

Wednesdays in Africa

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The palms of Africa are few compared with those of the American and Asiatic tropics but some of them are of especial interest because their relationships are not yet well understood. The late L. H. Bailey was preparing to undertake their study in 1950 in his 93rd year when a fall and broken hip precluded further field work. Various subsequent attempts to obtain the stages and kinds of preserved materials needed for anatomical and taxonomic studies of three crucial genera have largely failed. Thus, when an opportunity to participate in a symposium in Ghana in early 1971 presented itself, plans were made to look for *Podococcus*, *Sclerosperma*, and *Wismannia*. The symposium, unfortunately, was cancelled, but a beginning has been made on the projected field program in Africa, subsequently extended to include Madagascar, the Mascarene Islands, Indonesia, and further work in the Pacific.

Technical studies will follow ultimately but a more general account of some of the palms and of the collecting of them may interest those palm enthusiasts less mobile than the writer. The field program was preceded in late February by two days at the Muséum National d'Histoire Naturelle in Paris where much assistance, acknowledged separately, contributed very largely to what success followed in Gabon, Djibouti (Territoire Français des Afars et des Issas), and Madagascar. Work in Ghana was the realization of plans originally made for but not accomplished in 1969.

Ghana and *Sclerosperma*

Several years ago, Mr. J. B. Hall and Mr. A. A. Enti of the University of

Ghana at Legon, Accra, discovered plants of the strange arecoid genus *Sclerosperma* in the Ankasa Forest Reserve in southwestern Ghana not far from the border with Côte d'Ivoire and some hundreds of miles west of previously known stations in Nigeria, Fernando Po, Cameroun, Gabon, and Angola. Mr. Hall had most kindly sent vegetative material for study as well as a live plant which failed to endure the journey by air, but additional material of *Sclerosperma* was desired as well as material of the lepidocaryoid lianes *Ancistrophyllum* and *Eremospatha*, noteworthy for their perfect flowers. Hence, in planning a study and collecting trip to Africa, Ghana became a logical first stop, and in the early evening of Sunday, February 28th, I stepped off the plane from London at Accra to find Mr. Hall waiting.

A day of preparation followed after which, on March 2nd, four of us—Mr. A. A. Enti, Curator of the Herbarium, a driver, an herbarium assistant, and myself—set off by Land Rover to set up headquarters in the rest house of a government experiment station at Aiyinasi some 215 miles from the university. Much of the trip was across the Accra Plain, a dry savanna with *Phoenix reclinata* and occasional *Elaeis guineensis* in wet or moist areas, now and then an isolated *Borassus aethiopum*. Near Takoradi, however, we drove by a substantial stand of *Borassus*. More than 100 individuals were associated with dry ground and former or present habitation, according to Mr. Enti—for man has apparently played a part in distributing this species, the fruit of which may serve



1. *Ancistrophyllum secundiflorum* stems terminate in an inflorescence on a plant near the Ankasa Forest Reserve.

as an emergency food in difficult times. Most of the trees bore ripe orange-brown fruit on pendulous spikes or bore old staminate inflorescences, and all were swollen, usually about or above the middle of the gray trunk.

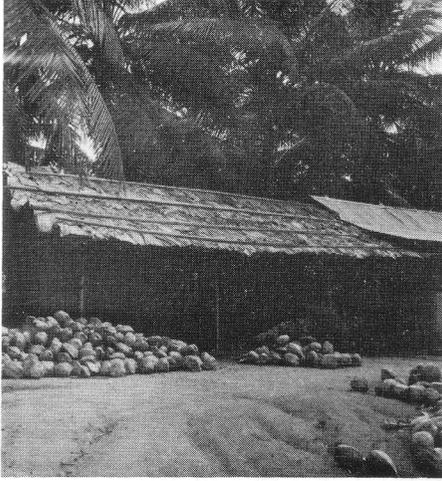
We stopped at Axim Junction beyond Takoradi for an impromptu lunch and shortly thereafter we encountered our first liane, *Ancistrophyllum secundiflorum*, in thickets of secondary growth near the road. As we continued into the wetter part of the country where cacao and rubber are much cultivated, the *Ancistrophyllum* became more abundant, most often in low wet areas near the road, for the species invades this habitat readily. To find mature fertile individuals, however, we had to wait for primary rain forest near the forest reserve at Ankasa.

