

## Two new species of rattan (*Palmae calamoideae*) from Africa

TERRY C. H. SUNDERLAND\*

*African Rattan Research Programme, Limbe, Cameroon; mail address: c/o LTS International,  
Pentlands Science park, Bush Loan, Penicuik, near Edinburgh, EH26 0PH, UK*

### INTRODUCTION

Rattans, or climbing palms, belong in the Calamoideae, a sub-family within the Palmae characterised by the presence of a scaly pericarp. Worldwide, there are around 650 species of rattan, representing 13 genera, and these are concentrated solely in the Old World tropics [1]. There are twenty species of rattan in Africa, represented by the endemic genera *Laccosperma* (G. Mann and H. Wendl.) H. Wendl., *Eremospatha* (G. Mann and H. Wendl.) H. Wendl. and *Oncocalamus* (G. Mann and H. Wendl.) H. Wendl., as well as by a single representative of the Asian genus *Calamus* L. [2]. In the genera endemic to the African continent, the cirrus, or climbing organ, has a form unique within the Calamoideae; it occurs as an extension between reduced, thornlike leaflets termed acanthophylls. In contrast, *C. deerratus* G. Mann and H. Wendl., the sole representative of *Calamus* in Africa, climb with the aid of a flagellum, a shoot arising directly from the sheath which is in fact a modified inflorescence [3].

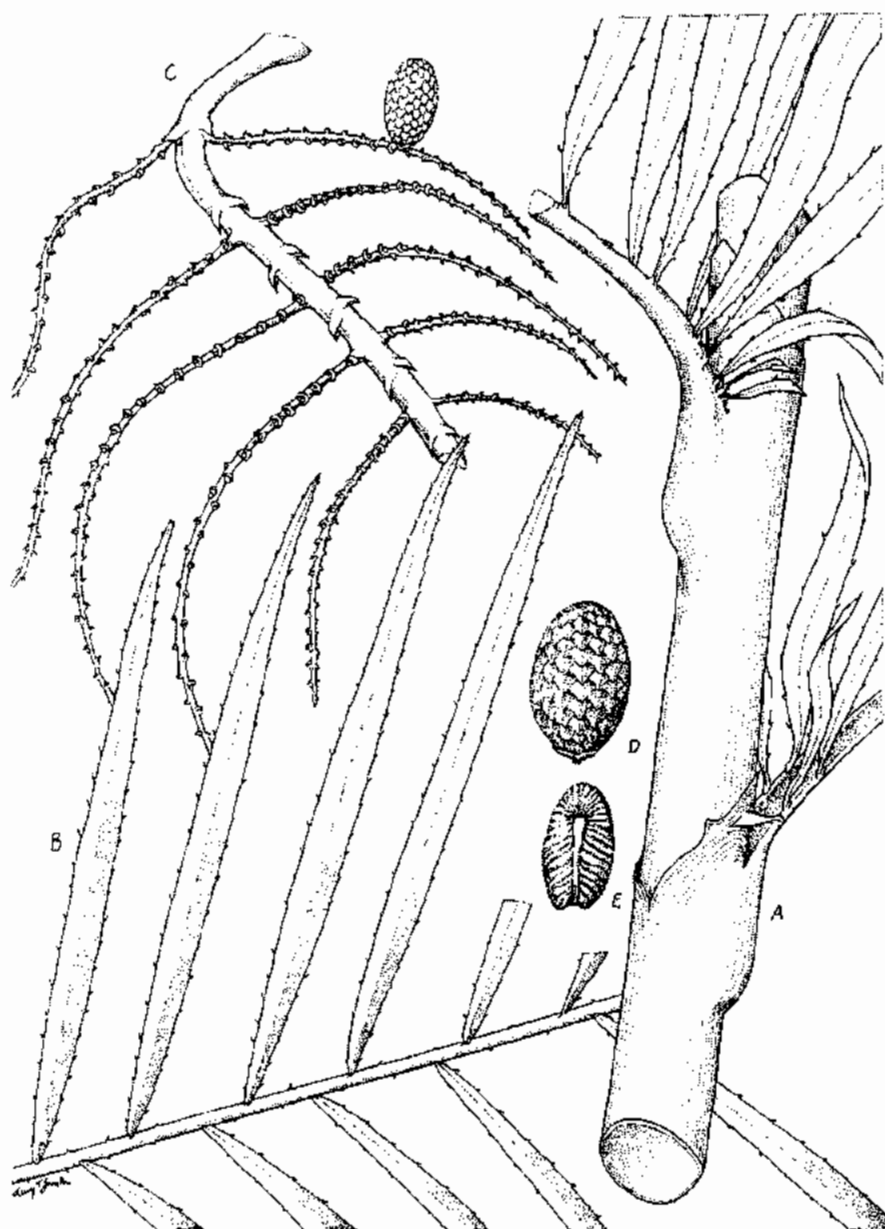
Rattans in Africa occur in a wide range of ecological conditions within the lowland tropical forests of the continent and, throughout their range, play a significant role in the forest economy of the region through the utilisation of the inner stems, or cane [4]. Of the 20 species occurring in Africa, six are utilised on a commercial basis [4]. Despite the economic importance of the rattans of Africa, until recently, the taxonomy of this group has been uncertain. This account describes two new species within the genera *Eremospatha* and *Oncocalamus*.

