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A new species of *Ceratozamia* (Zamiaceae, Cycadales) from Veracruz, Mexico

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***Ceratozamia huastecorum* sp. nov.** is from an isolated meseta or tepui-like mountain in the *Huasteca* region of northern Veracruz State, Mexico. It has affinity to *C. morettii* Vázq.Torres & Vovides from the Mexican transvolcanic mountain range, which lies over 200 km to the south. The most notable differences are in female cone colour, leaf and leaflet morphology and length. The specific epithet is chosen in honour of the *Huasteca* ethnic region of great cultural importance to northern Veracruz. *Botanical Journal of the Linnean Society*, 2003, **141**, 395–398.

ADDITIONAL KEYWORDS: endangered species – Huasteca – Mesoamerica – neotropical cloud-forest.

INTRODUCTION

The northern portion of the State of Veracruz in Mexico constitutes one of the most environmentally altered zones of the country. However, it is still possible to find, at higher elevations, vestiges of relict primary vegetation that has not been sufficiently explored from a floristic viewpoint. One of these is encountered on a meseta or tepui-like mountain in the *Huasteca Veracruzana* region where there still exists a cloud forest whose richness in species and state of conservation makes it an outstandingly important site of botanical interest (Castillo-Campos & Medina, 1996). During botanical explorations of Castillo-Campos during the 1980s this taxon was found and was considered tentatively as *Ceratozamia microstrobila* Vovides & J.D. Rees. However, upon further examination and comparison of fertile material we came to the conclusion that the new plants are different. We believe that these cycads with relatively small trunks and wide leaflets from north-eastern Mexico form the *C. latifolia* Miq. complex of species *sensu* Moretti, Sabato & Vázquez Torres (1980). During further research based on living material held at the '*Clavijero*' Botanic Garden at Xalapa, involving molecular as well as morphological studies (González & Vovides, 2002; Vovides *et al*. in press), we came to the conclusion that the taxon is new to science.

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DESCRIPTION

CERATOZAMIA HUASTECORUM AVENDAÑO, VOVIDES & CAST.-CAMPOS **SP. NOV.** (FIG. 1,2)

Holotype: MEXICO, Veracruz, 16.xii.1981 *Castillo-Campos et al. 2567* male (XAL).

Paratypes: MEXICO, Veracruz, 13, xii. 1981 *Castillo-Campos et al. 2418* male (XAL); *Castillo-Campos et al. 2481* female, 14.xii.1982 (XAL; MEXU; MO, UAMI).

Diagnosis: Truncus semihypogaeus, humilis vel 13 cm altus. Folia ascendentia 50–73 cm longa; foliola 5–16-jugara, oblanceolata, apice aegre bidentata, 6.5–21 cm longa. Affinis *Ceratozamia morettii* Vázq.Torres & Vovides.

Description: Cycad with short non-branching trunk, subglobose, erect, semihypogeous, reddish brown armed with persistent petiole and cataphyll bases, 12–13 cm (mean = 12.2) long, 11–13.5 cm (mean = 12) diameter ($N = 4$); leaf cataphylls triangular, lanose,

