

A NEW SPECIES OF *DEIREGYNE* (ORCHIDACEAE: SPIRANTHINAE) FROM HIDALGO, MEXICO

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Abstract: *Deiregyne callifera* Salazar & Hernández-Cardona, a new orchid species from the foothills of the Sierra Madre Oriental in the state of Hidalgo, Mexico is described and illustrated. The new species is similar to sympatric *D. eriophora* (B.L.Rob. & Greenm.) Garay, differing in the glabrous inflorescence with more numerous, smaller flowers arranged in several intertwined spirals, proximal part of the labellum wider than long and provided with a lunate, prominently papillose callus, and proportionately much shorter column with inflexed apex.

Key words: *Deiregyne callifera*, endemism, Sierra Madre Oriental.

Resumen: Se describe e ilustra a *Deiregyne callifera* Salazar & Hernández-Cardona, nueva especie de orquídea de las estribaciones de la Sierra Madre Oriental en el estado de Hidalgo, México. La nueva especie es similar a *D. eriophora* (B.L.Rob. & Greenm.) Garay, con la que es simpátrica, distinguiéndose por la inflorescencia glabra, flores más numerosas, de menor tamaño y dispuestas densamente en varias espirales entrelazadas, la parte proximal del labelo más ancha que larga y provista de un callo lunado prominentemente papiloso y la columna más corta y con ápice inflexo.

Palabras clave: *Deiregyne callifera*, endemismo, Sierra Madre Oriental.

The genus *Deiregyne* Schltr. sensu Garay (1982) encompasses 14 species restricted to the major mountain ranges of Mexico and adjacent Guatemala (Salazar, 2003; Soto *et al.*, 2007; Soto and Salazar, 2012). Although there has been considerable controversy regarding the typification and circumscription of this genus (e.g. Catling, 1989 *contra* Szlachetko, 1995), recent molecular phylogenetic analyses have shown that, as lectotypified and delimited by Garay (1982), *Deiregyne* corresponds to a strongly supported, monophyletic group (Salazar and Ballesteros-Barrera, 2010; Salazar *et al.*, 2011). Those analyses have also identified the genus *Dichromanthus* Garay as the sister of *Deiregyne*, and these two genera in turn belong in a more inclusive clade with the genera *Schiedeella* Schltr. and *Spiranthes* Rich. *s.str.* Except for three hummingbird-pollinated species of *Dichromanthus* with odorless, tubular, red or orange flowers, all the species of this lineage have fragrant, campanulate, white, green or yellow flowers. All these features conform to a syndrome of

pollination by nectar-collecting bees (Salazar, 2003; Salazar *et al.*, 2011 and references included there). *Deiregyne* can be easily distinguished from its relatives by the translucent floral bracts provided with dark veins (Catling, 1989; Salazar, 2003).

Recent field exploration conducted in the mountains of the state of Hidalgo, Mexico, leads to the discovery of an additional, undescribed species of *Deiregyne*, which has been mentioned as “*Deiregyne callifera* Salazar & A.Hernández, ined.” in previously published works (Hágsater *et al.*, 2005; Soto *et al.*, 2007), though it is formally named and described here for the first time.

Deiregyne callifera Salazar & Hernández-Cardona, sp. nov. (Figures 1, 2).

Similar to *Deiregyne eriophora* (B.L.Rob. & Greenm.) Garay but differing in the glabrous inflorescence with numerous, smaller flowers arranged in several intertwined spirals,

