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Hechtia marabascoensis (Hechtioideae; Bromeliaceae), a novelty from Colima and Jalisco, Mexico

RODRIGO ALEJANDRO HERNÁNDEZ-CÁRDENAS^{1,5,*}, ALEJANDRA FLORES-ARGÜELLES^{2,6}, ADOLFO ESPEJO-SERNA^{3,7}, ANA ROSA LÓPEZ-FERRARI^{3,8} & ANDREW SIEKKINEN^{4,9}

¹ Red de Biodiversidad y Sistemática, Instituto de Ecología A.C., Xalapa, Veracruz 91073, México

² Departamento de Botánica y Zoología, Centro Universitario de Ciencias Biológicas y Agropecuarias, Universidad de Guadalajara, Zapopan, Jalisco 45200, México

³ Herbario Metropolitano, Departamento de Biología, División de Ciencias Biológicas y de la Salud, Universidad Autónoma Metropolitana-Iztapalapa, Iztapalapa, Ciudad de México 09310, México

⁴ 5155 Ewing St., San Diego, California, United States of America

⁵ ✉ rodrigo.hernandez@inecol.mx; <https://orcid.org/0000-0001-5903-4393>

⁶ ✉ afa2502@gmail.com; <https://orcid.org/0000-0002-7648-5070>

⁷ ✉ aes@xanum.uam.mx; <https://orcid.org/0000-0001-7192-4612>

⁸ ✉ arlf@xanum.uam.mx; <https://orcid.org/0000-0003-1071-7075>

⁹ ✉ siekkinenar@gmail.com; <https://orcid.org/0009-0001-7828-9356>

*Author for correspondence: ✉ rodrigo.hernandez@inecol.mx; ✉ ralejandroh@gmail.com

Abstract

Recent botanical explorations carried out in the states of Colima and Jalisco, Mexico, led to the discovery of a novelty of Bromeliaceae: *Hechtia marabascoensis* which is described and illustrated. The proposed taxon is compared to *H. chamelensis*, *H. pacifica*, and *H. reticulata*, species with the most similarities. A morphological description, images, and a distribution map of the new species are included, as well as an identification key and a list of examined specimens of all *Hechtia* species known to date from the states of Colima and Jalisco.

Keywords: Endemism, Mexico, Monocots, Pacific Lowlands, Poales

Resumen

Recientes exploraciones botánicas realizadas en los estados de Colima y Jalisco, México condujeron al hallazgo de una novedad de Bromeliaceae: *Hechtia marabascoensis* que se describe e ilustra. El taxon propuesto se compara con *H. chamelensis*, *H. pacifica* y *H. reticulata*, especies con las cuales presenta algunas similitudes. Se proporciona una descripción morfológica, imágenes y un mapa de distribución de la nueva especie, así como una clave de identificación y una lista de ejemplares examinados de todas las especies de *Hechtia* conocidas hasta ahora de los estados de Colima y Jalisco.

Palabras Clave: Endemismo, México, Monocotiledóneas, Poales, Tierras Bajas del Pacífico

Introduction

Hechtia Klotzsch (1835: 401) is classified in its own subfamily, Hechtioideae (Givnish *et al.* 2007), which is entirely endemic to the region called Megaméxico 3 (Rzedowski 1991, Espejo-Serna 2012, Espejo-Serna *et al.* 2020). Ramírez-Morillo *et al.* (2018) proposed to divide *Hechtia* (*sensu lato*) in three genera: *Bakerantha* Smith (1934: 72), *Hechtia* (*sensu stricto*), and *Mesoamerantha* Ramírez & Romero (2018: 308). *Hechtia* (*sensu lato*) is a genus distributed from the southern United States to northern Central America, with the largest number of species in Mexico (Espejo-Serna & López-Ferrari 2018, Espejo-Serna *et al.* 2020). The main characteristics used to delimit the species in the genus are: the growth habit with the shape and size of the rosettes; the size, color, shape, margin and indumentum of the leaves (sheath and leaf blade); the branching pattern of the inflorescences (size, number, arrangement of branches and the

degree or order of branching); the characteristics of the peduncle bracts (size, color, shape, margin, and indumentum); the number of flowers and their arrangement on the rachis, and the characteristics of all the floral structures of both female and male plants (size, color, shape, margin, and indumentum); and some characteristics of the fruits and seeds (size, color, shape, indumentum and orientation). Other additional traits that help to recognize the species of the genus are their geographical distribution and its flowering season.

As a result of botanical explorations for the project Bromeliaceae of Mexico, we collected individuals in populations of *Hechtia* located in the municipalities of Manzanillo, Colima and Cihuatlán, Jalisco. Initially, we thought that this material could correspond to *H. pacifica* Hernández-Cárdenas, Flores-Argüelles, Espejo, López-Ferrari & Rosales (in Flores-Argüelles *et al.* 2024: 25) recently described, or to *H. reticulata* Smith (1937: 17–18); however, after a careful and detailed revision of the living material and herbarium specimens, type material, and protologues of all species of the genus distributed in Jalisco and Colima, we conclude that these populations belong to an undescribed taxon that we propose here.

Gouda *et al.* (updated continuously), include in their list 98 species for *Hechtia* (*sensu lato*). Including the new species herein proposed as new, the subfamily Hechtioideae comprises 99 taxa, 97 of them distributed in Mexico, and 95 endemic to the country. The Mexican states with the highest number of species are Oaxaca (30), Puebla (21), Guerrero (14), and Jalisco (11) (Espejo-Serna *et al.* 2020).

Material & Methods

Staminate and pistillate plants of the new taxon were collected in the municipalities of Cihuatlán, Jalisco and Manzanillo, Colima. The specimens were processed, measured, analyzed, and a description was made. Measurements and description were prepared from living and mostly from dry material. The morphological terms used in the description are those proposed by Radford *et al.* (1974) and Scharf & Gouda (2008). The vouchers were deposited at UAMIZ and IBUG herbaria (acronyms according to Thiers [updated continuously]). We revised the herbarium material of the genus *Hechtia* deposited at ENCB, FCME, IBUG, IEB, MEXU, MICH, MO, UAMIZ, XAL, and ZEA (Appendix 1). To ensure the status of the proposed new species, we reviewed protologues, living specimens, as well as herbarium specimens and type material of all *Hechtia* species previously cited for Colima and Jalisco (Magaña-Rueda 1986, McVaugh 1989, Espejo-Serna & López-Ferrari 2018, Espejo-Serna *et al.* 2020, Ramírez-Morillo *et al.* 2023, Flores-Argüelles *et al.* 2024, Ramírez-Morillo *et al.* 2024): *H. carrilloi* Ramírez (2023: 22), *H. chamelensis* Magaña & Ramírez (in Ramírez-Morillo *et al.* 2024: 588), *H. costalegreensis* Flores-Argüelles, Hernández-Cárdenas, Espejo, López-Ferrari & Rosales (2024: 21), *H. ibugana* Flores-Argüelles, Espejo & López-Ferrari (2019: 106), *H. iltisii* Burt-Utley & Utley (1993: 222–224), *H. jaliscana* Smith (1964: 482), *H. laevis* Smith (1964: 482–483), *H. pacifica*, *H. pedicellata* Watson (1891: 155), *H. reticulata*, *H. santanae* Ramírez & Carrillo (2016: 262–267), and *H. subalata* Smith (1937: 15–16). To name the vegetation type and the biogeographic provinces where the new species grows, we use the classifications proposed by Rzedowski (1978) and Morrone *et al.* (2017) respectively.