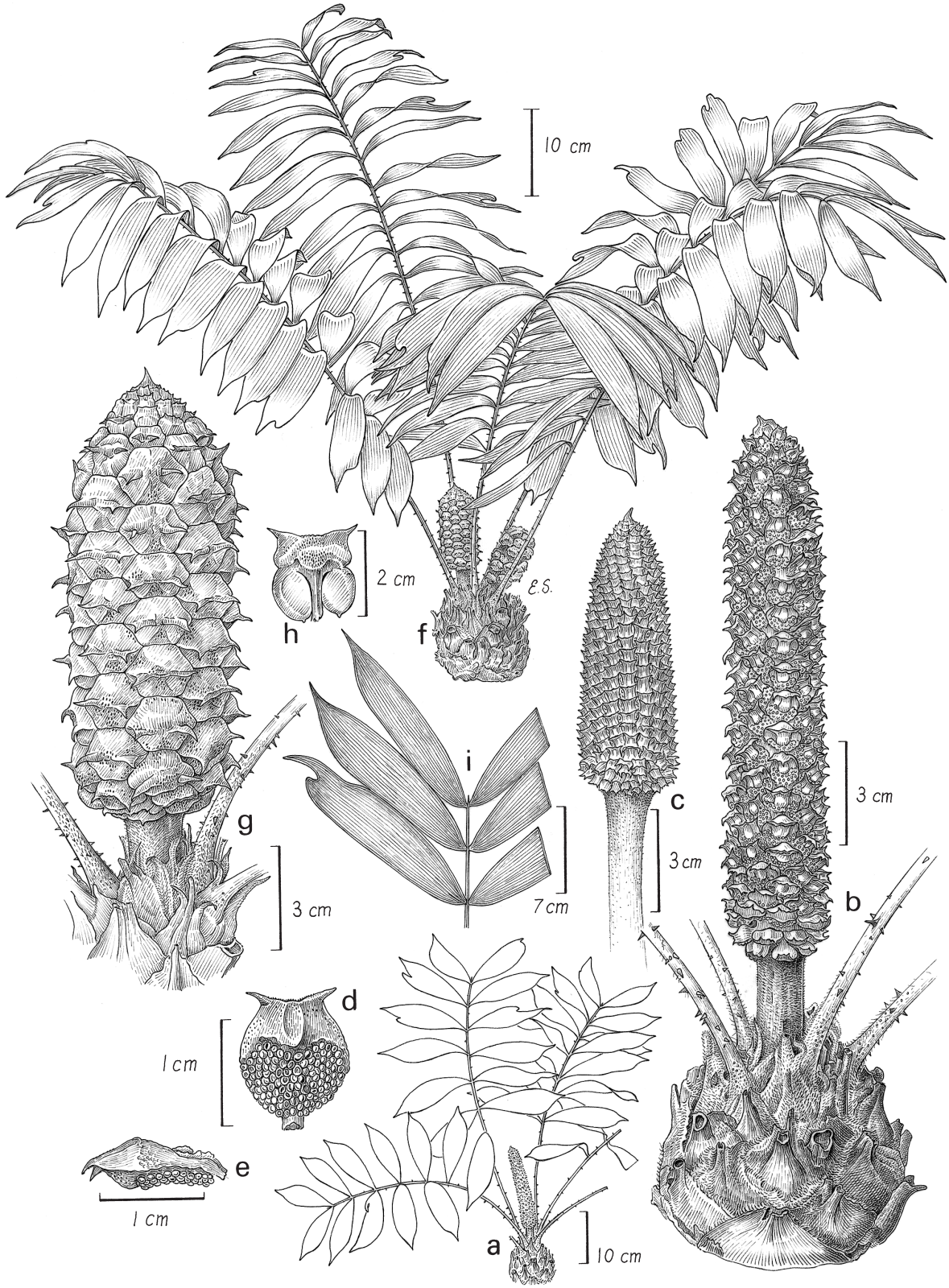

Figure 1. (a) Habit of male plant. (b) Detail of trunk, petioloes and mature microstrobilus. (c) Detail of immature strobilus. (d) Abaxial view of microsporophyll showing sporangia. (e) Side view of microsporophyll. (f) Habit of female plant. (g) Detail of mature megastrobilus. (h) Detail of megasporophyll showing ovules. (i) Detail of leaf apex showing leaflet details.

