

Hechtia atlantica sp. nov. (Bromeliaceae),
a new species from Veracruz, Mexico

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ABSTRACT

Hechtia atlantica Hern.-Cárdenas, Espejo & López-Ferr., sp. nov., a new taxon from the state of Veracruz in Mexico, is described and illustrated. The proposed species is compared with *H. myriantha* Mez and *H. schottii* Baker, taxa with some similarities. *Hechtia atlantica* sp. nov. differs from these by the size of the rosette and leaf sheath, the shape of the sepals and petals of the staminate flowers, and the flowering season. A morphological description and images of the new species are provided, as well as a comparison table, an identification key, a list of examined specimens, and a distribution map of all *Hechtia* Klotzsch species present in Veracruz.

RÉSUMÉ

Hechtia atlantica sp. nov. (Bromeliaceae), une espèce nouvelle de Veracruz, Mexique.

Hechtia atlantica Hern.-Cárdenas, Espejo & López-Ferr., sp. nov., un nouveau taxon de l'État de Veracruz au Mexique, est décrit et illustré. L'espèce proposée est comparée à *H. myriantha* Mez et *H. schottii* Baker, taxons présentant quelques similitudes. *Hechtia atlantica* sp. nov. s'en distingue par la taille des rosettes, de la gaine, la forme des sépales et des pétales des fleurs staminées ainsi que par la saison de floraison. Une description morphologique et des images de la nouvelle espèce sont fournies, ainsi qu'un tableau comparatif, une clé d'identification, une liste des spécimens examinés et une carte de répartition de toutes les espèces d'*Hechtia* Klotzsch présentes dans l'État de Veracruz.

KEY WORDS

Bromeliaceae,
endemism,
Mexico,
monocots,
Poales,
Veracruzian Province,
new species.

MOTS CLÉS

Bromeliaceae
endémisme,
Mexique,
monocotylédones,
Poales,
province de Veracruz,
nouvelle espèce.

INTRODUCTION

Hechtia Klotzsch (Klotzsch 1835) is a genus of dioecious plants distributed from southern Texas to southern Mexico and is classified in the subfamily Hechtioideae (Givnish *et al.* 2007). The genus is endemic to the region called Megaméxico 1 by Rzedowski (1991) and currently consists of 97 species (updated from Espejo-Serna & López-Ferrari 2018; Gouda *et al.* 2025), 95 (98 %) of which geographically restricted to Mexico (updated from Espejo-Serna 2012), and 45 are known only from one Mexican state. The states with the highest number of *Hechtia* species are Oaxaca (24), Puebla (17), Guerrero (15), and Jalisco (12) (updated from Espejo-Serna *et al.* 2020).

In fact, many *Hechtia* species have distribution restricted to very small areas, which suggests an active process of evolutionary radiation of the genus in the country (Espejo-Serna *et al.* 2017a, b). In the last 18 years (2007-2025), knowledge regarding the systematics and diversity of the genus has increased significantly, with more than 50 species being described, 47.6% of taxa known to date (Espejo-Serna *et al.* 2007, 2008; Ramírez-Morillo 2008; López-Ferrari *et al.* 2009; Martínez-Correa *et al.* 2010; Burt-Utley *et al.* 2011; Ramírez-Morillo *et al.* 2011, 2013, 2014, 2015, 2016, 2021, 2023a, b, 2024; Burt-Utley 2012; Ramírez-Morillo & Jiménez Nah 2012; López-Ferrari & Espejo-Serna 2013, 2014; García-Ruiz *et al.* 2014; González-Rocha *et al.* 2014; Flores-Argüelles *et al.* 2019, 2024; Hernández-Cárdenas *et al.* 2019, 2020, 2022, 2023, 2024a, b) (Fig. 1).

For the state of Veracruz, five *Hechtia* species have been reported, *H. purpusii* Brandege (Brandegee 1920), *H. myriantha* Mez (Mez 1901), *H. stenopetala* Klotzsch (Klotzsch 1835), *H. bracteata* Mez (Mez 1896), and *Hechtia* sp. (synonym of *H. liebmannii* Mez [Mez 1901]) (Espejo-Serna *et al.* 2005; Espejo-Serna & López-Ferrari 2011). As a result of botanical explorations in Veracruz to prepare the manuscript of the Bromeliaceae for the *Flora of Veracruz* (Espejo-Serna *et al.* 2005), we collected, in 2004, at la Quebrada, municipality of Actopan, specimens of the taxon here proposed as new (*A. Espejo et al.* 6726♀; CICY, IEB, UAMIZ, XAL); and although

since then we had suspected that the material could belong to an undescribed taxon, we did not have, at that time, fertile specimens of both sexes so we decided to provisionally identify it as *H. myriantha*. Recently, we had the opportunity to collect complete material as well as to carefully examine the populations at la Quebrada to confirm our hypothesis, verifying that these specimens have remarkable morphological and ecological differences with *H. myriantha*.

MATERIAL AND METHODS

Staminate and pistillate plants of the new taxon were collected in the municipality of Actopan, Veracruz. The specimens were processed, measured, analyzed, and a complete description was made from dry material. Terminology used is that proposed by Radford *et al.* (1974) and Scharf & Gouda (2008). The types were deposited at UAMIZ and XAL herbaria (acronyms follow Thiers [2025]). To ensure the identity of the new species we revised herbarium material of *Hechtia* deposited at C, CH, CHIP, CIB, CICY, CITRO, CORU, F, GH, IBUG, IEB, K, MEXU, MO, MICH, NY, SEL, TEX, UADY, UAMIZ, UC, US, WIS and XAL.

Protologues, live and herbarium specimens, including type material, of all *Hechtia* species previously cited from Veracruz (Espejo-Serna *et al.* 2005; Espejo-Serna & López-Ferrari 2011, 2018; Espejo-Serna *et al.* 2020): *H. bracteata*, *H. liebmannii* (including *H. perotensis* I. Ramírez & Mart.-Correa [Espejo *et al.* 2007]), *H. myriantha*, *H. purpusii*), and *H. stenopetala* and also the protologues and herbarium specimens of names considered as synonyms, as *H. schottii* Baker (Hemsley 1884), were reviewed (Appendix 1). To name the vegetation types, and species concept, we used the classifications proposed by Rzedowski (1978) and Cronquist (1988: 68-74) respectively.

HERBARIUM ABBREVIATIONS

BM	The Natural History Museum, London;
C	Natural History Museum of Denmark, Copenhagen;
CH	El Colegio de la Frontera Sur, San Cristóbal de las Casas;

ARTIFICIAL KEY TO THE *HECHTIA* KLOTZSCH SPECIES OF VERACRUZ (MEXICO)

1. Leaf margin minutely serrate; peduncle 3-5 mm diameter, inflorescence pendulous *H. purpusii* Brandege
— Leaf margin conspicuously spinose; peduncle 8-30 mm diameter, inflorescence erect 2
2. Primary branches glomerate to very slightly elongate, 1.5-6.5 cm long 3
— Primary branches never glomerate, 10-40 cm long 4
3. Leaf blades 15-31 cm long; pedicels glabrous, petals 6-7 mm long *H. liebmannii* Mez
— Leaf blades 37-60 cm long; pedicels lepidote, petals 3.5-5 mm long *H. bracteata* Mez
4. Peduncle, floral bracts, sepals, and petals glabrous *H. stenopetala* Klotzsch
— Peduncle, floral bracts, sepals, and petals lepidote 5
5. Leaf blades 100-170 cm long; inflorescence twice to three times branched; floral bracts 3-5 mm long, *c.* 3 mm wide *H. myriantha* Mez
— Leaf blades 50-60 cm long; inflorescence twice branched, never thrice; floral bracts 5.5-6.5 mm long, 4.5-5 mm wide *H. atlantica* Hern.-Cárdenas, Espejo & López-Ferr., sp. nov.