Taxonomy

Hechtia marabascoensis Hern.-Cárdenas, Flores-Arg., Espejo, López-Ferr. & Siekkinen, *sp. nov.* (Figs. 1–3, 4C–4D. Table 1)

The new species is similar to *Hechtia pacifica* but differs in the height of the plants in flower (100–140 vs. 170–300 cm), the length of the staminate inflorescence (110–120 vs. 150–170 cm), the shape of its flowers sepals (widely ovate vs. widely elliptic), the shape of its flowers petals (widely ovate vs. widely elliptic); the length of the pistillate inflorescence (95–110 vs. 235–265 cm), the number of its primary racemes (20–25 vs. 60–75), the shape of its flowers petals (triangular vs. narrowly oblong to narrowly triangular), and the length of its petals (2.5–3.0 vs. 6.1–6.5 mm).

TYPE:—MÉXICO. Jalisco: municipio Cihuatlán, camino que va de Cihuatlán a Peñitas y Truchas, sobre las paredes de la brecha en las orillas del río Marabasco (19°15'28.5"N, 104°32'4.14"W), 30 m, 16 July 2023, R. Hernández-Cárdenas & A. Flores-Argüelles 2740♀ (holotype UAMIZ! (4x)).

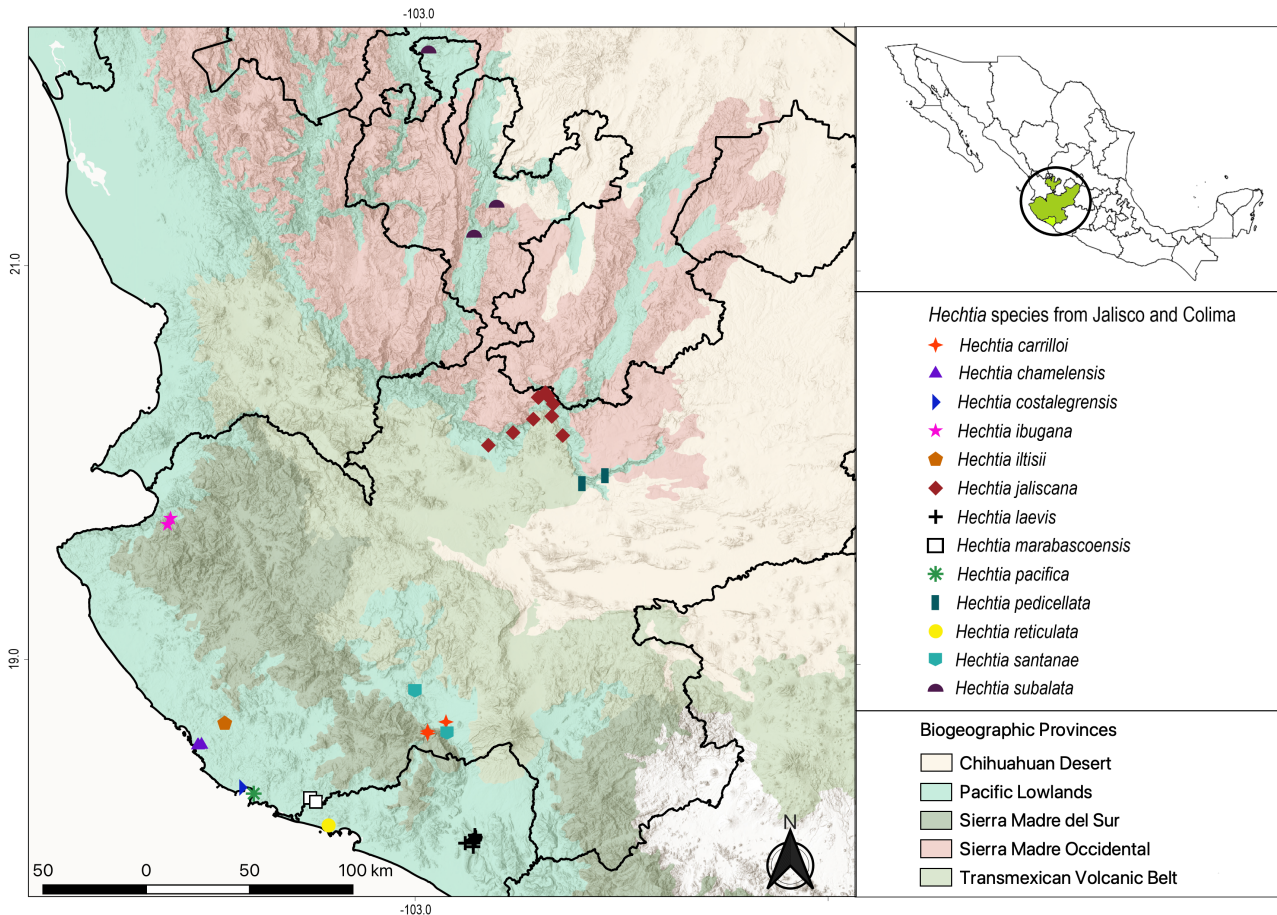


FIGURE 1. Geographic distribution of *Hechtia* species in the states of Colima and Jalisco. Biogeographic provinces according to Morrone *et al.* (2017).

