

ENCEPHALARTOS KISAMBO, A NEW CYCAD FROM KENYA, WITH A NOTE ON *E. TEGULANEUS*

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Abstract: a new species of *Encephalartos* (Cycadaceae) is described from Taita/Taveta District, Kenya. The note on *E. tegulaneus* contains additional data derived from collections discovered or made since the original description was drawn up.

Encephalartos kisambo Faden & Beentje sp. nov.

E. hildebrandtii affinis a qua imprimis differt folioliis falcatis marginibus pauciore-spiniferis strobilorumque marium bullis minus deflexis superficiebus medianis carentibus, strobilorum feminarum bullis minus profundis superficiebus medianis superficiebusque lateralibus aequantibus.

Typus: Kenya, Maungu Hills, Faden, Faden, Smeenk & Kichoi 71/965 (holotypus K; isotypus BR, EA, MO, PRE, UPS, US, WAG).

Encephalartos sp. 'B' of Heenan, Bot. J. Linn. Soc. 74: 285, Fig. 1c (1977)

Dioecious tree; trunk 0.9-2.2 m tall, 45-52 cm in diameter, erect or leaning, rarely with several (up to 12) trunks. Leaf scars rhomboidal, 12.5-15 cm wide, 5-7.5 cm high. Scale leaves linear to linear-lanceolate, 8-14 cm long, to 1.5 cm wide, glabrescent adaxially, densely dark brown tomentose abaxially. Leaves clustered at the summit of the trunk, 239-360 cm long, 51-76 cm wide, with 89-96 pairs of leaflets; petiole with a swollen base which is sometimes pubescent with matted brown hairs, sometimes glabrous; lamina lanceolate, glabrous when mature, with the leaflets gradually reduced towards the base in leaves of mature trees (abruptly reduced in young plants); median leaflets more or less crowded and overlapping, attached 2.5-3 cm apart (measured between centers of attachment along the rachis), lanceolate-oblong, falcate, 24-37.5 cm long, 2.9-3.7 cm wide, coriaceous, with the apex pungent, the margins revolute, anterior margin with 3-4 (-5) spines (to 10 mm long) all within 7 cm of the base of the leaflet, posterior margin unarmed (except on young plants) or with a single spine below the middle of the leaflet; lower leaflets passing downwards from spinose-palmate to bifurcate to simple spines at the base of the lamina. Male cones cylindrical, 49-64 cm long, 10-12.5 cm wide, creamy yellow at maturity, sometimes curved; peduncles 15-32 cm long, 3.5-4.5 cm wide when fresh, densely covered by a dark brown tomentum; median scales borne at more or less right angles or ascending, obovate, 3-4 cm long, bulla triangular to rhomboidal, deflexed, truncate, glabrous, 2.0-2.7 cm wide, 1.1-1.4 cm deep; abaxial face with two broad, trapezoidal facets (one lateral, one medial) and one very narrow, triangular to oblong lateral facet, latero-sagittal ridge between the large facets nearly medial,

distinct, the other latero-sagittal ridge distinct or indistinct, lateral margins acute, arched; terminal facet rhomboidal, 1/3-1/2 as wide and deep as the bulla; abaxial face receding, facets and latero-sagittal ridges similar to those of the adaxial, but ridges usually less distinct. Female cones borne in groups, cylindrical, 42-45 cm long, 16-16.5 cm wide, pale yellow or orange at maturity; peduncles 11-15 cm long, 5-5.5 cm wide when fresh, with pubescence as in the male cones; median scales with bulla 3.5-4.8 cm wide, 1.5-2.2 cm deep, rhomboidal, its facets trapezoidal, smooth (or sometimes the abaxial ones slightly verrucose), becoming strongly verrucose towards the margins; adaxial face with two broad facets (one medial, one lateral) and one narrow lateral facet, latero-sagittal ridges distinct, lateral ridges acute, straight or slightly arched; terminal facet compressed-hexagonal to rhomboidal, 1.4-1.8 cm wide; abaxial face partly exposed, the facets and latero-sagittal ridges similar to those of the adaxial face but the ridges only moderately distinct, seminal ridge ill-defined; lateral lobes triangular to irregular, rugose-verrucose to nearly smooth, with acute angles; median lobes not developed. Seeds with orange-yellow testa, ellipsoid, 3-3.9 cm long, 1.7-2.5 cm wide.

