

What is *Zamia fischeri* Miquel ?

DENNIS WM. STEVENSON¹, †SERGIO SABATO², ALDO MORETTI²,
PAOLO DE LUCA²

¹New York Botanical Garden, Bronx, NY 10458, U.S.A. ²Dipartimento di Biologia Vegetale, Università di Napoli Federico II, Via Foria 223, 80139 Napoli, Italia.

Abstract. Most specimens and plants in cultivation of *Zamia fischeri* Miquel, a Mexican cycad belonging to Zamiaceae, do not conform to the description and illustrations provided by Miquel. These plants have more leaves, larger leaves, a different leaflet shape and texture, and $2n=18$ instead of the $2n=16$ found in *Z. fischeri*. Accordingly, the disparate element commonly called *Zamia fischeri* is referred to a new species, *Zamia vazquezii* D. Stevenson, S. Sabato & P. De Luca.

Riassunto. La gran parte dei campioni di erbario e delle piante coltivate di *Zamia fischeri* Miquel, una specie messicana delle Zamiaceae, non appaiono congruenti con la descrizione e le illustrazioni di Miquel. Rispetto a *Z. fischeri* queste piante hanno foglie più grandi e più numerose, una differente forma e consistenza delle foliole ed un numero cromosomico $2n=18$ invece di $2n=16$. Pertanto, queste piante comunemente riferite a *Z. fischeri* vengono qui attribuite alla nuova specie *Zamia vazquezii* D. Stevenson, S. Sabato & P. De Luca.

Key words: *Zamia fischeri*, *Zamia vazquezii*, Zamiaceae.

In 1844 F.A.W. Miquel, in a letter to Louis Van Houtte, a noted Belgian horticulturalist, included a Latin description of a new species of *Zamia* that he apparently intended to publish in his monograph of cycads that would appear in *Linnaea* with specimen citation and illustration. However, Van Houtte published this Latin description in his horticultural catalogue, *Hortus Vanhoutteanus*, while attributing authorship to Miquel by concluding the description with "Miquel *in litt.*" (VAN HOUTTE, 1845). As pointed out by STEVENSON & SABATO (1986) in their work on the typification of names in *Zamia*, this publication of Miquel's Latin description of

Zamia fischeri Miquel has priority for nomenclatural purposes even though no material was cited. Because no specimens were cited in the letter published in Hortus Vanhoutteanus, Stevenson and Sabato chose to neotypify *Z. fischeri* with a specimen (Fig. 1A) that clearly was the specimen upon which Miquel based his drawing (Fig. 1B) for his monograph in Linnaea. Subsequent to this, the identify of *Z. fischeri* remained within the description and illustrations supplied by Miquel. This is true for the numerous monographs of MIQUEL (1847, 1848, 1849, 1852, 1861, 1869) and REGEL (1857a, 1857b, 1876, 1878), in the treatment of DE CANDOLLE (1868), in the description and illustration of DYER (1883), and in treatment by SCHUSTER (1932). There were only about six collections of *Zamia fischeri* up to the time of monograph by SCHUSTER in 1932. All of these collections are similar in morphology and are housed either at U or LE with the Berlin material destroyed in World War II.

Sometime after 1932, plants from Veracruz, Mexico were introduced into cultivation under the name *Zamia fischeri* but these plants are clearly different from the original specimens (compare Fig. 1 and 2 with Fig. 3). VOVIDES et al. (1983, 1992) included *Zamia fischeri* in their treatment of the cycads of Veracruz, Mexico. It is clear from their description and the cover illustration of the 1992 English edition that the plants are not really *Z. fischeri* as understood by earlier authors in the narrow sense but rather plants from Veracruz that have been referred to *Z. fischeri* in recent times. VOVIDES et al. were hampered by too few collections both from Veracruz and from San Luis Potosí with material from the latter being the original source of *Z. fischeri* and all herbarium specimens from there being housed in European herbaria. However, it has become clear that plants growing in Veracruz (Fig. 3) are distinct from those growing in San Luis Potosí (Fig. 2). Moreover, plants of *Z. fischeri* in cultivation from San Luis Potosí for 50 years at Fairchild Tropical Garden of Miami, Florida (accession 57-149) have maintained their distinctive morphology and conformation to the original description and illustration (Fig. 1) as have plants from the same area growing in the New York Botanical Garden (Stevenson 566) and the Orto Botanico at the