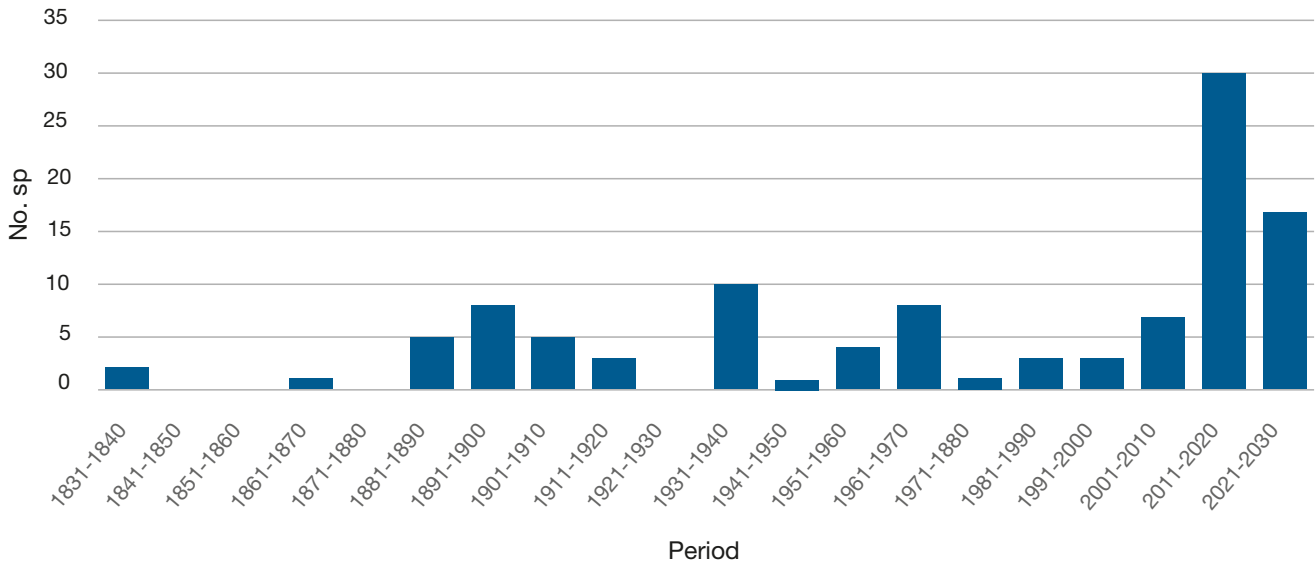


Fig. 1. — Description of *Hechtia* Klotzsch species throughout the time.

- CHAPA El Herbario-Hortorio del Colegio de Postgraduados, Mexico;
- CHIP Instituto de Historia Natural, Tuxtla Gutiérrez;
- CIB Universidad Veracruzana, Mexico, Veracruz, Xalapa;
- CICY Centro de Investigación Científica de Yucatán, Mérida;
- CITRO Centro de Investigaciones Tropicales, Universidad Veracruzana, Xalapa;
- CORU Universidad Veracruzana, Campus Córdoba, Córdoba;
- F Field Museum of Natural History, Chicago;
- GH Harvard University, Cambridge;
- IBUG Universidad de Guadalajara, Zapopan;
- IEB Instituto de Ecología, Pátzcuaro;
- K Royal Botanic Gardens, Kew;
- MEXU Universidad Nacional Autónoma de Mexico, Mexico;
- MO Missouri Botanical Garden, Saint Louis;
- MICH University of Michigan, Ann Arbor;
- NY The New York Botanical Garden, New York;
- SEL Marie Selby Botanical Gardens, Sarasota;
- TEX University of Texas at Austin, Austin;
- UADY Universidad Autónoma de Yucatán, Mérida;
- UAMIZ Universidad Autónoma Metropolitana Iztapalapa, Mexico;
- UC University of California, Berkeley;
- US Smithsonian Institution, Washington;
- WIS University of Wisconsin-Madison, Madison;
- XAL Instituto de Ecología, Xalapa.

vs obovate) and size (4.5-5 × 3.5-4 vs *c.* 3 × *c.* 2 mm) of staminate sepals, in the shape (broadly ovate vs oblong to triangular) and size (5-5.5 × 3.8-4.2 vs 3.6-4.1 × 2.2-2.5 mm) of the pistillate petals, in the smaller size of capsules (7-7.5 × 4-5 vs 10-12 × 6.7 mm), and in the flowering season (July to August vs January to June).

TYPE MATERIAL. — **Mexico** • Veracruz, municipio Actopan, playa Villa Rica, en los acantilados de la Quebrada; 19°40'42.51"N, 96°23'35.26"W; *c.* 20 m alt.; 8.VII.2024; *R. Hernández-Cárdenas & S. Lara-Godínez 2975♂*; holotype: UAMIZ! [6 sheets: UAMIZ92791, UAMIZ92792, UAMIZ92793, UAMIZ92794, UAMIZ92795, UAMIZ92796]; isotype: XAL! (8 sheets).

ETYMOLOGY. — The specific epithet refers to the region where the new taxon inhabits, located at the proximity of the Atlantic Ocean, in the coast of Gulf of Mexico.

MATERIAL EXAMINED. — **Mexico** • Veracruz, municipio Actopan, Quebrada Villa Rica, a 1-2 km de Villa Rica; 19°40'40"N, 96°23'35"W; 0-20 m alt.; 23.IV.2004; fr; A. Espejo *et al.* 6726♀; CICY, IEB, UAMIZ, XAL • playa Villa Rica, en los acantilados de la Quebrada; 19°40'42.51"N, 96°23'35.26"W; 20 m alt.; 8.VII.2024; fl; *R. Hernández-Cárdenas & S. Lara-Godínez 2977♀*; XAL • 2978♀; UAMIZ • playa Villa Rica, en los acantilados de la Quebrada; 19°40'41.12"N, 96°23'33.30"W; 30 m alt.; 11.VIII.2024; fl; *R. Hernández-Cárdenas & S. Lara-Godínez 2995♀*; XAL.

DISTRIBUTION, HABITAT AND ECOLOGY. — *Hechtia atlantica* Hern.-Cárdenas, Espejo & López-Ferr., sp. nov. is known only from the cliffs facing the sea located in la Quebrada, in the municipality of Actopan (Fig. 5), where it inhabits the scrub vegetation with some elements of tropical deciduous forests (*sensu* Rzedowski 1978). Plants of the new species grow in colonies or sometimes solitary on the sidewalls along the edge of la Quebrada, between 0 and 35 m elevation.

PHENOLOGY. — *Hechtia atlantica* Hern.-Cárdenas, Espejo & López-Ferr., sp. nov. blooms from July to August.

DESCRIPTION

Plants saxicolous to terrestrial, in flower 150-250 cm high, rosettes acaulescent, 50-60 cm high, 40-70 cm diam., cespitose forming clumps of five to ten rosettes or sometimes solitary.