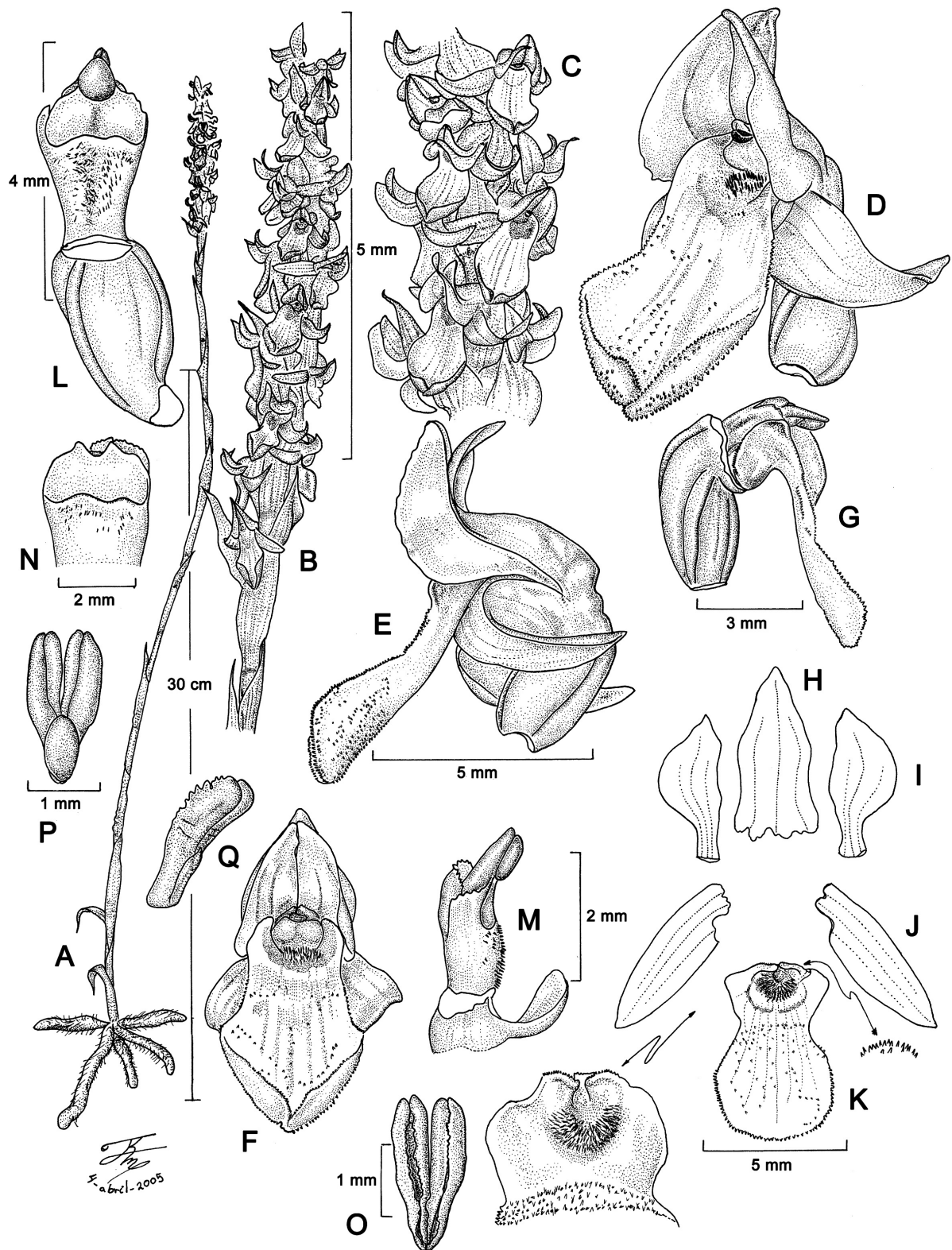


Figure 1. *Deiregyne callifera*. A. Habit. B. Inflorescence. C. Close-up of a portion of the inflorescence. D. Flower, oblique front view. E. Flower, side view. F. Flower, front view. G. Side view of flower with sepals and petals excised to show the position of labellum and column. H. Dorsal sepal. I. Petal. J. Lateral sepal. K. Labellum. L. Column and ovary, ventral view. M. Column, side view. N. Ventral view of column apex after removal of the pollinarium. O. Pollinarium from above. P. Pollinarium from below. Q. Pollinarium from side. Drawn with camera lucida by R. Jiménez-Machorro from Hernández-Cardona 1.