Ancistrophyllum and its near relatives *Eremospatha* and *Oncocalamus* are particularly interesting to one familiar with the American cocosoid genus *Desmoncus* because, like *Desmoncus*, the pinnae along the terminal part of the leaf are

modified into reflexed hooks which serve as grappling devices for the climbing plant. Stems of *Ancistrophyllum* are clustered like those of many if not all species of *Desmoncus* and most other lepidocaryoid lianes such as the African genera mentioned and *Calamus*, *Daemonorops*, *Korthalsia*, *Plectocomia*. Old growth of the plant we collected at Ananyi between Axim Junction and Axim had been burned but about six new stems were visible. When one was cut for anatomical specimens, the presence of large black ants in the long ocrea or ligule above the petiole became evident through sight and bite. Similarly, prickles in two lines along the ocrea and irregularly along the petiole and sheath made themselves felt. When later we found a fruiting stem with its terminal inflorescence (Fig. 1), the same kind of ants was present. Moreover, by the Ankasa River, similar but smaller ants inhabited the ocrea of *Ancistrophyllum opacum*, this a species smaller in all parts and with more or less sigmoid pinnae borne in groups along the rachis instead of linear and regularly arranged pinnae as in *A. secundiflorum*.

Many of the botanists at Cornell lunch together in one of the laboratories on Wednesdays during school term and I had promised to try to write a note on occasion to keep my colleagues posted. This day of the week, oddly enough, became associated with good luck during the trip, either because a rare palm was actually found or because arrangements for getting to or from such a palm were made on Wednesday. Our first day in the true rain forest of Ghana was Wednesday, March 3rd; our goal was to find flowering and/or fruiting material of *Sclerosperma*; our accomplishment, as may now be anticipated, was positive.

Setting off early from Aiyinasi, we stopped at a little village called Compound, where houses were thatched with



2. Leaves of *Sclerosperma* are used to thatch houses in the village of Compound.



3. A leaf of *Sclerosperma* stands twice as high as Mr. Enti (right) and Abu da Gomba (left).

leaves of *Sclerosperma* (Fig. 2), to pick up a local assistant and guide. The man of Mr. Enti's acquaintance being away from the village, we were accompanied by an older man, Abu da Gomba, who led us to a splendid stand of *Sclerosperma* a little south of Ankasa in a valley-bottom forest on sandy loam in low, undulating country. The soil is usually waterlogged or flooded, but becomes friable when dry and supports an open forest of such dicotyledonous associates as *Uapaca guineense*, *Musanga cecropioides*, *Carapa procera*, *Xylopia Staudtii*, *Tarrietia utilis*, *Libertodendron splendida*, and a vine of the genus *Dicellandra*. Four palms occurred here—*Raphia Hookeri*, *Calamus deeratus* (immediately identifiable by the prickly flagella on the leaf-sheaths and the slender pinnae in clusters), a sterile *Eremospatha*, and *Sclerosperma* in abundance, most frequent in low wet areas but extending up the gentle slopes to drier ground.

The stems of *Sclerosperma* are usually creeping and branch to form clumps up to five feet in diameter with undivided leaves taller than a man on the most

vigorous plants in the wettest sites (Fig. 3). One clump, however, grew differently from the rest. Here the stems were erect to a height of about five feet and a diameter of nearly four inches with leaves smaller than usual. Blades as much as 62 cm. across at the middle are elongate-cuneate, cleft at the apex, and with a slender fiber continuing the rachis which itself is about two meters long. Three or four large leaves are often accompanied by considerably smaller, more deeply cleft leaves on sucker shoots. Debris of fallen leaves and water-borne materials accumulates to some height among the petioles and obscures the true bases so that for our first two hours we poked in the crowns of literally hundreds of plants searching for flowers or fruit.