TAXONOMIC TREATMENT

Family BROMELIACEAE Juss.
Genus *Hechtia* Klotzsch

Hechtia atlantica

Hern.-Cárdenas, Espejo & López-Ferr., sp. nov.
(Figs 2-4; 6A; Table 1)

DIAGNOSIS. — *Hechtia atlantica* Hern.-Cárdenas, Espejo & López-Ferr., sp. nov., is similar to *Hechtia myriantha* from which it differs in the habit (acaulescent vs caulescent) and the smaller size of the rosette (50-60 × 40-70 vs 100-150 × *c.* 100 cm), in the shape (ovate



FIG. 2. — *Hechtia atlantica* Hern.-Cárdenas, Espejo & López-Ferr., sp. nov.: A-C, habit; D, E, plants at type locality. Scale bar: 20 cm. Photo credits: R. Hernández-Cárdenas.



FIG. 3. — *Hechtia atlantica* Hern.-Cárdenas, Espejo & López-Ferr., sp. nov.: **A**, rosette with lateral inflorescence; **B**, pistillate inflorescence; **C**, pistillate flowers; **D**, staminate flowers. Scale bars: A, 10 cm; C, D, 1 cm. Photo credits: R. Hernández-Cárdenas.

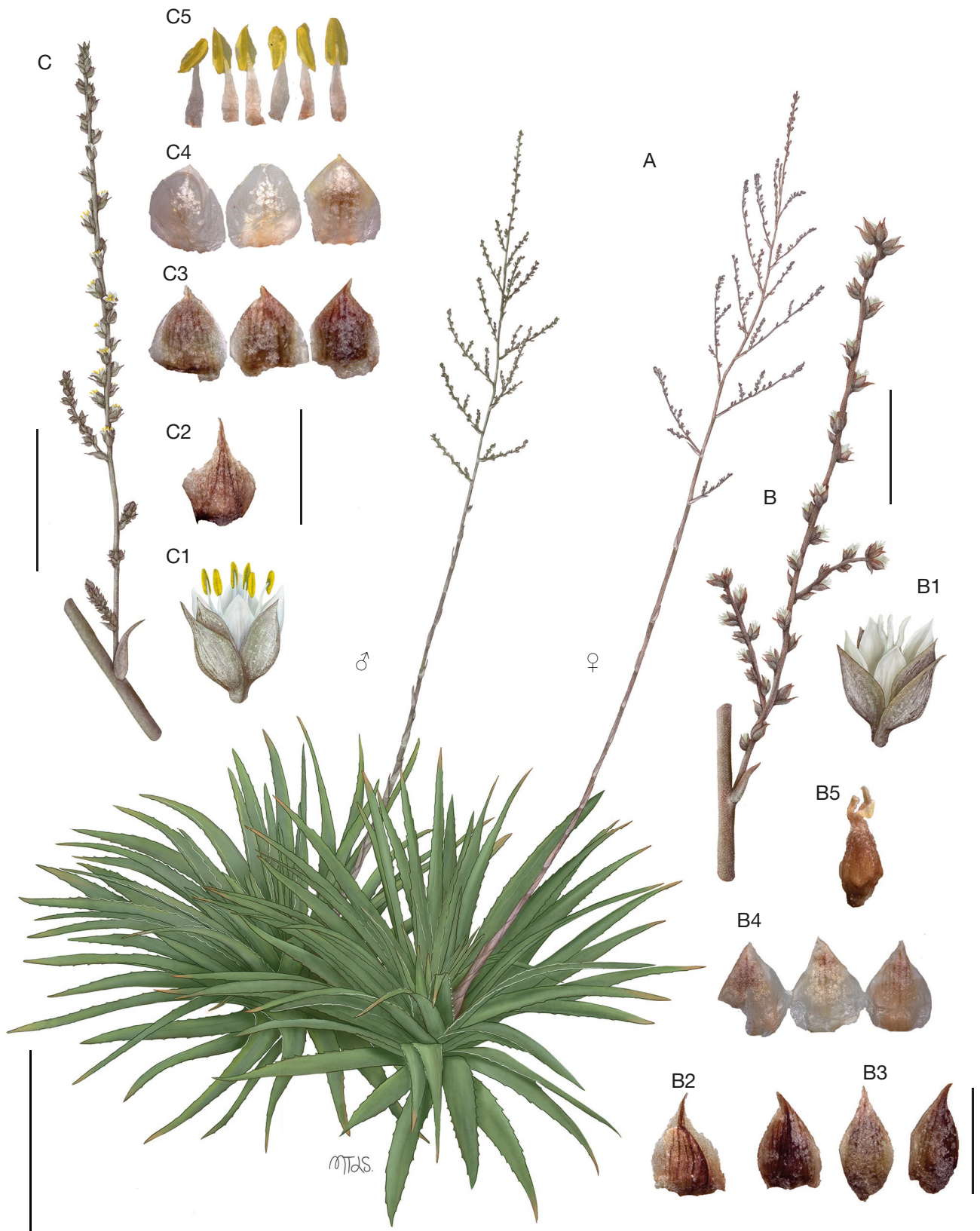


FIG. 4. — *Hechtia atlantica* Hern.-Cárdenas, Espejo & López-Ferr., sp. nov.: **A**, staminate and pistillate plants in bloom; **B**, pistillate primary branch; **B1**, pistillate flower; **B2**, floral bract; **B3**, sepals; **B4**, petals; **B5**, pistil; **C**, staminate primary branch; **C1**, staminate flower; **C2**, floral bract; **C3**, sepals; **C4**, petals; **C5**, stamens. Scale bars: A, 20 cm; B, C, 5 cm; B1-B5, 7 mm; C1-C5, 6 mm. Illustration drawing A, B, B1, C, C1 by M. T. Jiménez Segura; photo credits C2-C5, B2-B5 by R. Hernández-Cárdenas.

TABLE 1. — Comparative characteristics of *Hechtia atlantica* Hern.-Cárdenas, Espejo & López-Ferr., sp. nov., *H. myriantha* Mez and *H. schottii* Baker.

