

*Encephalartos aplanatus* (Zamiaceae): a new species from Swaziland

P. Vorster

Botany Department, University of Stellenbosch, Private Bag X1, Matieland, 7602 Republic of South Africa

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*Encephalartos aplanatus* is described as new from north-eastern Swaziland. It resembles *E. villosus* Lem. in its acaulescent habit, small number of long and arched leaves, proximal leaflets gradually reduced to prickles, and virtually identical cones, but differs in being altogether larger with longer leaves which are often shortly petiolate instead of sessile, with leaflets larger, more dentate, and with their margins out of plane or somewhat undulate rather than flat.

**Keywords:** *Encephalartos*, new species, Zamiaceae.

A critical study of *Encephalartos villosus* Lem. (Zamiaceae) led to the conclusion that plants from Swaziland represent a distinct and undescribed species.

*Encephalartos aplanatus* Vorster, sp. nov.

Plantae acaulescentes, non nisi apice trunci supraterraneo protrudenti. *Folia* 2-6(-8), ad 3.5 m longae, erectae et recurvatae, petiolatae; foliola proximalia gradatis aculeis redacta; foliola media in marginibus ambabus dentata, falcata, aplanata. *Strobili* in morphologia similes dum mox ante fecundatione, pedunculati, anguste ovoidei, atrovirides sed (saltem macrostrobilae) aurantescentes; sporophyllorum bullae convexae facietis inconspicuentibus, marginibus inferioribus labium non fimbriatum formantibus.

*Encephalartos villosus* Lem. habitus acaulescentis, folium aliquot, longarum recurvarum foliolis proximalibus gradatis ad aculeis redactarum, et strobilorum similibus similibus; sed differt apice trunci supraterraneo; foliolis latissimis, aplanatis, et dentissimis.

**TYPUS.**— Swaziland: precise locality withheld, *Vorster 2963b* (PRE, holo.).

*E. villosus* in the sense of Dyer in Flower. Pl. S. Afr. 26: tt. 1001 & 1002 (1947).

Plant acaulescent, with apex of stem usually exposed above ground, usually solitary. *Leaves* 2-6(-8), erect but sometimes becoming almost horizontal with age in very shady situations, arched, up to 3.5 m long with petiole up to 200 mm long, petiole and lower rachis covered with off-white somewhat shaggy indumentum; leaflets directed towards apex of leaf at angle of about 75° with rachis, opposing leaflets at angle of slightly less than 180° to each other, basal leaflets progressively reduced in size towards base of leaf with lowermost leaflets reduced to prickles, median leaflets very narrowly ovate and tapering to acute but not pungent apex, both margins sparsely dentate (very rarely entire) and somewhat undulate, relatively soft-textured, abaxially striate but not corrugated, dark glossy green, up to 300 mm long and 40 mm wide. *Male cones* up to 3, up to 650 mm long and 80-100 mm across, on stalks up to 220 mm long, emerging green but turning pale yellow when maturing; exposed faces of microsporophylls flat, smooth, glabrous, facets indistinct, with a sharp abaxial ridge which is not or only slightly fringed. *Female cones* up to 2, about 400 mm long and up to 120 mm across, on short stout stalks up to 60 mm long, emerging dark green but turning bright orange-yellow on ripening; exposed faces of megasporophylls flat, smooth, glabrous, facets indistinct, with a sharp abaxial ridge which is not fringed (cf. *E. villosus*); seed ellipsoid with

almost truncate ends, about 25 mm long and 13-15 mm wide, sarcotesta bright red. (Figures 1 to 3).

## Phenology

Observations on garden plants in Swaziland, Nelspruit, Pretoria, and Stellenbosch suggest that the cones appear in January, the pollen is shed in April, and the female cones disintegrate in late September to October.

