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Kerriodoxa, a New Coryphoid Palm Genus from Thailand

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When I began to rearrange the palm collections in the herbarium at Kew, I came across a collection from Thailand made in 1929 by A. G. F. Kerr, of a fan palm which had been tentatively named as *Livistona*, but which on a cursory investigation seemed not to belong to that genus. On checking Kerr's diaries, collecting books, and photograph albums preserved in the archives at Kew I discovered that there should have been two collections, one consisting of leaves and old pistillate inflorescences and one of an old staminate inflorescence. The latter eventually turned up thanks to Dr. B. C. Stone who rejected it from the Pandanaceae where it had been filed. The leaf of Kerr's collection bears a strong resemblance to that of *Borassodendron borneense* J. Dransf. in its discoloured lamina and razor-sharp petiole margins, but the inflorescences are coryphoid though without obvious affinity. Flowers are lacking, and the few fruit are so squashed as to show very few characters. However, Kerr's notes are meticulous and there is even a photograph of the palm in the forest, so that I had an excellent idea of the habit of the palm. I suspected this was an undescribed genus with possible affinity with *Trachycarpus*. In his diary Kerr described in considerable detail the locality and habitat of the palm on the island of Phuket off the west coast of Peninsular Thailand. A transcription follows:

"Monday March 11th 1920

8.15 a.m. left by car to go to Talang waterfall. At Talueen village (Talang), turned to right off the main road. At first

through some rubber plantations, then some scrubby evergreen forest. Later descended into a small valley and soon reached waterfall (at 9.00 a.m.) where road ends in evergreen forest.

Left car and ascended along a series of waterfalls. For the lower ones, cemented steps had been made. High evergreen forest here. A *Vanilla* (with leaves) not uncommon on trees near stream, but not seen in flower. *Arenga saccharifera*¹ very common in this forest among other trees being *Spondias* sp, *Duabanga*, *Ade-nanthera*, *Randia exaltata*, *Sterculia campanulata*, *Alangium* sp., etc.

10.55 a.m.: At head of waterfalls there was some level ground with a hut and a Chinaman. This turned out to be a hut used by Chinese felling firewood. From the hut there were some timber paths running into the forest, along which the firewood is drawn on sleighs by buffaloes. The ground from here on for some way was fairly level, this part being in the nature of a plateau. Beyond the hut the path ran through bamboo (*Kriap*) for some way and then into evergreen again, where *Arenga* particularly abundant *as well as a fan-leaved palm, dwarf, not met with before*² (? possibly one at Watbuan, Bangkok is this species); there were other palms such as *Calamus* sp, *Pinanga*, *Zalacca*, *Car-yota* etc. *Musa* sp also not uncommon, and there were quantities of *Donax*. . ."

¹ Probably not *A. pinnata* (syn. *A. saccharifera*), but *A. westerhoutii*.

² Dransfield's italics.

Kerr's diary is so exact in its details that I felt sure that if forest still existed at Talang, then the palm might be relocated. A palm enthusiast friend in Bangkok, Commander Watana Sumawong, was contacted and he passed on the information and request to Mr. Charal Bhoonab, Director of the Khao Chong Botanic Garden near Trang in South Thailand. Charal relocated the palm and was able to take me straight to it 50 years and 1 week after Kerr's visit. The palm was in young fruit; despite an intensive search we could find no fresh flowers and only 2 more or less ripe fruit. Yet there were sufficient details to suggest we were indeed dealing with an undescribed genus. Then, early in 1981 Charal forwarded staminate and pistillate flowers in spirit, and Dr. Tem Smitinand forwarded a staminate collection from a second locality near Surat Thani. The palm is here described as *Kerriodoxa elegans*.