Characters	<i>H. atlantica</i> Hern.-Cárdenas, Espejo & López-Ferr., sp. nov.	<i>H. myriantha</i> Mez	<i>H. schottii</i> Baker
Rosettes	Acaulescent; 50-60 × 40-70 cm; cespitose	Caulescent; 100-150 × c. 100 cm; solitary	Acaulescent; 100-150 × c. 100 cm; cespitose
Flowering plant height (cm)	150-250	350 or more	200-250
Leaf sheath size (cm)	10-13 × 12-16	5.5-6 × 9.5-11.5	4-5 × 4-5
Leaf blade size (cm)	50-60 × 8.5-10	100-170 × 2.5-6.5	50-100 × 3.4-4.5
Staminate plants (♂)			
Inflorescences	twice branched	twice to thrice branched	twice to thrice branched
Inflorescences length (cm)	170-190	150-350	100-180
Primary branches number	25-30	25-40	35-45
Primary branches length (cm)	15-25	8-40	9-45
Primary bracts (cm)	1-3.2	3.5-9.3	1.2-3.5
Floral bracts	widely ovate, acuminate; 6-6.5 × 4.5-5 mm	widely ovate to acuminate; 3-3.7 × c. 2.5 mm	widely ovate to widely oblong; 4-5 × 3.7-4.6 mm
Sepals	widely ovate, acuninate; 4.5-5 × 3.5-4 mm	oblong to ovate, acute; c. 3 × c. 2 mm	obovate to oblong to elliptic-ovate; 3.6-4.5 × 2.6-3.1 mm
Petals	widely ovate; 5-5.5 × 4-4.5 mm; lepidote	triangular; 3.5-4 × 2.5-3 mm; lepidote	obovate; 5.1-5.8 × 3-3.7 mm; glabrous
Pistillate plants (♀)			
Inflorescences	twice branched	twice to thrice branched	twice branched
Inflorescences length (cm)	100-190	100-350	100-150
Primary branches number	12-18	25-40	20-25
Primary branches length (cm)	8-25	10-36	7.5-23
Floral bracts	5.5-6 × 4.5-5 mm	3.5-5 × c. 2.5 mm	3-5 × 3.5-5 mm
Sepals	widely ovate to elliptic; 5.5-6 × 3-3.5 mm	elliptic; c. 3 × c. 2 mm	ovate; 4.7-5 × 3-3.3 mm
Petals	widely ovate; 5-5.5 × 3.8-4.2 mm; lepidote	narrowly ovate to triangular; 3.6-4.3 × 2-2.5 mm; lepidote	widely ovate; 5.4-5.8 × 3.3-3.8 mm; glabrous
Ovary	3.5-4 × 2.5-3 mm	4-5 × c. 2 mm	c. 5 × c. 2 mm
Capsules	ovoid; 7-7.5 mm × 4-5 mm	ovoid to ellipsoid, 10-12 mm × 6-7 mm	ovoid to ellipsoid; 7-8 mm × 5-6 mm
Flowering season	July to August	January to June	April to May
Geographical distribution	Endemic to Veracruz	Endemic to Veracruz	Endemic to Campeche and Yucatán

Leaves 40 to 60, ascending, recurved toward the apex; *sheaths* yellowish-brown at the base to brown toward the distal part, very broadly ovate, 10-13 cm long, 12-16 cm wide, glabrous near the base and lepidote abaxially toward the apex, glabrous adaxially, with minute marginal sharp teeth; *blades* grayish-green, narrowly triangular, long attenuate, 50-60 cm long, 8.5-10 cm wide at the base, very densely white lepidote abaxially, glabrous adaxially, margins with divaricate to ascending green to brown sharp teeth, 5-10 mm long, 5-8 mm wide at the base, 1-1.5 cm apart. Inflorescences lateral, erect, twice branched in staminate and pistillate plants. Staminate inflorescence 170-190 cm long; *peduncle* brown, terete, 1.3-1.8 cm diam., lepidote, internodes 2-6 cm long; *peduncle bracts* brown, foliaceous, sheaths triangular, 2-5 cm long, 1.4-2.2 cm wide, lepidote on both surfaces, margins hyaline, blades narrowly triangular, 1.5-3.5 cm long, 0.7-1.5 cm wide, lepidote on both surfaces, entire, the basal ones longer than the internodes, the upper ones shorter than the internodes; *primary bracts* light brown, narrowly triangular, 1-3.2 cm long, 0.7-1 cm wide, caudate, entire, margins hyaline, lepidote on both surfaces; *main axis* 110-140 cm long, internodes 2-6 cm long; *primary branches* 25 to 30, 15-25 cm long, 1-1.2 cm diam., *secondary branches*

1 to 7, 5-9 cm long, 0.8-1 cm diam.; *floral bracts* brown, broadly ovate, c. 5.7 mm long, c. 4.5 mm wide, longer than pedicels, apiculate, entire to erose, lepidote on both surfaces. Staminate flowers 20 to 40 per primary branch, sessile to shortly pedicellate, *pedicels* c. 0.5 mm long, inconspicuous; *sepals* brown, ovate, c. 5 mm long, c. 4 mm wide, apiculate to acute, hyaline, entire, lepidote on both surfaces; *petals* white, broadly elliptic, 4.7-5 mm long, 4-4.5 mm wide, obtuse, entire, glabrous adaxially, lepidote abaxially; *stamens* equal in length; *filaments* white, narrowly triangular, flattened, 3.5-4 mm long; *anthers* green, oblong, 2-2.3 mm long, versatile, pollen yellow; pistillode conspicuous, white, lepidote. Pistillate inflorescence 100-190 cm long; *peduncle* brown, terete, 0.7-1 cm diam., lepidote, internodes 1.5-2.5 cm long; *peduncle bracts* brown, foliaceous, sheaths triangular, 2-3 cm long, 1-1.5 cm wide, lepidote on both surfaces, margins hyaline, blades linear, 1-1.5 cm long, 0.5-1 cm wide, lepidote on both surfaces, entire, the basal ones longer than the internodes, the upper ones shorter; *primary bracts* brown, triangular, 1-2 cm long, 0.5-1 cm wide, caudate, margins entire, hyaline, lepidote on both surfaces; *main axis* 50-60 cm long, internodes 2.5-3.5 cm long; *primary branches* 12 to 18, 8-25 cm long, 0.8-1.2 cm diam.; *secondary branches* 1 to 6,

