

A NEW SPECIES OF *EURYSTYLES* (ORCHIDACEAE) IS EXPOSED BY A FIERCE HURRICANE IN PUERTO RICO

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ABSTRACT. A new species of *Eurystyles* (Orchidaceae: Orchidoideae, Cranichideae, Spiranthinae) is proposed, *E. luisortizii* Ackerman *sp. nov.*, which is most similar to *E. ananassocomos* (Rchb.f.) Schltr. from which it differs by a suite of floral traits. This species represents the first confirmed record of the genus for the island of Puerto Rico, bringing the *Eurystyles* species count for the West Indies to four.

RESUMEN. Se propone una nueva especie de *Eurystyles* (Orchidaceae: Orchidoideae, Cranichideae, Spiranthinae), *E. luisortizii* Ackerman *sp. nov.*, la cual es similar a *E. ananassocomos* (Rchb.f.) Schltr., de la que se diferencia por un conjunto de rasgos florales. Esta especie representa el primer registro confirmado del género para la isla de Puerto Rico, lo que eleva el recuento de especies de *Eurystyles* para las Indias Occidentales a cuatro.

KEYWORDS/PALABRAS CLAVE: Cranichideae, Flora de Puerto Rico, Orchidoideae, orquídeas de las Indias Occidentales, Puerto Rico flora, Spiranthinae, West Indies orchids

Introduction. The genus *Eurystyles* Wawra (Orchidaceae: Orchidoideae: Cranichideae; Spiranthinae) comprises of approximately 24 species and is widely distributed from Mexico, Greater Antilles, Central America to South America (Salazar *et al.* 2018, Bogarín 2020). Recently, three species have been reported for the West Indies (Ackerman *et al.* 2014). While no previous specimens of *Eurystyles* from Puerto Rico are known, there has been an unpublished report of the *E. ananassocomos* (Rchb.f.) Schltr. from the early 1970s. Professor Roy Woodbury of the University of Puerto Rico, Río Piedras, found a specimen on Cerro La Santa of the Sierra de Cayey, displayed it at a local orchid show but did not make a specimen of it. Unfortunately, the plant perished, and the locality was soon cleared and flattened to construct communication towers (Woodbury *pers. com.* 1981). Subsequent searches by Woodbury and others (including JDA) proved unsuccessful (Ackerman 1995). While Woodbury was a very good floristic botanist with a special interest in orchids, his determination that the plant was *E. ananassocomos* may be doubtful. Until Donald D. Dod (1977, 1978) studied the genus in Hispaniola, all *Eurystyles* in the West Indies were regarded as *E. ananassocomos*. We now know that there are at least three

species in the Greater Antilles, and *E. ananassocomos* is verified for only Jamaica (the type locality) and Hispaniola (Ackerman *et al.* 2014).

For nearly five decades, no new sightings of *Eurystyles* in Puerto Rico had been made until two months after the devastating September 2017 Hurricane María, a category four storm with sustained winds 250 km/h. One of us (Luis) was hiking on a ridge above Lago Garzas in the municipality of Adjuntas near his family's coffee farm. While walking the trail and climbing over and around broken and fallen tree trunks and branches, he found several plants of *Eurystyles* on a tree trunk. Luis looked among the numerous broken trees in the area but did not find other plants of *Eurystyles*. Then in the next season (December 2018), with Luis no longer on the island, JDA located the trail using Luis's geographical coordinates. Unfortunately, the forest was so damaged that the trail was impassable due to fallen trees, massive invasive grasses, and smothering vines that had grown up since the storm.

Upon examination of the specimens that Luis collected, we concluded that they were similar to the specimen of *E. ananassocomos* that Bobbi Angell illustrated for the Orchid Flora of the Greater Antilles, but differed by having slightly smaller flowers, a lip lack-