KENYA. Taita-Taveta District, Maungu (Nyangala) Hills, alt. ca. 900 m, 28 March 1970, P.G. Archer 606 (EA); same locality, alt. 975 m, 1 May 1970, Archer 614 (EA); same locality, alt. 1025 m, in dry evergreen mist forest with many epiphytes, few understory herbs, with *Craibia* sp., *Drypetes gerrardii*, *Eugenia* sp., *Erythroxylum emarginatum*, *Manilkara discolor*, *Cussonia holstii*, 26 Dec. 1971, R.B. & A.J. Faden, C. & N. Smeenk & D. Kichoi 71/965 (BR, EA, K, MO, PRE, UPS, US, WAG); same locality (also known as Ngasha Range), especially on South-east slopes, alt. ca. 800 m, in dry forest, less common in dry bushland on W slopes, 15 Sept. 1985, T.D. Willing & I.J. Robertson 85/1 (EA, K).

HABITAT: Low-canopy dry evergreen mist forest (summit, south-eastern and eastern slopes); occasionally on exposed steep slopes in dry bushland; alt. 800-1050 m.

DISTRIBUTION: Known with certainty only from a very small area in the Maungu Hills. Archer (on the label of Archer 614) records the species as occupying an area of

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about 160 hectare. The report by Heenan (1977) of this species from Kasigau and Sagala needs confirmation.

The specific name is the local name in the Taita language.

The only reference to this species in the literature is Heenan (1977) which refers to it as *Encephalartos* sp. 'B (Voi)'. Because Heenan has not cited any specimens, we have omitted his measurements where they exceed ours.

The species is perhaps most closely related to *E. hildebrandtii* A. Br. & Bouché, which has a more coastal distribution and occurs at lower elevations in Kenya. The new species further differs in its leaflets which are falcate and which have fewer teeth on their margins; in the male cones which are generally larger, with less sharply deflexed bullae of the cone scales; in the shallower bullae of the female cones, of which the medial facet is trapezoidal and not rectangular, and of equal size to one lateral facet (instead of smaller); and in the orange-yellow (instead of red) seeds.

Encephalartos tegulaneus Melville differs from *E. kisambo* by its smaller, more widely spaced leaflets which may have two teeth on the posterior margin (see below); male cones with the medial scales longer, the bulla much less deflexed and its adaxial face with a quadrangular facet; and the female cones with the bulla of the medial cone scales subtriangular, wider and deeper, with the facets various but not as in *E. kisambo*. *Encephalartos bubalinus* Melville differs from the new species in its smaller leaves and leaflets; the much smaller male cones with median scales much smaller and proportionally broader; and the bulla of the female cone scales wider and deeper, with the median adaxial facet rectangular.

The two undescribed species from the Western Usambara Mountains referred to in Flora of Tropical East Africa: Gymnospermae (Melville, 1958) also differ significantly from *E. kisambo*. Drummond & Hemsley 1372 (K) (*Encephalartos* sp. A of FTEA) has smaller leaves with widely spaced, smaller leaflets that lack spines or have one to two spines on the lower margin. The sterile plant Drummond & Hemsley 3150 (K) differs from *E. kisambo* in its shorter, proportionally broader leaves with several teeth on each margin.

The only other collection which we have seen that might belong in *E. kisambo* is Pócs 6137/B from the Kanga Mountains in Tanzania. The specimen (at EA) consists of a portion of a rachis and two pairs of leaflets, the largest being 27 cm long and 3 cm wide. The forward margin has five spinose teeth within 3 cm of the leaf base; the rear margin lacks teeth. The specimen differs from *E. kisambo* in three characters: adjacent leaflets are more widely spaced (they do not overlap); the leaflets are oblong (not lanceolate-oblong); and they are not at all falcate. We suspect that it is not conspecific with *E. kisambo*, but in the absence of fertile material we cannot be certain.

