

THE OFFICIAL PRESENTATION TO SCIENCE OF A NEW SPECIES OF *HECHTIA* (BROMELIACEAE: HECHTIOIDEAE) FROM THE PACIFIC LOWLANDS IN MEXICO

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Abstract

Background: *Hechtia* is characterized by its terrestrial, succulent rosettes, dioecy, and unisexual, dimorphic flowers, mainly fragrant. The paucity and fragmentary herbarium material limit the species recognition but living material reveals diagnostic characters to delimitate them.

Hypothesis: *Hechtia* species are circumscribed by a combination of vegetative and floral characters of both sexes. If the new taxon does not share morphological characters with other species, it will be described as new.

Taxon: *Hechtia*.

Study site and dates: Chamela-Cuixmala Biosphere Reserve, Jalisco, 1985-2023.

Methods: Field collected, cultivated as well as herbarium material of the new taxon were analyzed and compared to other species from the Pacific Lowlands and adjacent areas, particularly flowers of both sexes, fruits, and seeds. Conservation status using IUCN criteria is reported for the new species.

Results: Specimens of *Hechtia chameleensis* have been misidentified as *H. laevis* and *H. reticulata* (both described from fruiting, fragmentary specimens) but the fruit and seed features of both taxa do not match those of the new species. *H. chameleensis* is known from the Chamela-Cuixmala Biosphere Reserve and it is characterized by strict sympodial growth pattern, green leaves with red hues, shiny and glabrous above, white lepidote below, panicles usually simple to (rarely staminate ones) 2-divided, staminate flowers pinkish to pale white, pistillate with pale green to white petals.

Conclusions: Vegetative and reproductive features as well as geographical distribution allow the recognition of *H. chameleensis* as a new species native from Jalisco, Mexico.

Keywords: Chamela-Cuixmala Biosphere Reserve, conservation, endemic, floral dimorphism.

Resumen

Antecedentes: *Hechtia* está caracterizado por rosetas suculentas, terrestres, dioicismo y flores unisexuales, dimórficas, generalmente fragantes. El escaso y fragmentario material de herbario, por sus rosetas, dificulta la delimitación de especies, pero el material vivo revela caracteres diagnósticos para delimitarlas.

Hipótesis: Especies de *Hechtia* están circunscritas por una combinación de caracteres vegetativos y florales de ambos sexos. Si un taxón no comparte caracteres morfológicos y vegetativos con otras especies del género será descrito como nuevo.

Taxón: *Hechtia*.

Sitio y fechas de estudio: Reserva de la Biósfera Chamela-Cuixmala, Jalisco, 1985-2023.

Métodos: Se analizó material recolectado, cultivado y herborizado del nuevo taxón y se comparó con el de otras especies de las Tierras Bajas del Pacífico y de áreas adyacentes, se analizaron y caracterizaron flores de ambos sexos, frutos y semillas. Se reporta el estado de conservación de la nueva especie utilizando los criterios de la UICN.

Resultados: Ejemplares de *Hechtia chameleensis* se han identificado erróneamente como *H. laevis* y *H. reticulata* (descritas de especímenes con frutos), pero características de frutos y semillas de ambos taxones no coinciden con los del nuevo taxón. *H. chameleensis* es conocida hasta ahora de la Reserva de la Biósfera Chamela-Cuixmala, se caracteriza por crecimiento simpodial, hojas verdes con tintes rojizos, glabras y brillantes adaxialmente, blanco lepidotas abaxialmente, panículas simples a (raramente las estaminadas) 2 divididas, flores estaminadas con pétalos rosado a blanco pálido, en pistiladas verde pálido a blanco.

Conclusiones: Características vegetativas y reproductivas, y la distribución geográfica, permiten reconocer a *H. chameleensis* como una nueva especie nativa de Jalisco, México.

Palabras clave: conservación, dimorfismo floral, endémica, Reserva de la Biósfera Chamela-Cuixmala.

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Hechioideae Givnish, a Megamexican lineage (distributed in Megamexico III *sensu* Rzedowski 1991), contains three genera: *Bakerantha* L.B.Sm. restricted to Mexico, *Mesoamerantha* I.Ramírez & K.J.Romero distributed in Belize, Guatemala, Honduras, El Salvador, and Nicaragua (Romero-Soler *et al.* 2022a, b); and *Hechtia* Klotzsch, with the largest amount of its species in Mexico, few ranging into United States to the north, and in Belize, Guatemala, and Honduras to the south.

