

***Encephalartos aemulans* (Zamiaceae), a new species from northern Natal**

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Encephalartos aemulans Vorster is described from the Ngotshe district in northern Natal. It resembles *E. natalensis* R.A. Dyer & Verdoorn by the tuberculose bullae of the female cones, and *E. lebomboensis* Verdoorn by the relatively narrow leaflets which are reduced to prickles towards the base of the frond; but differs from both by the thick indumentum covering the cone surfaces, the sessile male cones without drooping beaks on the bullae, and by the morphological similarity between the submature male and female cones.

Encephalartos aemulans word beskryf vanuit die Ngotshe-distrik in Noord-Natal. Dit stem ooreen met *E. natalensis* R.A. Dyer & Verdoorn op grond van die vratterige bullae van die vroulike keëls, en *E. lebomboensis* Verdoorn op grond van die relatief smal pinnae wat reduseer is tot dorinkies na die basis van die blaar toe; maar dit verskil van beide deur die digte haarbedekking van die keëloppervlaktes, die sittende manlike keëls waarvan die bullae nie afbuigende snawels vorm nie, en deur die morfologiese ooreenkoms tussen die byna volwasse manlike en vroulike keëls.

Keywords: *Encephalartos*, new species, Zamiaceae

A critical study of *Encephalartos natalensis* R.A. Dyer & Verdoorn led to the conclusion that plants from northern Natal represent a distinct and undescribed species:

***Encephalartos aemulans* Vorster, sp. nov.**

Plantae arborescentes. *Fronde* ca. 1.4 m longes, fere apertiolatae, virides; pinnae 120-140 mm longae et 16-18 mm latae, marginibus dentatis, ad basim frondis ad aculeis dentatis redactae. *Strobili* ad forme fere aemulantes, sessiles, masculi flavi, feminei virides, sed indumento denso avellaneo tecti; megasporophyllorum bullae phymatodeae; microsporophyllorum bullae superficialia parva angulari rasili, non in rostrum demissum protractae.

E. lebomboensis Verdoorn propter pinnas pro ratio angustas, ad basim frondis ad aculeis dentatis redactas, et ad *E. altensteinii* Lehm. et *E. natalense* R.A. Dyer & Verdoorn propter megasporophyllatas bullas phymatodeas simulans; sed ab ambobus micro- et megastrobilibus aemulantibus pubescentibus avellaneis, microstrobilibus sessilibus, et microsporophyllis latioribus et bullis non rostratis.

TYPUS.—Northern Natal: Ngotshe district, 1 900 m alt., 20th April 1988 (frond and male cone). *Vorster 2951a* (PRE, holotypus; K, MO, FTG, LE, isotypi).

Plant arborescent, unbranched but usually suckering from base. *Stem* erect, up to 1.5 or rarely 3.0 m tall and 350 mm thick, with a densely tomentose crown. *Fronde* 1.20-1.45(-2.00) m long, dark glossy green, straight, rigid, with short petioles 70-110 mm long; leaflets directed towards apex of frond at angle of (15-35 (-45)°), opposing leaflets set at angle of ca. 135° to each other, basal leaflets spaced 25-30 mm apart and not overlapping, gradually reduced to prickles, median leaflets very slightly succubously overlapping or not at all, 125-150 mm long and 16-18 mm wide, very narrowly elliptic and very slightly falcate, tapering to

both ends, apices oblique and pungent, margins very slightly revolute (more conspicuously so in dried than fresh material) with 1-3 teeth on upper margin and 1-2 on lower margin. Cones of both sexes very similar almost to maturation, sessile, ellipsoid, 2-4 per stem observed; male cones ellipsoid becoming somewhat more narrowly ellipsoid only at maturation, lemon-yellow colour obscured by dense brown indumentum, 290-330(-380) mm long and 140-180 mm wide, sessile as peduncles 50-60 mm long are buried in crown of stem, median bullae rhombic, 30-35 mm wide by 22-32 mm high, not projected into beak-like structures but with central facet slightly raised and about half the diameter of the bulla, bullae smooth except for tuberculose central facet; female cones ellipsoid, green colour obscured by dense brown indumentum, 350-410 mm long and 200-230 mm wide, sessile as peduncles 20-25 mm long are buried in crown of stem, median bullae hexagonal, 44-57 mm wide by 30-40 mm high with central facet slightly raised and half or less the diameter of the bulla, bullae tuberculose, seeds covered with bright red flesh, seed kernels with poorly-expressed longitudinal ridges, ellipsoid to slightly ovoid, 25-29 mm long and 15-19 mm in diameter. (Figures 1-3).

