What is Zamia fischeri Miquel?

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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 Zamia 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 identity 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 Potosi 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 Potosi (Fig. 2). Moreover, plants of Z. fischeri in cultivation from San Luis Potosi 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 Linnæa 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 Potosi 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 Potosi 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*.

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

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

Caudex subterraneus; folia 6-30, erecta, multifoliolata; petioli inermes ad paucispinatos; foliola mediana ovata ad obpyriformata, acuminata, multiserrulata, papyracea ad membranacea, glabra; microsporophylia microsporangis abaxialibus; strobili feminei fusc; 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).
This research was supported, in part, by National Science Foundation Grants BSR 8607049 and BSR 8796279 to DWS.

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