges which the river had worn away through the ages. It was quite impressive. We were introduced to the head of the village and with him went on a short walk to the 'Shi Men Guan' ('Stone Gate') (Fig. 2), the local name for what Handel-Mazzetti had called the Chamutong Gorge where he described the river as 'breaking through the band of crystalline limestone'. Within an hour we were there and through binoculars saw our first *Trachycarpus*, just as he had promised!

There were certainly many *Trachy*'s there but there was something of a canyon between our vantage point and the Stone Gate itself so we could not get closer to them without a major detour and, as it was starting to get dark anyway, we decided to call it a day and head back to the village. We celebrated with bottles of the local beer and speculated on what tomorrow might bring.

The next morning, we were up at 6.30, before sunrise and even before cock-crow! After breakfast we left with a local guide and headed off in the same general direction as yesterday but then descended to river level, following a clear path through farms. The river itself is jade green in color and quite smooth though rather fast-flowing. Soon we saw *Trachycarpus* growing on the two high, sheer faces of the opposing cliffs which had the river running between them; a thousand foot deep crack in the mountain range, with the river at the bottom, somewhat less than Handel-Mazzetti's '600 m' (2,000 feet) but very impressive all the same. There were hundreds of palms and through binoculars we could see just how beautiful they were. At a distance they seemed very close



1. Joseph Rock's photograph of the Stone Gate, taken around 1914.

in general appearance to *Trachycarpus martinianus*, with erect, slender stems, apparently bare in some of the tall, older plants, and beautiful, spherical crowns, and we could easily understand how Handel-Mazzetti had misidentified them. The tallest seemed to be about 30 ft (9 m). Most were on the opposite bank but soon we had the opportunity to examine a tree at close quarters as one had recently fallen down near our path.

It had about 5 feet (150 cm) of trunk, covered with closely attached, fibrous leaf sheaths of a rather coarse texture. The exposed upper part of the sheath was short and divided into numerous, individual coarse threads, upright at first but strongly reflexed with age, as is the case with the spines formed by the leaf sheaths of *Trithrinax acanthocoma*. Certainly this was very different



from *Trachycarpus martianus*, and even more so from *T. fortunei*. However, perhaps the major difference from all other *Trachycarpus*, and certainly the most stunning, was the fact that the underside of the leaves was pure waxy-white (Figs. 3 and 4). There were no flowers or fruit so more positive identification would have to wait for a while. We took some photographs and measurements, and collected some herbarium material then continued down the path, now close to the river. Our guide told us that no palms were to be found north of here, so they were only growing in just this one tiny area.

Since 95% of the palms were growing on the opposite, west-facing bank we had to find some way to cross the river. Fortune must have been smiling on us as we soon came across a dug-out canoe moored at the river's edge. Our guide was dispatched to the nearby village to negotiate a price to ferry us across. While waiting for him to return, we cooked a simple lunch of packet soup on the pebbly river 'beach', just a stone's throw from hundreds of these beautiful palm trees. The more we looked, the more we saw. What an idyllic spot!

After an hour or so, our guide returned with four or five Lissu men who had agreed to take us across. We went one at a time, with two rowers, one in front and one astern (Fig. 5). It was quite tricky because of the speed of the water, fast-flowing even though it was the dry season. It was a question of paddling slowly until the fast water was reached, then paddling rather quickly so as not to be carried too far downstream. Soon we were assembled, still dry, on the far side and set off towards the palms. The river bank here was composed of pure crystalline limestone, in other words, white marble. Over the centuries the river had smoothed and sculpted it into sensuous curves and shapes worthy of Michelangelo. We struggled around the headland and soon we were among the palms. By far the majority were growing on the sheer cliff face, absolutely vertical and absolutely inaccessible (Fig. 6). Bearing in mind our experiences with other palms in habitat, we were quite delighted by this act; it means that they are quite safe from either man or goat. But where the cliff

moderated into a more gentle scree slope at its base, there were a good number growing in the forest there which could be reached with the minimum of effort, and it was towards these that we made our way, scarcely able to contain our excitement.