### TAXONOMY, PART 1

*Eremospatha barendii* Sunderland sp. nov. affinis *E. macrocarpa* (G. Mann and H. Wendl.) H. Wendl. sed vagina cum geniculus, ochrea fissa, siccus non integra,

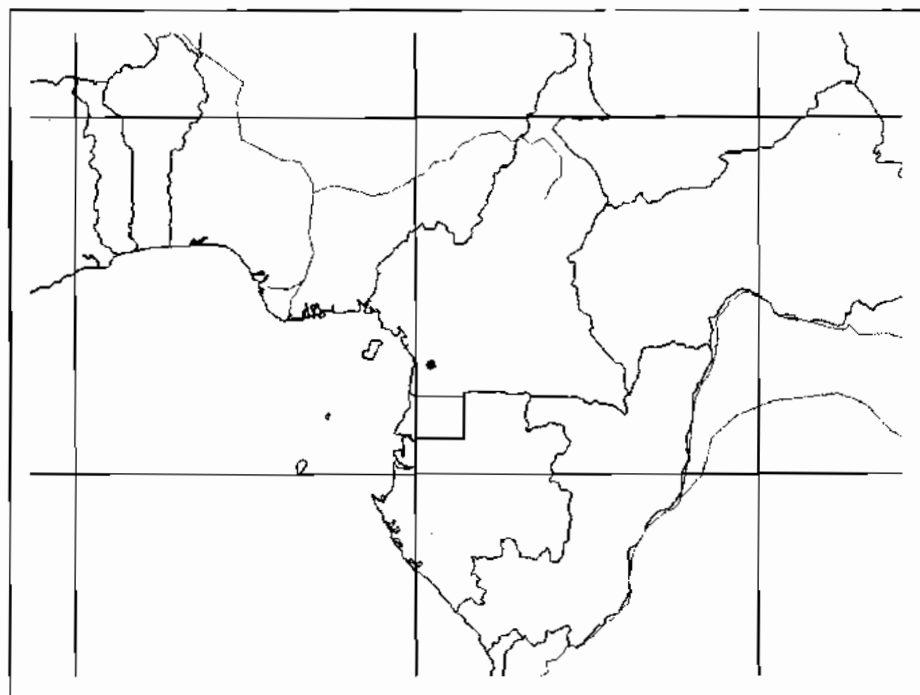
---

\*E-mail: [Afrirattan@aol.com](mailto:Afrirattan@aol.com)



**Figure 1.** *Eremospatha barendii* Sunderland van Gernerden 77; (A) stem  $\times 1$ , (B) leaflets  $\times 1/2$ , (C) infructescence  $\times 2/3$ , (D) Fruit  $\times 1\frac{1}{2}$ , (E) seed  $\times 1\frac{1}{2}$ . (Illustration by Lucy T. Smith.)

spadix leviter pileus non glabellus, conspicue bracteatus (3.0–5.0 mm longus non 1.0–3.0 mm). Typus: Cameroon, Ebom, near Lolodorf (03°44'N:10°43'E) 11th March, 1997, van Gernerden 77 [infructescence] (holotypus K!; isotypi YA!, KRI!) (Figs 1 and 2).



