



## *Coreopsis bakeri* (Asteraceae; Coreopsideae), a new species from Florida, USA

EDWARD E. SCHILLING<sup>1,\*</sup>, ANN F. JOHNSON<sup>2</sup> & GWENLLIAN D. IACONA<sup>1,3</sup>

<sup>1</sup>Department of Ecology & Evolutionary Biology, University of Tennessee, Knoxville, TN 37996, USA

<sup>2</sup>Florida Natural Areas Inventory, 1018 Thomasville Road, Suite 200-C, Tallahassee, FL 32303, USA

<sup>3</sup>Centre of Excellence for Environmental Decisions, University of Queensland, St. Lucia, QLD 4072, AU

\*Author for correspondence: [eschilling@utk.edu](mailto:eschilling@utk.edu)

### Abstract

*Coreopsis bakeri* (Asteraceae; Coreopsideae), an early blooming and very narrow-leaved perennial restricted to rare limestone glade habitats in northern Florida, is described as new. The plants most closely resemble *Coreopsis lanceolata*, a common species of the southeastern U.S., but have narrower, glabrous, and infolded leaves. In addition to phenotypic differences, the two species show divergence at two nuclear genes, the nuclear ITS and ETS regions, and for two chloroplast intergenic spacers (*psbA-trnH* and *rpl32-trnL*). Because of the rarity of *C. bakeri* and the very limited extent of its distinctive habitat, this species is in urgent need of protection. In addition, *C. lanceolata* is found in open areas near the limestone glades, and poses a potential threat through competition or hybridization.

### Introduction

An early blooming species of *Coreopsis* L. (Asteraceae) with narrow, infolded, glabrous leaves from Jackson County, Florida, has been under observation for a number of years. Plants of this species are restricted to remnants of limestone glade habitats (Johnson *et al.* 2013). The glade plants most closely resemble *Coreopsis lanceolata* Linnaeus (1753: 908), a widespread, somewhat weedy species that has apparently had significant range expansion along fields and roadsides following disturbance by humans and as escapes from cultivation (Smith 1976; Weakley 2015). The glade plants have been shown to differ from *C. lanceolata* in both phenotypic (Johnson *et al.* 2013) and molecular characters (Schilling *et al.* 2014).

The limestone glade habitat is rare in Florida, found only in a few places in Jackson and Gadsden counties, where it forms the southeastern outpost of a series of calcareous prairies and glades found across the southeastern U.S. (Johnson *et al.* 2013). The calcareous openings in Florida are dominated by a member of the sedge family, *Schoenus nigricans*, not found on any of the other upland calcareous openings in the Southeast and are denoted as “Florida upland glades” by Johnson *et al.* (2013), to distinguish them from the classical “limestone cedar glades” found in Tennessee and surrounding states (Baskin & Baskin 2000). This community is designated as “upland glade” by the Florida Natural Areas Inventory and as “panhandle Florida limestone prairie” by NatureServe and given the highest rarity ranking (GIS1).

*Coreopsis* is a genus of about 35 species (Strother 2006) but its composition, boundaries, and particularly separation from *Bidens* L. have fluctuated and still remain unclear (Mort *et al.* 2008; Tadesse & Crawford 2014). Within the genus, *C.* section *Coreopsis* is well characterized by having 5-lobed disc corollas, cuneate and 4–5-toothed ray flower corollas, leaves with entire margins, and attenuate pales (Smith 1976). The nine species currently recognized in the section are native to eastern North America (Smith 1976; Crawford *et al.* 1990). The section is well supported as monophyletic based on molecular sequence data (Crawford & Mort 2005), but there are few differences among individual species for the nuclear ribosomal ITS region (Schilling *et al.* 2014). Many species of *C.* sect. *Coreopsis* are associated with open habitats, such as prairies, glades, and woodland edges. Isolated glades provide the opportunity for evolutionary divergence, and a new taxon, *C. grandiflora* var. *inclinata* Allison in Allison & Stevens (2001: 162), was recently described from the Ketona glades in the Bibb Co., Alabama region.

The Florida upland glade plants of *Coreopsis* differ slightly but consistently in morphology from *C. lanceolata*, and all other related species of *Coreopsis*. These differences are maintained in common gardens (Johnson *et al.* 2013).