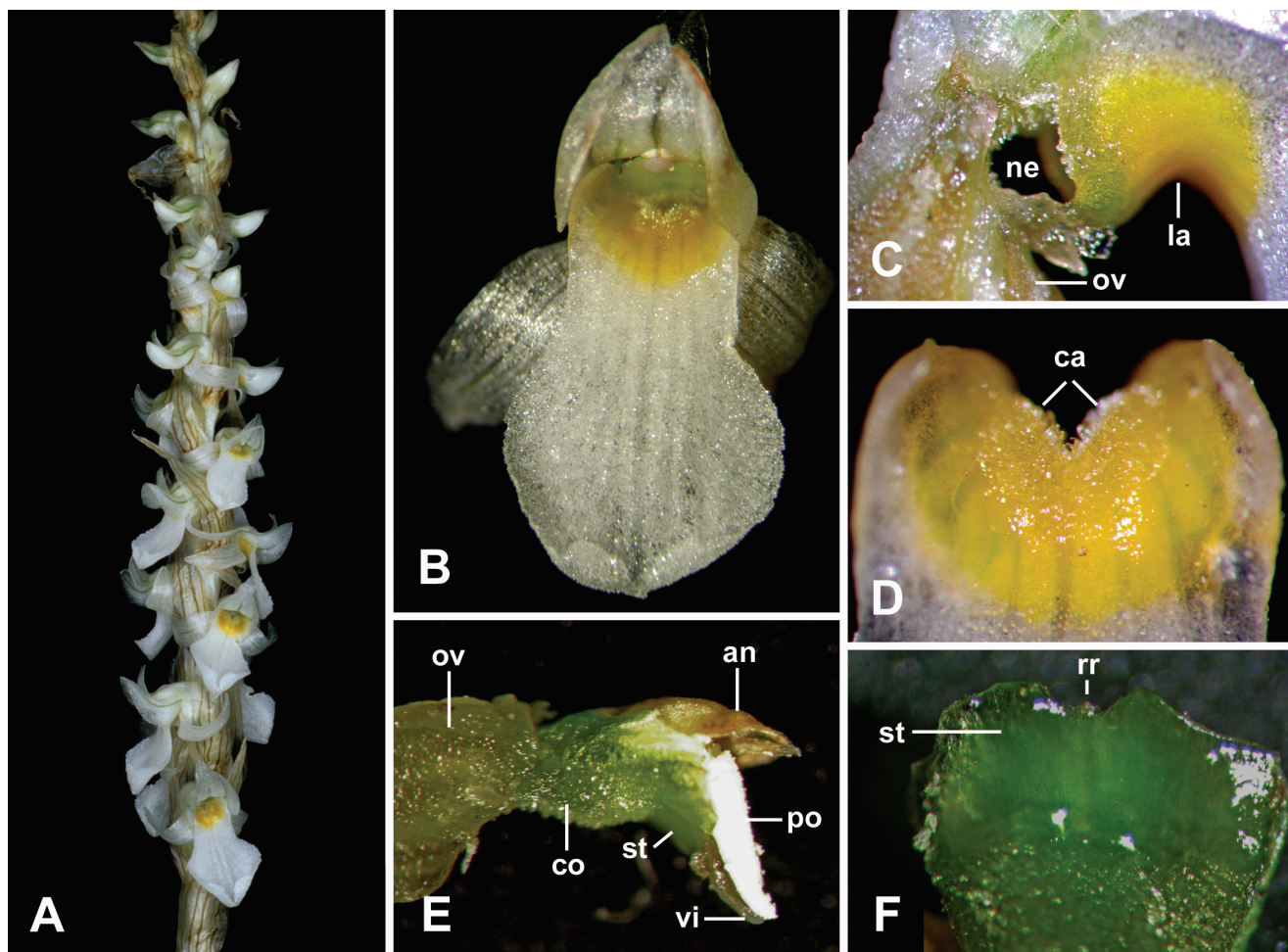


Figure 2. *Deiregyne callifera* (from Hernández-Cardona 1). A. Inflorescence. B. Flower. C. Nectary from side. D. Base of labellum from above showing the callus. E. Column from side. F. Column apex from below after removal of the pollinarium, showing the notched, minutely apiculate rostellum remnant. Abbreviations: an = anther; ca = callus; co = column; la = labellum; ne = nectary; po = pollinium; rr = rostellum remnant; st = stigma; vi = viscidium. Photographer: G. A. Salazar.

proximal portion of labellum wider than long and provided with a fleshy, lunate, prominently papillose callus, and shorter, apically inflexed column.