Kerriodoxa J. Dransf. gen. nov. Palma solitaria inermis acaulescens vel erecta dioica pleonantha foliis palmatis induplicatis ad Coryphoideas pertinens. Petiolus marginibus quam novaculis acutis, basi vaginanti primo integra dein contra petiolum findenti; hastula adaxialis conspicua. Inflorescentia staminata erecta dein arcuata, bracteis primariis conspicuis triangularibus spiraliter dispositis basi tubulosis, ramos subtendentibus quos in ordines 4 ramificantes turbam rachillarum tomentosarum facientes. Flores staminati in tuberculis demissis singulatim vel binatim dispositi, bracteolis minutis subtenti; calyx basi tubulosus lobis 3 angustis apiculatisque, corolla basi stipitata, petalis 3 anguste-triangularibus; stamina 6 filamentis gracilibus antheris latrorsis. Inflorescentia pistillata erecta quam staminata

robustior, in ordines 2 ramificans, ramis ultimis tomentososis superficialiter articulatis. Flores pistillati in tuberculis demissis singulatim vel binatim dispositi; calyx tubulosus lobis 3 brevibus; corolla basi columnaris stipitata lobis 3 triangularibus; staminodia 6; ovarium carpellis 3 apicibus liberis ad centrum connatis, stigmatibus paulo reflexis; ovula anatropa singulatim in basi carpelli disposita. Fructus 1-seminalis (raro 2-vel 3-seminalis) epicarpio granuloso vel papilloso, mesocarpio spongioso, et endocarpio exili; vestigium stigmatibus basali; endospermium vadoso-ruminatum, embryo sub-basali.

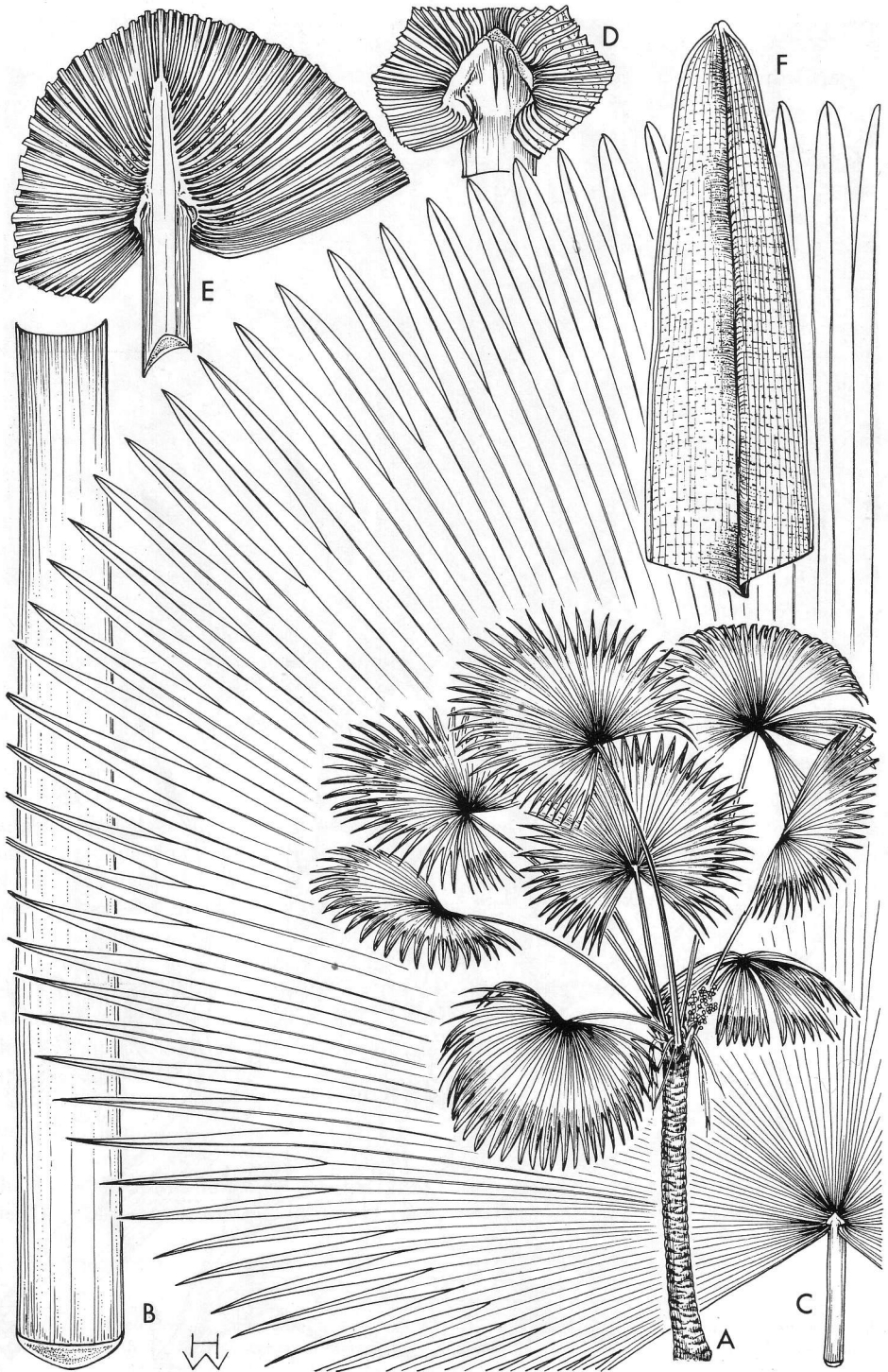
Kerriodoxa elegans J. Dransf. sp. nov. Palma formosa solitaria acaulescens aut erecta trunco dense annulato-cicatricoso usque 5 m alto, ca. 20 cm diametro; petiolus usque 2 m longus; lamina \pm circularis ca. 2 m diametro, valde discolor; inflorescentia staminata usque 45 cm longa, floribus usque 3 mm longis; inflorescentia pistillata usque 75 cm longa, floribus ca. 5 mm longis. Fructus maturus globosus basi concavo-depressus aurantiacus ca. 4.5 cm diametro.