**Figure 2.** Distribution of *Eremospatha barendii* Sunderland.

Clustering palm climbing to 25–30 m. Stems circular in cross-section, without leaf sheaths, *ca.* 15 mm in diameter, with, to 25 mm; internodes 10–15 cm long. Leaf sheath longitudinally striate, sparsely to moderately covered with dark brown caducous indumentum; ocrea obliquely truncate, dry, grey-brown, often splitting in conspicuous v-shape on abaxial side, extending to 2 cm; knee linear, 3–3.5 cm long, somewhat abrupt at base. Leaf up to 2.4 m long; rachis 1–1.2 m long, abaxially rounded, adaxially flattened or convex, becoming trapezoid then triangular in cross-section distally, armed along the margins with inequidistant black-tipped, bulbous-based spines, sparse brown indumentum present on underside of rachis, absent distally; cirrus up to 1.2 m long, unarmed; leaflets, opposite or sub-opposite, up to 26 on each side of the rachis, linear-lanceolate, broadly contracted at the base, apex narrowly praecurved, 25–32 cm long  $\times$  1.5–2 cm broad at the widest point, concolorous, armed along the margins with inequidistant, black-tipped spines, with 5–7 moderately conspicuous transverse veinlets 1–2 mm apart; lowermost leaflets smaller than the rest, linear-ovate, erect or reflexed and laxly swept across stem; acanthophylls 2.4–2.8 cm long. Inflorescence, very lightly pilose up to 30 cm long; peduncle 8–10 cm long; rachis 17–20 cm long, arching, sometimes straight, rachis bracts, finely to broadly acuminate, united at base to form a conspicuous sheathing bract, 3–5 mm long, decreasing distally; rachillae distichous, *ca.* 10 on each side, 10–14 cm long, decreasing distally, adnate for 5–8 mm of the inflorescence axis, arching, rarely straight, with 1–3 mm circular bracts subtending each dyad. Flowers

not known. Fruit at maturity, 1-seeded, 2.3–2.8 cm long  $\times$  1.5–1.7 cm broad, broadly cylindrical, with 16 vertical rows of scales. Seed compressed, 2 cm long  $\times$  1.2 cm wide  $\times$  0.7 cm thick, flattened on one side, embryo lateral, raised opposite flattened side.

### Notes

The genus *Eremospatha* is unique within the Palm family in the fact that it possesses inflorescence bracts that are minute and inconspicuous. Indeed, *Eremospatha* means 'destitute of spathes' (or bracts). Despite only being represented by a single collection, it is clear that *E. barendii* is an unusual species within the genus in the possession of large, conspicuous bracts on the inflorescence rachis, notably absent or much reduced on other species of *Eremospatha*. This character alone separates it from the other members of the genus. In addition to these rachis bracts, the presence of a vertically clefted ocrea, which often dries brown or grey on its outer margins, a character shared only by the distinct rhomboid-leafleted *E. wendlandiana*, also separates this taxon from *E. macrocarpa*.

### Habitat and conservation

Of the nine species of *Eremospatha* previously described from tropical Africa the majority are relatively widespread with only *E. tessmanniana* Becc. and *E. quinquecostulata* Becc. being restricted to the forests of Cameroon and Rio Muni, Equatorial Guinea. *E. barendii* also exhibits a similarly restricted distribution and is known from a single collection. The specimen was collected from a small population along a road in a forestry concession at Edem, near Lolodorf in the South Province, an area of significant logging activity (van Gernerden, pers. comm. 1999). In this regard, the conservation status of this taxon is unclear. Given the intensity of sampling of Cameroon's flora, one of the best represented in Central Africa, particularly for palms, it can be assumed that *E. barendii* is a highly localised species. Hence, there must be some concern about the future of the species, given the intensive timber extraction and subsequent land conversion in the area in which it occurs.

### Utilisation

Unlike a number of other species of *Eremospatha*, there are no recorded uses for this taxon.