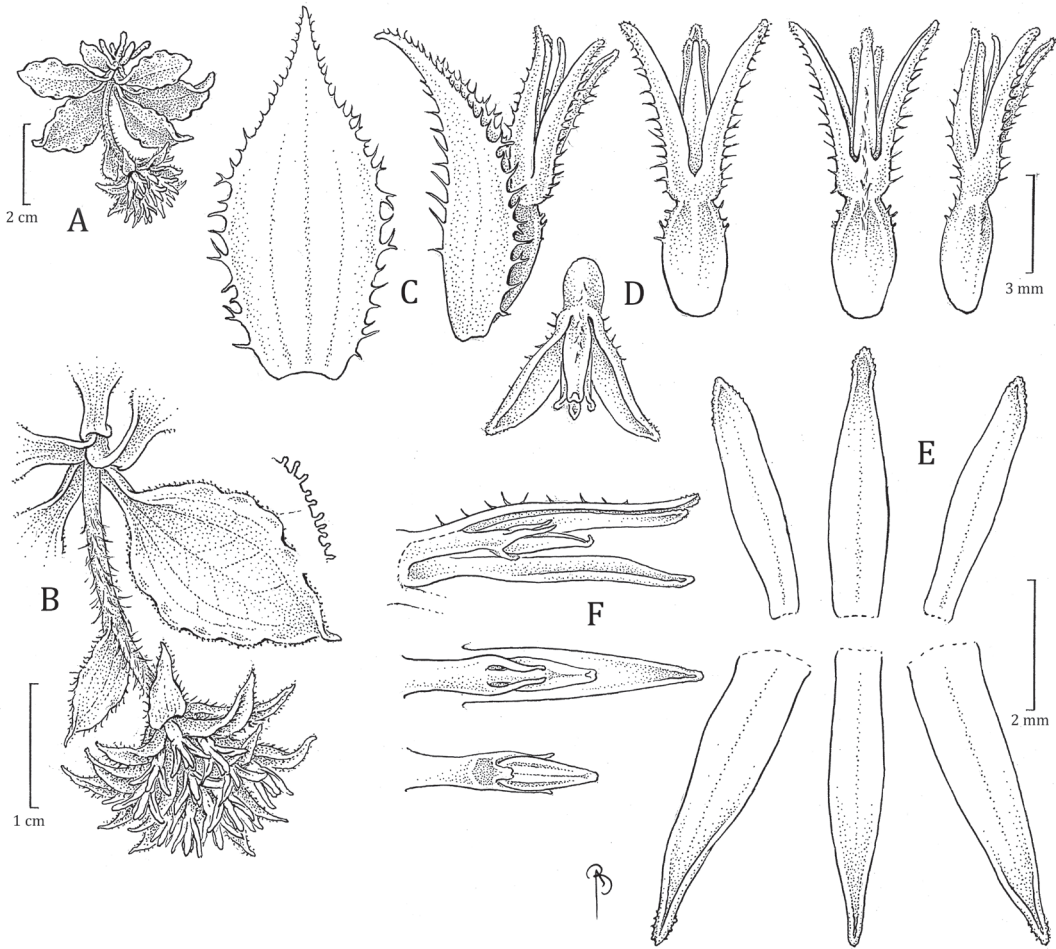


FIGURE 1. *Eurystyles luisortizii* Ackerman. **A.** Plant habit. **B.** Inflorescence and detail of leaf margin. **C.** Floral bract. **D.** Flower, left to right: front, ventral, dorsal and lateral views. **E.** Perianth, clockwise from upper left: petal, dorsal sepal, petal, lateral sepal, labellum, lateral sepal. **F.** Dissected flower, top to bottom: lateral view with one sepal and petal removed exposing the column; dorsal view of column with labellum; ventral view of column. Based on pickled material of holotype collection, *L. Ortiz Jordan s.n.* (US, UPRRP). Illustrated by Bobbi Angell.

ing basal auricles, and being single-veined, rather than having small basal auricles and 3 veins; and by having simple, erect staminodes, not bifurcated and curled.

We propose to designate these plants as representing a new species since flower morphology is both consistent and easily distinguishable from other *Eurystyles* species, especially those from the West Indies, which have been studied in detail (Ackerman *et al.* 2014). Bobbi Angell illustrated both the specimen from the Dominican Republic, which was published in *Orchid Flora of the Greater Antilles* (Fig. 51 in Ackerman *et*

al. 2014), and the Ortiz specimens examined here (Fig. 1). We can only speculate whether Woodbury collected the same thing five decades ago on Cerro La Santa, which is some 75 km east of the Adjuntas type locality.

TAXONOMIC TREATMENT

Eurystyles luisortizii Ackerman, *sp. nov.* (Fig. 1–3.)

TYPE: Puerto Rico. Municipality of Adjuntas: above Lago Garzas, trail from Rd 518 to bridge across the lake, 18°08'2.43"N, 66°44'23.43"W, wet secondary



FIGURE 2. *Eurystyles luisortizii* Ackerman. Inflorescence, side view; inflorescence head-on. Photographed by Jonathan López, reproduced with permission.

forest, elev. 783 m, originally collected in November 2017, flowered in cultivation 28 November 2018, *L. Ortiz Jordan s.n.* (holotype: US; isotype: UPRRP).

DIAGNOSIS: *Eurystyles luisortizii* Ackerman is vegetatively similar to *Eurystyles annassacomos* (Rchb.f.) Schltr. but differs florally by having a narrower lip (0.6–0.8 mm vs. 1.5–2.0 mm), a single-veined lip vs. 3-veined, lip lacking basal auricles vs. being auriculate, and the staminodes simple and erect vs. bifurcated and curved (Fig. 1).

