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## A Day on the Klingkang Range

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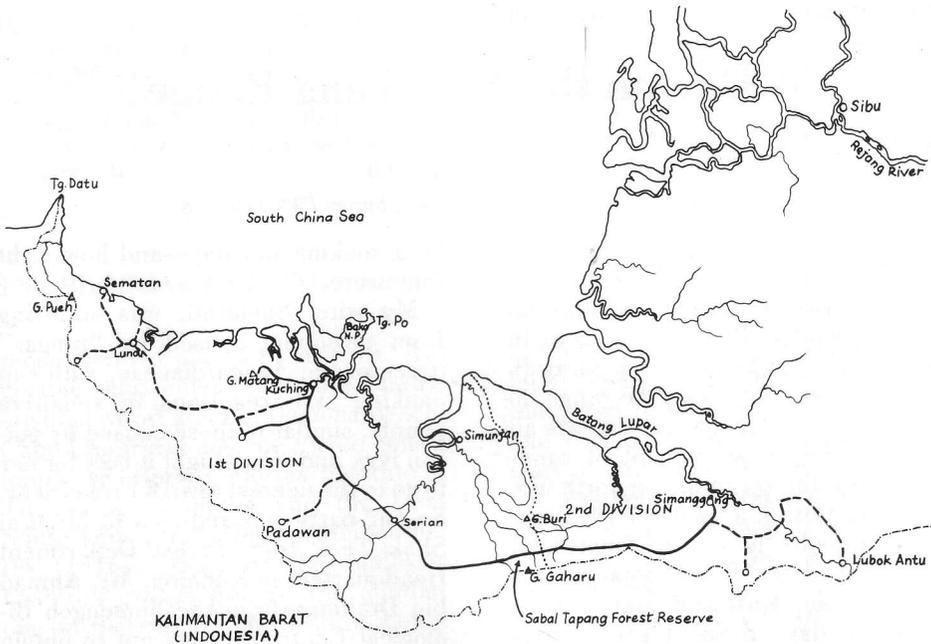
The Klingkang Range is a chain of hills along which runs the international border between Sarawak (Malaysia) and Kalimantan Barat (Indonesia) in the 1st and 2nd Divisions of Sarawak (Fig. 1). The summits of the range do not exceed 1,000 m altitude and are all part of a large escarpment of sandstone, with the scarp facing north into Sarawak. During a palm survey organized jointly by the Forest Department Kuching and the Royal Botanic Gardens Kew in April and May 1981, I spent four days in Sabal Tapang Forest Reserve, which lies at the foot of the Klingkang Range, and on one day we set out to climb to the nearest summit of the Range, Gunung Gaharu (Fig. 2). This day proved to be one of the most exciting palm-hunting days I have ever had.

We had made camp at the edge of logged forest just south of the 68th milestone on the main road between Kuching and Simanggang. The first three days were spent working in the lowlands and foothills of the range—the idea being that on the fourth day we should have seen much of the lower altitude palm flora, enabling us to climb straight to the escarpment without distractions. The plan was admirable, but took no account of the weather; the first three days had been reasonable enough, though we were caught in showers, but the day set aside for the ascent of Gaharu dawned very gloomily. Thick bands of cloud covered the forest and the summits of the escarpment, and despite my optimism, everyone else declared it was to

be a soaking wet day—and how right they were.

My wife, Soejatmi, was suffering from poisoning caused by “rengas” (trees of the Anacardiaceae, with sap causing skin reactions in sensitive people, similar to those caused by poison ivy), and we thought it best for her to go to the nearest town for treatment. So our party was reduced to Mr. Lai Shak Teck from Forest Department Headquarters in Kuching, Mr. Ahmad bin Drahan from the Semengoh Biological Centre (he was out to obtain as much living material as possible for cultivation in the developing botanic garden), and the two skilled plant collectors, Messrs. Banyeng and Salang, and myself. Of the party, only Banyeng had been to the summit of the range, so we relied on him to choose a way through the maze of old logging roads and ridges of primary forest.