### Specimen examined

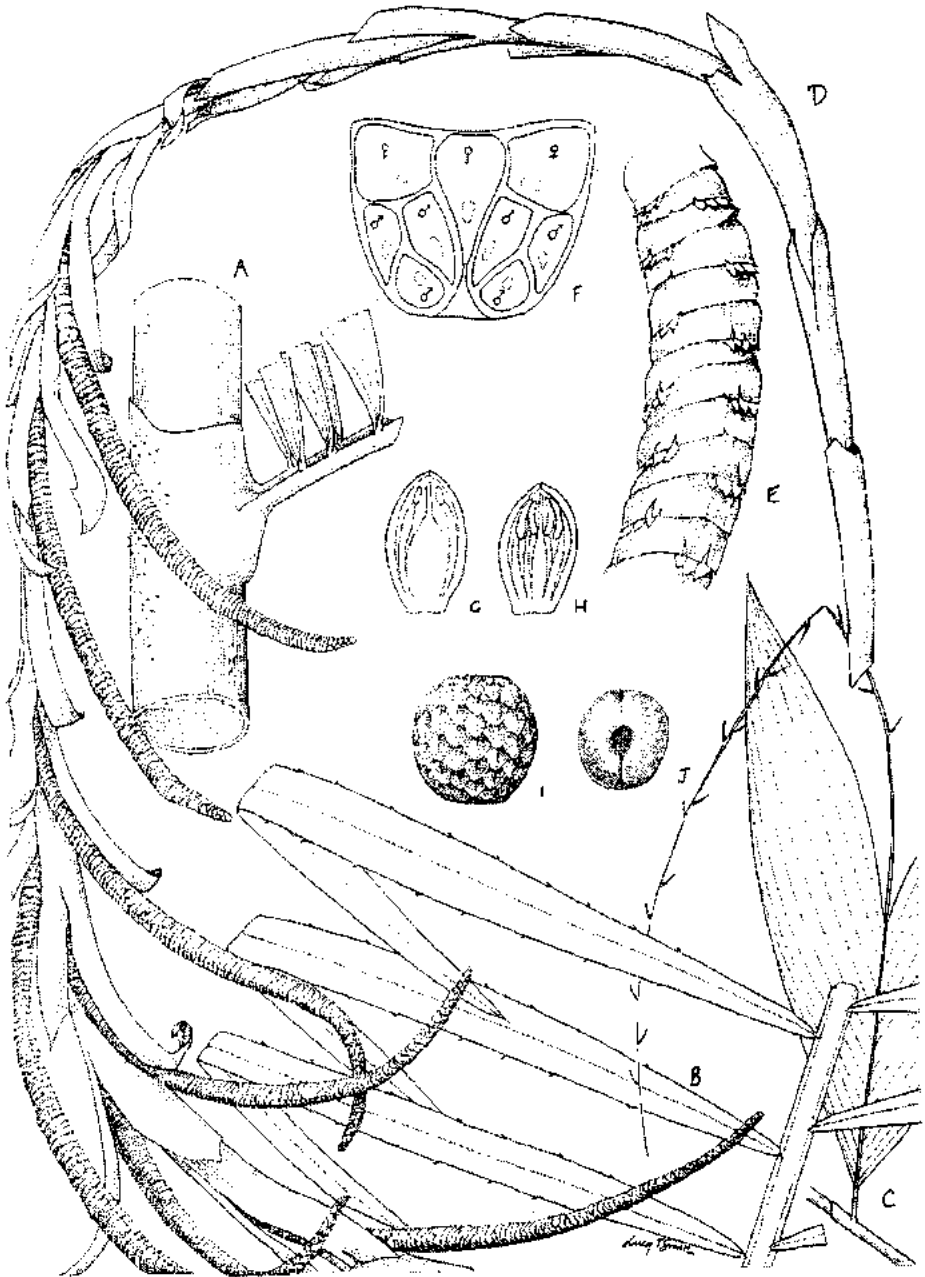
Cameroon: van Gernerden 77, Ebom (03°04'N:10°43'E) Fr., March 11, 1997 (K!)

## TAXONOMY, PART 2

*Oncocalamus tuleyi* Sunderland sp. nov. affinis *O. mannii* (H. Wendl.) H. Wendl. sed vagina robustus (25–45 mm diametrum) non tenuis (12–23 mm), ramis inflorescentia 1.2–1.8 m longis (non 0.8–1.0 m), rhachis bracteatus 13–15 cm longus (non 2.4–4.0 cm), floribus 9–11 (non 5–11), 3 (non 2–5) medii foemineis et 6–8 (non 4–6) masculis anterioribus, semen testa laevis non tuberculata. Typus: Cameroon, Ossing, near Mamfe (05°38'N:09°17'E), 20th November 1998, Sunderland 1939 [inflorescence] (holotypus K!; isotypi SCA!, YA!, NY!, MO!) (Figs 3 and 4).