Just when we had independently nearly concluded there was no hope, Mr. Enti discovered one plant with a young inflorescence still covered by bracts in the axil of a leaf. Spurred on by this



4. The inflorescence of *Sclerosperma* emerges from a leaf axil at ground level. Note debris among the leaves.

find, we continued our search until Mr. Enti discovered a plant in full staminate flower and then another close by it. The inflorescences, borne in the axil of the most forward leaf, are enclosed at the base by fibrous prophyll and bract which completely obscure the few pistillate buds at the base of the spike (Fig. 4). Staminate flowers are tan with a tinge of red, emitting abundant pollen on touch but without evident scent. Although we searched further, only the two individuals in flower and one in bud were found fertile. Fruit, if present, completely eluded us.

By noon, when I thought of my colleagues lunching at Cornell, we had preserved material and herbarium specimens ready for later study. After our own roadside lunch, we continued to a forest about half a mile south of the Ankasa River where we spent the afternoon gathering a fruiting plant of *Ancistrophyllum secundiflorum* and two

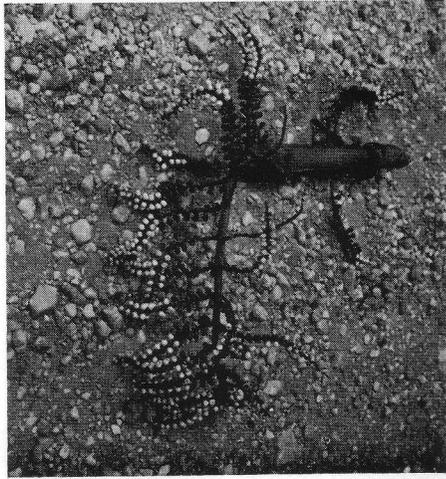
sorts of *Eremospatha*, one slender, one stout, both sterile but recognizable by the smooth leaf-sheath and short ocrea.

Thursday saw us back at Ankasa in the vicinity of the Ankasa River, this time with the axeman we had sought the day before. He was to serve a most useful purpose quite apart from cutting a large tree on which Mr. Enti had spotted some orchids which he thought might represent an undescribed species. While the tree was being studied, I wandered down the road, spotted something pale in a tree of *Parkia bicolor* a hundred feet high, and with binoculars determined the source as the inflorescence of *Eremospatha*. Thus that tree was also felled while Mr. Enti, his assistant, and I followed the Ankasa River upstream to a stand of *Raphia Palma-Pinus* which took the rest of the morning to get into notes, photographs, and herbarium material.

There are three species of *Raphia* in Ghana—*R. Hookeri*, *R. Palma-Pinus*, and *R. sudanica*. The last we did not see but the first two grew together near the river in a swampy area. *Raphia Hookeri*, which Dr. Tomlinson had previously collected in an ample series, suckers but develops a prominent trunk with pneumatophores at the base, shorter petioles orangish below, pinnae in several planes, and very prominent greyish coarse fibers which curl away from the leaf-sheath. *Raphia Palma-Pinus* also suckers but develops a less prominent stem and a grooved, elongate, green petiole above which occurs a prominent erect ligule more than a meter long. This ligule disintegrates into straight fibers markedly distinct from the fibers of *R. Hookeri*. The leaves are also less "ragged"—most of the pinnae are borne horizontally with every fourth or fifth at mid-leaf directed upward in a second plane to give a somewhat two-ranked effect. We saw *Raphia Palma-Pinus*



5. *Raphia Hookeri* is abundant in wet places near the road in southwestern Ghana.



