Maxburretia rupicola

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The limestone hills of the Malay peninsula are natural features of great beauty, relicts of an ancient calcareous mantle, now rising sheer from flat alluvial plains. The lower parts are mostly precipitous cliff; on the tops is a dense low forest quite different in composition from the rain forests of the rest of the country.

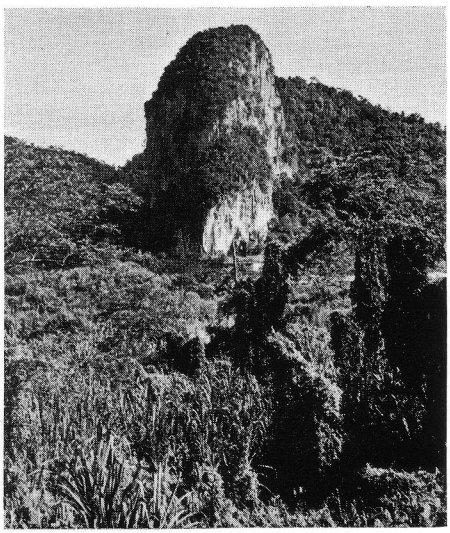
In Selangor state, a few miles north of the capital Kuala Lumpur, arise three limestone hills, Batu Caves, Bukit Takun and Bukit Anak Takun,* which until 1968 were thought to be the southernmost limestone outcrops on the mainland of Asia, a distinction which now goes to an outcrop near Kota Tinggi in Johore, only 20 miles north of Singapore.

These three limestone hills in Selangor are the habitat of *Maxburretia rupicola* (Ridley) Furtado, a dainty little corypheid fan palm, named for Dr. Max Burret of Berlin by Furtado in 1941, following his discovery that Ridley (1904) had been wrong to put the species into *Livistona*, and wrong to include with it the other Malayan limestone palm now known as *Liberbaileya gracilis* (Burret) Burret & Potztal (see Moore, 1967, Whitmore, 1970).

Maxburretia grows in the black humic soil of crevices in the limestone, sometimes in the open, sometimes under light forest shade. The stems grow to about 1 m. (3 ft.) tall, rarely more, are erect or leaning, and are entirely swathed in a thick mass of finely fibrous black old leaf sheaths; they are usually solitary but clumps of up to three have been found. The fronds are stiff, deeply and narrowly divided, and slightly smoky green below. The inflorescences are erect panicles ca. ½ to ⅔ m. (1½–2 ft.) tall, with usually five or six partial inflorescences of numerous slender branchlets. The flowers are corn yellow and fragrant. Mature fruits are ellipsoid, ripening shiny black, thinly fleshy, 6 mm. long; young ones are 4 mm. long, green and finely whiskery; the endosperm is homogeneous.

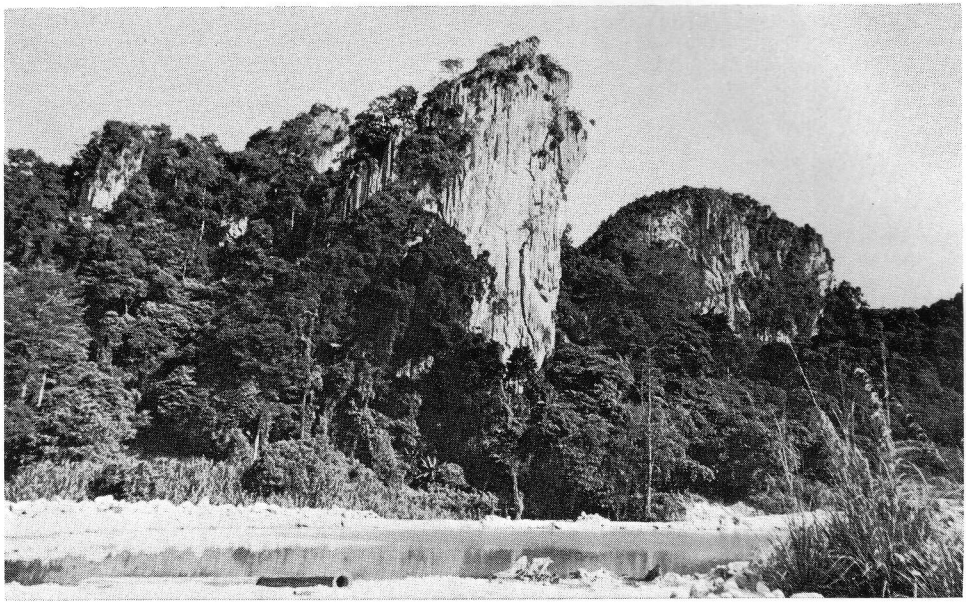
Furtado described both *Liberbaileya* and *Maxburretia* in the same paper and as dioecious species, *i.e.* with separate male and female plants. In his discussion, but not the Latin descriptions, he mentions "traces of polygamous spadices."