For the next couple of hours we went from tree to tree, admiring, photographing, measuring, comparing and generally having a good time. There were many palms to choose from, each more beautiful than the last, the white undersides of their leaves giving them a very special appearance (Fig. 7). We agreed that these were definitely the most beautiful *Trachycarpus* that we had ever seen.

Their rather open, spherical crowns were attractively arranged and consisted of around 22 regularly divided, semi- to $\frac{3}{4}$ circular leaves (Fig. 8). After dying, they form a small skirt below the crown before the blade rots and drops off. The slender petioles often stay attached to the trunk for much longer and this, together with their pale colour, gives the impression from a distance that the trunks are bare. In fact, many of the tall, old plants do shed their leaf sheaths to reveal a ringed, grey trunk.

Many plants carried old, dry inflorescences or infructescences but, to our great disappointment, none of the accessible trees carried either fruit or flowers. Whether they fruited earlier than other *Trachycarpus* or whether it had simply been a bad year (dry?) we did not know, but it was terribly important to find at least some seeds in order to determine if they belonged in the fortunei group (reniform seeds) or the martianus group (oval with a groove). Finally, after grubbing around in the dirt at the base of a tree with a recent infructescence, one of the Lissu came across just two fresh and a couple of empty, old seeds. They were kidney-shaped, meaning that the trees belong in the former group.

We were not really surprised to find that many of the accessible palms had been either stripped of trunk fiber, or had had some of their leaves harvested. A few had even been cut down, the trunks being useful for building purposes, or perhaps the 'cabbage' is edible. But, by and large, we felt that the locals were sympathetic and there

←

2. Eighty years on, Martin Gibbons & Tobias Spanner in the same spot. Nothing has changed. 3 and 4. *Trachycarpus princeps* has stunning and distinctive waxy-white backs to the leaves. The petioles and emerging leaf spear also have a waxy covering. 5. The only way to cross the Salween River was by dug-out canoe, helpfully paddled by Lissu villagers.



6. *Trachycarpus princeps* grows on vertical cliffs on tiny ledges and in small pockets of soil. 7. *Trachycarpus princeps*. The white backs to the leaves distinguish this *Trachycarpus* from all others.

was certainly no wholesale destruction as we had seen in, for example, *Trachycarpus takil* in India. Even if every accessible tree were to be cut down, this would still leave the vast majority of the population, some 400 or 500 mature plants in total. We feel that their future is quite secure.