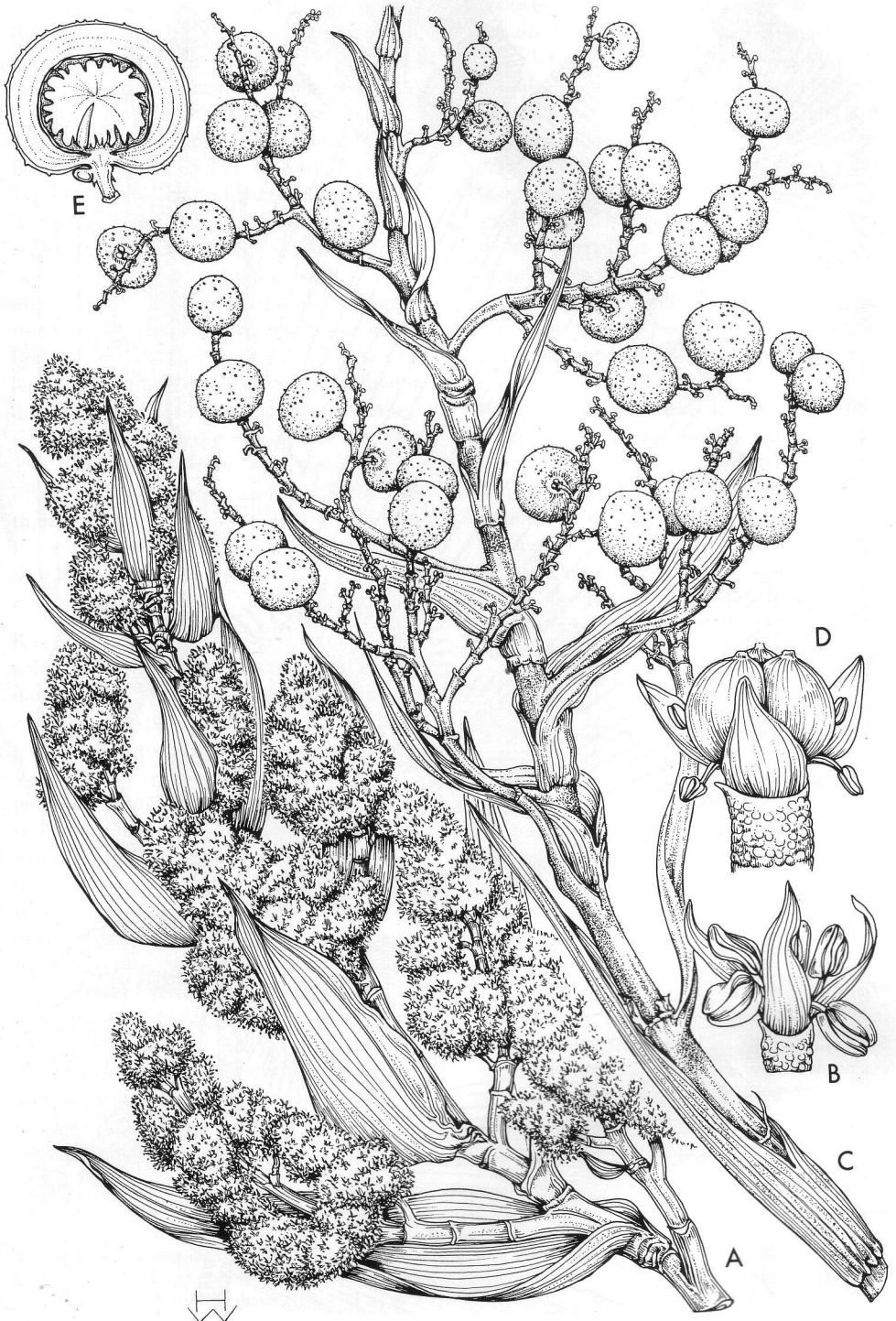
Typus: Thailand, Phuket, *Dransfield JD 5421* (holotypus K: isotypi AAU, BH, BKF, L).