All *Hechtia* taxa are dioecious (but one polygamomonoecious, *Hechtia gayorum* L.W. Lenz). Most species have individuals with large to medium-sized rosettes and long inflorescences, making difficult to prepare herbarium specimens that adequately represent all forms and dimensions of the species, resulting in fragmentary vouchers: a leaf, and one or few branches of the inflorescences of one sex. The locality also is vague for several species, making impossible to relocate them, this is very important because of the narrow endemism of almost all species (Rivera-Martínez *et al.* 2022). An additional factor that makes species identification difficult is the floral dimorphism, *i.e.*, the differences between flowers of both sexes is not only the presence/absence of anthers and pistil but floral size, color, arrangement on the inflorescence, etc. About 70 *Hechtia* species were described before 1994 but since 2007, 46 species have been described, becoming the Mexican genus with the largest rate of species description in the family. Fortunately, species described since 2007 are well morphologically and geographically documented, with images of plants in habitat and cultivation, providing all information to understand the species (*e.g.*, Flores-Argüelles *et al.* 2019, Hernández-Cárdenas *et al.* 2022, Ramírez-Morillo *et al.* 2023a; for the complete list go to <https://www.tropicos.org/name/Search?name=hechtia>).

Within the 15 provinces proposed by Morrone *et al.* (2014) in Megamexico, for the genus *Hechtia*, the Balsas Basin is the one with the largest number of species (36) and endemism (22), followed by the Pacific Lowlands (25 species, 12 endemic) and Sierra Madre del Sur (24 species, 10 endemic) (modified from Rivera-Martínez *et al.* 2022), figures subject to change by new species described every year for the genus, which reaches more than 90 species. For the Mexican state of Jalisco, there are seven reported species of *Hechtia* (McVaugh 1989, Espejo-Serna & López-Ferrari 2018, Flores-Argüelles *et al.* 2019, Ramírez-Morillo *et al.* 2023b), which are: *H. iltisii* Burt-Utley & Utley, *H. jaliscana* L.B.Smith, *H. pedicellata* S.Watson, *H. santanae* I.Ramírez & P.Carrillo, *H. subalata* L.B.Sm. (but also present in the neighboring states of Zacatecas and Nayarit, Ramírez-Morillo *et al.* 2021), *H. ibugana* Flores-Arg., Espejo & López-Ferr.; and the recently described *H. carrilloi* I.Ramírez (Ramírez-Morillo *et al.* 2023b). All of them are endemic to Jalisco excepting *H. subalata*. The presence of *Hechtia podantha* Mez in Jalisco (McVaugh 1989) has been previously discussed (Ramírez-Morillo *et al.* 2016, 2023b) and its presence in Jalisco has not confirmed. The new species herein proposed will be the eighth species reported to Jalisco, and the seventh endemic to this state.

Materials and methods

Field work was carried out under the scientific permits (SGPA/DGVS/01280/21 and SGPA/DGGFS/712/2913/17) issued by the Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT) to researchers at Centro de Investigación Científica de Yucatán, A.C. (CICY). To describe the new species, field work was performed in the Chamela-Cuixmala Biosphere Reserve, at Jalisco state where plants of both sexes were collected and herbarium specimens prepared, as well as bloomed under cultivation at the Roger Orellana Regional Botanical Garden at CICY (accession number 2021-012) in order to obtain fresh flowers of both sexes. The herbarium specimens were deposited at herbarium CICY (acronyms according to Thiers [count. updated]) whereas duplicates were sent to the herbarium IBUG. Specimens from herbaria MEXU, SLPM, and XAL were borrowed and studied as well. Additionally, we visited and studied collections at the following herbaria: GUADA, IBUG, MEXU (at UNAM and at the Chamela Biological Station), and ZEA. The new species was compared with all species reported for the Mexican state of Jalisco and surrounding states (Aguascalientes, Colima, Michoacán, Nayarit, and Zacatecas) and to those from the Pacific Lowlands, in order to determine its status.