*O. mannii* sensu Holland in Kew Bull. 9: 727 (1922); Russell in F.W.T.A. 2(3): 167 (1968); Morakinyo in Principes 39(4): 206 (1994) partim non H. Wendl.; Tuley in Palms of Africa, 83: (1995) partim non H. Wendl.; Cable and M. Cheek in Pl. of Mt. Cam. 179: (1998).

Clustering robust palm climbing to 30 m, rarely to 50 m. Stems without sheaths 13–22 mm in diameter, with, 25–45 mm; internodes 14–25 cm long, commonly 15–18 cm. Leaf sheath lightly striate, light brown to mid-green, very sparsely and patchily armed with dark brown to glaucous black spines, often concentrated on the ocrea; sheaths often becoming bare with spines sloughing to leave raised, linear blister-like scars; thin white caducous indumentum present on young sheaths, absent on mature sheaths; ocrea saddle-shaped, with 1.5–2 cm rounded lobe abaxial to the leaf, armed as the leaf sheath, spines concentrated on margin, extending for  $\pm 2.5$  cm; knee absent, although conspicuous horizontal rounded swelling visible beneath leaf. Spear leaf dull reddish brown, becoming green. Juvenile stems up to 10 m, with sheaths <2 cm in diameter, leaves strongly bifid, becoming pinnate, with a short (<6 cm) petiole, 30–45 cm long, 10–15 cm broad at the widest point, with 60–100 cm-long cirrus emerging from the centre; elaminate rachis common at base of stem, 1.5–2 m long. Leaves on mature stems sessile, or with a short (<3 cm) flattened, unarmed petiole; rachis unarmed 1.2–2 m long, abaxially rounded, adaxially concave, becoming trapezoid then triangular in cross-section distally, unarmed; cirrus 0.8–1.5 m long, rarely 2 m, unarmed; leaflets up to 30–50 on each side of the rachis, composed of a single fold, rarely rarely composed of up to 4-folds, linear-lanceolate or  $\pm$  sigmoid, broadly to narrowly attenuate at base, finely acuminate at apex, 25–45 cm long, 2.2–3.3 cm broad at the widest point,  $\pm$  pendulous, uni-, bi- or sometimes tri-nerved, armed along the margins with robust spines particularly at base of leaflet, lowermost leaflets smaller than the rest, arching and somewhat pendulous; acanthophylls up to 4 cm long. Inflorescences borne in leaf axils ca. 3 m, from stem apex, peduncle up to 30 cm long, flattened,  $\pm$  rectangular in cross-section; prophyll up to 15 cm long; peduncular bracts ca. 4, 13–15 cm long, grey-brown without, crimson-brown within; rachis up to 1.8 m long, pendulous; rachis bracts as the peduncular bracts except increasingly triangular, acute at apex; rachillae  $\pm$  rounded or slightly flattened, 35–45 cm long, bracts dull crimson prior to anthesis; prophylls subtending flower cluster 4–6 mm long, somewhat striate. Flower cluster with 1 central pistillate flower subtended by



**Figure 3.** *Oncocalamus tuleyi* Sunderland Sunderland 1939; (A) stem  $\times 1/2$ ; (B) leaflets  $\times 1/2$ ; Sunderland 1746; (C) juvenile leaf  $\times 1/4$ ; Sunderland 1939; (D) inflorescence  $\times 1/3$ ; (E) portion of immature rachilla  $\times 1\ 1/2$ ; (F) flower cluster diagram  $\times 6$ ; (G) staminate flower  $\times 7\ 1/2$ ; (H) pistillate flower  $\times 7\ 1/2$ ; Sunderland 1761; (I) fruit  $\times 1\ 1/2$ ; (J) seed  $\times 1\ 1/2$ . (Illustration by Lucy T. Smith.)