When I discovered recently (Whitmore, 1970) that *Liberbaileya* actually

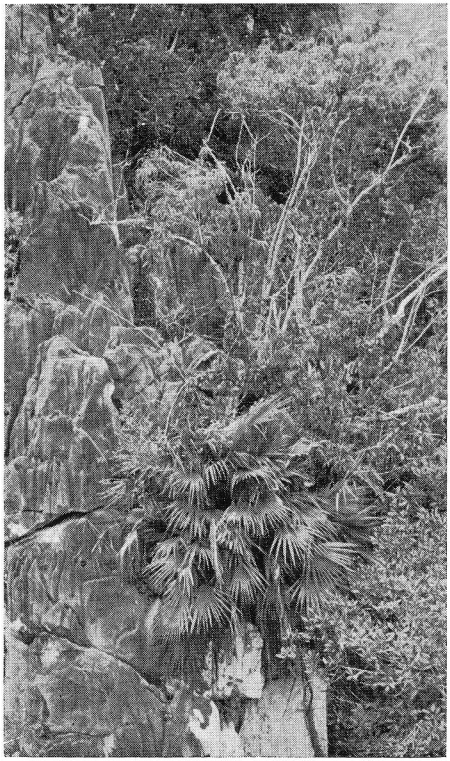


1. Bukit Takun rising sheer from the valley floor, as seen from the trunk road.

* Malay: *bukit*—hill, *anak*—child.



2. Bukit Anak Takun and (right) Takun itself. In the foreground a tin mine within the Templer Park.



has hermaphrodite flowers, which incidentally is by far the commonest condition in this subfamily, it was natural to have a careful look at *Maxburretia*. Examination of all the collections at the Kepong and Singapore Botanic Garden herbaria, followed by a morning on Bt. Anak Takun, led to the discovery that *Maxburretia* has both male plants and hermaphrodite ones, with the latter much more abundant on Bt. Anak Takun. Furthermore there is a difference in inflorescence structure. The hermaphrodite panicles have two orders of branching in the partial inflorescences and the branchlets are fairly straight. The male ones have three orders of branching except in the topmost partial inflorescences, with the branchlets slender, finely zigzag and forming a dense mass somewhat reminiscent of a witches'-broom.

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3. *Maxburretia*, an exposed plant on the summit crags of Bt. Anak Takun.

4. *Maxburretia*, an unusually tall specimen; with Gi.

5. *Maxburretia*, a branched plant showing the dead fibrous leaf sheaths (photo P. R. Wycherley).

The flowers differ in size and shape. Hermaphrodite flowers are campanulate and ca. 2.5 mm. long by 2 mm. broad; the petals are broadly triangular. The anthers are oblong to triangular-oblong and ca. 5 mm. long, later shrivelling. Male flowers are oblong, and slightly smaller, ca. 2 mm. long by 0.9 mm. broad, with oblong, acute petals. There is either no trace of a pistillode at all (*SFN 34370* inflorescence b), or a tiny knob (*KEP 39585*), or 3 tiny discrete vestigial carpels (*KEP 56257*, *KEP 99501*). In both types of flower the petals are coriaceous and finely striate on the outer surface.