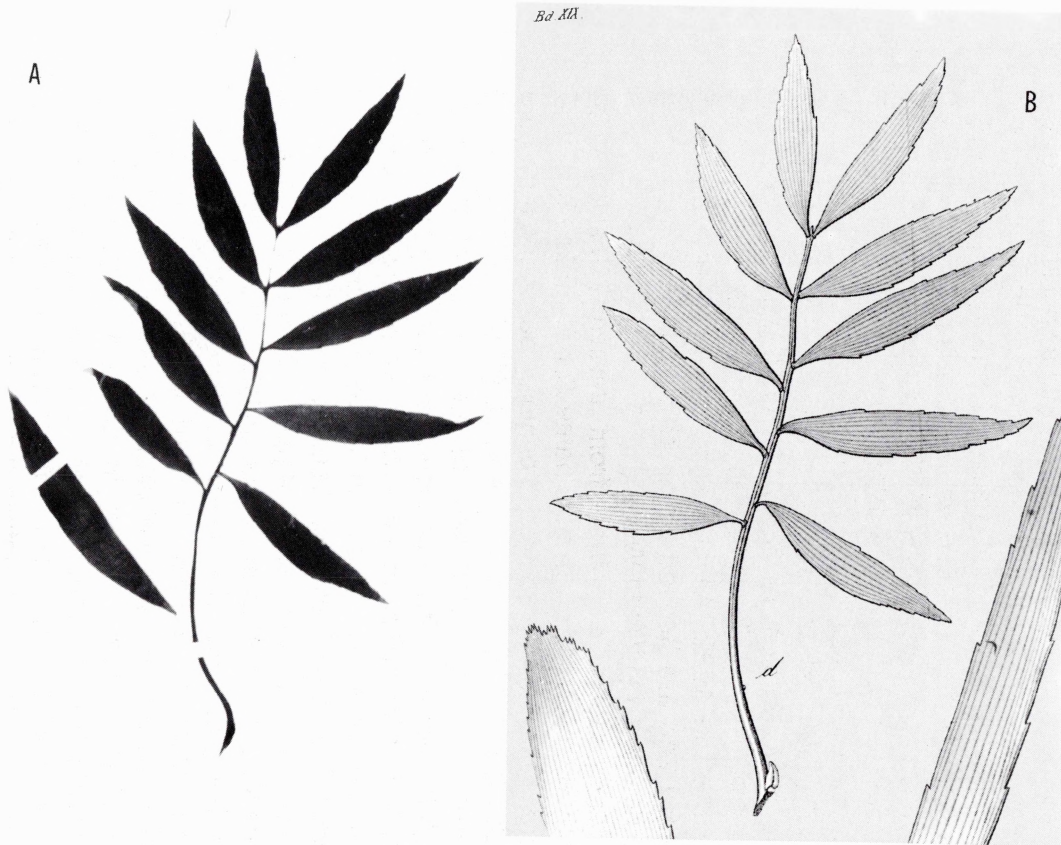


Fig. 1 - Illustrations of *Zamia fischeri*. A. Neotype at U. B. Illustration of *Z. fischeri* published by Miquel in *Linnaea* 19: VII. fig. d. 1847.