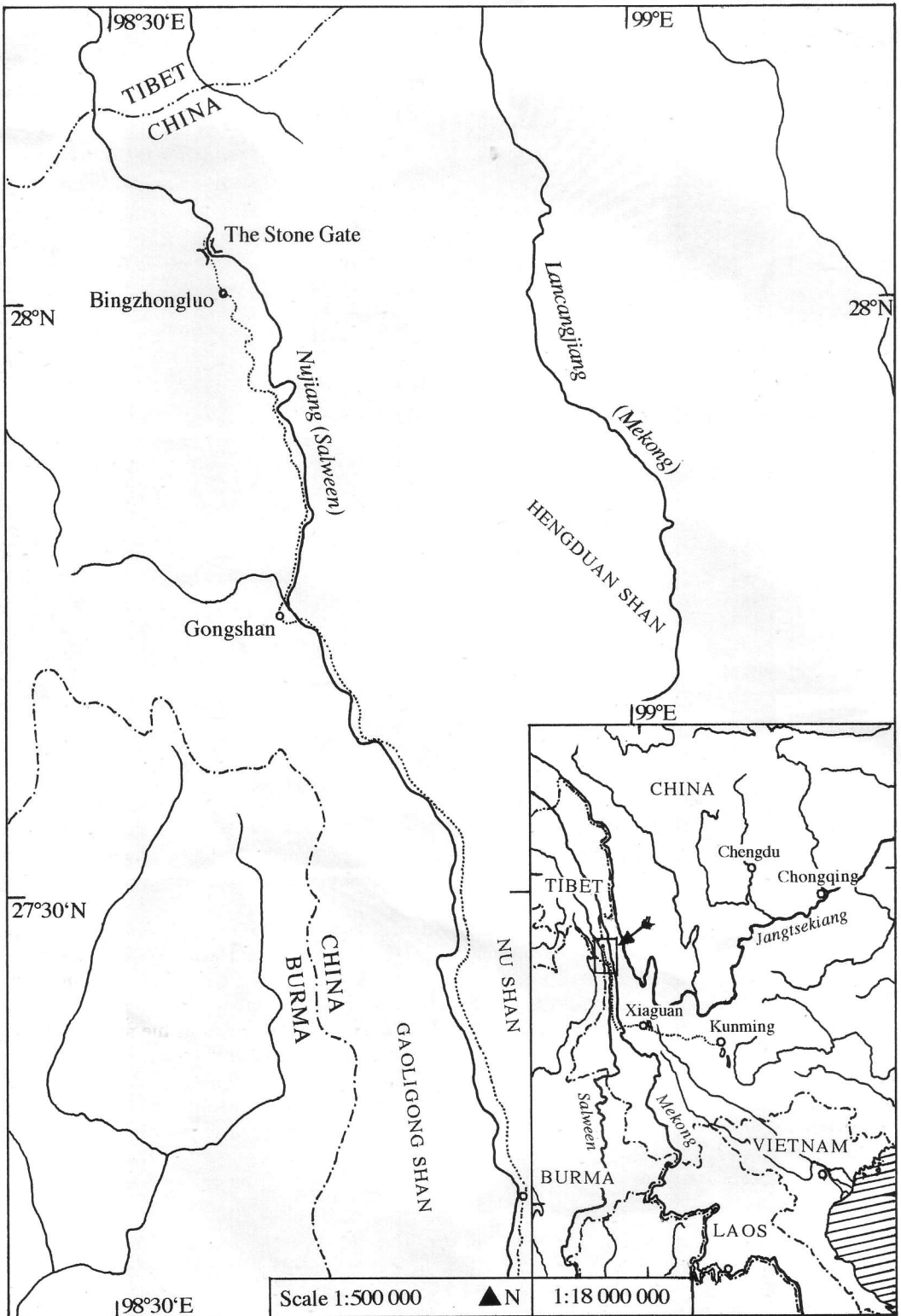
Additionally we were very pleased to see a good number of seedlings, indicating that the trees are reproducing well. This is a very good sign. The seedlings themselves were very pretty with regularly split leaves in the manner of *T. martianus* seedlings which they closely resembled, but with the same waxy-white backs to their leaves as their parents (Figs. 9, 10).

After a very happy time amongst these beautiful palms we regretfully took our leave, and one at a time, as before, crossed the Nu Jiang in the dug-out canoe. With many backward glances at the Stone Gate, we departed for the village and the long drive back to Kunming.

The cost of getting up to the site where these palms grow was not insignificant, not only in financial terms, but also in terms of physical effort, time, and patience. Despite this, the pleasure we had in rediscovering Handel-Mazzetti's palm made it all very worthwhile. Unfortunately, because of the remoteness of the site and the paucity of seeds it is unlikely that this beautiful tree will get into

8. *Trachycarpus princeps* has a leaf silhouette unique in the genus. 9 and 10. *Trachycarpus princeps*. The seedlings look identical with *T. martianus* until the waxy-white underside is seen. →





cultivation, but it is there, and will continue to be so, just waiting for other dedicated palm enthusiasts to discover it for themselves.

Although we were unable to find any flowers, the material collected by the three of us is sufficient to show the Stone Gate palm to be clearly distinct from all other species of *Trachycarpus*.