6. *Eremospatha* inflorescences are borne in leaf axils unlike those of *Ancistrophyllum*. The flowers are white.

only here but returning to Accra we encountered many stands of *Raphia Hookeri* prominent in swamps along the road (Fig. 5).

Raphia and lunch finished, we returned to the felled *Parkia* in the crown of which the once inaccessible flowers of *Eremospatha* were now within reach (Fig. 6). Unlike *Ancistrophyllum*, the stems of *Eremospatha* do not terminate in an inflorescence but produce axillary inflorescences over a long period, the branches being more or less two-ranked along the inflorescence axis. Those branches obtained by us had creamy white or almost yellow buds and flowers, the last opening by a triradiate cleft to expose yellow anthers. Other flowers, usually toward the base of the branches, were reddish-black and either spent or fertilized.

Following the success with *Eremospatha*, we searched the roadsides of the Ankasa Reserve and as far as the border village of Elubo without further sight of flowering lianes. Time being up, we headed back to Aiyinasi to process materials and pack up for the return to Accra on Friday.

Gabon and Podococcus

Podococcus, a small genus of arecoid palms of uncertain alliance, has been on the list of desiderata for anatomical and other studies for many years. All attempts to obtain material having failed and a good locality in Gabon having been suggested by M. Nicolas Hallé at Paris as a result of his field work, a visit to Gabon was the second project in West Africa.

Again Wednesday was the lucky day, this time March 10th. Four days had been planned for Gabon but a strike on the French airline that was to have started me toward Ethiopia and Djibouti on Saturday made a drastic revision of plans necessary. I arrived in Libreville from Ghana on Tuesday afternoon. When the airline office had been located, was found open, and all alternatives considered it was 4:00 P.M. and I had until 6:00 A.M. on Thursday to find *Podococcus*. I had planned to visit a forestry center for advice on transport and assistants. The center, however, lay well out of town and I knew no one personally.



7. *Sclerosperma* in Gabon has pinnately divided leaf blades.

So, having noted a car-rental agency associated with the airport bus, I found its offices and by closing time had arranged for a car and driver to be ready at 6:00 next morning.

We had been unable to locate any road map of Gabon but with the aid of a small sketch-map prepared by M. Hallé, the driver and I set out at first light to locate the village of Nkam. At Kougouleu on the Kango road, we turned toward Kingalé and, with questioning along the way, found the correct turn toward Mela, Nkam, and Merounden, reaching Nkam about 10:00 A.M. after brief stops to collect anatomical material from vegetative plants of a third lepidocaryoid genus, *Oncocalamus*, and to collect and photograph sterile *Sclerosperma* with dissected leaves in a swamp by the road. (Fig. 7).

At Nkam, my chauffeur undertook to explain my desires without evident success. It turned out, however, that the chief of the village, M. le Chef Martin Ndungu, spoke French and remembered

M. Hallé well from his stay of several days a few years ago. Contact thus established, the chief himself served as guide and we set off for the forest behind the village at 10:30, passing through some cultivated plots and down a slight slope to a small stream where we stepped over sterile plants of *Sclerosperma* or *Akora* in the Lofang language. On ascending the opposite slope within the edge of the forest, I saw the distinctive wedge-shaped leaflets of a small palm. Excitedly telling the chief that this was the plant I had come for, I learned that he called it *Atzilim* and that it was common. All along the trail in this beautiful virgin forest we found various stages of fruit and bud but only when we arrived at the border of a small stream were there any plants in flower. There, however, good series in male flower were obtained and I also learned why the chief carried a gun—the holes in the muddy trail were fresh elephant tracks but in a situation far different from my only other experience with elephants in the open spaces of Amboselli Park in Kenya.