Solitary dioecious, unarmed, moderate, pleonanthic induplicate palm, acaulescent or with a short grey erect trunk to 5 m tall, ca. 20 cm diam., with very close nodes, usually obscured by leaf bases, but ultimately becoming smooth. Leaf base sheathing at first, later splitting opposite the petiole, and not encircling the stem, not fibrous; petiole to 2 m, dark shiny green covered with grey indumentum when young, semicircular in cross-section when fresh, ca. 26 \times 15 mm, distorting on drying, the two margins extremely sharp;

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1. *Kerriodoxa elegans*. A, habit $\times 1/50$; B, portion of petiole with sharp margins $\times 2/3$; C, surface of part of lamina $\times 1/5$; D, adaxial hastula $\times 2/3$; E, abaxial view of insertion of lamina $\times 1/5$; F, detail of tip of lamina segment $\times 2/3$. A from a photograph, B-F from *Dransfield JD 5421*. Drawn by Heather Wood.





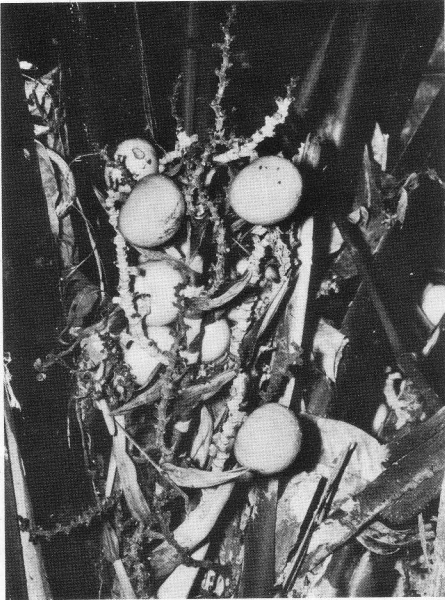


3. A pistillate plant of *Kerriodoxa elegans*. March 1979

lamina palmate or very shortly costapalmate \pm circular in outline, held \pm strictly in one plane, ca. 1.5 m from petiole to apex and ca. 2.0 m wide at widest point; adaxial hastula conspicuous \pm triangular ca. 5 mm high; adaxial folds ca. 45 on each side of the mid-line, splitting to 10–40 cm to produce rather uniform stiff single fold segments, ca. 40 mm wide; brown interfold filaments present in expanding leaf, usually fast disintegrating; adaxial surface of lamina rich dark shiny green; abaxial surface densely covered with chalky white indumentum; transverse veinlets conspicuous; ribs and hastula cov-