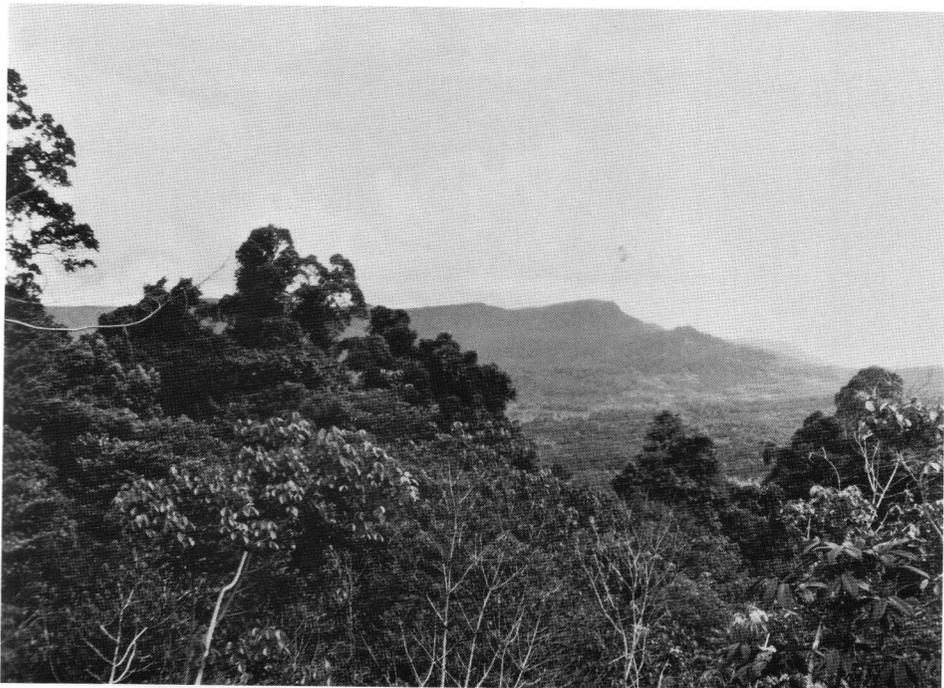
We left our camp in the Forest Department vehicle and drove along the main road towards the east for about 2½ miles and, just beyond Sabal Sawmill, turned off the road onto a deeply rutted, abandoned logging trail. After half a mile the going proved to be too difficult and we started to climb on foot, the land cruiser returning to camp to take Soejatmi to Serian. Old logging trails can be very useful for access to the forest; although we may bemoan the destruction of the forest, we can still use the trails. About five years after active logging, the trails usually have deteriorated into deep ruts with algal-slime, slippery crests, and an entanglement of secondary for-



1. Map of west Sarawak.

est climbers to trip one up—species such as *Merremia borneensis* may not be too bad, but *Ziziphus* spp. and *Rubus moluccanus* with their thorny stems are a positive menace. Banyeng and Salang set a spanking pace; in the still wet morning air I was soon dripping and panting in the rear. Little of interest was noted in this destroyed forest apart from racket-tailed drongos, mynahs, paradise fly-catchers with their astonishing long white tail feathers, and the continual serenading of Borneo's most beautiful songster, the white-rumped shama. In a deep valley we caught the sickly smell of two wild durians in flower and further on saw plants of *Korthalsia jala* with its remarkable net-like ocreas (Fig. 3) and *Plectocomiopsis mira* with its very different, tightly sheathing ocreas (Figs. 4, 5). The trail wound steeply up to about 400 m altitude and, where it skirted a ridge, we branched off and

climbed steeply into primary mixed Dipterocarp forest on a very steep ridgetop up to about 500 m. Banyeng suggested we might have taken the wrong path and, as if to endorse this, it began to rain, gently but drenchingly. Before it became too wet, we collected a slender *Calamus* related to *C. pogonacanthus* in old male flower. From our minor summit we cut a trail falling gently through fine forest with an abundance of *Iguanura palmuncula* var. *magna* (Fig. 6A, B), *Pinanga sessilifolia* and *P. crassipes* (Fig. 7), and *Areca minuta*. The *Iguanura* has astonishing fruit with five crests and a basal stigmatic vestige. After dropping down about 50 m in altitude we rejoined a logging trail and entered a superb patch of *kerangas* forest developed on the sandy plateau. *Kerangas* is an Iban word given to the type of forest occurring on extremely poor soils in the lowlands; it has several features (such as trees with low



2. The Klingkang Range seen from Gunung Buri; the peak just right of center is the summit of Gunung Gaharu.

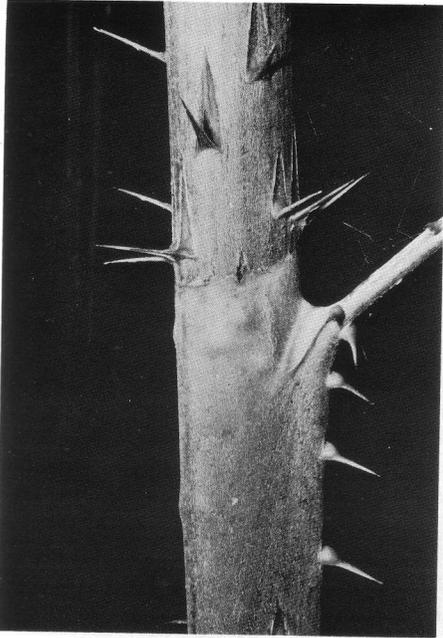
rather even crowns and small leaves, and an abundance of moss in the undergrowth) in common with montane forest, and because of its poor soils, is rarely felled for shifting cultivation. Some facies of *kerangas* are very rich in palms, while others may be palmless; furthermore many of the strangest Bornean palms are confined to this vegetation type. Thus one of the excitements of entering *kerangas* is not knowing beforehand what will be there. The *kerangas* we were about to enter was filled with an abundance of *Licuala orbicularis* (Fig. 8), surely one of the most beautiful palms in Borneo. It has an entire leaf, but, unlike the commonly cultivated *L. grandis*, the leaf of *L. orbicularis* is held stiffly in one plane, not irregularly buckled. Would that this species produced

fruit; day after day in Sarawak we saw this fine stemless palm, but only once saw immature fruit. Could its inability to produce fruit be due partly to the frequent cutting of its leaves for use as umbrellas? Certainly our party quickly cut a few leaves to help keep off the rain. With *L. orbicularis* grew three more species, *L. bidentata* with very slender leaflets, sometimes consisting of a single fold (Fig. 9), *L. furcata* with the central leaflet usually deeply bifid, and *L. petiolulata*; the last is a robust stemless species in which the central leaflet is borne on a separate distinct stalk or petiolule (hence the name).

