



Two new species of *Euphorbia* subg. *Chamaesyce* (Euphorbiaceae) from Baja California Sur, Mexico and their phylogenetic relationships

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Abstract

Two new species of *Euphorbia* subg. *Chamaesyce* sect. *Anisophyllum* are described and illustrated. Both are endemic to the Sonoran Desert of Baja California Sur, Mexico, and were previously determined as *Euphorbia polycarpa*. Their recognition is highly supported by both molecular and morphological data. *Euphorbia vizcainensis* occurs in the Vizcaino and Magdalena subdivisions at elevations from 20 to 250 m. It differs from *E. polycarpa* in having rugose seeds with transverse ridges (vs. smooth seeds). It is most similar to *E. pondii* from which it is separated by features of the stipules, involucre appendages, and seeds. *Euphorbia cerralvensis* is restricted to the Cerralvo Island in the municipality of La Paz of the Central Gulf Coast subdivision, and occurs at elevations from 10 to 300 m. It also differs from *E. polycarpa* by having seeds with transverse ridges. Morphologically it is very distinct from other *Euphorbia* species in the region. Phylogenetic evidence suggests that it belongs to a clade with *E. dentosa*, *E. leucophylla*, *E. petrina*, and *E. brandegeei*, species from which it is distinguished by its suffrutescent ascending habit (vs. herbaceous prostrate habit).

Key words: Central Gulf Coast, endemic, flora, Magdalena, Sonoran Desert, Vizcaino

Introduction

Euphorbia Linnaeus (1753: 450) is one of the five most speciose genera of plants and has more than 2000 species and a subcosmopolitan distribution (Webster 2014). There are major centers of diversity in both the Old and New Worlds. Its taxonomy and classification have been studied numerous times (Klotzsch 1860, Boissier 1862, Wheeler 1943, Webster 1967), resulting in a complex and often contradictory infrageneric classification with various genera such as *Chamaesyce* Gray (1821: 260), *Poinsettia* Graham (1836: 412–413), and *Pedilanthus* Necker ex Poiteau (1812: 388) either segregated from or included within *Euphorbia*. Recent phylogenetic studies (Horn *et al.* 2012, Yang *et al.* 2012, Dorsey *et al.* 2013, Peirson *et al.* 2013, Riina *et al.* 2013) have resulted in a new subgeneric classification in which 4 subgenera and 65 sections are proposed. *Euphorbia* subg. *Chamaesyce* Rafinesque (1817: 119) sect. *Anisophyllum* Roesler (1828: 412) (corresponding to *Chamaesyce* or *Euphorbia* subg. *Chamaesyce* hereafter shortened as *Euphorbia* sect. *Anisophyllum*) has been relatively well studied in North America including taxonomic treatments for many species (Wheeler 1936, 1941). Furthermore, detailed phylogenetic studies of their systematic relationships have been conducted (Yang & Berry 2011, Yang *et al.* 2012). However, many taxonomic problems still exist, often due to a complex morphology with frequently overlapping characters among species, and coupled with similar cyathia, some species can be easily confused with others.

Euphorbia sect. *Anisophyllum* is morphologically very distinctive and characterized by a number of unusual synapomorphies: apical abortion of the main shoot and subsequent sympodial growth; interpetiolar stipules; and opposite, frequently asymmetrical leaves. Most species conduct C₄ photosynthesis, and in general they have reddish leaves, stems, and reproductive parts, as well as numerous cyathia with white involucre appendages.

Many species of *Euphorbia* sect. *Anisophyllum* are locally known as golondrina (Spanish in Mexico) or sandmat (in the United States), the latter name referring to their frequently prostrate habit and preference for sandy soils. They are very common in the Sonoran Desert of the southwestern United States and northwestern Mexico, and Wiggins (1964) reported 34 species from this region. An additional two species have been subsequently described (Wiggins