## Diagnostic features and affinities

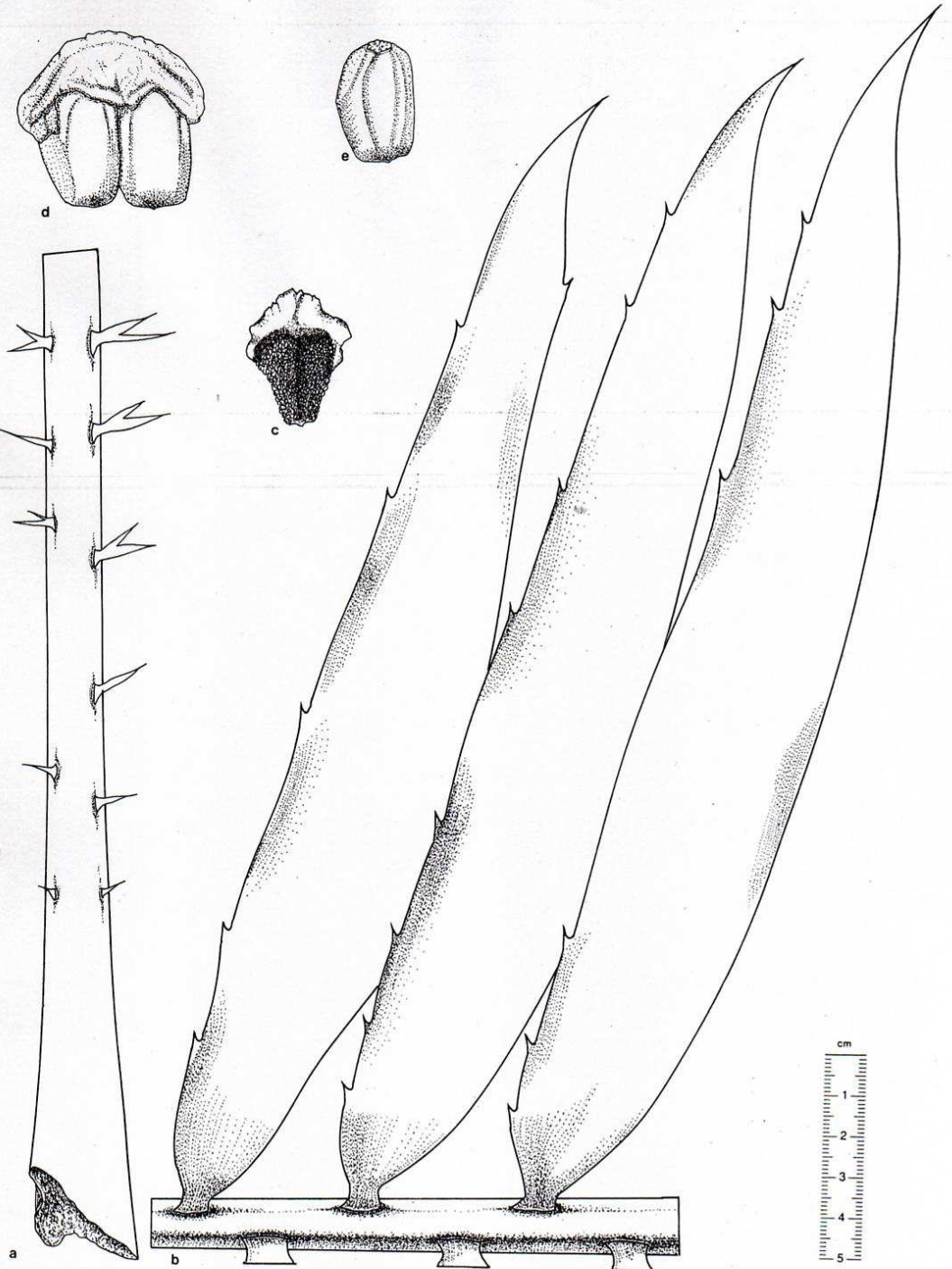
*E. aplanatus* closely resembles *E. villosus* Lem. (cf. Dyer 1965) in its virtually identical cones (Figure 2), its acaulescent habit (Figure 3), and its small number (less than 10) of long and arching leaves with the proximal leaflets gradually reduced to prickles; but is distinguished by being altogether larger (leaves up to 3.5 instead of up to 2.5 m long) with leaves often shortly petiolate instead of sessile and leaflets larger (up to 300 × 40 compared to up to 250 × 20 mm) and more dentate with the margins twisted out of plane or somewhat undulate (Figure 1b) rather than flat, hence the specific epithet. The apex of the stem is often exposed above ground, compared to completely underground in *E. villosus*. All plants seen were solitary, whereas *E. villosus* often suckers to form clumps.

Contrary to the author's philosophy (Vorster 1993) that the distinguishing characteristics of a species should lie in the reproductive (i.e. isolating) structures, this species is distinguished solely on vegetative characteristics. Although it resembles *E. villosus* in some respects, as detailed above, and may possibly be a close relative of that species, it is clearly distinct because of its vegetative morphological and geographical discontinuity with that species (see below). It might be argued that subspecific ranking would be more appropriate, but that would imply a close evolutionary relationship for which there is no proof.