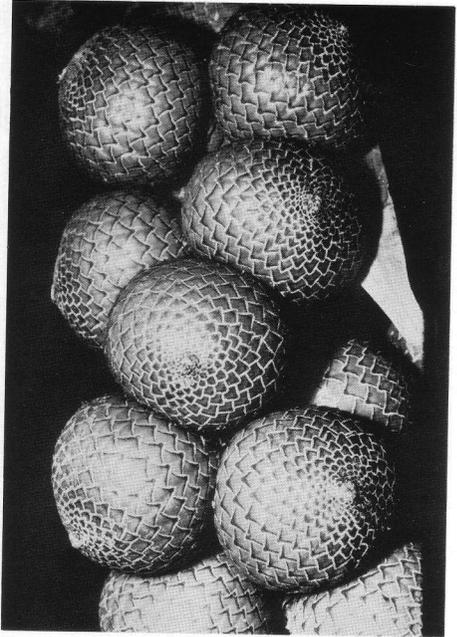
As we penetrated the *kerangas* we came across a few well-grown but sterile individuals of *Johannesteijsmannia altifrons* and some huge young plants



3. *Korthalsia jala* has loose net-like ocreas.



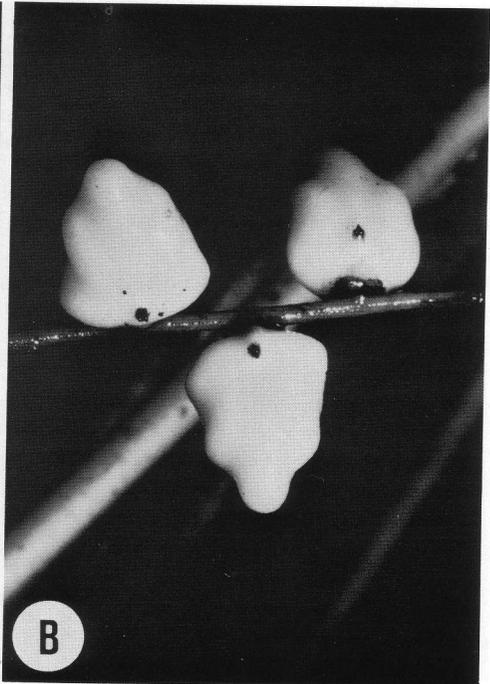
4. The juvenile sheath of *Plectocomiopsis mira* has few spines and a tightly sheathing ocrea.