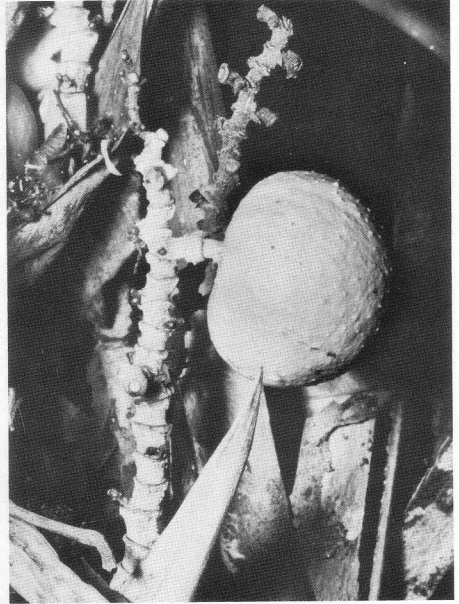
ered with scurfy caducous indumentum when young. Staminate inflorescence erect at first becoming arcuate, to ca. 45 cm; peduncle ca. 20 mm diam., creamy white, drying brown, densely covered with pale greyish brown tomentum; peduncular bracts ca. 15 in all, conspicuously tubular in the basal ca. 1 cm, with an expanded \pm triangular acuminate limb, the longest to 17×6 cm, decreasing in size towards the tip of the inflorescence, drying dull brown, with adaxial surface glabrous and abaxial surface densely greyish brown tomentose; each bract subtending a first order branch, adnate to the axis to just

2. *Kerriodoxa elegans*. A, staminate inflorescence $\times 2/3$; B, staminate flower $\times 7/2$; C, infructescence $\times 1/3$; D, pistillate flower $\times 5$; E, vertical section of mature fruit $\times 3/3$. A from *Dransfield JD 5423*, B & D from *Charal Bhoonak s.n.*, C & E from *Dransfield JD 5421*. Drawn by Heather Wood.



4. An infructescence of *Kerriodoxa elegans*. March 1979

below the following bract; lowermost first order branch to 15 cm, decreasing in length towards inflorescence tip, branching to the fourth order to give a condensed mass of short rachillae, each branch subtended by a somewhat undulate tubular bract with a triangular apiculate tip; all inflorescence axes densely covered with greyish-brown tomentum; rachillae ca. 12×1 mm, somewhat zig-zag, bearing spirally arranged tubular bracts with undulate margins and short triangular apiculate limbs to 1 mm, each subtending a low tubercle to 0.5×0.5 mm bearing 2 flowers and a minute triangular bracteole to 0.3×0.1 mm. Staminate flower \pm symmetrical creamy yellow at anthesis, soon turning brown; calyx with a basal trigonous tube to 0.5×1.0 mm densely covered in pale brown tomentum, and three narrow, triangular apiculate, keeled \pm glabrous lobes to 0.5 mm, with somewhat undulate margins; corolla at the base forming a solid three-angled column to 1.0×0.5 mm; corolla lobes 3, trian-



5. Close up of a more or less mature fruit of *Kerriodoxa elegans*; note the jointed appearance of the rachilla, the persistent calyx, and the enlarged stipitate corolla base forming the fruit stalk, the scattered irregular papillae on the epicarp, and the abortive carpel remains at the base of the fruit. March 1979.

gular, to 2.5×1.0 mm, the margins and abaxial surfaces papillose, the adaxial surface rugulose; stamens 6 borne in two whorls of 3 with antesepalous filaments free, the antepetalous filaments joined together at the base and also partly fused to the petals; filaments of the two whorls \pm equal in size ca. 1.0×0.2 mm at the base, tapering gradually; anthers oval in outline to 1.3×0.9 mm, latrorse, pollen grains spheroidal, L 25-27, l 24-27, monosulcate; sulcus slightly longer than L axis; exine c. 1.0 thick; ornamentation of thin, disjointed muri forming an incomplete, coarse reticulum; lumina 1.5-3.5 in diameter, 0.5, irregularly gemmate or granular; pistillode absent. Pistillate inflorescence \pm erect to 75 cm, much more robust than the staminate; peduncle to 30 cm long, ca. 3.0 cm diam. at the base,