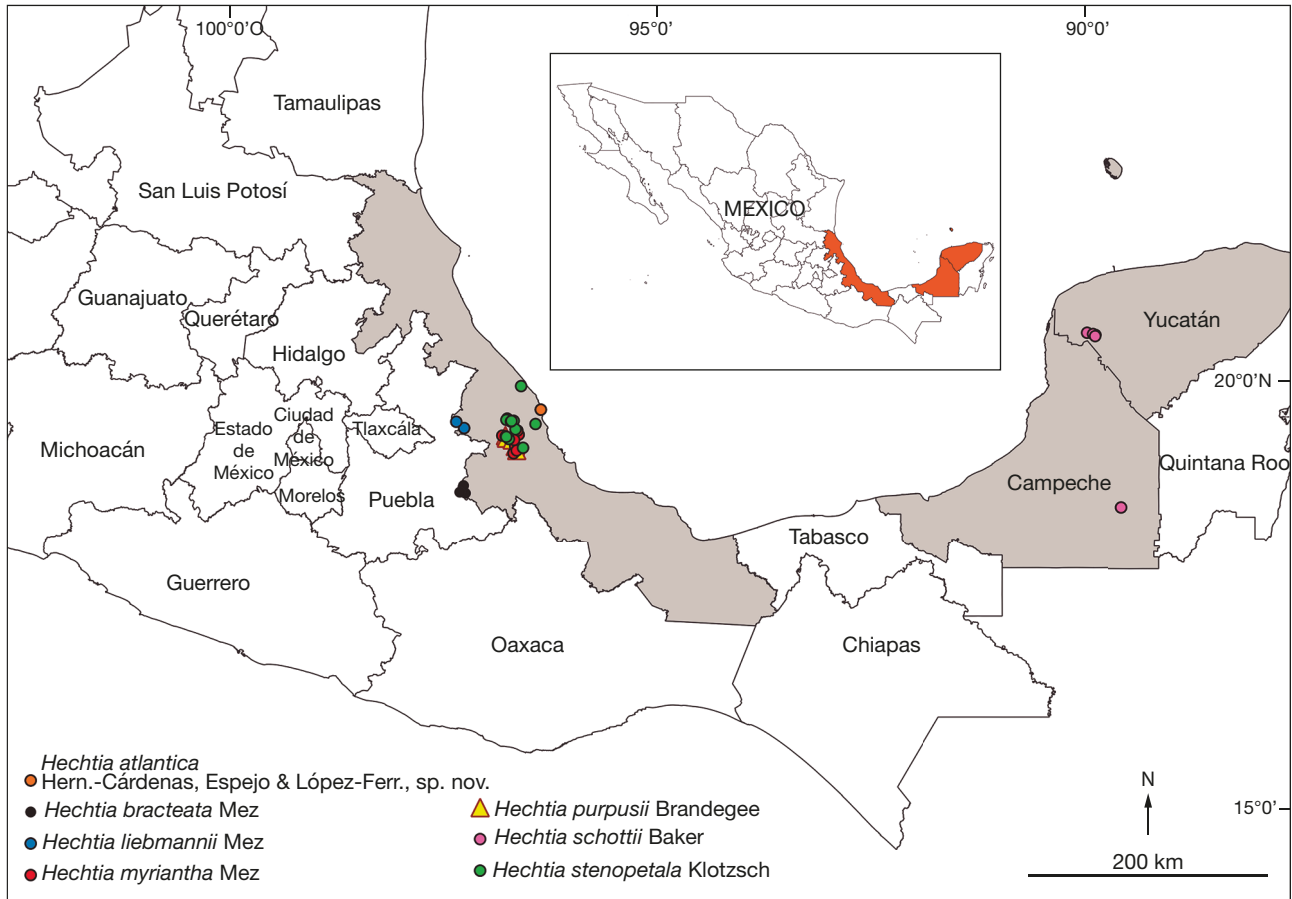


FIG. 5. — Distribution map of *Hechtia* Klotzsch species present in the state of Veracruz and *H. schottii* Baker.

2-9 cm long, 0.8-1 cm diam.; *floral bracts* brown, broadly ovate, *c.* 6 mm long, *c.* 5.3 mm wide, longer than pedicels, apiculate, lepidote on both surfaces, margins hyaline, entire to erose. Pistillate flowers 20 to 30 per primary branches, sessile to shortly pedicellate, *pedicels c.* 0.5 mm long; *sepals* brown, ovate, 5.5-7 mm long, 3.5-4 mm wide, acute, lepidote on both surfaces, margins hyaline, entire; *petals* white, broadly ovate, 6-6.4 mm long, *c.* 4.7 mm wide, acute, entire, glabrous adaxially, lepidote abaxially; *staminodes* rudimentary, white; *ovary* superior, green to white, oblong, *c.* 4.5 mm long, *c.* 2.8 mm diam., lepidote; *stylar branches* white, recurved, slender, 1.2-1.5 mm long, stigmas conduplicate-patent, papillose. Capsules dark brown, ovoid, 7-7.5 mm long, 4-5 mm diam.; *seeds* not seen.

REMARKS

The specimens of the new taxon never exceed in flower 2.5 m height, they are caespitose and have acaulescent rosettes that produce lateral shoots. The rosettes are less than 60 cm high and 70 cm in diameter, being much smaller than those of *Hechtia myriantha*. Their leaf blades never exceed 60 cm length. The inflorescences are twice branched, never three times branched, measuring less than 2 m height. Besides, it

grows on vertical cliffs in scrub vegetation (*sensu* Rzedowski 1978) facing the sea and blooms from July to August.

On the other hand, the plants of *H. myriantha* are 3.5 m height or more and have solitary and conspicuously caulescent rosettes up to 1 m high and 1 m diameter, with stems conspicuous and pachycaulous over time. The leaf blades reach 100 cm length and have tufts of scales in the axils of the sharp teeth. The inflorescences are twice to three times branched, longer than 2 m and frequently up to 3.5 m height (Espejo-Serna *et al.* 2020) (Figs 7; 8). It grows in tropical deciduous forests (*sensu* Rzedowski 1978).

Hechtia myriantha was considered by Smith & Downs (1974) as synonym of *H. schottii* because they share some morphological similarities and that is the reason to include it in the comparative table (Espejo-Serna *et al.* 2005, 2020). *Hechtia atlantica* sp. nov. differs from the type specimen of *H. schottii* by the acaulescent habit (*vs* caulescent), smaller size (50-60 × 40-70 *vs* 100-150 × *c.* 100 cm) of the rosette, in the larger leaf sheath (10-13 × 12-16 *vs* 4-5 × 4-5 cm), in the wider leaf blade (8.5-10 *vs* 3.4-4.5 cm), in the shape (widely elliptic *vs* obovate) and lepidote (*vs* glabrous) staminate petals, in the lepidote pistillate petals (*vs* glabrous), and in its geographical distribution (Veracruz *vs* Campeche and Yucatán) and flowering season (July to August *vs* April to May) (Table 1).



FIG. 6. — Comparison of rosettes: **A**, *Hechtia atlantica* Hern.-Cárdenas, Espejo & López-Ferr., sp. nov.; **B**, *H. myriantha* Mez. Scale bars: A, 50 cm; B, 100 cm. Photo credits: A, R. Hernández-Cárdenas; B, A. Espejo-Serna.



FIG. 7. — *Hechtia myriantha* Mez: **A**, plant in the habitat; **B**, staminate flowers; **C**, pistillate flowers. Scale bars: A, 100 cm; B, C, 5 mm. Photo credits: R. Hernández-Cárdenas.