5. Ripe fruit of *Plectocomiopsis mira*.

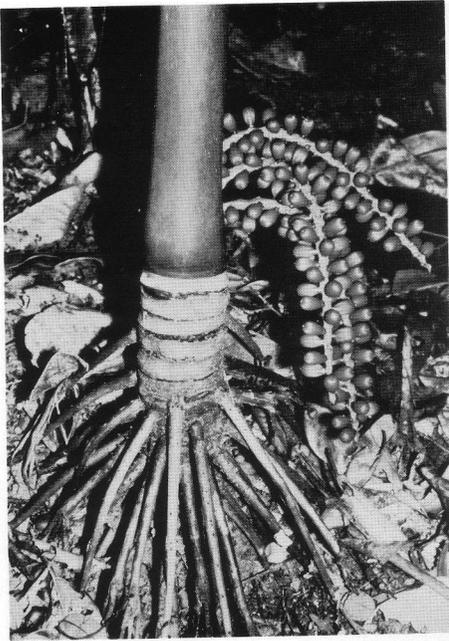


A



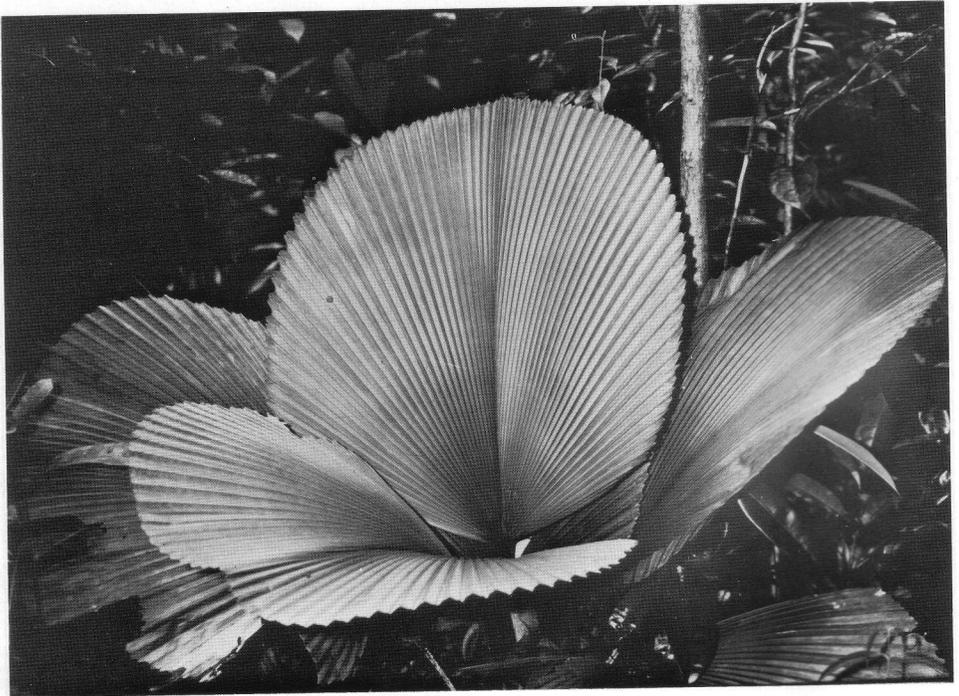
B

6. *Iguanura palmuncula* var. *magna*. A. The flowers (staminate shown here) are borne on very slender rachillae. B. The fruit are of a most unusual shape; note the basal stigmatic remains.



7. The stem base of *Pinanga crassipes* with its stiltroots.

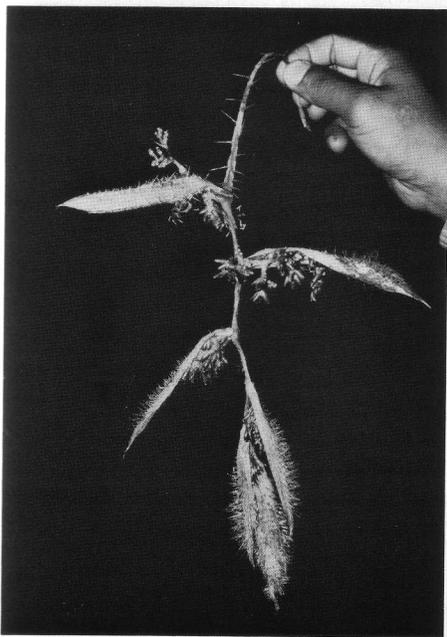
of *Pholidocarpus maiadum*, with dark green petioles brilliantly striped with yellow. Here too was an abundance of rattans such as *Daemonorops collarifera*, *D. lasiospatha* (Figs. 10, 11) and *D. formicaria* with ant galleries (Figs. 12, 13), *Korthalsia rostrata*, *Ceratolobus subangulatus* (Fig. 14), and *Calamus marginatus*. However the most exciting find was an undescribed, massive *Calamus* with a short stout erect trunk, and no climbing organs; its affinities appear to be with Malayan *C. castaneus* but this cannot be confirmed until the material arrives at Kew. We found male and female flowers at anthesis (Fig. 15), but though we plodded around, dodging the spines and coaxing our umbrellas through the thickets, we could find no fruit, except for a few fallen shells. A slender undergrowth *Pinanga* growing in colo-



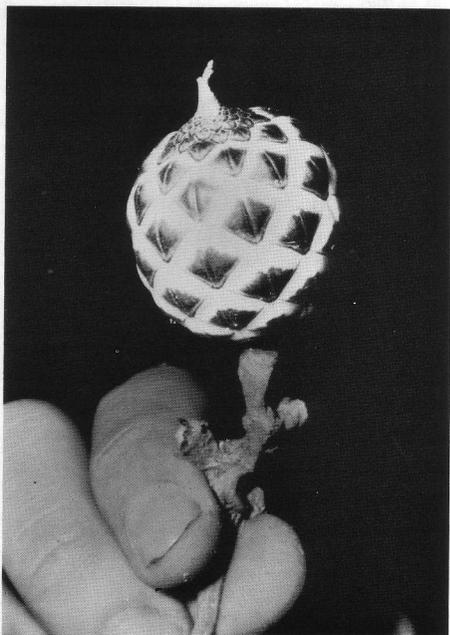
8. *Licuala orbicularis*, one of the finest palms of Sarawak.



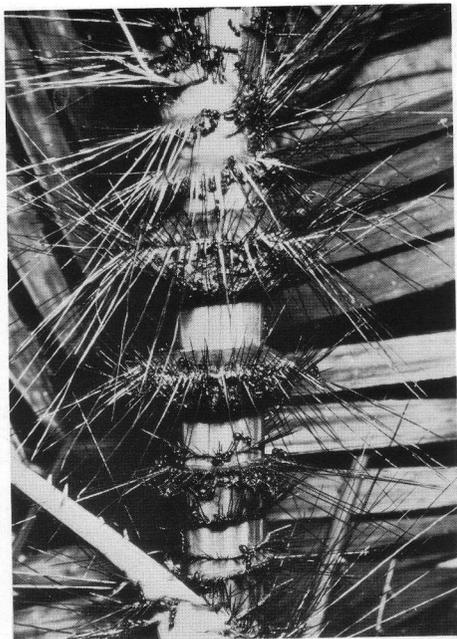
9. The leaves of *Licuala bidentata* are divided into very narrow single-fold segments.