Description. Plants saxicolous, in flower 100–140 cm high, rosettes 10–20 × 40–55 cm, solitary or forming clumps of 2–4 rosettes. **Leaves** 15–25, recurved towards the apex; *sheaths* white with brown at the base to pale yellow toward the apex, depressed ovate, 5.5–7.0 × 5.0–7.5 cm, with minute marginal sharp teeth, glabrous near the base and lepidote distally on both surfaces; *blades* purple or green, narrowly triangular, 50–69 × 2.5–5.0 cm at the base, long attenuate, lepidote on the abaxial surface, glabrous on the adaxial surface, margin with divaricate to ascending sharp teeth, green to purple, 3.5–5.0 × 3.5–4.5 mm, 0.8–1.5 cm apart. **Inflorescences** terminal, erect, once branched in staminate and pistillate plants; main axis 50–60 cm long, internodes 1.5–2.0 cm long; racemes ascending to divaricate. **Staminate inflorescence** 110–140 cm high; *peduncle* brown with purple spots or green with purple spots, terete, 0.6–0.8 cm diameter, glabrous, internodes 4.0–6.0 cm long; *peduncle bracts* purple or green with gray, foliaceous, sheaths triangular, 1.0–1.3 × 1.0–1.3 cm, glabrous on both surfaces, hyaline at the margin, blades linear, 2.0–13 × 0.2–0.4 cm, lepidote on the abaxial surface, glabrous on the adaxial surface, entire, the basal ones larger than the internodes, the upper ones shorter; *primary bracts* light brown, triangular, 1.0–2. × 0.2–0.4 cm when extended, caudate, entire and hyaline at the margin, glabrous on both surfaces; *racemes* 15–20, terete, 4.0–10 × 1.2–1.5 cm; *floral bracts* brown with purple spots, widely ovate, 2.5–3.2 × 2.5–3.6 mm, longer than the pedicels, apiculate, entire to erose at the margin, glabrous on both surfaces. **Staminate flowers** numerous; *pedicels* 0.3–0.7 mm long; *sepals* green at the base, brown toward the apex with purple spots, widely ovate, 2.8–3.5 × 2.5–3.3 mm, obtuse, hyaline and entire, glabrous on both surfaces; *petals* white, brown with white when dry, widely elliptic to orbicular, 5.0–6.0 × 4.2–4.5 mm, obtuse, entire, glabrous on both surfaces; *stamens* equal in length; *filaments* white, narrowly oblong, flattened, 4.0–5.0 mm long; *anthers* green in living and dry material, oblong, 1.5–2.4 mm long, versatile; pistillode conspicuous, purple cream, glabrous. **Pistillate inflorescence** 95–135 cm long; *peduncle* purple to green with gray, terete, 0.72–0.9 cm in diameter, glabrous, internodes 4.0–6.0 cm long; *peduncle bracts* purple to green with gray, foliaceous, sheaths triangular, 1.0–1. × 1.0–1.5 cm, glabrous on both surfaces, hyaline at the margin, blades linear, 2.0–11 × 0.25–0.4 cm, lepidote on the abaxial surface, glabrous on the adaxial surface, entire, the basal ones larger than the internodes, the upper ones shorter; *primary bracts* light brown, triangular, 0.5–2.2 × 0.2–0.25 cm when extended, caudate, entire and

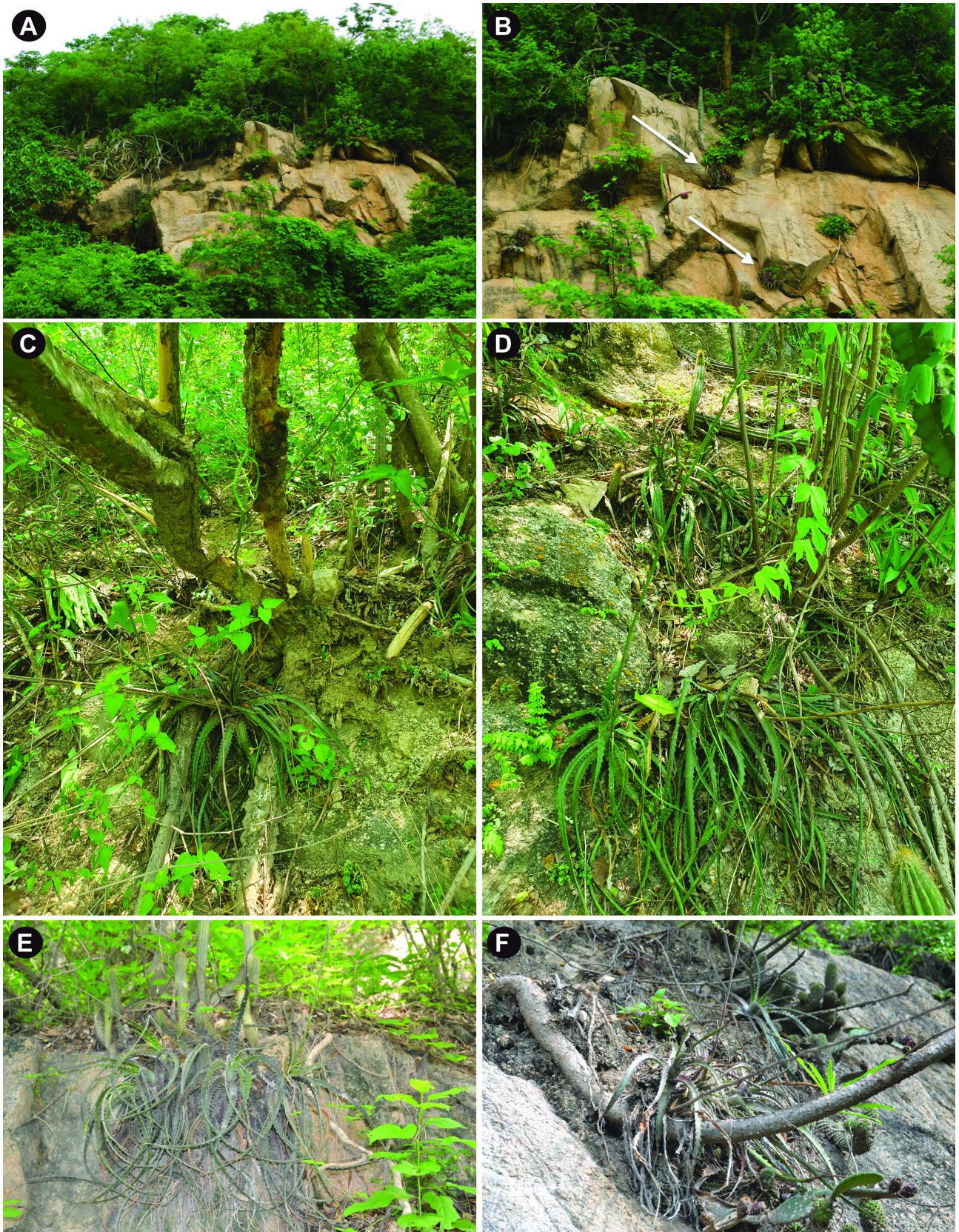


FIGURE 2. *Hechtia marabascoensis*. A–B. Habitat. C–F. Plants at type locality. (Photographs A–D by A. Flores-Argüelles; E–F by R. Hernández-Cárdenas).

hyaline at the margin, glabrous on both surfaces; *racemes* 20–25, terete, 4.0–10 × 1.2–1.5 cm; *floral bracts* brown with purple spots, widely ovate, 2.2–2.7 × 2.2–2.7 mm, longer than the pedicels, acute, hyaline and entire to crose at the margin, glabrous on both surfaces. **Pistillate flowers** numerous; *pedicels* 1.2–1.5 mm long; *sepals* green at the

base, brown toward the apex with purple spots, ovate, 2.2–2.5 × 1.8–2.2 mm, acute, hyaline and entire, glabrous on both surfaces; *petals* white, brown with white when dry, triangular, 5.0–6.0 × 3.0–3.7 mm, acute, entire, glabrous on both surfaces; *staminodes* rudimentary, white, narrowly triangular, 3.0–4.0 mm long; *ovary* superior, green at the base, purple toward the apex, oblong, 2.7–3.5 × 1.8–2.5 mm, glabrous; *stilar* branches whitish-purple, recurved, slender, 1.0–1.8 mm long, stigmas papillose. **Capsules** green, ovoid, 7.0–9.0 × 2.5–3.5 mm, with prominent longitudinal ridges or creases, glabrous; *seeds* brown, fusiform, 4.5–5.0 mm long, caudate.