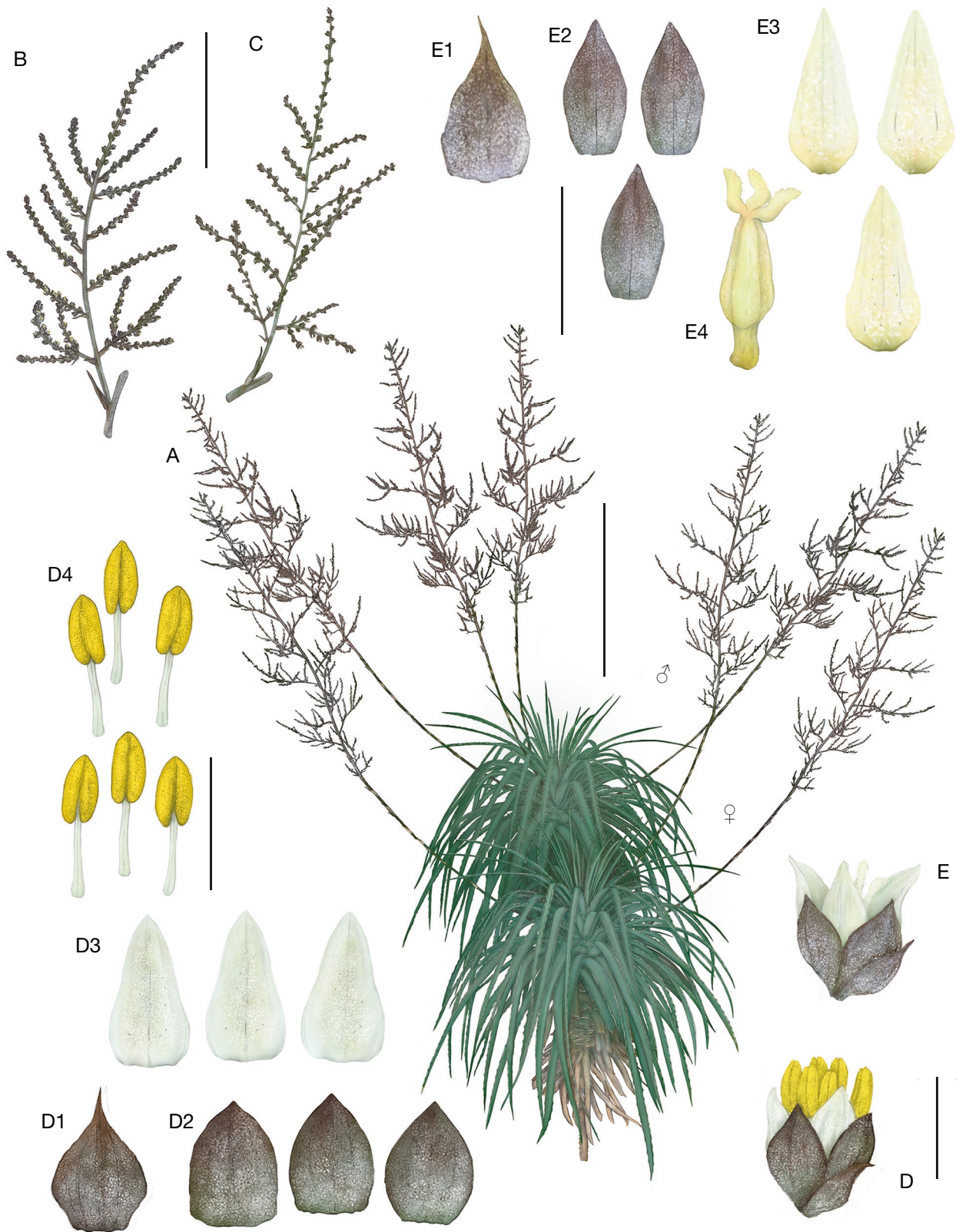


FIG. 8. — *Hechtia myriantha* Mez: **A**, staminate and pistillate plants in bloom; **B**, staminate primary branch; **C**, pistillate primary branch; **D**, staminate flower; **D1**, floral bract; **D2**, sepals; **D3**, petals; **D4**, stamens; **E**, pistillate flower; **E1**, floral bract; **E2**, sepals; **E3**, petals; **E4**, pistil. Scale bars: A, 1 m; B, C, 10 cm; D, E, 4 mm; D1-E4, 3 mm. Illustration drawing by M. T. Jiménez Segura.

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Hechtia bracteata Mez

EXAMINED MATERIAL. — Mexico • Veracruz, Acultzingo; c. 5 km después de Acultzingo rumbo a Tehuacán; 18°42'55"N, 97°20'12"W; 2035 m alt.; 26.IV.2004; fr; *A. Espejo-Serna et al.* 6746♀; UAMIZ57697 • Acultzingo, Km 331.4 de la carretera Tehuacán-Orizaba. 4 km después de Puerto del Aire; 18°42'53"N, 97°20'11"W; 2013 m alt.; 10.XII.2005; fr; *N. Martínez et al.* 22♀; UAMIZ66421, XAL138898 • Acultzingo, cerro por el camino a El Potrero, 18°42'10"N, 97°16'17"W; 1887 m alt.; 1.IX.2012; fr; *J. Rivera Hernández & A. Vargas* 4848♀; CORU, UAMIZ 74217 • Acultzingo, about 2.4 miles west end of Acultzingo along MEX 150 which enters Puebla and junction with MEX 125 to Tehuacán; 18°42'50.2"N, 97°20'5.3"W; 2000 m alt.; 4.VIII.1991; *J. Utely & K. Utley* 8748♀; MO6881026.

Hechtia liebmannii Mez

EXAMINED MATERIAL. — Mexico • Puebla, Chignautla, bei Chignautla; 19°48'52"N, 97°23'17"W; 7000-8000 ft; VII.1841; *F. Liebmann* [s.n.]; holotype: C; isotype: B10 0242805 • Guadalupe Victoria, a 6.6 km al SW de Alchichica, c. 2 km al SW de la desviación a Techachalco, carretera San Salvador el Seco – Perote; 19°22'10"N, 97°26'15"W; 2390 m alt.; 22.IV.2004; *A.R. López-Ferrari et al.* 3109♀; UAMIZ57764 • Veracruz, Perote, carretera que va de Amozoc a Xalapa (140D); 19°32'12.4"N, 97°22'39.6"W; 2414 m alt.; 4.XII.2022; *R. Hernández-Cárdenas & S. Lara-Godínez* 2629♀; fr; UAMIZ88992 • Perote, Tenex-tepec, cerro de Tenex-tepec; 19°28'25.8"N, 97°16'49.8"W; 2550 m alt.; 3.III.1973; *G. Castillo-Campos et al.* 14257♀; XAL[s.n.] • Perote, hacienda de San Agustín, al SE; 19°27'47"N, 97°17'10"W; 2560 m; 4.XI.1998; fr; *G. Castillo-Campos et al.* 18732♀; MEXU[1359682] • Perote, cerros calizos cerca del límite con el estado de Puebla (cerca de Alchichica); 19°20'29.6"N, 97°28'8"W; 2430 m alt.; 14.VII.1968; *C.H. Ramos* 227♂; MEXU307849.

Hechtia myriantha Mez

EXAMINED MATERIAL. — Mexico • Veracruz, Actopan, cerro de la Mesa; 19°32'0"N, 96°30'0"W; 400 m alt.; 5.VI.1987; *R. Acosta P.* 1607♂; fr; CIB, XAL[s.n.] • Apazapan, 0.5 km de Apazapan hacia Jalcomulco; 19°19'8.3"N, 96°44'17"W; 378 m alt.; 24.IV.2007; *I. Ramírez et al.* 1462♀; CHIP, XAL105318 • Camarón de Tejeda, Camarón; 19°1'23"N, 96°36'52"W; 320 m alt.; 1.III.1921; *C.A. Purpus* 8628♂; fr; GH[s.n.], MO, UC • Emiliano Zapata, cañón de Palo Gacho; 19°23'3"N, 96°37'30"W; 400 m alt.; 1.III.1981; fl., *M. Cházaro & A. Justo* 1439♂; XAL82714 • Emiliano Zapata, Cerro Gordo, carretera Jalapa – Veracruz; 19°31'54.5"N, 96°39'32.25"W; 420 m alt.; 24.I.1972; fl.; *J. Dorantes* 499♂; MEXU172424 • Emiliano Zapata, La Cumbre, carretera Xalapa – Veracruz; 19°23'11"N, 96°39'3"W; 374 m alt.; 5.III.2004; fl.; *A. Espejo-Serna & J. García-Cruz* 6704♀; IEB, MEXU1351036, MEXU1351037, MEXU1351038, MEXU1351092, UAMIZ57749, XAL • *ibid.* 6705♂; IEB, MEXU1351073, MEXU1351075, MEXU1351094, MEXU1351094, UAMIZ57754, XAL • Emiliano Zapata, Carrizal; 19°21'50"N, 96°38'5"W; 420 m alt.; 12-14.V.1901; fl.; *E. A. Goldman* 712♂ F, US397082 • Emiliano Zapata, between Plan del Río and La Cumbre, on Xalapa-Veracruz road; 19°23'35.8"N, 96°39'4.2"W; 340 m alt.; 14.I.1993; fl.; *P. Hietz & U. Seifert* 815♂; XAL82716 • Emiliano Zapata, Cerro Gordo, carretera Xalapa-Veracruz, entre Cerro Gordo y Plan del Río; 19°26'0"N, 96°41'53"W; 420 m alt.; 2.III.1998; *I. Ramírez & C. Durán* 642♂; XAL105317 • *ibid.*