Flowering and reproduction

Receptive female cones as well as male cones shedding pollen were observed between April and early July, therefore the coning period is similar to those of *E. altensteinii* Lehm., *E. lebomboensis* Verdoorn, and *E. natalensis* R.A. Dyer & Verdoorn. Male cones on a cultivated plant still contained pollen in August, 2½ months after opening of the sporangia, and apparently the dense indumentum had prevented wind from blowing the pollen away (Mrs C. Giddy, pers. comm.). This leaves the impression that insect vectors may be essential in

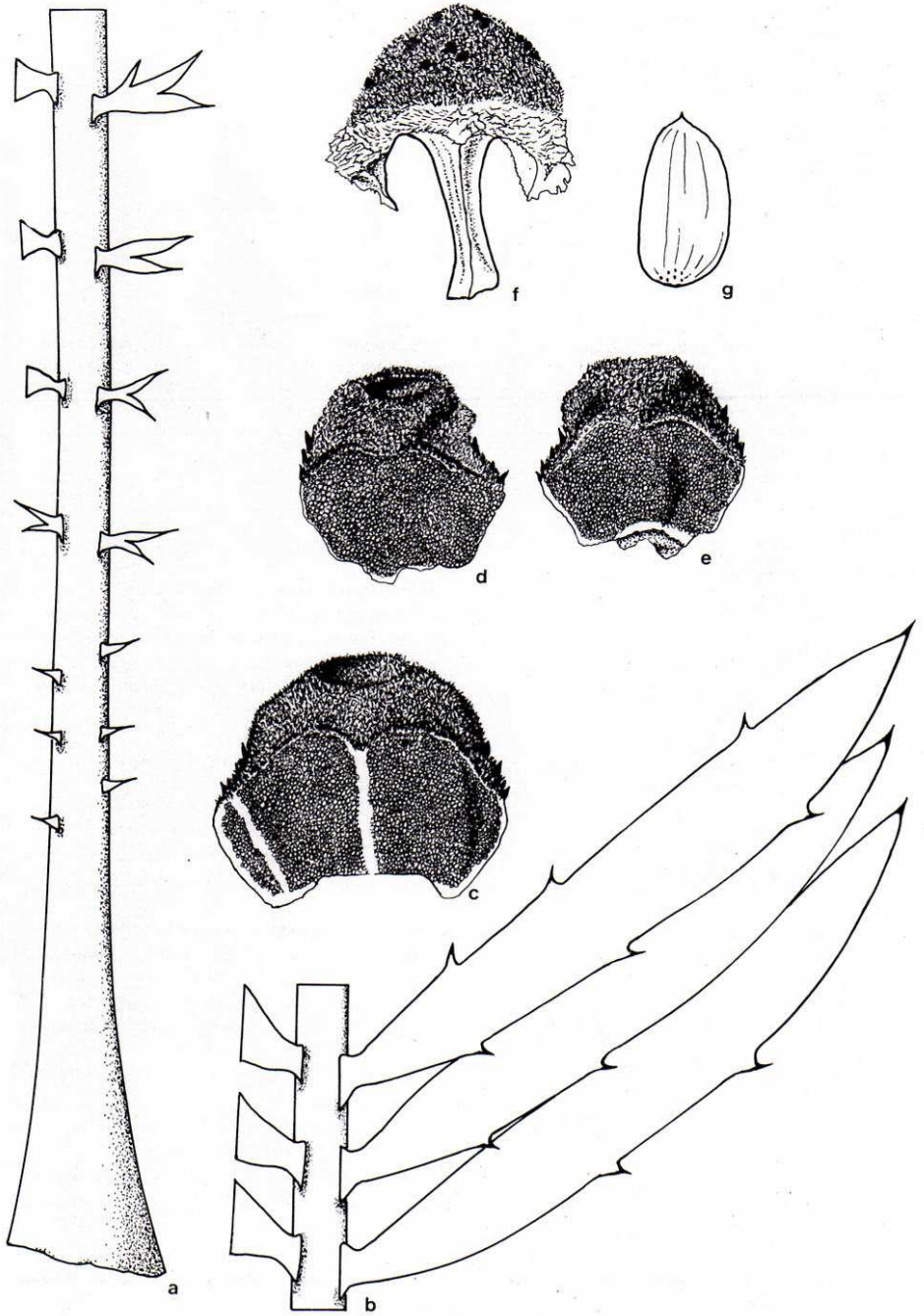


Figure 1 *Encephalartos aemulans*: (a) proximal part of frond showing short petiole and basal leaflets reduced to prickles; (b) dorsal view of succubously overlapping median leaflets; (c-e) ventral views of microsporophylls; (f) ventral view of megasporophyll; (g) seed kernel; all $\times 1$. a, b, d, e, after Vorster 2951a; c, after Vorster 2972; f, g, after Vorster 2951b. Del. E.C. Vorster.