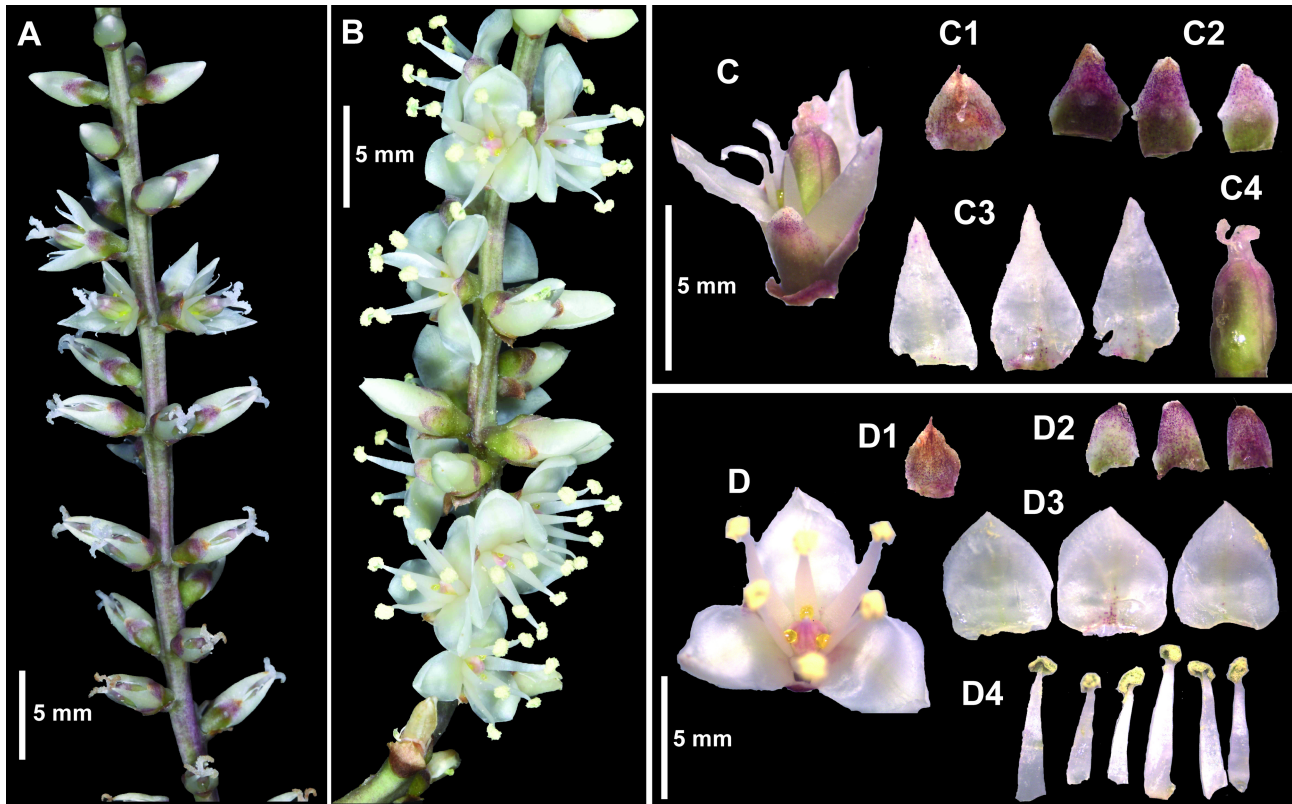


FIGURE 3. *Hechtia marabascoensis*. **A.** Detail of the pistillate raceme. **B.** Detail of the staminate raceme. **C.** Pistillate flower. **C1.** Floral bract. **C2.** Sepals. **C3.** Petals. **C4.** Pistil. **D.** Staminate flower. **D1.** Floral bract. **D2.** Sepals. **D3.** Petals. **D4.** Stamens. (Photographs A–B by R. Cerros-Tlatilpa; C–D4 by R. Hernández-Cárdenas).

Distribution and habitat:—*Hechtia marabascoensis* is known so far from the municipalities of Cihuatlán, Jalisco and Manzanillo, Colima, in the biogeographic province of Pacific Lowlands (Fig. 1) (Morrone *et al.* 2017), where it grows in tropical deciduous forest on vertical rock walls (Rzedowski 1978) with the presence of *Tillandsia guenther-nolleri* Ehlers (1995: 13), *T. ionantha* Planchon (1854: 101) and species of *Cnidocolus* sp., *Commelina* sp., Fabaceae, *Ficus* sp., *Mammillaria* sp., and *Plumeria* sp. *Hechtia marabascoensis* grows solitary or in colonies on the sidewalls along the edge of Marabasco River that delimits the states of Colima and Jalisco. Plants of *H. marabascoensis* inhabit elevations between 30 and 40 m elevation and blooms from July to August.

Etymology:—The specific epithet refers to the Marabasco River, on whose edges the new species grows.

Paratypes:—MÉXICO. Colima: municipio Manzanillo, alrededores del rancho San Vicente a 1 km de El Charco, camino El Charco - río Marabasco (19°14'24"N, 104°30'25"W), 40 m, 11 April 2003, *A. Espejo-Serna, A. R. López-Ferrari, J. Ceja & A. Mendoza* 6544♀ (UAMIZ). Jalisco: municipio Cihuatlán, camino que va de Cihuatlán a Peñitas y Truchas, sobre las paredes de la brecha en las orillas del río Marabasco (19°15'28.5"N, 104°32'4.14"W), 30 m, 16 July 2023, *A. Flores-Argüelles & R. Hernández-Cárdenas* 1739♀ (IBUG), 1740♂ (IBUG); *R. Hernández-Cárdenas & A. Flores-Argüelles* 2758♂ (UAMIZ).