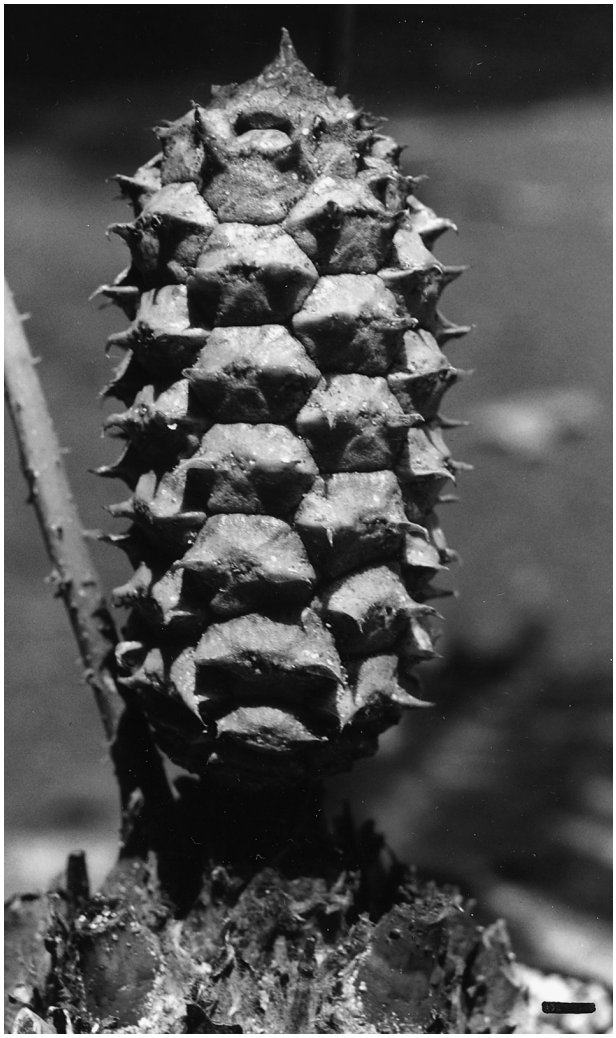

Figure 2. Mature megastrobilus, scale bar = 1 cm.

stipulate, 3–3.2 cm long, 2.6–2.8 cm wide at base. LEAVES pinnate, glabrous, 3–5, ascending, extending forming an open apical crown, 50–73 cm (mean = 60) long, 30–42 cm (mean = 38) wide (N = 25); petiole and rachis terete, armed with few prickles that diminish in number and thickness from proximal to distal ends; petiole linear, 19–41 cm (mean = 25) long, 0.8 cm diameter, tomentose at base, rachis 30–64 cm (mean = 57) long; LEAFLETS coriaceous, 5–16 (mean = 15) pairs, opposite to subopposite at times subalternate along proximal and mid portion of leaf, oblanceolate, rarely bidentate at or near asymmetrical apex, apex acuminate, margin entire, subrevolute, brilliant green on adaxial surface, light green on abaxial, 6.5–21 cm (mean = 16.5) long, 3.2–6.5 cm (mean = 4) wide, veins visible 30–38 (mean = 32), intervein distance 1.1–1.6 mm (mean = 1.4) (all N = 25). MICROSTROBILI erect, cylindrical tapering towards apex, pale to light green, 16 cm long 3 cm diameter at maturity, peduncle scarcely tomentose 3–21 cm (mean = 8) long (N = 5); microsporophylls indefinite, cuneiform, spirally arranged along axis forming apparent vertical rows, bicornate at distal face, fertile portion covering *c*. two thirds of the proximal abaxial surface, 8–10 mm (mean = 9.2) long, 7.2–9.8 mm (mean = 8.6) wide (N = 20), distal horns 1.1–1.2 mm long, distance between horns 5–6.8 mm (mean = 6), microsporangia indefinite, in sori of three, 0.9–1.1 mm long, *c*. 0.9 mm wide, longitudinally dehiscent. MEGASTROBILI cylindrical to barrel-shaped, erect, olive green, 13.5 cm long, 5 cm diameter, peduncle 3–8 cm long; megasporophylls indefinite, peltate, 1.8–2 cm long, 1.4–1.8 cm (mean = 1.6) wide, distal face hexagonal, bicornate, indument scarce, grisaceous, horns 4–6.2 mm (mean = 4.5) long, distance between horns 1.3–1.8 (mean = 1.5) cm. SEEDS ovate, 1.2 cm long, 0.9–1 cm wide, sarcotesta brown at maturity, sclerotesta beige, smooth. Chromosome number $2n$ = 16.