6. View from a roadside looking into forest at Thalang with abundant *Kerriodoxa elegans*. *Caryota* and wild bananas also visible.

creamy white at anthesis becoming green, densely covered in grey brown tomentum; peduncular bracts to ca. 17 in all, the longest 23×6 cm, tubular in the basal up to 7 cm, and expanded above as in the staminate, the basal 1 or 2 bracts empty,

the rest subtending first order branches adnate to the main axis as in the staminate, the whole inflorescence branching to 2 orders; first and second order branches appearing articulated, owing to the dense tomentum on axes and the truncate \pm

glabrous bracts; proximal first order branches to 20 cm, distal much shorter, bearing up to 5 rachillae; rachillae to 11×0.5 cm somewhat zig-zag, bearing bracts at intervals of 5–6 mm near the base, decreasing to 3–4 mm near the rachilla tip; bracts ca. 1 mm high except for the triangular tip to 3 mm, the margins \pm glabrous, bract subtending a pair of flowers, borne on a short densely tomentose tubercle to 2 mm high, 2×3.5 mm diam. occasionally much larger near the base of the inflorescence; bracteoles if present, obscured by tomentum. Pistillate flower creamy-yellow at anthesis; calyx forming a tube ca. 1.25 mm long, 2.0 mm diam., tipped with 3 short narrow triangular lobes 0.5–0.8 mm, in the tubular part densely tomentose, the lobes and sometimes also the margins glabrous; corolla base forming a solid column 1.0×1.5 mm– 2.0×1.5 mm; densely tomentose; corolla lobes 3, spreading at anthesis, triangular ca. 2.7×1.3 mm, glabrous, the margins \pm hyaline and denticulate or papillose; staminodes 6, with filaments to 0.8×0.15 mm, and flattened empty anthers to 0.5×0.4 mm; ovary of 3 (rarely 4) carpels, free at their tips, partially fused along the middle, ca. 2×1.5 mm (just past anthesis), topped by short free, outward curving stigmas to 0.2 mm; ovules 1 in each carpel, anatropous. Corolla base enlarging after fertilization, increasing to 6×4 mm. Usually one carpel only maturing, rarely two, the abortive carpels and stigmatic residue persisting at the base of the fruit. Mature fruit spherical, concave-depressed at the base, to 4.5 cm diam. horizontally, 3 cm diam. vertically; epicarp orangey yellow, covered in short pustules; mesocarp ca. 7 mm thick, whitish, soft and spongy; endocarp thin, sparsely developed. Seed ca. 2.5–3.0 cm diam. covered in a thin pale brown testa; endosperm shallowly ruminate, the ruminations corresponding to the vascular supply of the testa; embryo sub-basal. Seedling leaf not known.

THAILAND: Phuket, Thalang, Khao

Pha Tail, *Dransfield & Charal Bhoonab JD 5421* (Holotype K; isotypes AAU, BH, BKF), *JD 5423* (BKF, BH, K), *Kerr 17448* (K), *17448a* (K), *Koyama et al. 15,303* (AAU); Surat Thani, Khao Sok, *Vithoon Peerawat s.n.* (25.1.81) (BKF, K).

VERNACULAR NAMES. "Ching Lang Kao," "Tang Lang Kao," "Thang."

HABITAT: *Kerriodoxa elegans* is a conspicuous abundant component of the undergrowth of the rather dry evergreen forest developed on underlying granite at Thalang, growing on hill slopes but apparently avoiding ridgetops and valley bottoms. With it grows an assortment of palms including *Caryota mitis*, *Arenga westerhoutii*, and *A. caudata*, *Orania sylvicola*, *Daemonorops tabacina*, *Calamus peregrinus*, and *Pinanga* sp. (aff. *P. adangensis*). Within the population of *Kerriodoxa* there seemed to be a preponderance of pistillate plants. Flowering occurs while the plant is still stemless. No observations have been made on pollination or dispersal, and the eophyll is as yet unknown. The area of forest at Thalang has recently been designated as a National Park.