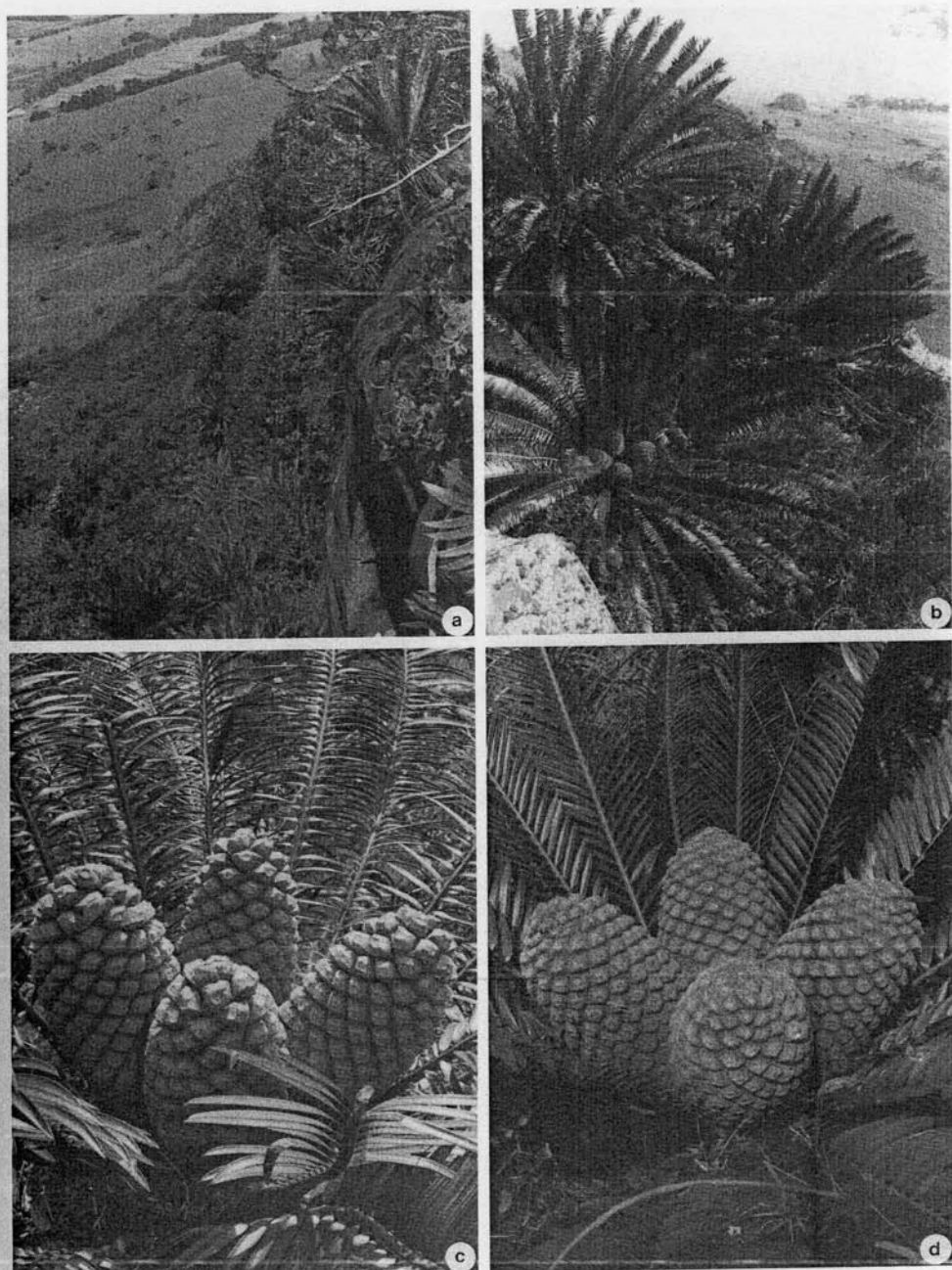


Figure 2 *Encephalartos aemulans*: (a) habitat at type locality, showing dense stand of plants against south-facing cliffs and on the scree slope below; (b) a multi-stemmed plant with tallest stem about 3 m, against north-facing cliff at type locality; (c) cluster of mature sessile male cones, each 330 mm long, 21st May; (d) cluster of mature sessile female cones, each 350 mm long, 19th April —Vorster 2951b.