No elephants interfered this day and by noon we were back in Nkam where we waited for one of the village women to return from a hunt for *Sclerosperma* fruits. The hunt was a success since three fresh inflorescences with mature or nearly mature fruits almost violet in color were brought in together with a quantity of older fruits that had been collected earlier for the edible seeds. The whole spike is only a few inches long with few closely set fruits and certainly not likely to be obvious to the casual observer. Thus the unsuccessful search for fruit in Ghana was successful here. Palms of the two areas do differ, however, in the leaf as a comparison of Figures 3 and 7 will show. I think it likely that these represent mere leaf forms such as one finds in other species, though popu-

lations have undivided leaves consistently in Ghana (except when torn by wind), pinnate leaves in Gabon. Until the question can be more carefully considered, I refrain from using specific epithets.

Podococcus, our main achievement, is a most attractive little palm, more so than the accompanying poor photograph (Fig. 8) can suggest. The stems are slender, mostly three to four, rarely to five feet high and forming colonies or open tufts by means of slender rhizomes. The cuneate pinnae are green on both sides and pendulous fruiting spikes with stalked orange succulent fruits are prominent among the leaves. Inflorescences in bud or at anthesis are brown, erect, covered with green buds and flowers which are far less conspicuous. It is to be hoped that seeds collected and forwarded to the United States will germinate so that we may examine this interesting palm even more closely.

Mission accomplished, we set out for the return, losing an hour and 50 kilometers on a wrong turn and losing a handsome fruiting stem of *Ancistrophyllum secundiflorum* for lack of man-power to pull it from the trees which it held onto far beyond my ability to pull and haul in swamp mud. These were minor losses for a day so eminently successful despite the odds that had seemed against success the previous day. Thus at 6 the next morning I was on my way to Addis Ababa with three days to spend in Ethiopia rather than a few hours before continuing to a third Wednesday in the Territoire Français des Afars et des Issas (formerly the Côte Française des Somalis.)

Djibouti and *Wissmannia*

One of the reasons for stopping in Paris enroute to Africa was to find out, if possible, how one might manage a trip to a place called Bankoualé in the Monts Godats, T.F.A.I., where grows



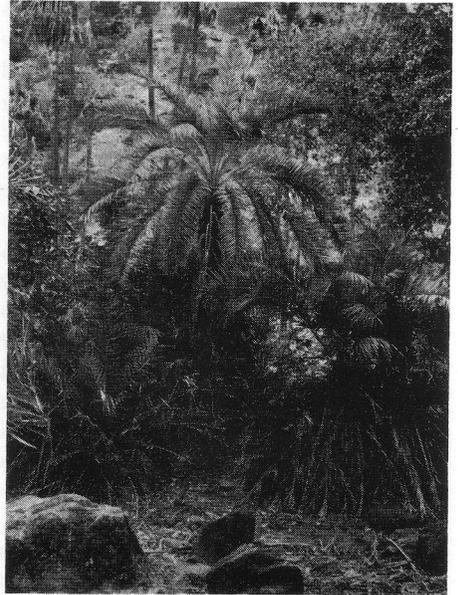
8. A plant of *Podococcus Barteri* grows beside a small stream near the village of Nkam, Gabon.

Wissmannia carinensis, a monotypic genus of considerable interest. Professor Monod wrote about this palm some years ago [Remarques sur un palmier peu connu: *Wissmannia carinensis* (Chiov. 1929) Burret 1943. Bull. Inst. Fr. Afr. Noire ser. A, 17: 338-358. 1955] on the basis of material collected by Colonel Cheddeville. I had failed earlier to get to another area in the Hadramaut region of southern Arabia, where Wissmann had photographed it, because of a local uprising in the Aden area in 1955. By a stroke of great fortune, Dr. Alicia Lourteig at Paris introduced me to Professor Gillet, an ethnobotanist and specialist on Africa, who had recently returned from Djibouti. Professor Gillet, in turn, put me in touch with friends of his and wrote them himself suggesting that I might accompany, M. Germeaux, Director of the Agricultural Service, on one of his inspection trips to Bankoualé.