HOLOTYPE: Mexico, Hidalgo, Sierra de las Navajas, cañada Cuesta del Macho, parte sur de la sierra saliendo del poblado Lagunicatlán, 20° 06' N, 90° 30' W, 2,790 m, 24 April 2005, A. Hernández-Cardona 4 (MEXU).

Terrestrial, acaulescent **herb** 18-45 cm in height above ground. **Roots** fasciculate, terete, glabrous, dull brownish-yellow, to 70 mm long and 7 mm in diameter. **Leaves** 2-3, forming a basal rosette, linear-lanceolate, acute, bluish-green, to 10 cm long and 1 cm wide, withered or absent altogether at flowering time. **Inflorescence** completely glabrous; **peduncle** 14-37 cm long, 2-4 mm in diameter, greenish-white, nearly completely sheathed by 8-15 papery bracts,

these acuminate, whitish with brownish-red veins, bracts 4-10 cm long; **raceme** dense, 3.5-8.5 cm long, with 15-45 flowers, most of which are open at the same time; rachis white, glabrous. **Floral bracts** translucent, colorless, with reddish-brown veins, ovate, acuminate, 7-22 mm long. **Flowers** resupinate, spirally arranged, delicately perfumed during daylight hours, floral segments translucent white with a brown or green vein on the dorsal sepal and two green veins on the petals, labellum provided with a yellow blotch with greenish veins at the entrance of the nectary; column green. **Lateral sepals** shortly connate (0.5-1 mm) and adnate to the sides of the column foot and base of the labellum to form a chin-like, spacious nectary, free portions strongly recurved below the middle, somewhat conduplicate near the apex, obliquely lanceolate, acute, 4-6 mm long, 1.5-2 mm wide. **Dorsal sepal** concave below the middle, recurved above, triangular-ovate, acute, 3.5-4.5 mm long, 2.2-2.5 mm wide.

Petals adhered to the dorsal sepal for about 3/4 of their length, free apical portions somewhat recurved and concave, base clawed (the claw linear), the rest obliquely ovate, apex acute to obtuse, 4-5 mm long, 2-2.5 mm wide. **Labellum** strongly arcuate-sigmoid when seen from side in natural position, base fleshy, joined to the apex of the column foot, concave, when spread out pandurate, 5-5.5 mm total length; proximal portion transversely elliptic, concave, cordate and fleshy-thickened at base (the thickenings apparently secreting the copious nectar that accumulates between the labellum and lateral sepal bases), lateral margins adhered to the sides of the column, inner surface provided with a fleshy, lunate, prominently papillose callus (the papillae finger-shaped), outer surface shortly papillose, 1.5-2.5 mm long, 2.5-3.3 mm wide; distal portion semiorbicular to orbicular or elliptic (this feature varies even among different flowers of the same inflorescence), densely papillose all over, margins crenulate, apex truncate or widely rounded, apical margins somewhat inflexed, 2.2-3.5 mm long, 2.7-3.7 mm wide. **Column** short (i.e., with the column body shorter than the anther), ventrally prominent and papillose, apically inflexed, 2-2.5 mm long, ca. 2 mm wide; anther orbicular, rounded at apex; clinandrium margins membranaceous, denticulate; column foot channeled, 0.6-0.8 mm long. **Pollinarium** formed by two narrowly ovoid, longitudinally cleft pollinia, these cream white, friable, joined to an apical, ellipsoid, gray viscidium. **Rostellum** obsolete, the rostellum remnant (after removal of the pollinarium) consisting merely of a broad notch with a minute, blunt apicule in the middle. **Stigma** ventral, green, flat, shiny, and somewhat sticky in fresh condition, transversely oblong-trapezoid. **Ovary** obliquely ellipsoid, glabrous, slightly twisted, 4-6.5 mm long, 1.4-2.6 mm in diameter. **Capsule** not seen.