10. The staminate inflorescence of *Daemonorops lasiospatha*.



11. The attractive fruit of *Daemonorops lasiospatha* contains thick sweet flesh.

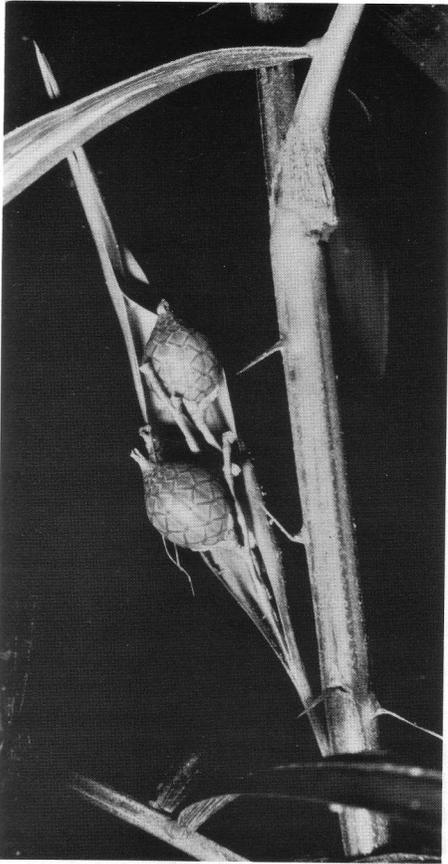


12. *Daemonorops formicaria* is a typical ant-rattan.

nies has proved to be a new species, quite widespread in *kerangas* forest in the Kuching area. We also found the elegant very slender *Calamus corrugatus*, with its corrugated sheaths and opposite broad leaflets. At a bend in the path we noted sterile *Calamus convallium* and a great thicket of *Retispatha dumetosa* (Figs. 16, 17). *Retispatha* is an endemic monotypic rattan genus I described as new in 1979; it forms thickets of short climbing stems, about the thickness of sugarcane; indeed, bare canes sufficiently resemble sugarcane for the rattan to be called "howi tebu bruang" (bear's sugar-cane rattan) in some parts of Borneo. Of my other new rattan genus, *Pogonotium*, we as yet saw no sign. We kept on leaving the logging trail and following a footpath (probably a hunters' path) through the *kerangas*, and then joining the trail again.

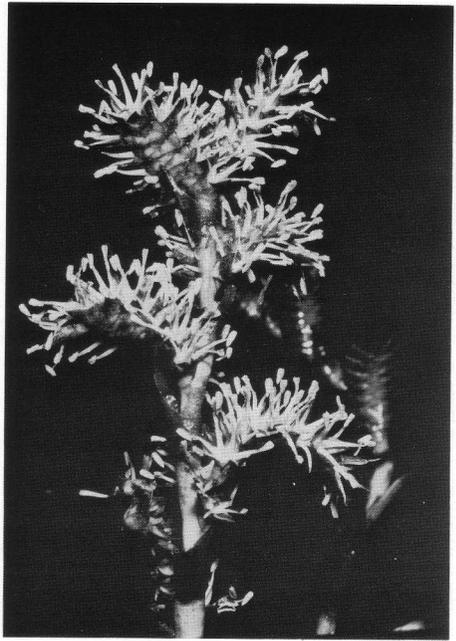


13. Despite the fierce ants and spines of the mature plant, seedlings of *Daemonorops formicaria* would make attractive pot-plants.



14. *Ceratolobus subangulatus* with almost ripe fruit.

Eventually we came up to a much steeper slope with sandstone boulders and *in situ* rock; here the logging trail turned abruptly away from the slope and joining the footpath again, we scrambled up the slope, using roots as handholds. Ten minutes of scrambling brought us to a short plateau covered with forest transitional between *kerangas* and mixed Dipterocarp forest—time for me to get my breath back while I pretended to examine the palms in detail, though there was little of great interest. Then we reached the main escarpment, and fortunately the rain abated. Forcing our way up the



15. Staminate flowers of an undescribed species of *Calamus*.

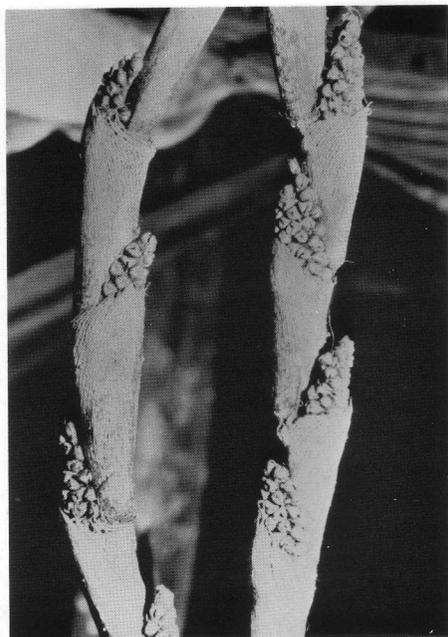
old hunting path was quite daunting with very little to hold on to, and the path slippery with rain, but after climbing up about 200 m we came out on a marvellous ridgetop covered in submontane *kerangas*. First thing to do was to get my breath back while Banyeng told how orang-utan used to frequent this very spot. We also admired a fine tree of *gaharu*, after which the mountain is named. This curious tree, *Aquilaria malaccensis* (Thymelaeaceae) is of enormous value, but only when diseased; the diseased heart wood is fragrant and is used in the manufacture of incense and joss-sticks. As it is almost impossible to know whether a tree will yield incense before cutting it, much mysticism and divination goes along with searching for *gaharu*.

