



## Generic Placement of the Former *Condaliopsis* (Rhamnaceae) species

MELISSA B. ISLAM<sup>1,3,4</sup> & ROBERT P. GURALNICK<sup>2</sup>

<sup>1</sup>Present address: Department of Research & Conservation, Denver Botanic Gardens, 909 York Street, Denver, CO, 80206

<sup>2</sup>University of Florida Museum of Natural History, University of Florida at Gainesville, Gainesville, FL 32611-2710 U.S.A.

<sup>3</sup>Department of Ecology and Evolutionary Biology, University of Colorado, Ramaley N122, Campus Box 334, Boulder, CO 80309, U.S.A.

<sup>4</sup>Author for correspondence ([melissa.islam@botanicgardens.org](mailto:melissa.islam@botanicgardens.org))

### Abstract

*Condaliopsis* is a genus of eight thorny shrub species. Previous morphological research shed doubt on the validity of *Condaliopsis* as a distinct genus in Rhamnaceae. *Condaliopsis* species were transferred to one of two genera, *Ziziphus* or *Condalia*, but some authors continue to recognize *Condaliopsis*. A recent phylogenetic study did not support *Condaliopsis* as monophyletic and placement of *Condaliopsis* species in either *Ziziphus* or *Condalia* was not straightforward. To clarify the generic placement of these eight species, we conducted phylogenetic analyses based on two nuclear loci (nrITS and 26S), two chloroplast loci (*trnL-F* and *trnQ-rps16*) and morphological characters. We present evidence that five of the *Condaliopsis* species should remain in *Ziziphus*, one should remain in *Condalia*, and two should be transferred from *Ziziphus* to *Condalia*. One of these species had an existing binomial within *Condalia*, *Condalia parryi*, and one required a new combination, *Condalia celata*. *Condalia celata* is a federally listed endangered species with a limited range in Florida.

**Keywords:** *Ziziphus celata*

### Introduction

The cosmopolitan mostly woody plant family Rhamnaceae includes 52 genera and roughly 900 species (Stevens 2001, onwards) and includes several economic species including *Ziziphus jujuba* Miller (1768: sin page no.) (Chinese jujube), *Z. mauritiana* Lamarck (1789: 319) (Ber), and the weedy *Rhamnus cathartica* Linnaeus (1753: 193) (Common buckthorn). Three genera, *Ziziphus* Miller (1754: sin page no.), *Condalia* Cavanilles (1799: 39), and *Condaliopsis* (Weberb.) Suessenguth (1953: 134), although not closely related (Richardson *et al.* 2000a), share morphological similarities that resulted in the back and forth generic placement of several species (Weberbauer 1895, Johnston 1962, 1963).

All three genera are composed of thorny shrubs that occur in sub-tropical to tropical regions with *Ziziphus* also including tree species with spines or thorns. *Condalia* is a genus of 18 species in North and South America with the highest diversity in Mexico. The genus *Ziziphus* is a paraphyletic, pantropical genus with approximately 100 species (Medan & Schirarend 2004) and is split geographically into two distinct lineages (Record 1939, Record & Hess 1943, Johnston 1963, Schirarend 1991, Islam & Simmons 2006). One well-supported lineage of approximately 30 *Ziziphus* species occurs in the Americas (Islam & Simmons 2006). For evolutionary questions, this group is referred to here as New World (NW) *Ziziphus* and is considered separately from the Old World (OW) lineage as they are not sister lineages (Islam & Simmons 2006).

Given confusion regarding the placement of a number of species as *Condalia*, *Condaliopsis* or *Ziziphus*, we define *Condaliopsis* species as those species that were placed in *Condaliopsis* by Suessenguth (1953), or following his definition of the genus should have been placed within *Condaliopsis* (Table 1). Under this definition, *Condaliopsis* includes eight species restricted to North America. Because not all of these species have names under *Condaliopsis* (discussed more fully below), when referring to species we use the names proposed by Johnston (1962, 1963) (Table 1) with the addition of *Z. celata* Judd & Hall (1984: 382) named after Johnston's publications but fitting with Suessenguth's definition of *Condaliopsis*.

The history of nomenclature for *Ziziphus*, *Condalia* and *Condaliopsis* is complex, with multiple amendments. In