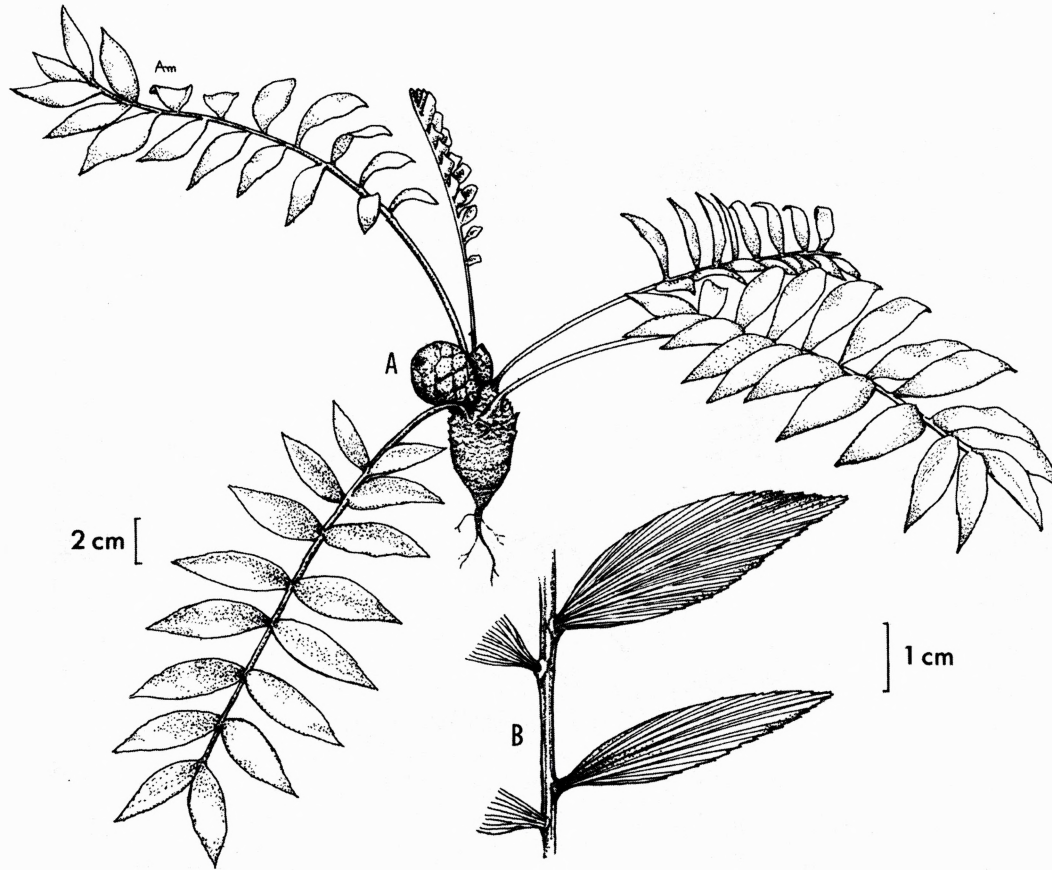


Fig. 2 - *Zamia fischeri*. A. Habit of ovulate plant. B. Median portion of the rachis with leaflets.

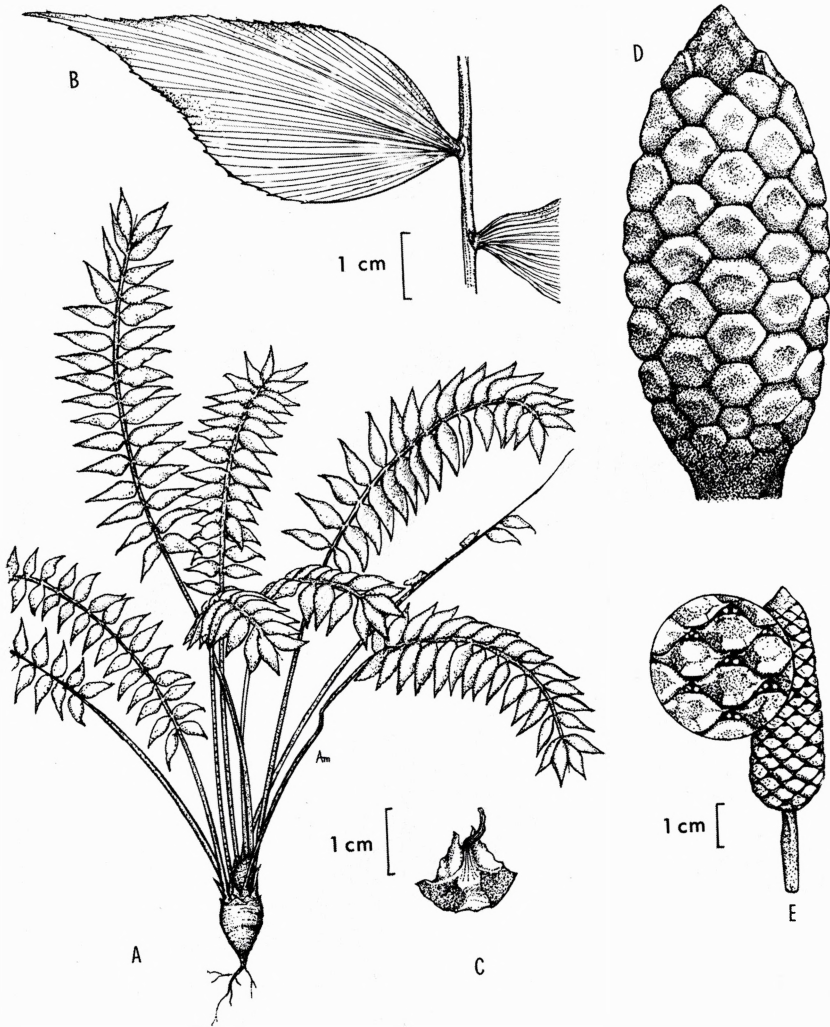


Fig. 3 - *Zamia vazquezii*. A. Habit. B. Median portion of the rachis with a leaflet. C. Cataphyll. D. Ovulate strobilus. E. Polleniferous strobilus.

University of Naples (Sabato e Moretti s.n.) for more than 15 years (Fig 2). Plants from Veracruz growing at the Fairchild Tropical Garden (69-521) have maintained their distinctive morphology as have plants at the New York Botanical Garden and the Orto Botanico at the University of Naples.