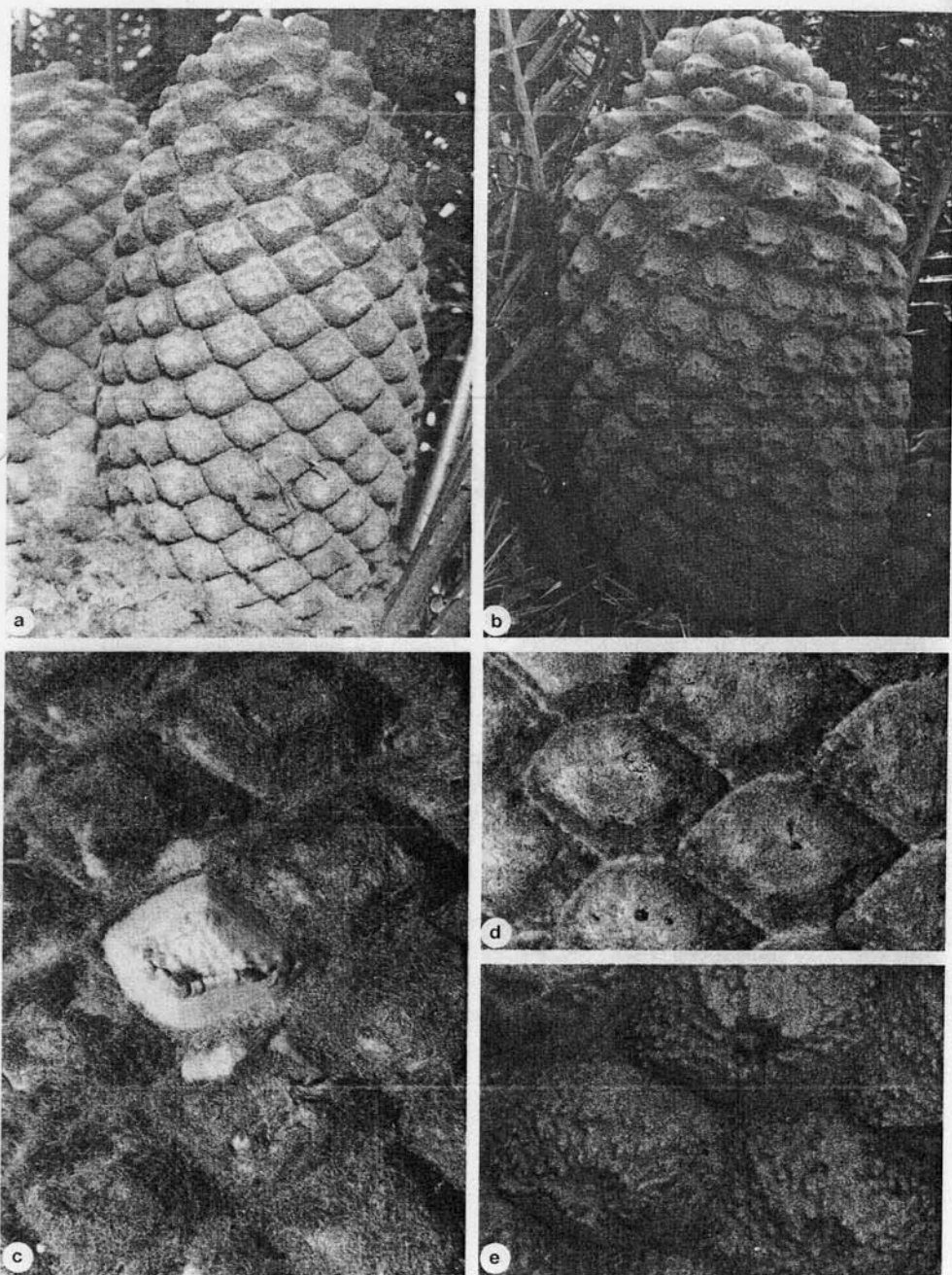


Figure 3 *Encephalartos aemulans*: (a) submature sessile male cone, 290 mm long, 19th April, note similarity to following; (b) mature female cone with unusually small central facets of bullae towards apex, 410 mm long, 21st May; (c) surface of submature male cone with indumentum removed from one bulla, life size; (d) surface of submature female cone, life size; (e) surface of mature female cone (cf. 3b) with indumentum removed from bullae to reveal tuberculose surface, life size. a, from Vorster 2951a; d, from Vorster 2951b; b, c and e, from plants at type locality.

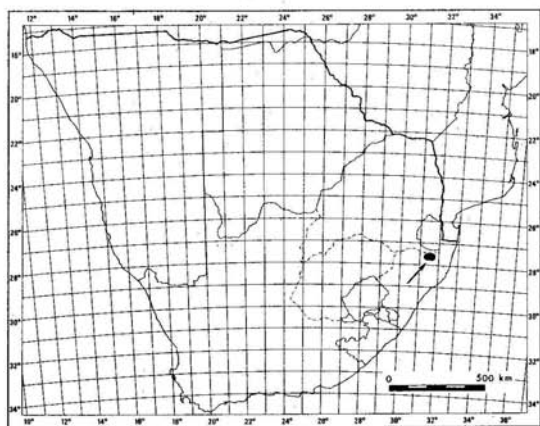


Figure 4 *Encephalartos aemulans*: geographical situation of type locality.

pollination. Seedling regeneration in habitat seems to be very successful.

Diagnostic features and affinities

E. aemulans resembles *E. lebomboensis* vegetatively on account of its relatively narrow leaflets (Figure 1b) which are reduced to prickles towards the bases of the fronds (Figure 1a); and *E. natalensis* and *E. altensteinii* on account of the tuberculate bullae of the female cones (cf. Dyer 1965) (Figure 3e). It differs profoundly from both by its subsimilar (hence the epithet), densely tomentose male and female cones (Figures 2c, d; 3a, b), by the sessile male cones (Figure 3a), and the bullae of the male cones in which the central facets are slightly raised but not drawn out into drooping beak-like structures (Figures 3a, c). The very wide, rhombic microsporophylls (Figure 1c) are quite different from those of any of the other three species which it superficially resembles.

Geographical distribution and habitat

At present this species is known from a hill in the Vryheid district, at an altitude of 1 000–1 100 m where a population of several hundred individuals occur. Two old, multi-stemmed male plants were seen some 10 km from the first site, at an altitude of about 600 m (Figure 4). In spite of some effort, its wider distribution could not be established. The plants favour south-facing sand-