Etymology: The specific epithet is dedicated in honour of the *Huasteca* ethnic region of great cultural importance to northern Veracruz.

Other vouchers examined: Mexico: Veracruz: *Castillo-Campos & Benavides 2232, 2244* (XAL); Jardín Botánico 'Clavijero', *Avendaño 5380* (XAL).

HABITAT DESCRIPTION

This cycad is found in an area of cloud forest in northern Veracruz. It inhabits the forest understorey at elevations from 900 to 1300 m. The cloud forest is characterized by the following dominant tree species: *Quercus acutifolia* Née, *Q. skinneri* Benth., *Carya palmeri* W.E. Manning, *Clethra mexicana* DC., *C. alcoceri* Greenm., *Turpinia insignis* (Kunth) Tul., *Styrax glabrescens* Benth. and *Ilex* sp. The shrub layer is distinguished by the presence of: *Nectandra* sp., *Persea* sp., *Hoffmania excelsa* (Kunth) K. Schum., *Psychotria lundellii* Standl. and *Viburnum ciliatum* Greenm. The herbaceous layer is dominated by: *Ichnanthus tenuis* (J. Presl) Hitchc. & Chase, *Zephyrantes carinata* Herb. and *Calathea coccinea* Standl. & Steyerm (Castillo & Medina, 1996).

Ceratozamia huastecorum populations are found under partial shade in inaccessible sites along the mountain crest, on basalt rocky substrate. They occur on a stony, medium texture lithosol and luvisol substrate rich in humus. Winds charged with moisture lash these sites with great strength and mists are frequent. The vegetation in these areas, with abundant *Eugenia capuli* (Schltdl. & Cham.) Hook. & Arn. and *Ilex* sp., is dwarfed due to the effect of the winds.

KEY SEPARATING *CERATOZAMIA HUASTECORUM* FROM *C. MICROSTROBILA*, *C. MIQUELIANA* AND *C. MORETTII*

1. Rachis unarmed ..... *C. microstrobila*
1′. Rachis armed 2
2. Leaves greater than 80 cm long 3
2′. Leaves less than 80 cm long, leaflets oblanceolate, 6.5–21 cm long ..... ***C. huastecorum***
3. Leaflets obovate to oblanceolate, 20–29 cm long, leaves 80–180 cm long ..... *C. miqueliana*
3′. Leaflets ovoid, 25–35 cm long, leaves 100–140 cm long ..... *C. morettii*

Exact locality information has been purposely omitted in order to avoid illegal collecting, which may lead to the extinction of this species.

DISCUSSION

Ceratozamia huastecorum is a member of a group of *Ceratozamia* spp. of north-eastern Mexico, north of the Mexican transvolcanic mountain range, which includes the *C. latifolia* complex *sensu* Moretti *et al*. (1980). This forms an unresolved clade of morphologically distinct taxa of probable recent speciation (Gonzalez & Vovides, 2002). It also comprises a group of *Ceratozamia* species with wide leaflets that include wide ranging species such as *C. microstrobila* from the transition zone of seasonal tropical forest and mixed oak woodland, *C. hildae* G.P. Landry & M.C. Wilson from oak forest, both from north-eastern Mexico; *C. morettii* from the transvolcanic mountain range in cloud forest; and *C. euryphyllidia* Vázq. Torres, Sabato & D.W. Stevenson, *C. miqueliana* H. Wendl., *C. whitelockiana* Chemnick, Gregory & S. Salas, and *C. zoquorum* Pérez-Farrera, Vovides & Iglesias, in tropical rain forest, all from south-eastern and southern Mexico south of the transvolcanic mountain range (Vovides *et al*. in press; Pérez-Farrera, Vovides & Iglesias, 2001).

Ceratozamia huastecorum shows affinities with *C. morettii* in male and female cone size, but differs in trunk, leaf, and leaflet length as well as leaflet number. When cultivated under uniform greenhouse conditions the leaf and leaflet lengths do not change appreciably. Though both species share similar cloud forest habitats they are from different physiographic regions of Veracruz and are separated by over 200 km.

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