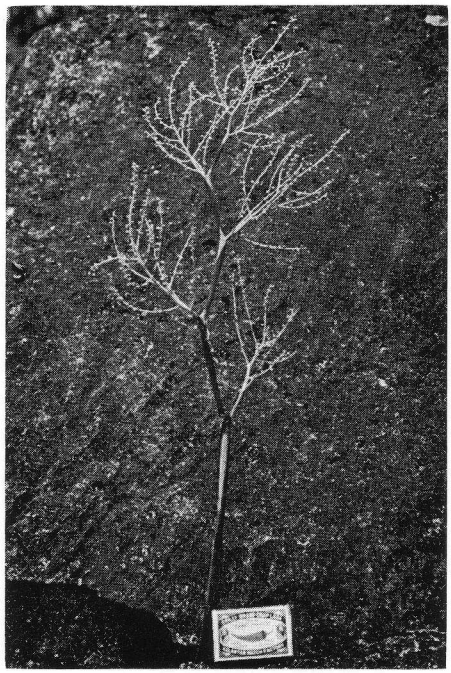
The type collection of *Livistona rupicola* (*Ridley 8285*) at Singapore has no flowers or fruits left; the inflorescence is of the hermaphrodite type and was presumably in flower because Ridley does not mention fruit. Furtado based his description of *Maxburretia rupicola* on the only other sheet at Singapore, *Nur SFN 34370*. This collection has three separate detached inflorescences; nearly all the flowers have dropped off and are preserved in a capsule. I dissected a few of the remaining attached flowers. Inflorescences (a) and (c) are of the hermaphrodite type and have old hermaphrodite flowers in very young fruit, the anthers are 0.3–0.5 mm. long and empty, with signs of deep splits along the lateral faces. Inflorescence (b) is male with the finer branching described above and with well developed male flowers bearing fat anthers 0.5 mm. long not yet dehisced.

Furtado had only two collections to work on, one with no flowers remaining, the other a mixture from several plants. My interpretation differs from his in regarding his "female" flowers as old hermaphrodite ones in which the anthers have dehisced and shrivelled. He did not notice that there are two kinds of inflorescence associated with the different kinds of flowers. I have found no trace of the "polygamous spadices" mentioned *en passant* in his discussion.

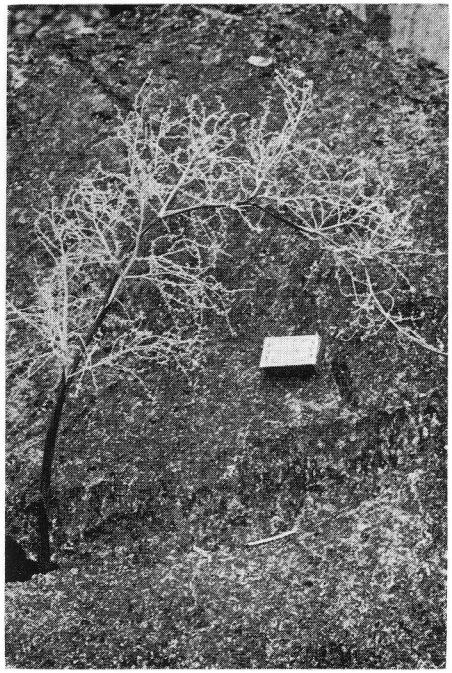
On Bt. Anak Takun I observed that hermaphrodite panicles are strongly acropetal in flower development: the lower partial inflorescences are often in young fruit while the upper ones are in flower. On male plants the flowers drop after opening leaving bare panicles which slowly wither away. Most of the plants were in flower when I visited the hill on 13 June 1970.