It was nonetheless a great surprise to



9. Part of the population of *Wissmannia carinensis* at Bankoualé, T.F.A.I.



10. A cespitose *Phoenix* grows with *Wissmannia* at Bankoualé.

be greeted at Djibouti by another friend of M. Gillet who explained that M. Germeaux was occupied but had made plans for me to accompany him on a trip to Bankoualé the next day. I was soon located in a hotel and over dinner that evening learned more of the projected trip.

One gets to Bankoualé by flying across the Bay of Tadjoura to the old Turkish port of Tadjoura, a port much antedating the contemporary port at Djibouti. This we did at 1:00 P.M. on Tuesday, March 16, in a matter of minutes, then proceeded at a very much slower pace in a Land Rover over a rough track in desert country reminiscent of parts of the southwestern United States. By about 3:00 P.M. we had reached the trickle of water in a canyon that marks Bankoualé, passed a cluster of eight palms, and left the Land Rover to walk up the canyon to a stand of 97 *Wissmannia carinensis* (Fig. 9).

The trees are obviously old, of nearly the same size and age, and are effectively prevented from regeneration by the goats and cattle that browse even the fallen dried leaves to say nothing of any seedling that might send up a leaf. *Wissmannia* much resembles *Washingtonia robusta*, though dead leaves do not persist on the trunk, and, like it, grows in surroundings that would be inhospitable to most palms. Accompanying it is a small cespitose *Phoenix* (Fig. 10) which may be *P. caespitosa* Chiovenda—at least the male flowers seem different from those of *P. reclinata*.

Trunks of *Wissmannia* are enlarged at the base, about 65 cm. in diameter, then taper to about 40 cm. in diameter at breast height and 20 cm. in diameter below the crown with leaf-scars sometimes conspicuous. The height of one individual was 18 m. or about 60 ft. Leaves are green on both sides with the blade about 95 cm. long, the petiole 1.2

m. long. Margins of the petiole are armed with retrorsely hooked marginal teeth and the lower surface is bright orange-yellow-green. Slender inflorescences among the leaves extend beyond the blades, reaching a length of 2.4 m. and bearing as many as eight or nine pendulous green branches that are again branched about three times into very slender yellowish rachillae bearing tiny yellow-green flowers. There are ten acute, tubular bracts including the basal prophyll and most subtend a branch which in turn bears a small prophyll, though the succeeding axes are not provided with conspicuous bracts.

It was necessary to fell a tree if anatomical, cytological, and other materials were to be secured. Fortunately, though most trees were in bud, the one individual with open flowers had a trunk that was partially decayed thus our consciences were somewhat salved when, with much labor (for the trunk is extremely fibrous) the tree was cut down. We now have adequate study material, except for ripe fruits which may be obtained in August, and we should be able to place *Wissmannia* with confidence not only among the coryphoid palms where Professor Monod showed it to belong, but in relation to *Livistona* which seems to be its closest relative.

Tuesday night was spent in a camp on the summit of Mont Day surrounded by a relict Mediterranean forest which Professor Gillet is studying. Perhaps the presence of this forest will help in understanding why *Wissmannia* came to be where it is in three known areas of northeastern Africa and southern Arabia. On Wednesday we returned to Djibouti,

stopping to photograph a small cluster of *Wissmannia* near Ronda (Cover) where two younger trees occur among the few older ones.

Our conversations during the trip had dwelt on the rarity of this palm and the need for its protection by fencing, as parts of the relictual forest on Mont Day are now being protected. It was, therefore, a pleasure to have an opportunity to present a case for conservation to M. Bourhan, Présidence du Conseil de Gouvernement du T. F. A. I. and to M. Godefroy, Directeur de Cabinet, Présidence de Conseil de Gouvernement. Monsieur Germeaux and I both hope that this remarkable species may be preserved by appropriate action.

Thus Wednesdays in Africa ended. A flight to Madagascar on Thursday introduced a new chapter in the search for rare and poorly understood genera to be reported separately.

Acknowledgments

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