Observations:—The new species is characterized by the length of the primary racemes of the staminate inflorescence (4.0–10 cm), the size (2.5–3.2 × 2.5–3.6 mm) and shape (widely ovate) of its floral bracts, the size (5.0–6.0 × 4.2–4.5 mm) and shape (widely elliptic to circular) of its petals, the length of the primary racemes of the pistillate inflorescence (4.0–10 cm), and the size (5.0–6.0 × 3.0–3.7 mm) and shape of its petals (triangular). *Hechtia marabascoensis* shares some similarities with *H. reticulata* including the shape of the staminate floral bracts and sepals, the lack of indumentum of its sepals, and the once branched pistillate inflorescence. However, *H. marabascoensis*

differs from *H. reticulata* in the size of the leaf sheaths (5.5–7.0 × 5.0–7.5 vs. 7.0–10 × 7.0–11 cm), the staminate inflorescence (once branched vs. twice branched), the indumentum of its peduncle (glabrous vs. sparsely lepidote), the length of its primary racemes (4.0–10 vs. 15–25 cm), the shape of its petals (widely elliptic to circular vs. oblong); the length of the pistillate inflorescence (95–135 vs. 250–260 cm), and the shape of its sepals (ovate vs. very widely ovate). *Hechtia marabascoensis* also shares some similarities with *H. chamelensis*, like the leaf sheath size (4.0–7.0 × 4.0–7.5 cm), the leaf blade size (26–69 × 1.0–5.0 cm) the number of staminate primary racemes (15–20), and the number of pistillate racemes (20–25). Nevertheless, *H. marabascoensis* differs from *H. chamelensis* in the peduncle indumentum of the staminate inflorescence (glabrous vs. lepidote), in the shape of its floral bracts (widely ovate vs. oblong to oblong-ovate), in the shape of its sepals (widely ovate vs. oblong); in the shape of the floral bracts of the pistillate inflorescence (widely ovate vs. triangular-oblong), and in the indumentum of its sepals (glabrous vs. lepidote), see also Table 1 and Figure 4. We provide a key for the identification of the species of *Hechtia* that inhabit the states of Colima and Jalisco.

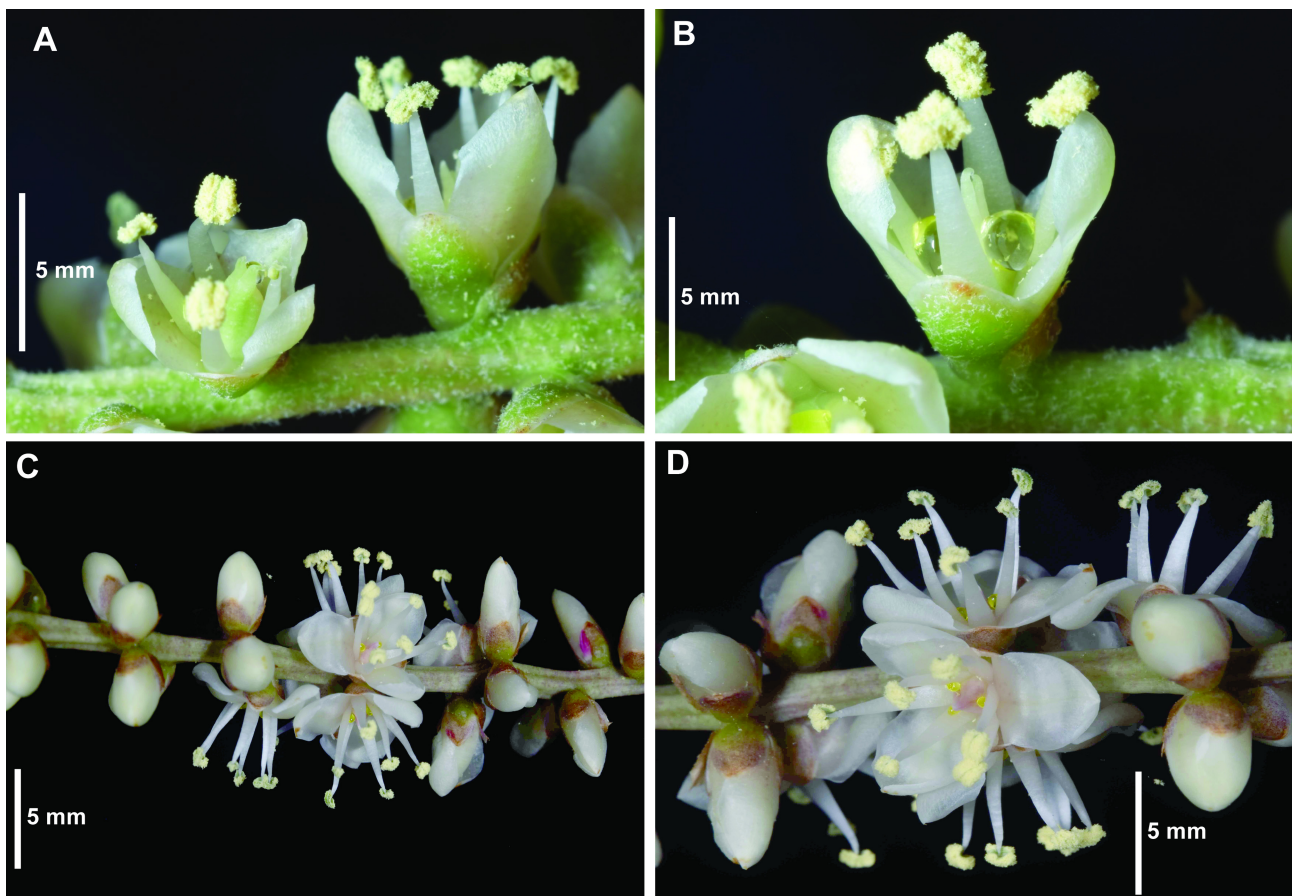


FIGURE 4. Staminate flowers of **A–B.** *Hechtia chamelensis* and **C–D.** *H. marabascoensis* to compare the presence or not of scales on the rachis and sepals. (Photographs A–B by A. Siekkinen; C–D by R. Cerros-Tlatilpa).

TABLE 1. Morphological differences between *Hechtia marabascoensis*, *H. chamelensis*, *H. pacifica*, and *H. reticulata*.

Characters	<i>H. marabascoensis</i>	<i>H. chamelensis</i>	<i>H. pacifica</i>	<i>H. reticulata</i>
Flowering plant length (cm)	100–140	100–200	170–300	170–360
Leaf sheath size (cm)	5.5–7.0 × 5.0–7.5	4.0–6.0 × 4.0–5.0	5.0–6.0 × 6.5–8.5	7.0–10 × 7.0–11
Leaf blade size (cm)	50–69 × 2.5–5.0	26–40 (–58) × 1.0–3.0 (–4.0)	50–70 × 4.5–5.5	65–85 × 3.5–5.5
Staminate plants (♂)				
Inflorescences	once branched	once to twice branched	once branched	twice branched
Peduncle indumentum	glabrous	lepidote	glabrous	sparsely lepidote

.....continued on the next page

TABLE 1. (Continued)