The very lip of the escarpment was occupied by a thicket of *Pinanga angustisecta*, a clustering species with



16. *Retispatha dumetosa* forming a great thicket.

short erect stems bearing leaves finely divided into stiff dark green, close, single or double fold leaflets—an elegant plant. Away from the lip was an abundance of *Johannesteijsmannia altifrons*, *Licuala orbicularis* and *Daemonorops lasiospatha*, all lending a marvellously varied aspect to the forest. But it was between these obvious beauties that we began to find the choicest palms. Ahmad pointed out a few plants of *Pinanga veitchii* with broad bifid leaves dull liver-colored, mottled with dark brown on the upper surface, and purplish tinged beneath. No seed could we find, but what a fine ornamental this would make. *Pinanga tomentella* formed a great contrast (Fig. 18); its short erect stems bear about six very narrow undivided leaves, dark shiny green with a broad pale line down the middle, and on the undersurface, with a dense felt of pale hairs. We did see flowers and young but



17. The staminate flowers of *Retispatha dumetosa* are partly covered with net-like bracts.

no mature fruit. In 1975 I was successful in obtaining two ripe fruits of this species and one seedling grew at Kew for about 1 year before we lost it. It seems that the palms from *kerangas* are tantalizingly difficult to cultivate. Two more widespread *Pinanga* spp., *P. aristata* and *P. salicifolia* were also present; the former also has mottled leaves, and seems to be easier to cultivate than *P. tomentella*. We collected several Calami and noted an increasing abundance of *Iguanura palmuncula* var. *magna* as we started to walk westwards along the ridgetop.

Within a short distance we began to find seedlings of *Pogonotium ursinum*. This palm was first collected by Becari who found a specimen in male flower of a most extraordinary, short erect rattan on the summit of Gunung Matang above Kuching; this he named *Daemonorops ursina*, and after Becari's record it was not collected again



18. Banyeng holds two specimens of *Pinanga tomentella*.

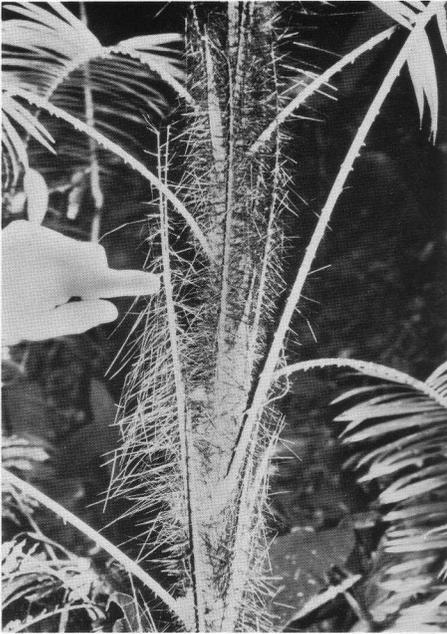


19. *Pogonotium ursinum*, a short erect rattan with beautiful regular leaflets.

until 1975 when I refound it in the type locality. Many aspects of the plant seemed not to fit *Daemonorops* and fortunately I was able to collect more or less complete material. Then I found a second species closely related to *D. ursina* in 1977 in the Gunung Mulu National Park. It was while working up my Mulu material that I realized that *D. ursina* and the Mulu plant could not be included in *Daemonorops* and created the new genus *Pogonotium* with *P. ursinum* and *P. divaricatum* as the two known species. One tends to show a proprietary interest in the genera and species one has described, and I certainly always become excited when finding *Pogonotium*. Not only is the genus rare, but it is morphologically very peculiar; furthermore *P. ursinum* is positively beautiful when young. The most curious vegetative feature of the genus is the presence of two erect ear-like pro-

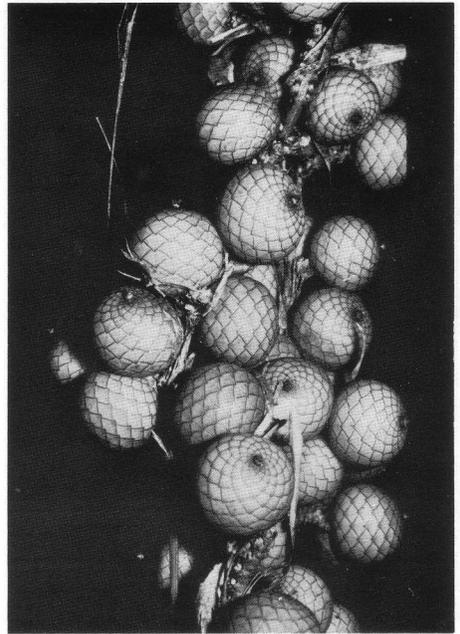
cesses on either side of the petiole base. *P. ursinum* has very many, close fine, delicately hairy leaflets on each side of the rachis; this coupled with the very fine black spines all over the sheaths and the ear-like processes lends a marvellous aspect to the plant (Figs. 19, 20). Here on the summit of the Klingkang Range was a population of this rare rattan much larger than in the type locality. What I wanted more than anything was to find mature fruit for distribution to the Seed Bank and to grow at Kew for a chromosome count. Alas, though we saw a few female plants, the fruit was not ripe. The inflorescence is almost hidden between the two ears, so looking for fruit entails careful searching of plant after plant.