An epiphytic, bromeliad-like, pendent, caespitose herb up to 4 cm long including the inflorescence. *Roots* few, short, fleshy 6–9 mm long, 2.0–2.5 mm in diameter. *Stem* covered by leaf bases, ca. 3–4 mm long. *Leaves* up to 7, rosulate; petioles from an expanded, sheathing base, broad, canaliculate, ca. 4.5 × 2.0 mm; blades waxy, shiny grayish-green, soft-textured, ovate-elliptical, cuneate, acute with an apiculate tip, with five main arching veins, the mid vein pinnate, 18–25 × 12.5–23.0 mm, margins undulate, pectinate-ciliate. *Inflorescences* terminal, solitary, pendulous; *peduncles* terete, densely ciliate, about 16–20 mm long, 1 mm diameter; *bracts* foliaceous 1–2, elliptical, acuminate, denticulate-ciliate from broad-based hairs, ca. 10.0 ×

4.5 mm; *racemes* subcapitate, congested, with 10–20 flowers opened more or less simultaneously; *floral bracts* slightly exceeding the length of the flowers, foliaceous, elliptical, acuminate when spread, funnel shaped enveloping flower, margins pubescent, hairs with a broad base, denticulate-ciliate, 3.7–4.0 × 1.6–2.0 mm. *Flowers* inconspicuous, non-resupinate, tubular, sepals, petals, and lip white. *Ovary* green, sessile, obovoid, glabrous below, sparsely ciliate above near junction with perianth, somewhat flattened-obovoid, 3.0–3.4 × 1.5–1.7 mm. *Dorsal sepal* lanceolate, minutely warty at apex, otherwise glabrous, 4.0–4.5 × 1 mm. *Lateral sepals* slightly gibbous and fused at the base for 0.5 mm, dorsally hirsute along mid vein, canaliculate, lanceolate, acuminate, dorsally keeled at apex, 4–5 × 0.8 mm when spread. *Petals* narrowly oblanceolate, acute-obtuse, adhering to the dorsal sepal, 4.0 × 0.5 mm. *Lip* narrowly elliptic, lacking basal auricles, apex acuminate, canaliculate, slightly thicker than the rest of the lip and minutely warty, 4.0–4.5 × 0.6–0.8 mm. *Column* subterete, glabrous, 2.8–3.0 mm long, rostellum triangular-ovate, acuminate, 0.5 × 0.2–0.3 mm at base, staminodes aciculate, erect, 1.1 mm long anther subsessile, 1.5 mm long, *pollinia* 2, clavate, mealy, 1.1 mm long. *Fruits* not seen; post-anthesis



FIGURE 3. *Eurystyles luisortizii* Ackerman. Plant habit *in situ*. Photographed by Luis Ortiz Jordan.

swollen ovaries *ca.* 4 mm long, 2.5 mm in diameter. Seeds not seen. Description based on three plants.

ETYMOLOGY: The specific epithet is named for the discoverer, Luis Ortiz Jordan, an avid native orchid enthusiast. He has a Master of Science in Environmental Management and works as an environmental scientist in Florida, USA.

PHENOLOGY: Flowers appear from November to February. Fruiting was not observed. New shoots begin to form as leaves senesce and flowering ends.

REPRODUCTIVE BIOLOGY: The ovaries of all flowers in the two inflorescences we have studied were swelling, yet they all had intact pollinaria, suggesting apomixis or autogamy may occur, a phenomenon that appears to be common in the genus (Szlachetko 1992). However, despite the plants doing very well in cultivation since late 2017, none of them have produced mature fruits, which of course may mean they require pollinator-mediated pollination. In the 2020–2021 flowering season, we self-pollinated five flowers. The ovaries became swollen, but no seeds formed so the flowers may be self-incompatible. If reproduction is verified to be pollinator-dependent, then attraction is likely based on deception. We carefully dissected flowers to detect nectar, but no free liquid was evident. Vigorous plants in cultivation produce scentless flowers to the human nose and last 4–6 weeks unpollinated. In cultivation under insect-free conditions, ovaries appear to swell somewhat, but fruits do not mature.

DISTRIBUTION AND ECOLOGY: Known only from the type locality, where they grow epiphytically on tree trunks in wet tropical montane forests. If the *Eurystyles* previously reported by Professor Woodbury was *E. luisortizii*, then elevational range is up to 900 m.

CONSERVATION STATUS: We think that the situation for *Eurystyles luisortizii* is dire. Only three plants were found 2 m up on the trunk of a severely damaged tree,

the consequence of Hurricane María. Most of the forest canopy was destroyed on ridges and those slopes that faced the brunt of the storm. Winds were so strong that those trees left standing (primarily palms) had the appearance of being power-washed. Epiphytes were ripped off or fell with their hosts, as has happened with other strong hurricanes (Migenis & Ackerman 1993). Nevertheless, small pockets of forest were somewhat intact, and until the forest recovers sufficiently to make detailed surveys of the area, we regard the conservation status of *E. luisortizii* to be data-deficient (DD) but likely endangered.

KEY TO THE SPECIES OF *EURYSTYLES* OF THE WEST INDIES
(MODIFIED FROM ACKERMAN ET AL. 2014)

1. Sepals distinctly inflated basally; high elevations (> 1500 m) *E. alticola*
- 1a. Sepals not inflated basally; lower elevations (< 1000 m) 2
2. Labellum pandurate with a distinct suborbicular apex *E. domingensis*
- 2a. Labellum narrowly elliptic to oblanceolate, with a keel-like acuminate apex 3
3. Labellum basally auriculate, 3-veined; staminodes bifid, the dorsal lobe incurved over the anther *E. ananassocomos*
- 3a. Labellum lacking auricles, 1-veined; staminodes simple, straight *E. luisortizii*

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