Three species of vascular epiphytes have been observed on *E. kisambo*: *Impatiens walleriana* Hook. f. (Balsaminaceae), *Streptocarpus caulescens* Vatke

(Gesneriaceae) and the fern *Davallia chaerophylloides* (Poir.) Steud. (Davalliaceae).

The very local distribution of *E. kisambo* leaves it extremely vulnerable to habitat destruction and to the ravages of unscrupulous collectors. We have reason to believe that it has already been collected in considerable numbers by non-Kenyans, for sale to cycad enthusiasts. One of us has already given it the status **Vulnerable**, possibly **Endangered** (Beentje, 1988). We feel that it should be given complete protection as soon as possible.

The small patch of forest in which *E. kisambo* occurs is also the only Kenyan locality for two orchid species, *Oberonia disticha* (Lam.) Schltr., and *Polystachya polychaete* Kraenzl., and is the type locality (and one of only two sites) for the Kenyan endemic orchid *Polystachya teitensis* Cribb.

A NOTE ON *ENCEPHALARTOS TEGULANEUS*

E. tegulaneus is generally believed to have been collected for the first time by Joy Adamson in 1954. Indeed, it is upon this collection alone that the original description was based (Melville, 1957), and this is the only collection cited in FTEA Gymnospermae (Melville, 1958). Research for this paper has led one of us (R.B.F.) to discover a much earlier specimen, and presumably truly the first collection of this species. It is an unnumbered collection made by Edmund Heller on 1 September 1911 in the Mathews Range. The specimen, which is in the U.S. National Herbarium (US sheet no. 634263) and was collected on the 1911-1912 Paul J. Rainey Expedition to East Africa sponsored by the Smithsonian Institution, consists of the apex of a leaf. It has the following data on a hand-written label: Mt. Garguez (=Warges), North Creek, 4000-5000 ft alt., abundant on lower edge of forest and in forest on west slope to 6000 ft; tree 8-12 ft; flower stalk preserved; photographed; Sept. 1--11, EH. It was originally determined as *Encephalartos hildebrandtii*. No photographs or reproductive material have been found.

A recent collection of this species from the Mathews Range (A. Faden 87/12, at EA and US) shows a somewhat different arrangement of spines on the leaf margins from that reported in the type description (Melville, 1957). The longest median leaflets are 28.5 cm long and 2.2 cm wide (-2.5 cm wide in Bronner s.n., June 1987, from Warges). The anterior edge has one or two teeth towards the base, as reported, but the posterior edge may have up to two teeth, the lower one being near the middle or distal to it, and the upper (when two are present) being near the apex.

While the original description as well as FTEA report this species as being only known from Mt. Lolokwe (said to be part of the Mathews, but actually distinct), it has since been found in the Ndoto Mountains (J. Beentje in Beentje 3985). As mentioned above, it also occurs in the Mathews Range proper (additional collections seen: Kerfoot 2494, J.G. Williams & J. Smart 3, Beentje 4045). In both these localities it can be one of the dominant lower story species in the dry forests of higher altitudes, which on the Mathews (at 1600-2150 m) are dominated by *Podocarpus latifolius*



FIGURE 1. *Encephalartos kisambo* -- 1: median leaflets of leaf of mature plant. 2: leaf base. 3-5: median cone scale of male cone, 3-lateral view, 4-end view, 5-abaxial view. 6: female cone. 7-10: median cone scale of female cone, 7-lateral view, 8-end view, 9-adaxial view, 10-abaxial view. [1-10 from Faden et al. 71/1965]. Drawn by Alice R. Tangerini.

and *Juniperus procera*. It is less common in moister forest with *Croton megalocarpus* and *Strychnos spp.* and dry bushland with *Euphorbia candelabrum* at lower altitudes (down to 1400 m). The Samburu name for this species is Lpision. The number of female cones per plant seems to be 4, while the number of male cones may vary from 3-6.

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