The ridge we were following dropped very gently until we reached a swampy hollow with scattered plants of the rather coarse *Salacca affinis* and *S.*



20. Two erect spiny "ears" are found, one on each side of the base of the petiole in *Pogonotium ursinum*; the inflorescence sits between the "ears."

*vermicularis*, and a great abundance of *Pinanga tomentella* and *Areca mitata* with scattered plants of *P. aristata*. A small stream flowed southwards. Could we be in Indonesia? I suspect we were not, and that the stream merely flowed down to the face of some sandstone cliffs before continuing into Sarawak. At this moment the sun came out briefly and, as it was already after noon, we decided to have lunch. Out of Banyeng's rattan carrying basket (or "selabit") came bundles of rice, bottles of cold coffee, some fried cabbage, and that was all. There was no sign of the curried, fried salt fish which had smelled so delicious when it had been cooking at breakfast time. We had of course forgotten it, and so lunch was frugal indeed. Two packets of fried peanuts discovered in



21. Ripe fruits of *Calamus eriocanthus*.

the bottom of my rattan basket saved the day by helping to get the rice down!

After lunch we abandoned as much of our luggage as possible and climbed steeply up through increasingly mossy forest developed on a slope strewn with great sandstone blocks. Here we saw fine *Pogonotium ursinum* again, but *Johannesteijsmannia altifrons* and *Licuala orbicularis* ceased and the forest took on a more montane aspect. We found our first plants of another new species of *Pinanga* which also grows in the lowlands at Bako National Park; it has curious thick, almost fleshy, narrow opposite leaflets, and a short inflorescence with four branches. At the top of the boulder strewn slope we reached a sheer rock face about 10 m high which, so Banyeng assured us, was the topmost wall of the Klingkang Range. The face was covered with fine gesnerads, *Neckia malayana*, filmy ferns, and bryo-

phytes, with the sunlight sparkling on the drops of moisture on every leaf. On the top of the rock face billowing masses of moss and shrubs leaned over the edge.

Our path followed the foot of the wall, zigzagging north then west, then south, and eventually we reached a steep boulder strewn slope allowing us to climb up on to the summit plateau, noting *Calamus zonatus*, *C. eriocanthus* (Fig. 21), and *Daemonorops atra* on the way. The path ended in a magical area of huge sandstone blocks covered in mossy forest. We could wend our way along ledges, squeeze between two 5 m high walls of sandstone, creep through tunnels beneath the blocks, and come out into mossy glades overlooking small pools, with everywhere the tinkling of underground streams. The sun went in and thunder sounded—over Indonesia? Or were we in Indonesia? By the time we had snaked our way amongst the blocks, it was difficult to be certain where we were. Thanks to the tree slashes Banyeng and Salang had made we were in little danger of losing our way. Besides the palms were so wonderful, it seemed not to matter where we were.

The new species of *Pinanga* was common everywhere as was *Pogonotium*. We noted a slender *Calamus* related to *C. nematospadix* which we had seen two weeks earlier on Gunung Pueh. However the most interesting rattan was an even more slender species with leaves bearing 5 cm long irregular leaflets. The inflorescences of this *Calamus* appear to revert to vegetative shoots quite commonly, so the base of the stem was often surrounded by old inflorescences bearing new plants at their tips. *Calamus pygmaeus* of Gunung Matang is one of the very few species which behave in this way—but this was not *C. pygmaeus*.

(I now have a tantalizing wait while the material is sorted in Kuching and sent sea mail to Kew.) About 2 p.m. we reached a cliff face and were able, after a bit of scrambling and tree climbing, to look out through the forest over the edge. By this time, however, great bands of cloud were massing on all sides and we could see little but mist and tree tops. We never did find out where we were. As the thunder crashed around increasingly, we decided to retreat, admiring on the way flowering *Bulbophyllum uniflorum* with rotten-fish scented flowers, and a truly exquisite *Dendrobium* with delicate salmon-pink flowers about 5 cm across, borne on wiry, grass-like stems.

As we retraced the path between the blocks I realized that a low rattan with very sparse divaricate leaflets (about ten on each side of the rachis) was not the seedling of a *Calamus* but a *Pogonotium*. There at the base of the petiole were two short erect ears, and between the ears the characteristic small inflorescence, bearing unusually pointed fruit. Immense excitement ensued. This was obviously not *P. ursinum*, neither could it be *P. divaricatum*. It was certainly new and I had almost completely overlooked it. We searched and searched but could find only two female plants and several minute seedlings. The seedling leaves with a single pair of opposite divaricate leaflets are quite different from the fern-like seedling leaves of *P. ursinum*. There do seem to be a wealth of differences between the three taxa, but again, nothing further can be done before the material arrives at Kew. It was now 2:45 p.m. and darkening rapidly, and just as we left the plateau I found a solitary palmlet which proved to be a new species of *Areca* related to the recently described *Areca abdulrahmanii*. I dislike finding new things

at the end of the day's trail because I always have the feeling that I may have missed things. Of course we should have spent at least two days on the summit plateau, but time had run out. We began the mad scramble down the block slope to our lunch spot. As we collected up our belongings the heavens opened and not even the leaves of *Licuala orbicularis* could keep off the downpour, let alone my folding umbrella. It became very very wet and the scramble down the main escarpment was particularly nasty; when we reached the logging trail umbrellas and palm leaves could be sported with safety but we were all drenched. Fortunately we found a shorter way back along the trails, avoiding the minor summit we had ascended in the morning.