643♀; XAL147240 • Emiliano Zapata, Cerro Gordo; 19°26'0"N, 96°41'53"W; 450 m alt.; 15.I.1975; fl.; *F. Ventura A.* 10803♂; IEB, MEXU349860, XAL • Jalcomulco, cerro de Achichuca, Tuzamapan; 19°23'N, 96°48'5"W; 800 m alt.; 2.III.1979; fl., fr.; *G. Castillo-Campos* 463♀♂; CIB, US2854481, US2854482, XAL82713 • Jalcomulco, 4 km antes de Tacotalpan, camino a Jalcomulco; 19°21'25.9"N, 96°46'17"W; 6345 m; 9.XI.1991; *G. Castillo C. & P. Zamora C.* 7591; XAL[s.n.] • Jalcomulco, al N del río de los Pescados, frente al puente; 19°21'53.2"N, 96°49'32.7"W; 460 m alt.; 18.VI.1998; fr; *G. Castillo-Campos et al.* 17918♂; CICY, IEB159178, XAL109083 • Jalcomulco, subida al cerro de Achichuca, al NW de Jalcomulco; 19°21'4"N, 96°46'45"W; 800 m alt.; 6.III.2004; fl.; *A. Espejo-Serna et al.* 6709♀; UAMIZ567730 • Jalcomulco, barranca de Santa María Tlatetla prope Mirador; 19°16'54"N, 96°43'30"W; III.1842; *F. Liebmann s. n.*; B10 0242806, C • Jalcomulco, camino a Coetzalan - Cueva del Abono; 19°18'0"N, 96°42'30"W; 500 m alt.; 12.II.1983; fl.; *L. Robles H.* 2♂; XAL82722 • Jalcomulco, cerro de Achichuca, ejido Tuzamapan, sobre carretera Tuzamapan - Huatusco, antes del río Pescado; 19°22'38"N, 96°49'12"W; 600 m alt.; 9.V.1981; fr; *A. P. Vovides y J. I. Calzada* 657♀; XAL82704 • Puente Nacional, parte alta de la barranca del Pastor, c. 2.5 km después de Mata de Jobo, rumbo a Santa María Tatetla; 19°15'6"N, 96°41'26"W; 500 m; 22.IV.2004; fr; *J. Ceja-Romero et al.* 1636♂; IEB, MEXU1355924, MEXU1356096, UAMIZ57706, XAL • *ibid.* 1637♀; IEB, UAMIZ57729 • Jalcomulco, carretera federal que va de Jalcomulco a Apazapan; 19°20'06"N, 96°45'06"W; 350 m alt.; 8.II.2025; fl; *R. Hernández-Cárdenas & S. Lara-Godínez* 3210♂; XAL, *ibid.* 3211♀; XAL • Puente Nacional, camino de herradura entre el rancho Dos Caminos y la barranca de Panoaya; 19°12'7"N, 96°40'25"W; 790 m; 25.IV.2004; fl.; *A.R. López-Ferrari et al.* 3119♀; MEXU1355921, UAMIZ57707 • Puente Nacional, barranca de Panoaya, 1.5 km al NW de El Coyol; 19°12'7"N, 96°40'25"W; 420 m alt.; 30.I.1986; *M.E. Medina & G. Castillo-Campos* 885♂; CORU, XAL • Puente Nacional, barranca near La Palmilla; 19°11'57.5"N, 96°45'4"W; 590 m alt.; 1.III.1934; fl.; *C.A. Purpus* 16359 GH[s.n.] • Totutla, Fortín; 19°12'41"N, 96°51'2"W; 940 m alt.; III.1919; fl.; *C.A. Purpus* 8505♂; GH, MO, UC204964 • Totutla, Zacuapan; 19°12'36.7"N, 96°50'38.9"W; 915 m alt.; I.1920; fl.; *C.A. Purpus* 8522a♂; MO858645.

Hechtia purpusii Brandege

EXAMINED MATERIAL. — Mexico • Veracruz, Jalcomulco, cerro de Achichuca, entre Jalcomulco y Tuzamapan; 19°23'0"N, 96°48'40"W; 600 m alt.; 17.IV.1984; fr.; *G. Castillo-Campos* 3124♀; CIB, XAL[s.n.] • Jalcomulco, ejido de Jalcomulco, 100 m antes de llegar a La Mesa del Barro; 19°21'55"N, 96°46'30"W, 600 m alt.; 18.IX.1980; fr.; *G. Castillo-Campos & L. Tapia* 1141♀; XAL[s.n.] • Jalcomulco, 1.5 km al NO del poblado de Jalcomulco; 19°20'47"N, 96°46'37"W; 600 m alt.; 17.VI.1998; fl.; *G. Castillo-Campos et al.* 17881♀; IEB, MEXU, UAMIZ54803, XAL109082 • Jalcomulco, 5 km al S de Santa María Tatetla; 19°15'3"N, 96°41'27"W; 450 m; 3.IX.1998; fr.; *G. Castillo-Campos et al.* 18247♀; IEB, MEXU1085949, XAL109081 • Jalcomulco, Santa María Tatetla – Coetzalan; 19°17'50"N, 96°42'30"W; 450 m alt.; 12.IV.1983; fl.; *L. Robles H.* 85♂; IBUG92013, XAL[s.n.] • Jalcomulco, 4 km antes de Jalcomulco viniendo de Apazapan; 19°19'34.9"N, 96°43'36.2"W; 306 m alt.; III.2011; fl.; *I. Ramírez & G. Carnevali* 1667♂; MEXU, XAL147241 • Puente Nacional, c. 8.5 km después de Mata de Jobo, rumbo a Santa María Tatetla; 19°15'16"N, 96°41'19"W; 467 m alt.; 22.IV.2004; fl.; *J. Ceja et al.* 1642♂; UAMIZ57766 • *ibid.* fr; 1643♀; IEB, MEXU, UAMIZ57767 • Puente Nacional, barranca de Pachuquilla; 19°14'0"N, 96°36'40"W; 450 m alt.; 14.IV.1990; fl.; *M. Cházaro & C. Viveros* 6211♂; MEXU565358, MICH, TEX, WIS, XAL[s.n.] • Puente Nacional, barranca de Panoaya; 19°12'7"N,

96°40'25"W; 795 m alt.; 25.IV.2004; fl.; *A.R. López-Ferrari* 3120♀; UAMIZ57768 • Puente Nacional, barranca de Panoaya, 1.5 km al NW de El Coyol; 19°11'9.34"N, 96°41'26"W; 476 m alt.; 30.I.1986; fr.; *M.E. Medina & G. Castillo* 883; XAL[s.n.] • Tenampa, barranca de Tenampa; 19°14'15"N, 96°52'50"W; 990 m alt.; 1.V.1919; fl.; *C.A. Purpus* 8420♀; GH, MO, NY247109, UC, US • Tlacotepec de Mejía, barranca de Consoquitla, prope el Fortín; 19°12'5.54"N, 96°50'13.4"W; 830 m alt.; III.1842; *F. Liebmann* 7951; C, F.

