Encephalartos hirsutus (Zamiaceae): a newly described species from South Africa

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Encephalartos hirsutus P.J.H. Hurter is described from the Northern Transvaal. This species resembles E. eugene-maraisii Verdoorn, E. lehmannii Lehm., E. princps R.A. Dyer and E. middelburgensis Vorster et al. in its pungent, stiff, glaucous leaves. It differs from all these species in its decurrent pinna and glabrous sporophylls with a waxy covering.

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An ongoing evaluation of Zamiaceae in southern and tropical Africa is being undertaken by one of us (P.J.H.H.). This study has already revealed the existence of a distinct, undescribed species in the Northern Province of South Africa.

Encephalartos hirsutus P.J.H. Hurter, sp. nov.


TYPUS — South Africa: Northern Province, 1 000 m alt., 7 June 1994 (fond and male cone), P.J.H. Hurter 94R/1 (PRE, holotype).

Plant decumbent, suckering from the base. Trunk decumbent, up to 3.5 or rarely 4.2 m long and 350–400 mm in diameter, leaf bases persistent, with a golden, densely tomentose crown, turning greyish with age. Leaves numerous in a dense crown, subsessile, apex recurved, rigid, glaucous, 1.1–1.2(1.4) m long, petiole bulbous, up to 130 mm long, tomentose, radula tomentose, becoming subglabrous with age, pinnae entire, inflexed and directed towards the apex of the frond at an angle of ca. 50° to the rachis, opposite leaflets set at an angle of 40° to each other, recurved overlapping, proximal leaflets gradually reduced but not to a series of spines, median leaflets 130–170 mm long and 20–24 mm wide, narrowly elliptic and falcate, gradually acuminate and pungent apically, decurrent basally on the rachis, apices somewhat turned towards the frond apex. Strobili dimorphic, glabrous, scale facets smooth, waxy bluish-green, microsporangiate strobili 5 per trunk, narrowly ovoid, 500 mm long and 90 mm in diameter, peduncle 120 mm long, median microsporophylls rhombic, ca. 29 mm wide, 30 mm long and 7 mm high, with the central facet flat or slightly concave, megasporangiate strobili 1–3 per trunk, ovoid, 400 mm long and 330 mm in diameter, appearing sessile but with peduncle up to 60 mm long, hidden amongst caespitulose in the trunk crown, median megasporophylls rhombic, with four lateral and one central facet, ca. 50 mm wide, 44 mm long and 15 mm high with central facet a third of the horizontal diameter of the bulb. Seeds ca. 200 per cone, sarcocarps orange-red, kernel 30–35 mm long and 15–18 mm in diameter, ellipsoidal, round and smooth (Figure 1).

Diagnostic features and affinities

E. hirsutus superficially resembles E. eugene-maraisii Verdoorn (Verdoorn 1945), E. lehmannii Lehm., E. princps R.A. Dyer (Dyer 1953a, b), E. doolomiticus Lavranos & Goode, E. dyeri Lehm., E. middelburgensis Vorster et al. (Robben et al. 1989) in its stiff, pungent and glaucous fronds. However, even vegetatively it is easily distinguished from all six species by its decurrent habit, decurrent bases of the pinnas and the raised veins on the abaxial surface of the pinnas. The morphology of the fronds in E. hirsutus is very distinctive; the pinnas are inflected, overlap incurvously and the proximal part of the pinnas bases are shortly decurrent, a character not yet observed elsewhere in the genus. In E. eugene-maraisii, E. doolomiticus and E. princps the pinnas are also inflected and overlap incurvously but the veins of these three species are not raised on the abaxial surface of the pinnas and the pinnas are subsessile on the rachis. E. lehmannii and E. dyeri also differ from E. hirsutus in that their leaflets are subsessile and succesively oriented on the rachis, although their median leaflets usually do not overlap. E. middelburgensis differs strikingly from E. hirsutus in its subsessile, strongly succes- sive pinnae.

Profound differences are also observable in the strobili of the new species. In E. hirsutus the microsporobilli are narrowly ovoid, glabrous, waxy, with the median bulbs drawn out but not into a drooping or lip-like structure, the median microsporophylls being flat and rhombic. In E. eugene-maraisii and E. lehmannii the microsporobilli are covered by a short indumentum and the bulbs is more drawn out than that of E. hirsutus. In E. dyeri the surface of the bulbs is strongly drawn out to form a beak-like structure, also evident to a lesser extent in E. doolomiticus. The microsporobilli differ from those of E. dyeri in the markedly waxy covering, which remains evident in herbarium material. In all six of these species the microsporophylls are much longer than broad, while in E. hirsutus the microsporophylls are as broad as long or only slightly longer than broad.

In E. hirsutus the megasporobilli are ovoid and bluish green, and the megasporophylls are glabrous and smooth surfaced. Megasporyphylls of E. doolomiticus and E. princps differ from those of E. hirsutus in that the terminal facets of the bulbs are markedly verrucose. The megasporophyll of E. eugene-maraisii and E. lehmannii differ from that of E. hirsutus in that they are usually covered by a dense indumentum. The megasporobilli of E. middel- burgen sis and E. dyeri are similar but are not as smooth surfaced as those of E. hirsutus in that some ridges and papillae always occur on the lateral facets of the bulb.
Figure 1  Encephalartos hirundae. (a) Megaspore, (b) median pinnae, (c) microspore, (d) leaf base, (e) pair of pinnae showing the rhombic rachis in section and the angle of insertion of the pinnae, (f) sub-apical pinnae. Leaf details: 0.45 x; cone details: 0.67 x (drawing by M.C. Huxley).
Geographical distribution and habitat
At present this species is known only from three widely separated localities in the Northern Province, at an altitude of 800–1 000 m.

Plants grow exposed on south-east-facing quartzite cliffs, in moist semi-deciduous mixed scrub where observation is often obscured by the dominant Androstachys johnsonii trees. At the type locality, plants grow exposed on a dry south-facing cliff in association with Androstachys johnsonii, Adenia spinosa, Barleria bremekampii and Eracrostis superba (Figure 2). The rainfall of some 350–650 mm per annum occurs in summer. Over the distribution range of this species (Figure 3), E. transvenosa is the only other Encaphalarias species occurring nearby.

Material studied
To protect plants from poachers, precise localities are not given, and grid references are restricted to a 1:250 000 scale:

—220: Allwood, Hurter 94R7 (PRE).
—223: Mokala, De Winter 10034 (PRE) (male), Glen 5747 (PRE), UNIN, K, MO, Hurter 94R7a (PRE) (male), Hurter 94R7a (PRE) (female), Hurter 94R7b (PRE).

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References