By the time the downpour changed to a gentle drizzle we had already descended to 300 m altitude, slipping horribly through the tunnels of the coarse fern *Blechnum orientale* on the deserted logging trails. At one point we glimpsed the brilliant blue of the Forest Department land cruiser waiting for us at the bottom, and about ten minutes later we reached it.

By 4:30 p.m. we were back beside the main road in a coffee shop with Soejatmi, drinking beer, enthusing about the palms, and totting up the list of species noted that day. In all we had seen (though not collected) a total of 61 different species since breakfast. There can be few places where a day's walk will produce such a large collection of palms. So rich is the area of Sabal Tapang Forest Reserve, that I have provided a checklist of the palms observed during the four days we worked there.

CHECKLIST OF PALMS OF SABAL TAPANG  
FOREST RESERVE, FIRST DIVISION,  
SARAWAK

- Johannesteijsmannia altifrons  
(Reichb. f. et. Zoll.) H. E. Moore  
Pholidocarpus maiadum Becc.  
Licuala bidentata Becc.  
L. furcata Becc.  
L. orbicularis Becc.  
L. petiolulata Becc.  
L. valida Becc.  
Korthalsia cheb Becc.  
K. debilis Bl.  
K. echinometra Becc.  
K. furcata Becc.  
K. jala J. Dransf.  
K. rigida Bl.  
K. rostrata Bl.  
Eugeissona insignis Becc.  
Salacca affinis Griff.  
S. vermicularis Becc.  
Eleiodoxa conferta (Griff.) Burr.  
Plectocomia mulleri Bl.  
Plectocomiopsis mira J. Dransf.  
Retispatha dumetosa J. Dransf.  
Daemonorops acanthobola Becc.  
D. atra J. Dransf.  
D. collarifera Becc.  
D. cristata Becc.  
D. didymophylla Becc.  
D. fissa B.  
D. formicaria Becc.  
D. hystrix (Griff.) Mart. var. exulans Becc.  
D. lasiospatha Furt.  
D. longipes (Griff.) Mart.  
D. micracantha (Griff.) Becc.  
D. microstachys Becc.  
D. sabut Becc.  
D. sp. aff. D. didymophylla Becc.  
D. sp. aff. D. florida Becc.  
Calamus conirostris Becc.  
C. convallium J. Dransf.  
C. corrugatus Becc.  
C. eriocanthus Becc.  
C. flabellatus Becc.  
C. gonospermus Becc.  
C. hewittianus Becc.  
C. javensis Bl.  
C. laevigatus Mart. var. laevigatus  
C. laevigatus Mart. var. mucronatus (Becc.) J.  
Dransf.  
C. marginatus (Bl.) Mart.  
C. muricatus Becc.  
C. optimus Becc.

*C. paspalanthus* Becc.  
*C. pogonacanthus* Becc.  
*C. pseudoulur* Becc.  
*C. scabrifolius* Becc.  
*C. zonatus* Becc.  
*C. sp. aff. C. ashtonii* J. Dransf.  
*C. sp. aff. C. castaneus* Griff.  
*C. sp. aff. C. nematospadix* Becc.  
*C. sp. aff. C. nielsenii* J. Dransf.  
*Pogonotium ursinum* J. Dransf.  
*P. nov. sp.*  
*Ceratolobus concolor* Bl.  
*C. discolor* Becc.  
*C. subangulatus* (Miq.) Becc.  
*Nenga pumila* (Mart.) H. Wendl.  
*Pinanga angustisecta* Becc.  
*P. aristata* (Burr.) J. Dransf.  
*P. crassipes* Becc.  
*P. dumetosa* J. Dransf.  
*P. salicifolia* Bl.  
*P. sessilifolia* Furt.  
*P. tomentella* Becc.

*P. veitchii* H. Wendl.  
*P. nov. sp.*  
*P. nov. sp.*  
*Areca minuta* Scheff.  
*A. sp. aff. A. abdulrahmanii* J. Dransf.  
*Iguanura palmuncula* Becc. var. *magna* Kiew.

### Acknowledgments

My sincere thanks go to the Director of the Forest Department, Mr. Joseph Yong and the Senior Forest Botanist, Mr. Paul Chai, who invited me to Sarawak and who gave me every facility for collecting palms, and to their staff. Funding for the expedition was partly from Royal Botanic Gardens, Kew and partly from the Sarawak Forest Department.

### Harold E. Moore, Jr.

This volume, PRINCIPES 26, 1982 is dedicated to Harold E. Moore, Jr., the world's foremost student of palms and talented editor of PRINCIPES from July 1957 until his unexpected death in October 1980. The volume will include articles about him and papers in his honor as well as writings that he had prepared but not published.

There is still time to send copy for the July and October issues. We will welcome anecdotes, letters, pictures, and articles of any length pertaining to or in honor of Hal. Send them to: Natalie W. Uhl, 467 Mann Library, Cornell University, Ithaca, N.Y. 14853, USA.

THE EDITORS