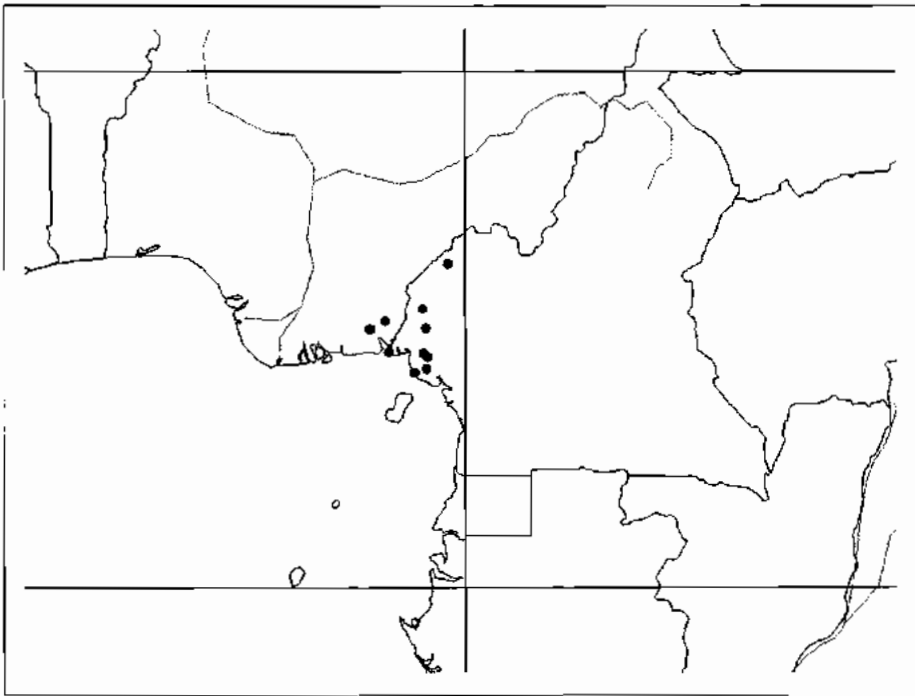


Figure 4. Distribution of *Oncocalamus tuleyi* Sunderland.

2 lateral cincinni with 1 pistillate and 3–4 staminate flowers. Flowers at anthesis not known. Fruit at maturity  $\pm$  globose, 1.9–2.1 cm  $\times$  1.6–1.8 cm, with 17–19 rows of vertical scales. Seed smooth, sub-globose, 1.5–1.7 cm  $\times$  1.2–1.5 cm with linear cleft or rounded depression below; sarcotesta white, very thin ( $<0.3$  mm).

#### Notes

The genus *Oncocalamus* was, until recently, thought to consist of a single species, *O. mannii* [5]. However, recent fieldwork has indicated that there are in fact four distinct species within the genus, which are situated in different biogeographical regions of Central Africa [2]. *Oncocalamus* is monoecious and possesses a complex flower cluster that is distinctive within the Palmae [3, 6]. Each member of the genus consists of a variation of a central 1–3 pistillate flowers with two lateral cincinni subtended by a single bract, with each cincinnus bearing basal 1–3 pistillate flowers and 3–5 distal staminate flowers [2]. As such, within the species, the number of flowers in each cluster varies significantly, often on a single inflorescence. In this regard, *O. tuleyi* is highly unusual within the genus in that it possesses a uniform number of individual flowers within each cluster. A further highly distinctive character that separates this taxon from *O. mannii* is the possession of a smooth seed coat, whereas the seed coat of the latter species is conspicuously warty. In addition to these differences, *O. tuleyi* is a far more large and robust taxon than

*O. mannii*, is characteristically devoid of spines on the sheath and possesses long pedunculate inflorescences with large longitudinally-splitting rachis bracts.

#### *Habitat and conservation*

*O. tuleyi* is restricted to coastal forest from SE Nigeria to the northern bank of the Sanaga River; a well-known biogeographical barrier for many biota [7]; interestingly *O. mannii* only occurs south of the Sanaga. *O. tuleyi* is particularly light demanding and occurs at the forest edge, particularly at roadsides and in gap regrowth vegetation. As such, it is a relatively common component of forest regeneration after selective logging activities. However, its restricted distribution makes it vulnerable, particularly given increasingly rapid changes in land use, particularly for both subsistence and commercial agriculture.

#### *Utilisation*

In common with the other species of *Oncocalamus*, the cane of this species is of poor quality and there are no recorded uses for this taxon.