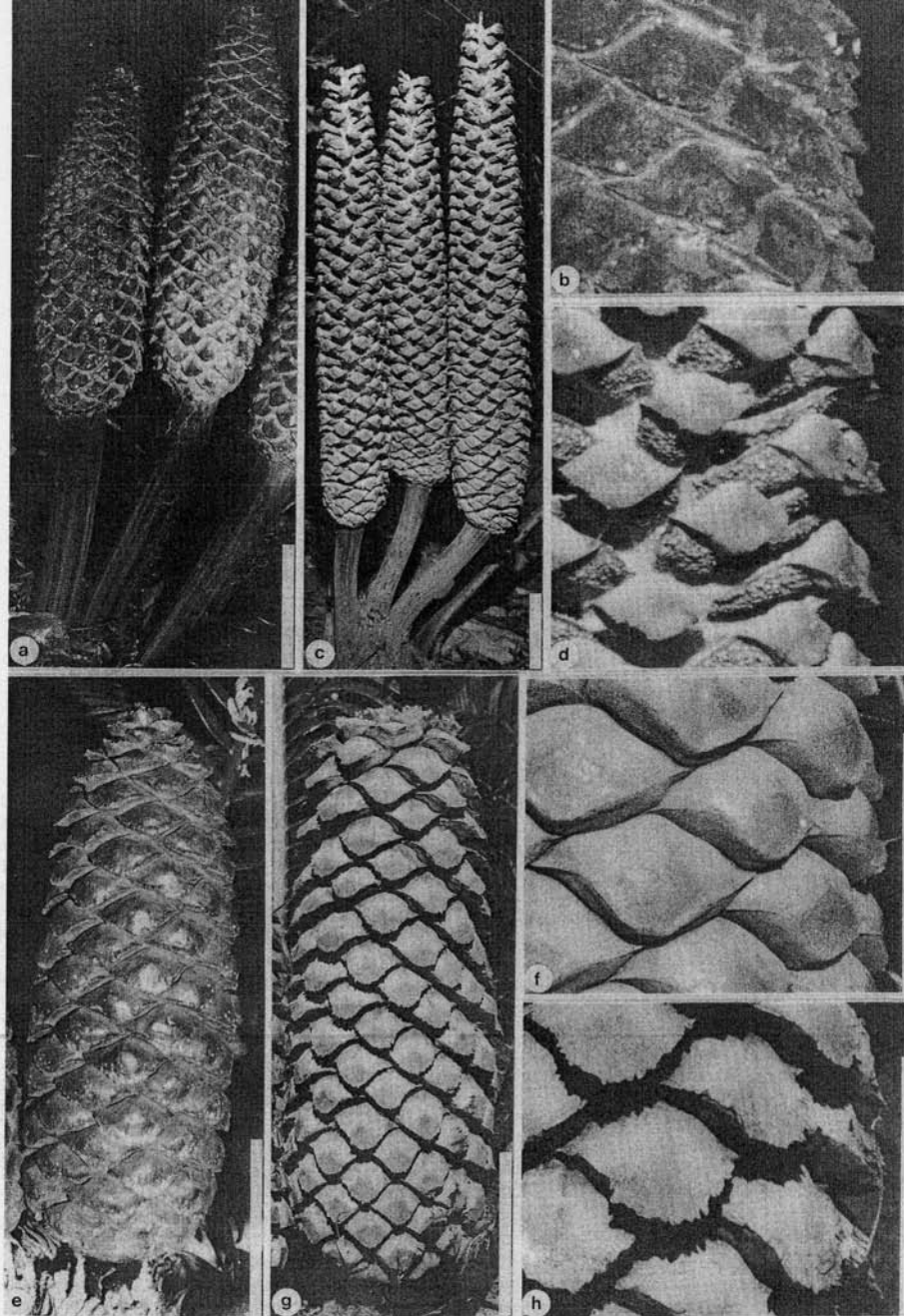
The known localities of *E. aplanatus* are situated approximately 100 km from the closest occurrence of *E. villosus*, and *E. aplanatus* is not considered to be a hybrid involving that species.

## Geographical distribution and habitat

Known only from a small area in the north-eastern part of Swaziland (Figure 4). I saw it only once in the field, in a steep ravine where it occurred in rather dense shade cast by deciduous and fairly dry ravine forest (Figure 3). It is not known to be sympatric with either *E. villosus* or *E. umbeluziensis* R.A. Dyer, and is in fact separated by a considerable spatial discontinuity from the former.



**Figure 1** *Encephalartos aplanatus*: (a) petiole with proximal leaflets gradually reduced to prickles, (b) median leaflets, (c) microsporophyll in abaxial view, (d) megasporophyll and seeds in abaxial view, (e) seed with sarcotesta. a & b from Vorster 2991, c from Vorster 2963a, d & e from Dyer 9794. Del. E.C. Vorster.