stone cliffs, in short grassland where they are fully exposed, as well as humus-rich scree below the cliffs where especially small plants were found underneath scrubby vegetation under more shady conditions. All coning plants were found fully exposed. On north- and north-east facing cliffs only a few plants were found, mostly very old individuals, and these aspects do not seem to be favourable for seedling regeneration. Light winter frost could be expected at this locality and the rainfall amounts to 600–800 mm per annum, occurring during summer.

The area from where this species is described, is unusually rich in species of *Encephalartos*, with *E. lebomboensis*, *E. natalensis*, *E. villosus* Lem., *E. umbeluziensis* R.A. Dyer and *E. ngoyanus* Verdoorn occurring almost within view.

Conservation status

The type locality is in a healthy state with several hundred reproductively mature plants, and active seedling regeneration taking place. However, as this species seems to have a very restricted distribution, and as already individuals thought to have been taken from the type locality have been noticed in a considerable number of private collections, serious thought should be given to declaring the type locality a nature reserve with special protective measures.

Material studied

To protect the plants from poachers, precise localities are not given, and grid references are restricted to full degree squares:

—2731: Ngotshe district (male), *Vorster 2950* (FTG, K, LE, MO, PRE); *Vorster 2951a* (FTG, K, LE, MO, PRE); *Vorster 2972* (FTG, K, LE, MO, PRE); *ibid.* (female), *Vorster 2951b* (FTG, K, LE, MO, PRE).

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Reference

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