Distribution and ecology. This species is known only from two populations in the Sierra de las Navajas, southeasternmost extension of the Sierra de Pachuca, which separates the closed basin of the Cuenca de Mexico and the Río Pánuco basin, in the foothills of the Sierra Madre Oriental (Barrios-Rodríguez and Medina-Cota, 1996). The new species is terrestrial, living in shallow, humus-rich soil among rhyolitic rocks in *Pinus* spp.-*Quercus* spp. forest with interspersed *Arbutus* sp. and *Alnus* sp. trees. In one station it was found in an open area with a secondary, low scrub of *Quercus frutex* Trel., apparently favored by a forest fire that occurred in the mid-1990s, which suggests that the species is tolerant to some disturbance. The known populations of *Deiregyne callifera* occur at approximately 2,790-2,840 m above the sea level.

Phenology. Flowering occurs during spring (March to May), corresponding with the driest part of the year. Mature capsules were not observed.

Etymology. The specific epithet is a Latin compound term meaning “callus-bearing” and refers to the callus (fleshy thickening) on the labellum, which distinguishes this species from its congeners.

At first glance, *Deiregyne callifera* looks like a miniature version of *D. eriophora*, a widespread species that also occurs at the Sierra de las Navajas. Nevertheless, the former can be easily distinguished by the more numerous (≥ 15), much smaller flowers densely arranged in several intertwined spirals (*vs* ≤ 12 flowers in a single, loose spiral), glabrous inflorescence and sepals (*vs* lanuginose rachis and long-pilose sepals), translucent floral segments that give the flower a crystalline appearance (*vs* opaquely white segments), differently proportioned labellum with the proximal portion wider than long (*vs* distinctly longer than wide) and provided with a fleshy, lunate callus with digitiform papillae (*vs* ecallose), and very short, straight column with inflexed apex (*vs* elongate, arching column with straight apex). Detailed line drawings of *D. eriophora* useful for comparison can be found in McVaugh (1985) and Espejo-Serna *et al.* (2002; as *Spiranthes eriophora* B.L.Rob. & Greenm. and *Schiedeella eriophora* [B.L.Rob. & Greenm.] Burns-Bal., respectively).

Several other orchids, all of them terrestrial, have been recorded at the Sierra de las Navajas, such as *Deiregyne eriophora*, *Funkiella rubrocallosa* (B.L.Rob. & Greenm.) Salazar & Soto Arenas, *Goodyera brachyceras* (A.Rich. & Galeotti) Garay & G.A.Romero-González, *Govenia superba* (Lex.) Lindl., and *Malaxis myurus* Lindl. (A. Hernández-Cardona, pers. obs.). All of these are relatively common species which are widespread on the mountains of Mexico and adjacent Guatemala. As far as we know, *D. callifera* is the only species of Orchidaceae known solely from the Sierra de Pachuca and it is worthy of note that, of the ca. 110 species of Orchidaceae that have been recorded in Hidalgo (G. A. Salazar, unpubl. data), only three previously-known ones are endemic to this state. *Laelia gouldiana* Rchb.f., of which wild populations are not known, is considered as probably extinct in the wild but has been in cultivation possibly for centuries, on mesquite (*Prosopis* sp.) and other trees around rural homes in several towns in the region of Metztitlán (cf. Halbinger and Soto, 1997; Hågsater *et al.*, 2005). *Cuitlauzina pygmaea* (Lindl.) M.W.Chase & N.H.Williams, formerly placed in the monotypic genus *Dignathe* Lindl., is known with certainty from a single population in *Pinus-Quercus* forest in the northernmost portion of Hidalgo (Sosa *et al.*, 2001). Last, an as yet undescribed, epiphytic species of *Goodyera* was noted by Ceja-Romero *et al.* (2010). Therefore, *Deiregyne callifera* is a significant addition to the seemingly endemic orchid flora of Hidalgo, although it should be noted that both the plants and flowers of this species are rather inconspicuous and further field exploration is required to determine whether it occurs somewhere else in Hidalgo or it is endemic to the Sierra de las Navajas.

Additional specimens examined. Mexico, **Hidalgo:** Sierra de las Navajas, lado sur de la Peña del Horcón, saliendo del poblado El Zembo, 13 March 2005, 20° 06' 46.3" N, 98° 32' 49" W, 2,840 m, A. Hernández-Cardona et al. 1 (MEXU); same locality, 24 April 2005, A. Hernández-Cardona et al. 3 (MEXU).

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