**Figure 2** *Encephalartos aplanatus*: (a) immature male cones, (b) detail of same, (c) male cones at pollen-shedding stage, (d) detail of same, (e) female cone, (f) detail of same showing lack of distinct facets and sharp but fringed abaxial ridge on exposed faces of mega-sporophylls, (g) female cone of *E. villosus* from near Port St. Johns showing similarity to that of *E. aplanatus*, (h) detail of same showing sharp and fringed abaxial ridge on exposed faces of megasporophylls – this fringe was not observed in any specimens of *E. aplanatus* but neither is it constant in *E. villosus*, so that it is not a distinguishing characteristic. Scale bars: a, c, e, g = 100 mm; b, d, f, h = 50 mm. a–d from plants grown from seed of *Culverwell* 794, e & f from *Vorster* 2963b, g & h from a plant in the author's living collection.

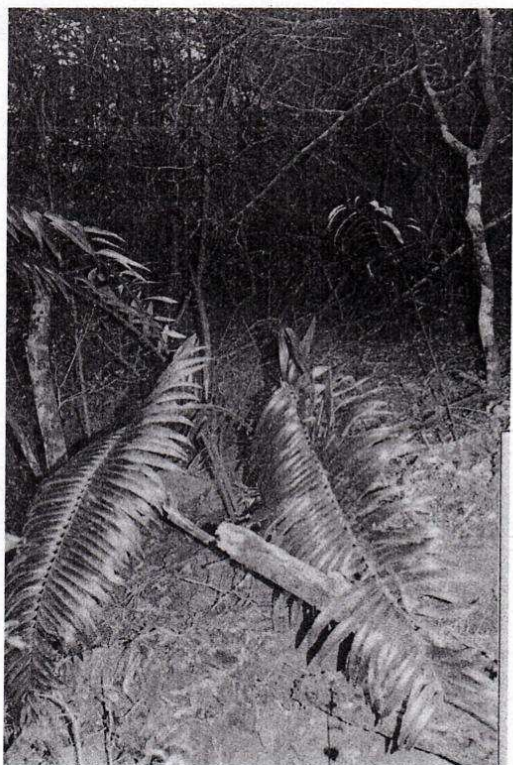


Figure 3 *Encephalartos aplanatus*: plant in habitat with almost reclining leaves (Vorster 299). Scale bar = 1 m.

#### Conservation status

Some years ago a fair number of specimens appeared in gardens, no doubt the result of illegal collecting. In the course of a field expedition to its known native habitat, only a single locality with a few scattered and not very healthy looking plants was located. I was unable to locate it at localities where it was known to have occurred in the late 1940's, and it is concluded that its numbers, which were probably never high, have been reduced by illegal collecting to a point of near extinction. Due to the nature of the land where it occurs, it is unlikely that it can be adequately protected, for which reason the precise geographical information is not made public.

The species is represented in the public collections of the Pretoria National Botanical Garden as well as the Lowveld Botanical Garden at Nelspruit, but regrettably not in the National Botanic Garden, Kirstenbosch.

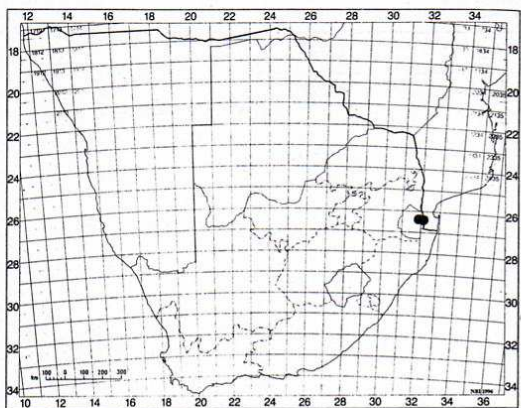


Figure 4 *Encephalartos aplanatus*: known geographical distribution.

#### Material examined

##### SWAZILAND

Locality withheld, Culverwell 794 (PRE), Compton 29734 (PRE), Dyer 4794 (PRE, 2 sheets), Dyer 9794 (PRE, 5 sterile sheets plus 2 of microsporophylls and 2 of megasporophylls added from cultivated plants), Keith s.n. sub Christian 604 (PRE), Keith s.n. sub PRE 33007 (megasporangia and seeds) (PRE), Keith s.n. sub PRE 33019 (PRE, 2 sheets, seedlings), Nicholson s.n. sub PRE 27261 (PRE, 3 sheets), Verdoorn & Christian s.n. sub PRE 33034 (PRE), Vorster 2963a (PRE), 2963b (PRE), 2992 (PRE, 3 sheets).

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