Cytology supports this conclusion because those plants of *Z. fischeri* from San Luis Potosí always have $2n=16$ (Fig. 4A) whereas those plants from Veracruz always have $2n=18$ (Fig. 4B) (CAPUTO et al., 1996; MORETTI et al., 1991). Additionally, the populations of *Zamia* in San Luis Potosí and neighboring Queretaro are disjunct from those of Veracruz. Therefore we have decided to describe those plants from Veracruz as a species distinct from *Z. fischeri*.

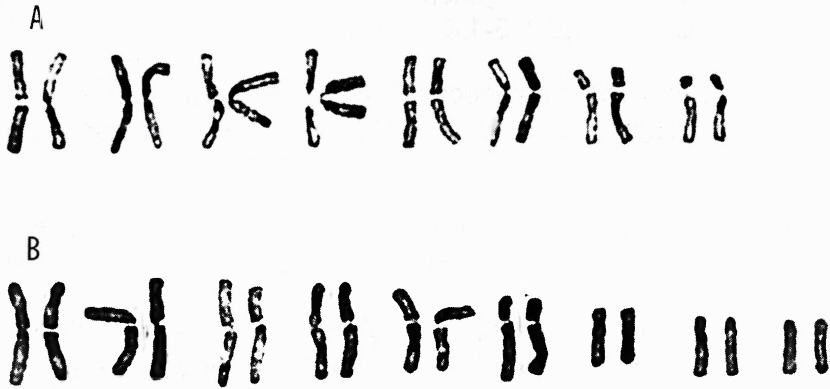


Fig. 4 - Karyograms of A. *Zamia fischeri* (X 320) and B. *Zamia vazquezii* (X 370).
(After MORETTI et al., 1991).

Zamia vazquezii D. Stevenson, S. Sabato, & P. De Luca sp. nov.
(Fig. 3).

TYPE: MEXICO. Veracruz: 22 Jan 1989, *M. Vázquez Torres et al.*
3990 (HOLOTYPE: NY; ISOTYPES: FTG, MO, NY, U, XALU).

Caudex subterraneus; folia 6-30, erecta, multifoliolata; petioli inermes ad paucispinatos; foliola mediana ovata ad obpyriformata, acuminata, multiserrulata, papyracea ad membranacea, glabra; microsporophylla microsporangii abaxialibus; strobili feminei fusci; semina rubra.

Stem subterranean, subglobose, to 10 cm diam. *Cataphylls* ovate, 1-1.5 cm long, 1.5-2 cm wide. *Leaves* 3-30, 0.3-1 m long; petiole 15-40 cm long, smooth to sparsely prickled; rachis with 12-25 (30) pairs of leaflets. *Leaflets* ovate to obpyriform, cuneate basally, acuminate apically, margins with numerous serrations in the upper two-thirds, the larger median leaflets 6-7 (8) cm long, 3-4 cm wide. *Polleniferous strobili* tan, ovoid to ovoid-cylindrical, 5-7 (8) cm long, 2-2.5 cm diam.; peduncle 1.5-2.5 cm long. *Microsporophylls* with sterile tip composed of six slightly inclined facets surrounding a small, centrally depressed terminal facet, sporangia present on abaxial surface only. *Ovulate strobili* tan to brown, cylindrical to ovoid-cylindrical, 10-15 cm long, 5-7 cm diam. *Seeds* orange-red to red, 1.3-1.8 cm long, 0.5-0.8 cm diam. $2n = 18$.

Other specimens examined: MEXICO. **Veracruz**: *Rees 1617* (XALU); *Vázquez Torres et al. 3470* (NY, XALU); *Castillo s.n.* (XALU).

The species is named for Mario Vázquez Torres, astute student of Central American cycads, who first discovered and collected the species.

The salient and most easily seen differences between *Z. fischeri* and *Z. vazquezii* are in leaf and leaflet features as revealed in Figs. 1 and 2 of the former and compared to Fig. 3 of the latter. Leaves of *Z. vazquezii* are more numerous (i.e., more than 6), are longer in being greater than 30 cm, are erect, and have more than 12 pairs of leaflets as compared to those of *Z. fischeri* which number less than six, are less than 30 cm long, are reflexed and have less than 12 pairs of leaflets. Leaflets of *Z. vazquezii* are ovate to obpyriform in shape with attenuate to acuminate apices and reminiscent of the fern genera *Cyrtomium* or species of *Adiantum* (Fig.3) in contrast to those of *Z. fischeri* that are lanceolate with acute apices (Fig. 2).

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