***Trachycarpus princeps* Gibbons, Spanner & S.-Y. Chen sp. nov.**

A ceteris speciebus vagina folii appendicibus tenuissimis ad 10 cm longis ferenti, petiolo valde glauco, lamina infra conspicue albo-ceracea ad medium regulariter in 45–48 segmenta divisa, forma fructus *T. fortunei* similis sed fructu minore mesocarpio glutinoso differt. Typus: China, Yunnan, Nujiang, Chen, Gibbons & Spanner 14440 (holotypus KUN, isotypus K).

Solitary, very lightly armed, dioecious palm to about 10 m tall; trunk erect, slender, densely clothed in closely appressed, persistent, fibrous leaf-sheaths, around 22 cm diam. or bare, ringed, 13–16 cm diam.; leaves 18–26, palmate, marcescent leaves few, sometimes forming a small skirt below the crown, petioles often persisting; leaf-sheath fibrous, relatively coarse, robust, about 45 cm long, abaxially densely covered in pale brown, woolly tomentum; leaf-sheath appendages approximately 10 cm long, very finely divided, upright at first, later strongly reflexed; petiole slender, arching, about 80 cm long, 0.8 cm high and 1.3 cm wide, slightly convex above, triangular below, strongly glaucous, very finely toothed along the margins; hastula shallowly triangular, 1 cm long, regular, crested; leaf-blade, semi- to $\frac{3}{4}$ orbicular, 60–80 cm long from the hastula, 90–115 cm wide, dark green above, wax-white below, regularly parted for about half its length into 45–48 stiff, linear segments, tapering towards the apex from their broadest point; central segments 3–3.5 cm wide at the middle, lateral segments gradually more narrow and shorter, apex acute-notched, shortly bifid. Inflorescences few, solitary, interfoliar, slightly erect to horizontally arranged; male inflorescences about 50 cm long, branched to 4 orders; peduncle short; prophyll about 18 cm long, very broad; peduncular bract one, around 25 cm

long, very broad, slightly tomentose abaxially; rachis bracts 3, similar to peduncular bracts; rachillae 1–3 cm long, fine and very densely branched; female inflorescences about 75 cm long, branched to 3 orders; peduncle about 20 cm long, peduncular bract one, tubular, 30 cm long; rachis bracts 2, similar to ped. bract; rachillae short, 2–10 cm, fleshy. Flowers not seen. Infructescence bright yellow when fruit are ripe; fruit small, on short stalks, slightly reniform to almost oval, wider than long, 0.8 cm long, 1.0 cm wide, 0.75 cm high; epicarp very thin, black, with a white bloom; mesocarp approximately 0.1 cm thick, spongy-fibrous, coated in a very sticky substance; seed reniform, 0.6 cm long, 0.85 m wide, 0.55 cm high; endocarp pale beige, very thin, very slightly crustaceous sand-like layer on a red-brown skin; endosperm homogenous with a deep lateral intrusion; embryo lateral. Germination remote-tubular, eophyll simple, narrow, plicate, wax-white abaxially.

Distribution. China, Yunnan, Nujiang county, 3 km NW of Bingzhongluo on the banks of the Nujiang, on the two almost vertical, bare marble cliffs of the Shi Men Guan (Stone Gate) and below the cliffs in mixed, evergreen monsoonal rainforest on a black, humus-rich, alkaline soil (pH 7.5–8); 1,550–1,850 m a.s.l.

Specimens Examined. China, Yunnan, Nujiang county, Sitjitong, Aug. 1916, *H. Handel-Mazzetti* 9802 (Vienna); Nujiang county, Shi Men Guan, Aug. 1916, *H. Handel-Mazzetti* 9818 (Vienna); idem, Oct. 1994, *Chen, Gibbons & Spanner* 14440 (holotype KUN, isotype K).

The specific epithet (*L. princeps*, a prince) refers to the stately bearing of this palm and the majestic way it looks down from its lofty position on the sheer cliff faces.

Note: The description of the seeds is based on two mature and several empty old seeds only.