Relationships with Other Genera

The partial fusion of the carpels confined to the central area and the free stigmas suggest an affinity of *Kerriodoxa* with the simpler apocarpic palms such as those belonging to the *Trithrinax* alliance, rather than to the palms of the *Livistona* alliance. (Moore 1973). The well developed stipitate base of the corolla in *Kerriodoxa* is also a feature of *Chuniophoenix* and, to a lesser extent, *Corypha* and *Nannorrhops* in the *Corypha* alliance, and some species of *Rhapis* (e.g. *Rh. micrantha*) in the *Trithrinax* alliance. The vasculature of the ovule is similar to that of *Corypha* (N. W. Uhl pers. comm.). Yet in habit there is no resemblance between *Kerriodoxa* and *Rhapis*, and neither is

there much in the habit to suggest relationships with *Corypha* or *Chuniophoenix*. *Kerriodoxa* combines several features which are unusual in the coryphoid major group, and because of this it appears to occupy a rather isolated position. I believe it should be accommodated in an alliance of its own in a position intermediate between the strictly apocarpic palms of the *Trithrinax* alliance and the fully syncarpic palms of the *Corypha* alliance.

Acknowledgments

I should like to thank Dr. Natalie Uhl for many stimulating comments on the structure of the flowers and generic relationships of this new genus. Without the cooperation of Dr. Tem Smitinand and Cmdr. Watana Sumawong in Bangkok it

would not have been possible to relocate Kerr's palm so quickly, but most of all my thanks go to Mr. Charal Bhoonab who actually refound the palm and to whom I am greatly indebted for his hospitality and his perseverance in obtaining spirit-preserved flowers; his enthusiasm for Thai palms has done much to increase my knowledge of the flora of Peninsular Thailand. My visit to Phuket was made during an FAO rattan consultancy. The pollen description was prepared by Keith Ferguson. Heather Wood prepared the drawings.

LITERATURE CITED

- MOORE, H. E., JR. 1973. The Major Groups of Palms and their Distribution. *Gentes Herbarum* 11(2): 27-140.

NEWS OF THE SOCIETY

Southern California

A two day meeting was held on July 24th and 25th by the Southern California chapter giving members an opportunity to visit many different gardens. Approximately sixty-five people attended.

The first day started at 9:30 AM in Oceanside at the home of Paul and Mary Grigsby. Paul conducted a tour of his 3½ acre garden and told us about his palms, the problems of growing them, and plans for the future. A pot luck was held upon completion of the tour. Next on the agenda was a short drive to Quail Gardens to see the palms growing there. A short meeting was held in the exhibition hall and followed by a palm auction. Final stop for the day was at the home of Bill Gunther. After touring his garden, refreshments and a buffet dinner including roast pig and corn were provided. To everyone's surprise we were then entertained by the Folklorica Los Amigos, a Mexican dance group. Their very good performance brought to a close the first day's activities.

The second day was spent in the San Diego area enjoying the hospitality and viewing the lovely gardens of Ed Moore, Jim Wright, Bob Cantos, Bill Clark, and Allan Bredeson.

On September 11th a beautiful sunny day for a meeting greeted everyone journeying to the home of Lynn and Juanita Muir at Dana Point. After a tour of the garden, snacks and refreshments were provided under a canopy set up for the occasion. A short meeting was held followed by a raffle of many choice palms which had been donated by members. A side trip to the home of Bob and Jennifer DeJong in San Clemente provided a fine ending to the day.

FRANK KETCHUM

New Address for Seed Bank

Ernie has moved. The correct address for the Seed Bank is now:

Mr. Ernest B. Chew, Correspondent
1965 Sheridan Ave.
San Diego, CA 92183