Characters	<i>H. marabascoensis</i>	<i>H. chamelensis</i>	<i>H. pacifica</i>	<i>H. reticulata</i>
Inflorescences length (cm)	110–140	100–125	150–170	190–210
Primary racemes number	15–20	ca. 20	35–55	35–40
Primary racemes length (cm)	4.0–10	(3.5–) 10–15	8.0–17	15–25
Floral bracts	widely ovate; 2.5–3.2 × 2.5–3.6 mm; glabrous	oblong to oblong-ovate; 2.3–2.7 × 1.5–1.8 mm; lepidote	widely ovate to very widely ovate; 3.0–3.3 × 2.7–3 mm; glabrous	triangular to widely ovate; 3.8–4.2 × 2.5–3 mm; glabrous
Sepals	widely ovate; 2.8–3.5 × 2.5–3.3 mm; glabrous	oblong; 2.0–2.5 × 1.2–1.5 mm; lepidote	widely elliptic; 2.7–3.0 × 2.5–2.8 mm; glabrous	ovate to widely ovate; 2.3–2.7 × 2.0–2.3 mm; glabrous
Petals	widely elliptic to orbicular; 5.0–6.0 × 4.2–4.5 mm	oblong to oblong-elliptic; 4.3–4.8 × 2.8–3.2 mm	ovate to widely ovate; 5.7–6.0 × 4.3–4.5 mm	oblong; 4.5–4.8 × 3.1–3.5 mm
Pistillate plants (♀)				
Inflorescences	once branched	once branched (twice branched)	once branched	once branched
Peduncle indumentum	glabrous	lepidote	glabrous	glabrous
Inflorescences length (cm)	95–135	100–200	235–265	250–260
Primary racemes number	20–25	20–22	60–75	30–40
Primary racemes length (cm)	4.0–10	(3–12) 20–25	10–20	8.0–30
Floral bracts	widely ovate; 2.2–2.7 × 2.2–2.7 mm; glabrous	triangular-oblong; 2.8–3.0 × 1.8–2.2 mm; lepidote	widely ovate; 2.9–3.3 × 2.6–3.0 mm; glabrous	triangular; 3.7–4.2 × 2.9–3.3 mm; lepidote
Sepals	ovate; 2.2–2.5 × 1.8–2.2 mm; glabrous	triangular; 1.5–2.2 × 1.4–1.8 mm; lepidote	ovate; 2.9–3.3 × 2.1–2.5 mm; glabrous	very widely ovate; 2.3–2.7 × 2.2–2.5 mm; glabrous
Petals	triangular; 5.0–6.0 × 3.0–3.7 mm	narrowly triangular; 4.5–5.0 × 2.0–2.5 mm	narrowly oblong to narrowly triangular; 6.1–6.5 × 2.2–2.6 mm	lanceolate; 4.2–4.8 × 1.6–2.0 mm
Ovary	2.7–3.5 × 1.8–2.5 mm; glabrous	3.5–3.7 × 2.0–2.3 mm; slightly lepidote	3.8–4.2 × 1.8–2.2 mm; glabrous	4.0–4.4 × 2.0–2.4 mm; glabrous

Artificial Key to the Species of *Hechtia* from Colima and Jalisco, Mexico.

1. Staminate plants 2
- Pistillate plants 14
2. Sepals lepidote 3
- Sepals glabrous 7
3. Leaf sheaths 7.0–7.5 × 9.5–10.7 cm; flowers sessile; petals pink *H. ibugana*
- Leaf sheaths 2.0–6.0 × 1.3–9.5 cm; flowers pedicellate to subsessile; petals white or green 4
4. Leaf blades 3.6–6.8 cm wide; floral bracts broadly ovate; sepals 4.5–8.0 mm long; petals green, 5.5–9.0 mm long *H. iltisii*
- Leaf blades 1.0–3.0 cm wide; floral bracts narrowly triangular, triangular or oblong to oblong-ovate; sepals 0.8–2.5 mm long; petals white, 2.0–4.8 mm long 5
5. Floral bracts oblong to oblong-ovate; sepals 2.0–2.5 mm long; petals 4.3–4.8 mm long *H. chamelensis*
- Floral bracts narrowly triangular to triangular; sepals 0.8–1.3 mm long; petals 2.0–2.8 mm long 6
6. Leaf sheaths 4.0–4.5 × 4.0–7.0 cm; floral bracts narrowly triangular; pedicels 1.5–3.0 mm long; sepals 1.0–1.3 mm long; petals 2.0–2.4 mm long *H. laevis*
- Leaf sheaths 2.0–3.5 × 1.3–1.5 cm; floral bracts triangular; pedicels 0.8–1.0 mm long; sepals 0.8–1.0 mm long; petals 2.5–2.8 mm long *H. carrilloi*
7. Primary racemes apparently arranged in fascicles by reduction of the secondary racemes *H. pedicellata*
- Primary racemes one per node, never arranged in fascicles 8

8.	Inflorescences twice branched	9
-	Inflorescences once branched	10
9.	Peduncle glabrous	<i>H. costalegrensis</i>
-	Peduncle lepidote	<i>H. reticulata</i>
10.	Floral bracts 6.0–9.0 mm long; sepals 4.1–6.0 mm long	<i>H. jaliscana</i>
-	Floral bracts 1.0–6.0 mm long; sepals 1.0–4.0 mm long	11
11.	Leaf blades 50–70 cm long; primary bracts glabrous	12
-	Leaf blades 12–50 cm long; primary bracts lepidote	13
12.	Inflorescence 150–170 cm long; primary racemes 35–55; petals ovate to widely ovate	<i>H. pacifica</i>
-	Inflorescence 110–140 cm long; primary racemes 15–20; petals widely elliptic to orbicular	<i>H. marabascoensis</i>
13.	Leaf sheaths 3.0–4.0 cm long; stipe of the racemes 1.0–6.0 cm long; flowers short pedicellate; floral bracts oblong-triangular, 3.4–3.9 mm long	<i>H. santanae</i>
-	Leaf sheaths 4.1–5.2 cm long; stipe of the racemes none; flowers sessile; floral bracts broadly ovate, 4.5–6.0 mm long	<i>H. subalata</i>
14.	Sepals lepidote	15
-	Sepals glabrous	19
15.	Rachis brown to green; floral bracts 1.0–3.0 mm long; petals white	16
-	Rachis pink; floral bracts 5.0–11 mm long; petals green or pink	18
16.	Leaf blade 11–17 cm long; sepals 0.8–1.3 mm long; petals 2.5–3.5 mm long	<i>H. carrilloi</i>
-	Leaf blade 20–60 cm long; sepals 1.5–2.4 mm long; petals 3.5–5.0 mm long	17
17.	Floral bracts ca. 2.0 mm long; petals 4.0–4.4 mm long; ovary glabrous	<i>H. laevis</i>
-	Floral bracts 2.8–3.0 mm long; petals 4.5–5.0 mm long; ovary slightly lepidote	<i>H. chamelensis</i>
18.	Leaf sheaths 7.0–7.5 × 9.6–10.7 cm; petals pink	<i>H. ibugana</i>
-	Leaf sheaths 3.5–5.6 × 5.5–9.5 cm; petals green	<i>H. iltisii</i>
19.	Inflorescences twice branched	<i>H. costalegrensis</i>
-	Inflorescences once branched	20
20.	Pedicels 5.1–6.0 mm long; sepals 1.5–2.0 mm long	<i>H. pedicellata</i>
-	Pedicels 0–3.2 mm long; sepals 2.1–4.0 mm long	21
21.	Peduncle lepidote	22
-	Peduncle glabrous	24
22.	Flowers pedicellate (2.8–3.2 mm long); floral bracts oblong; petals oblong, 4.7–5.0 mm long	<i>H. santanae</i>
-	Flowers sessile; floral bracts broadly ovate, ovate or lanceolate; petals ovate to triangular, 3.0–4.5 mm long	23
23.	Leaf blades 20–50 cm long; primary bracts glabrous, 1.5–2.5 cm long; floral bracts 3.0–4.5 mm long	<i>H. subalata</i>
-	Leaf blades 51–75 cm long; primary bracts lepidote, 2.6–4.0 cm long; floral bracts 7.0–9.0 mm long	<i>H. jaliscana</i>
24.	Inflorescence 95–135 cm long; primary racemes 20–25; petals 3.0–3.7 mm wide	<i>H. marabascoensis</i>
-	Inflorescence 230–270 cm long; primary racemes 30–75; petals 1.6–2.6 mm wide	25
25.	Primary bracts glabrous on both surfaces; pedicels 1.0–1.5 mm long; sepals ovate, 2.9–3.3 mm long; petals narrowly oblong to narrowly triangular, 6.1–6.5 mm long	<i>H. pacifica</i>
-	Primary bracts lepidote abaxially; pedicels 2.0–2.5 mm long; sepals very widely ovate, 2.3–2.7 mm long; petals lanceolate, 4.2–4.8 mm long	<i>H. reticulata</i>