Maxburretia is easy to see on the cliffs at Batu Caves, a well known tourist spot (though quarrying is fast removing the habitat) and also on the two Takun outcrops, a few miles further north in the Templer Park and further from the road. It is a tough scramble to reach any of these plants, and local guides should be employed. It is curious that this palm has never been found on any of the other limestone hills in Malaya, some of which have their own peculiarities. *Maxburretia*, the outstanding plant of the Selangor limestone, in fact epitomizes the fantastic richness and local endemism of the flora of Malaya, and it is fortunate that at least the part of its habitat in Templer Park is fairly secure from destruction.

6. *Maxburretia*, hermaphrodite plant in flower (photo P. R. Wycherley).

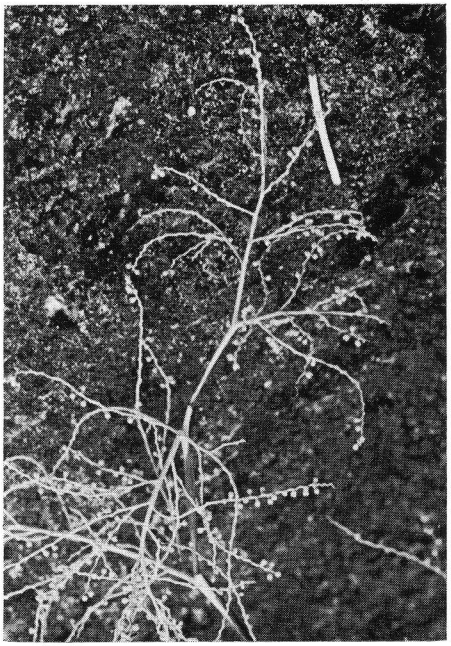


7. *Maxburretia*, hermaphrodite panicle.

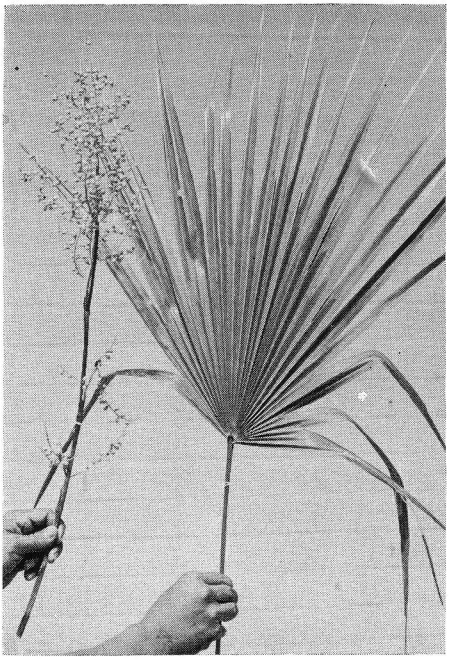


9. *Maxburretia*, male panicle.

8. *Maxburretia*, hermaphrodite partial inflorescence with two orders of stiff branchlets.



10. *Maxburretia*, end of male panicle showing three orders of sinuous branchlets except at tip with two orders only.



11. *Maxburretia*, leaf and infructescence.

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Maxburretia in Thailand

While sorting through the unmounted palm material in the Herbarium Bogoriense, Bogor, I came across a collection of a small fan palm from a limestone ridge in South Thailand near Surat Thani. The locality and habitat details are as follows: Surat, Khao Phra Rahu, 300 m. Common on limestone ridge. 4th Unesco Training Expedition. Leg. *T. Smitinand & H. Sleumer, No. 1230*, 22.9.1963.

The collection obviously represented *Liberbaileya*, *Maxburretia* or another new coryphoid genus. Close examination of the flowers (male) and vegetative structures have shown it to be *Maxburretia rupicola* (Ridley) Furtado. This remarkable collection about 400 miles north of the only other locality of *Maxburretia* in Selangor, Malaya, goes to emphasize how little is known of the palm flora of South Thailand. Maybe we can expect further localities of *Maxburretia* and possibly *Liberbaileya* in the future. The distribution of *Maxburretia* is shown to be extremely disjunct.

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