#### SPECIMENS EXAMINED

Nigeria: *Morakinyo* 1002, Cross River National Park (05°15'N:08°42'E) sterile, August 16, 1993 (K!); *Tuley* 1078, Calabar to Ikot Opora road (05°00'N:08°12'E) sterile, December 10, 1964 (K!); Cameroon: *Dransfield* 7007, Mile 48 Buea-Kumba road (05°02'N:09°24'E) sterile, June 28, 1991 (K!, SCA!); *Dransfield* 7476, 8 km S of Nguti (05°02'N:09°24'E) Fl., November 26, 1997 (K!); *Garltan* 39, Southern Bakundu Forest Reserve (04°46'N:09°29'E) Fr., November 11, 1968 (K!); *Sunderland* 1705, Southern Bakundu Forest Reserve (04°46'N:09°29'E) sterile, November 8, 1995 (K!, SCA!, BR!); *Sunderland* 1706, Southern Bakundu Forest Reserve (04°46'N:09°29'E) sterile, November 8, 1995 (K!, SCA!, BH!); *Sunderland* 1731, Rumpi Hills Forest Reserve (04°54'N:09°20'E) seedling, May 19, 1996 (K!, SCA!, NY!); *Sunderland* 1733, Rumpi Hills Forest Reserve (04°54'N:09°20'E) sterile, May 19, 1996 (K!, SCA!, BH!); *Sunderland* 1739, Rumpi Hills Forest Reserve (04°54'N:09°20'E) sterile, May 19, 1996 (K!, SCA!); *Sunderland* 1743, Rumpi Hills Forest Reserve (04°54'N:09°20'E) sterile, May 19, 1996 (K!, SCA!, WAG!); *Sunderland* 1746, Rumpi Hills Forest Reserve (04°54'N:09°20'E) juvenile, May 19, 1996 (K!, SCA!, NY!, MO!); *Sunderland* 1756; Limbe — Kumbe road: Mile 40 (04°23'N:09°26'E) juvenile, November 11, 1996 (K!, SCA!, NY!, WAG!); *Sunderland* 1759, Limbe — Kumbe road: Mile 40 (04°23'N:09°26'E) sterile, November 11, 1996 (K!, SCA!, WAG!); *Sunderland* 1761, Southern Bakundu Forest Reserve (04°46'N:09°29'E) Fr., November 25, 1996 (K!, SCA!, BR!); *Sunderland* 1939, Mamfe to Ossing road, 15 km south of Mamfe (05°38'N:09°17'E) Fl., November 20, 1998 (K!, SCA!, NY!); *Sunderland* 2056, Takamanda Forest



Reserve (06°08'N:09°16'E) sterile, January 17, 1999 (K!, SCA!); *Thomas* 9732, Idenau (04°16'N:09°01'E) Fr., September 10, 1993 (K!, SCA!); *Thomas* s.n. Korup National Park (04°55'N:08°50'E) sterile, s.d. (SCA!).

#### Acknowledgements

The recent study on the taxonomy, ecology and utilisation of African rattans was undertaken by the African Rattan Research Programme with funding from the United States Forest Service, the Central African Regional Program for the Environment (CARPE) and the International Network for Bamboo and Rattan (INBAR). The author is particularly grateful to Dr. John Dransfield for his advice and support for the programme over the past five years.

#### REFERENCES

1. J. Dransfield, The ecology and natural history of rattans, in: *A Guide to the Cultivation of Rattan*, R. W. M. Wan, J. Dransfield and N. Manokaran (Eds), pp. 27–34. Forest Research Institute, Forest Record No. 35, Kuala Lumpur, Malaysia (1992).
2. T. C. H. Sunderland, Taxonomy, ecology and utilisation of African rattans (*Palmae: Calamoideae*), PhD Thesis, University of London and Royal Botanic Gardens, Kew (2001).
3. W. J. Baker, J. Dransfield, M. M. Harley and A. Bruneau, Morphology and cladistic analysis of sub-family Calamoideae (Palmae), in: *Evolution, Variation and Classification of Palms*, A. Henderson and F. Borchsenius (Eds), *Memoirs of the New York Botanical Garden* **83**, 307–324 (1999).
4. T. C. H. Sunderland, Rattan resources and use in West and Central Africa, *Unasylva* **52**(205), 18–26 (2001).
5. P. Tuley, in: *The Palms of Africa*, pp. 34–84. Trendrime Press, UK (1995).
6. N. Uhl and J. Dransfield, in: *Genera Palmarum*, pp. 239–241. Allen Press, Kansas (1987).
7. D. C. D. Hapold, Mammals of the Guinea-Congo rain forest, *Proc. Roy. Soc. Edin.* **104**, 243–284 (1996).