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References

- Burt-Utley, K. & Utley, J.F. (1993) Two new species of *Hechtia* (Bromeliaceae, Pitcairnioideae) from western Mexico. *Brittonia* 45: 219–225.
<https://doi.org/10.2307/2807104>
- Ehlers, R. (1995) *Tillandsia guenther-nolleri* R. Ehlers spec. nov. *Die Bromelie* 1995: 13–18.
- Espejo-Serna, A. (2012) El endemismo en las Liliopsidas mexicanas. *Acta Botanica Mexicana* 100: 195–257.
<https://doi.org/10.21829/abm100.2012.36>
- Espejo-Serna, A. & López-Ferrari, A.R. (2018) La familia Bromeliaceae en México. *Botanical Sciences* 96: 533–564.
<https://doi.org/10.17129/botsci.1918>

- Espejo-Serna, A., López-Ferrari, A.R. & Martínez-Correa, N. (2020) *Hechtia* Bromeliaceae. In: Egli, U. & Nyffeler, R. (Eds.) *Illustrated Handbook of Succulent Plants: Monocotyledons*. Springer, Berlin, pp. 997–1032.
- Flores-Argüelles, A., Hernández-Cárdenas, R.A., Rosales-Martínez, S., Espejo-Serna, A., López-Ferrari, A.R. & Siekkinen, A. (2024) Two new species of *Hechtia* (Bromeliaceae; Hechtioideae) from Jalisco, Mexico. *Plant Ecology and Evolution* 157: 20–31. <https://doi.org/10.5091/plecevo.108472>
- Flores-Argüelles, A., López-Ferrari, A.R., Espejo-Serna, A., Romero-Guzmán, A.R. (2019) A novelty in the genus *Hechtia* (Hechtioideae, Bromeliaceae) from Jalisco, Mexico. *Phytotaxa* 414: 105–112. <https://doi.org/10.11646/phytotaxa.414.2.2>
- Givnish, T.J., Millam, K.C., Berry, P.E. & Sytsma, K.J. (2007) Phylogeny, adaptive radiation, and historical biogeography of Bromeliaceae inferred from *ndhF* sequence data. *Aliso* 23: 3–26. <https://doi.org/10.5642/aliso.20072301.04>
- Gouda, E.J., Butcher, D. & Gouda, C.S. (2023 [updated continuously]) *Encyclopedia of Bromeliads, Version 5*. Utrecht University Botanic Garden. Available from: <http://bromeliad.nl/encyclopedia/> (accessed: 12 December 2023)
- Klotzsch, J.F. (1835) *Hechtia*, eine neue Gattung der Bromeliaceen. *Allgemeine Gartenzeitung* 3: 401–403.
- Magaña-Rueda, P. (1986) *La Familia Bromeliaceae en la Costa de Jalisco*. Universidad Nacional Autónoma de México, Ciudad de México, 79 pp.
- McVaugh, R. (1989) *Bromeliaceae to Dioscoreaceae. Flora Novo Galicana*. University of Michigan Press, Ann Arbor, Michigan, 398 pp.
- Morrone, J.J., Escalante, T. & Rodríguez-Tapia, G. (2017) Mexican biogeographic provinces: map and shapefiles. *Zootaxa* 4277: 277–279. <https://doi.org/10.11646/zootaxa.4277.2.8>
- Planchon, J.E. (1854) *Tillandsia ionantha*, Planch. *Flore des Serres et des Jardins de l'Europe* 10: 101.
- Radford, A.E., Dickison, W.C., Massey, J.R. & Bell, C.R. (1974) *Vascular Plant Systematics*. Harper and Row, New York, 891 pp.
- Ramírez-Morillo, I., Carrillo-Reyes, P., Tapia-Muñoz, J.L. & Cetzal-Ix, W. (2016) An addition to genus *Hechtia* (Hechtioideae; Bromeliaceae) from Jalisco, Mexico. *Phytotaxa* 266: 261–270. <https://doi.org/10.11646/phytotaxa.266.4.3>
- Ramírez-Morillo, I., Ramírez-Díaz, C., Magaña Rueda, P., Tapia-Muñoz, J.L. & Rivera Martínez, R. (2024) The official presentation to science of a new species of *Hechtia* (Bromeliaceae: Hechtioideae) from the Pacific Lowlands in Mexico. *Botanical Sciences* 102: 586–597. <https://doi.org/10.17129/botsoci.3404>
- Ramírez-Morillo, I., Ramírez-Díaz, C., Ortiz Brunel, J.P. & Romero-Soler, M.K. (2023) Male flowers have revealed the true identity of a new *Hechtia* (Bromeliaceae) species from the Mexican State of Jalisco. *Phytotaxa* 626: 21–31. <https://doi.org/10.11646/phytotaxa.626.1.3>
- Ramírez-Morillo, I., Romero-Soler, M.K., Carnevali, G., Pinzón, J.P., Raigoza, N., Hornung-Leoni, C., Duno, R. & Tapia-Muñoz, J.L. (2018) The reestablishment of *Bakerantha*, and a new genus in Hechtioideae (Bromeliaceae) in Megamexico, *Mesomerantha*. *Harvard Papers in Botany* 23: 301–312. <https://doi.org/10.3100/hpib.v23iss2.2018.n15>
- Rzedowski, J. (1978) *Vegetación de México*. Limusa, D.F., 431 pp.
- Rzedowski, J. (1991) Diversidad y orígenes de la flora fanerogámica de México. *Acta Botanica Mexicana* 14: 3–21. <https://doi.org/10.21829/abm14.1991.611>
- Scharf, U. & Gouda, E.J. (2008) Bringing Bromeliaceae back to homeland botany. *Journal of the Bromeliad Society* 58: 123–129.
- Smith, L.B. (1934) Studies in Bromeliaceae, V. *Contributions from the Gray Herbarium of Harvard University* 104: 71–82.
- Smith, L.B. (1937) Studies in Bromeliaceae, VIII. *Contributions from the Gray Herbarium of Harvard University* 117: 3–33.
- Smith, L.B. (1964) Notes on Bromeliaceae, XXII. *Phytologia* 10: 454–488.
- Thiers, B.M. (2023 [updated continuously]) *Index Herbariorum*. Available from: <https://sweetgum.nybg.org/science/ih/> (accessed 12 December 2023)
- Watson, S. (1891) Contributions to American botany. *Proceedings of the American Academy of Arts and Sciences* 26: 124–163.