Hechtia schottii Baker

EXAMINED MATERIAL. — Mexico • Campeche, Calakmul, 1 km del ejido Eugenio E. Castillo – 2; 18°41'36"N, 89°35'19"W; 248 m alt.; 25.V.2003; fl.; *D. Álvarez* 5076♂; MEXU1237845, UAMIZ56294 • Calakmul, 3 km al W de Eugenio Echeverría Castellot I, sobre la carretera Escárcega – Chetumal; 28.X.1997; fl.; *E. Martínez* 29610♀/♂; CHAPA, CHIP23612, MEXU908973, MEXU909129, MO5704619 • Calakmul, mina de yeso Coconal, a 23 km al W de Xpujil, camino a Escárcega; 18°31'47"N, 89°35'21"W; 262 m alt.; 12.VIII.1997; fl.; *E. Martínez* 28433♂; CHAPA, CICY, MEXU837905 • Yucatán, Maxcanú, 20°34'36.9"N, 90°0'48.1"W; 60 m alt.; 1917; fl.; *G.F. Gaumer & sons* 23839; GH[s.n.] • Maxcanú, cerro en el sur del pueblo, capilla la Ermita; 20°34'33"N, 90°0'16"W; 51 m alt.; 10.IV.2011; *I. Ramírez et al.* 1676♂; CICY, IEB, MEXU, MO, US, XAL • *ibid.* 1677♀ CICY • Maxcanú, cerro de Maxcanú; 20°34'15.3"N, 90°1'25.6"W; 55 m alt.; 1865; *A.C. V. Schott* 645; BM85619 • Opichén, grutas de Calcehtok; 20°33'36.7"N, 89°56'27"W; 100 m alt.; 10.XI.1980; fr.; *J.I. Calzada et al.* 6712♀; CICY, XAL • Opichén, Okintok; 20°33'32.5"N, 89°57'13.9"W; 43 m alt.; *S.P. Darwin & E. Sundell* 2068; MEXU, MO3032530, MO3032531 • Opichén, cultivated at Mérida; 14.II.2004; fl.; *A. Espejo & A.R. López-Ferrari* 6701♀; UAMIZ • 6702♂; UAMIZ • Opichén, grutas de Calcehtok; 20°33'36.7"N, 89°56'27"W; 100 m alt.; 24.II.1991; fl.; *M. Méndez et al.* 471♂; TEX46072, XAL[s.n.] • Opichén, grutas de Calcehtok; 20°33'N, 89°48"W; 100 m; 17.III.1984; fr.; *J.J. Ortiz* 437; MEXU650753, MO.

Hechtia stenopetala Klotzsch

EXAMINED MATERIAL. — Mexico • Veracruz, Actopan, cerro de la Mesa (sierra Manuel Díaz); 19°32'0"N, 96°30'0"W; 400 m alt.; 6.VI.1987; fl.; *A. Acosta P.* 1599♂; XAL • Actopan, raya La Tempestad (sierra Manuel Díaz); 19°32'0"N, 96°27'0"W; 400 m alt.; 22.XII.1985; fr.; *A. Acosta & N. Acosta*

140♀; UAGC8255, XAL[s.n.] • Actopan, trapiche del Rosario; 19°33'23"N, 96°44'28"W; 450 m alt.; 31.V.2000; fl.; *G. Castillo-Campos* 19906♂; XAL109091 • Actopan, 3 km aprox. al NE de la desviación a Otates; 19°32'53"N, 96°42'33"W; 400 m alt.; 30.IX.1999; fr.; *G. Castillo-Campos & I. Acosta R.* 19397♀; MEXU, XAL[s.n.] • Actopan, trapiche del Rosario; 19°32'45"N, 96°44'5"W; 440 m alt.; 22.X.1999; fr.; *G. Castillo-Campos & I. Acosta R.* 19539♀; XAL109086, XAL109087 • *ibid.* 19580♀; XAL109084, XAL109085 • Actopan, Sierra Manuel Díaz; 19°32'36"N, 96°26'17"W; 200 m alt.; 2.IV.1998; fl.; *G. Castillo-Campos et al.* 17644♀; CICY, XAL[s.n.] • Actopan, el Común en las faldas de la sierra Manuel Díaz, entre Mozomboa y la Costera; 19°31'3.6"N, 96°27'19.6"W; 100 m alt.; 12.X.1984; fr.; *G. Castillo-Campos et al.* 3403♀; CIB, UAGC8260, XAL[s.n.] • Actopan, sierra de Manuel Díaz; 19°32'36"N, 96°26'17"W; 200 m alt.; 1.IV.1998; fr.; *G. Castillo-Campos et al.* 17590♀; CICY, XAL[s.n.] • Actopan, trapiche del Rosario; • Actopan, 19°32'21.5"N, 96°44'38.8"W; 530 m alt.; 14.V.2004; fl.; *G. Castillo-Campos & B. Cano E.* 20916♂; UAMIZ58436 • *ibid.* 20918♀; UAMIZ58439 • *ibid.* 20919♂; UAMIZ58437 • Actopan, alrededores de Trapiche del Rosario; 19°32'47"N, 96°44'8"W; 495 m alt.; 23.IV.2004; fl.; *A. Espejo-Serna et al.* 6731♀; MEXU1350553, MEXU1350570, UAMIZ57759, XAL • *ibid.* 6734♂; UAMIZ57755 • Emiliano Zapata, lomas de Rogel, al N; 19°33'34"N, 96°47'37"W; 640 m alt.; 20.VI.1999; fr.; *G. Castillo-Campos et al.* 19217♀; XAL109089, XAL109090 • Emiliano Zapata, parte alta de la cascada de Cerro Gordo (río San Antonio). Aproximadamente 2 km al NE de Cerro Gordo; 19°26'55"N, 96°41'13"W; 420 m alt.; 4.XI.2007; fr.; *P. Carrillo-Reyes & D. Cabrera-Toledo* 5242♀; UAMIZ69335, XAL91492 • Emiliano Zapata, los Reyes; 19°27'5"N, 96°43'54"W; 670 m; 24.VII.1971; fr.; *F. Ventura A.* 3946-B♀; ENCB[s.n.], IEB • Jalcomulco, 2 km al N de Jalcomulco; 19°20'48"N, 96°46'19.5"W; 435 m alt.; 2.IX.1998; fr.; *G. Castillo-Campos et al.* 18179♀; XAL[s.n.] • Naolinco, orillas de la carretera Actopan km 21 antes de la desviación al Coyol; 19°35'21"N, 96°50'20"W; 530 m alt.; 26.VI.1976; fr.; *R. Ortega O.* 306♀; ENCB, MEXU, MO3504273, XAL • Puente Nacional, Tamarindo; 19°20'21"N, 96°29'25"W; 144 m alt.; 20.VI.1981; fl.; *A. Figueroa N. et al.* 23♂; XAL82719 • Puente Nacional, 1 km antes Encinal, carretera Puente Nacional – Huatusco; 19°12'30"N, 96°48'55"W; 700 m alt.; 5.VII.1971; fr.; *L.I. Neuling & A. Gómez-Pompa* 2405♀; MEXU166404 • Vega de Alatorre, 2 km antes de La Mesilla, camino Los Reyes - Santa Gertrudis; 19°50'30"N, 96°33'30"W; 350 m alt.; 24.VII.1981; fr.; *A. Benavides & G. Castillo-Campos* 83♀; CORU, XAL[s.n.] • Xalapa, malpays de Chiltoyac « Chiltoyaque »; 19°34'46.7"N, 96°52'8.5"W; 1030 m alt.; IV.1929; fl.; *C. Schiede & F. Deppe s.n.*; B10 0144793, HAL.