As there is no recent taxonomic treatment of the genus *Trachycarpus* (but see Beccari 1931 and Kimnach 1977), relationships of *T. princeps* will be dealt with in a conspectus of the whole genus, which will appear in a later publication.

←

11. Map shows our route along the Salween River and the location of the Stone Gate in north west Yunnan province, China.

LITERATURE CITED

- BECCARI, O. 1931. Asiatic Palms: Coryphea. Ann. Roy. Bot. Gard., Calcutta 13: 272-286.
- HANDEL-MAZZETTI, H. 1927. Naturbilder aus Südwestchina: Erlebnisse und Eindrücke eines Forschers. Pp. 242-243. Österreichischer Bundesverlag, Wien, Leipzig.
- . 1936. *Symbolae Sinicae*: VII. Teil Anthophyta. Verlag Julius Springer, Wien.
- KIMNACH, M. 1977. The Species of *Trachycarpus*. *Principes* 21: 4, 155-160.
- PEI SHENG-JI AND CHEN SAN-YANG (Eds). 1991. *Flora Republicae Popularis Sinicae*. Vol. 13(1). *Palmae*. Pp. 172. The Science Press, Beijing.

Principes, 39(2), 1995, p. 74

CHAPTER NEWS AND EVENTS

News from the South Pacific

Carpoxylon macrospermum, a study in seed distribution and species conservation. The rare palm, *Carpoxylon macrospermum*, is found naturally only in Vanuatu in the South Pacific. It has been deemed "desirable" for hobby collectors and certain commercial landscaping operations by people familiar with its appearance and growth habit. It is familiar in form to *Clinostigma* and *Veitchia*.

The Foundation for the Peoples of the South Pacific has set up a "Profitable Environmental Protection" Project to ensure responsible collection and distribution of the seed as well as species conservation, also serving to feed back some revenues to the local populus. This project is partially funded by US AID.

In a logical first step, the PEP project conducted a study of the locations, fruiting status, natural regeneration status, etc. of all *Carpoxylon* trees on the islands. This report was done by a very well known and respected palm expert from Australia, John Dowe of Townsville Palmetum (who is also an IPS and PACSOA member). The report on the exact locations and numbers of natural populations is being held confidential, because "this

data would be very useful to one wishing to unscrupulously exploit the resource."

It was noted, however, that there was almost no seedling regeneration from cultivated palms. The study concluded that marketing of the seeds from ONLY these cultivated specimens would have no detrimental effect on the species recovery plan. Additionally, some seeds and seedlings from the naturally regenerating populations will be used in a species recovery plan in Vanuatu.

A non-profit business has been established on Vanuatu to market the seeds (from the cultivated plants). These seeds will soon be available through the International Palm Society (IPS) and through PACSOA (the IPS Australian affiliate). They are not cheap—a US-landed price to the IPS of US\$6 per seed has been set. The seeds are large so postage is expected to be between \$0.50 and \$1.00 per seed. The IPS Seed Bank will sell these seeds at US\$7 per seed (see ordering information below).

This is the first year pilot project and these extremely rare seeds will soon be available for shipment from California. Order now to be assured of seed. The quantity of seeds expected by the IPS should be sufficient to meet the demand. However, if this is not so, your payment will be promptly refunded.

CLASSIFIED

RARE VANUATU PALM SEED! The IPS Seed Bank is expecting a shipment of freshly collected seeds of the rare *Carpoxylon macrospermum*, a palm native only to Vanuatu. Send US\$7 per seed, payable to the International Palm Society, to IPS Seed Bank, c/o Lynn Muir, 33802 Valencia Place, Dana Point, CA 92629.

This very attractive palm is reminiscent of *Clinostigma* and *Veitchia*, and should prove a valuable addition to your palm garden (see *Principes* Vol. 32(2):63-73. (1989) for related articles). These seeds are being supplied to the IPS by the Peoples Environmental Project run by the Friends of the South Pacific.