APPENDIX 1. Specimen examined

Hechtia carrilloi I. Ramírez. JALISCO: K. Romero-Soler et al. 1242♀ (IBUG), 1243♀ (IBUG); F. Santana-Michel & J. Cevallos 7182♂ (ZEA); F. Santana-Michel & B. Benz 6716♀ (ZEA). *Hechtia chamelensis* Magaña & I. Ramírez. JALISCO: P. Magaña & R. Almeida 317♀ (MEXU); A. Domínguez 565♀ (MEXU, UAMIZ); E. Lott 909♀ (MEXU); J. Calónico 4867♀ (MEXU); P. Domínguez 804♀ (MEXU). *Hechtia costalegreensis* Flores-Arg., Hern.-Cárdenas, Espejo, López-Ferr. & Rosales. JALISCO: A. Flores-Argüelles & G. Contreras 1298♀ (UAMIZ); R. Hernández-Cárdenas et al. 2626♂ (UAMIZ); S. Rosales 1♂ (IBUG), 2♀ (IBUG). *Hechtia ibugana* Flores-Arg., Espejo & López-Ferr. JALISCO: A. Flores-Argüelles & A. Romero-Guzmán 1032♂ (UAMIZ), 1033♀ (UAMIZ); A. Flores-Argüelles & A. Romero-Guzmán 727♂ (MEXU, UAMIZ). *Hechtia iltisii* Burt-Utley & Utley. JALISCO: J. & K. Utley 773♀/♂ (MO); I. Ramírez 2216♀ (IBUG). *Hechtia jaliscana* L.B. Sm. JALISCO: L. Villarreal de Puga 3423♂ (IBUG); P. Carrillo-Reyes & R. Ramírez-Delgadillo 22♂ (IBUG, IEB); P. Carrillo-Reyes & R. Bello 1136♂ (IBUG, UAMIZ); P. Carrillo-Reyes & A. Castro-Castro 6937♂ (IBUG); P. Carrillo-Reyes et al. 7001♀ (IBUG); P. Carrillo-Reyes et al. 7506♀ (IBUG); P. Carrillo-Reyes & C. Ramírez-Díaz 7714♀ (IBUG); P. Carrillo-Reyes et al. 8221♀ (IBUG); R. Hernández-Cárdenas & S. Lara-Godínez 2427♂ (UAMIZ), 2428♀ (UAMIZ); J. Lomeli-Sención et al. 3265♀ (IBUG, UAMIZ); J. Vázquez-García & M. Cházaro-Basáñez 7752♂ (XAL); Zabalgoitia 171♀ (IBUG). *Hechtia laevis* L.B. Sm. COLIMA: R. Hernández-Cárdenas & A. Flores-Argüelles 2616♂ (UAMIZ), 2617♀ (UAMIZ); A. López-Ferrari & A. Espejo-Serna 918♂ (UAMIZ); A. López-Ferrari et al. 2959♀ (UAMIZ); E. Lott & T. Atkinson 2788♀ (MEXU); R. McVaugh 15528♀ (MICH); R. McVaugh 16035♂ (MEXU, MICH); F. Santana-Michel & S. Lemus 9185♂ (ZEA), 9186♀ (ZEA); S. Zamudio et al. 9133♂ (MEXU, UAMIZ, XAL, ZEA); P. Carrillo-Reyes 1763♀/♂ (IBUG, MEXU, UAMIZ); R. Cuevas & G. Guzmán 10119♀ (ZEA); R. Cuevas et al. 11262♂ (ZEA); L. Ortiz & A. Rodríguez 201♂ (IBUG); M. Harker & L. Hernández 3792 (IBUG); L. Hernández & M. Harker 956♀ (IBUG). *Hechtia pacifica* Hern.-Cárdenas, Flores-Arg., Espejo, López-Ferr. & Rosales. JALISCO: R. Hernández-Cárdenas et al. 2624♂ (UAMIZ, IBUG), 2625♀ (UAMIZ, IBUG). *Hechtia pedicellata* S. Watson. JALISCO: M. Harker & J. Luna 1641♀ (IBUG); C. Pringle 3934♀ (MEXU); P. Carrillo-Reyes et al. 8602♂ (IBUG). *Hechtia reticulata* L.B. Sm. COLIMA: R. S. Ferris 6111♀ (GH); A. Flores-Argüelles & G. Contreras-Félix 1735♀ (IBUG, UAMIZ); R. Hernández-Cárdenas et al. 2618♀ (UAMIZ), 2619♂ (UAMIZ); E. Palmer 1352♀ (GH, F, US). *Hechtia santanae* I. Ramírez & P. Carrillo. JALISCO: E. Lott & R. Hernández 1370♀ (MEXU); F. Santana-Michel 8320♀ (ZEA); F. Santana-Michel & A. Cervantes 9355♀ (ZEA); F. Santana-Michel et al. 9409♀ (ZEA); F. Santana-Michel & L. Guzmán 9884♀ (ZEA); F. Santana-Michel 10407♀ (IBUG, ZEA); F. Santana-Michel & L. Guzmán 10504♀ (ZEA). *Hechtia subalata* L.B. Sm. JALISCO: D. Figueroa et al. 235♂ (IBUG), 236♀ (IBUG); C. Chávez-Reyes 169♀ (IBUG); K. Romero-Soler et al. 1239♀ (IBUG), 1240♂ (IBUG); P. Carrillo-Reyes et al. 8520♀ (IBUG).