Herbarium specimens of the new species from Chamela proposed here have been misidentified as *Hechtia laevis* L. B. Sm. and *H. reticulata* L. B. Sm., as a consequence of the fragmentary types of both taxa that do not allow to

understand either of the two species morphology. We studied the types of both species and compare them with the specimens of the new species from Chamela. For *H. reticulata*, we studied the following types: *Palmer 1352*, HT: GH!, IT: US!; and for *H. laevis*: *McVaugh 15528*, HT: MICH!, IT: MICH!, in order to discard if the proposed new taxon was one of these two. All types of both taxa are fruiting specimens thus we compared pistillate inflorescence architecture, fruit shape and arrangement on the rachis, as well as seeds among them, resulting that the new species was neither *H. reticulata* nor *H. laevis* but a new to science taxon. Later, we provide information and detailed discussion to support our hypothesis.

Results

Hechtia chamelensis Magaña & I. Ramírez, sp. nov. ([Figures 1-4](#)).

Type: Mexico. Jalisco, municipio La Huerta, estación biológica de Chamela, vereda Calandria, 350 m, 4 septiembre 1985, *P. Magaña-Rueda & R. S. Almeida 317* (fruits, ♀ MEXU-420881(1/6)!; ♂, fruits (MEXU-420882 (2/6)!; ♂ MEXU- 660589 (3/6)!; ♂ MEXU-666157(4/6)!; ♀ MEXU-666159(5/6)!; ♂ MEXU-676801(6/6)!).

Diagnosis. This new species differs from *Hechtia reticulata* in the following characters: fruits 5-6 per each 5 cm length (vs. 8-2 fruits), reticulate (vs. smooth), seeds ca. 1 mm long (vs. 3 mm), inflorescence branches 10-15 cm long vs. 10-12 (-25) cm long). *H. laevis* has branches with many fruits (40-50 in each 5 cm length) while *H. chamelensis* only has 5-6 fruits in each 5 cm length, primary inflorescence branches have no stipe nor primary bracts (vs. 2.5-4 cm long in *H. chamelensis* and primary bracts triangular, long-acuminate, 3-4.5 cm long, 4-10 mm wide, longer to equaling the length of the stipe). The new taxon also shows staminate flowers 6-8 mm long, 7-9 mm diameter, petals apically white, basally pink, widely spread; pistillate flowers 3 mm long, ca. 1 mm diameter; with white petals and sepals basally green apically brown, adnate to the ovary.

Description. Terrestrial or lithophytic plants, rosettes cespitose, in general shape globose, 40-60 cm tall, 50-60 cm diameter, generally forming dense, small groups of 3-6 rosettes. *Rhizomes* abbreviated, 3-5 cm long. *Leaves* 40-60, rigid, central ones erect, basal ones slightly reflexed; *sheaths* broadly ovate, 4-6 × 4-5 cm, light brown, margins erose, densely white lepidote abaxially, lustrous and glabrous adaxially; *blades* narrowly triangular, attenuate, 26-40(-58) × 1-3(-4) cm, succulent, barely conduplicate in cross section, green, sometimes with red spots at the apex or margins, densely white lepidote abaxially, white lepidote at base but glabrous and glossy adaxially, margin straight, armed; *spines* antrorse, triangular, 1.5-2.5 (-5) mm long, 0.4-1(-1.5) cm apart, light green or occasionally purple, with a short tuft of white trichomes at the axile of the basal spines. *Inflorescence* central, erect, emerging from an immature or mature rosette (strict sympodial growth pattern, type SPP, *sensu* Ramírez-Morillo *et al.* 2014).

Staminate inflorescence a 1 (-2)-divided panicle, cylindrical in general shape, erect, but becoming somewhat arched when in bloom, 1-1.25 m long; *peduncle* terete, 40-53 cm long, 0.9 cm diameter at the base, green, surface white-lepidote, *internodes* 1.5-2.5 cm long; *peduncle bracts* sheath wide triangular, 8-10 × 6-8 mm, purple, finely dentate, glabrous above, sparsely lepidote below, blade triangular, long attenuate, acute, 1.9-3.2 (-6 the basal ones) × 0.5-0.9 (-1.3) cm, brownish, entire to slightly erose, multinerved, homogeneously lepidote on the adaxial surface, abaxially glabrous, shorter than internodes but the very basal ones larger than internodes; *rachis* 60-75 cm long, ca. 4 mm diameter at the base until 1 mm in diameter at the apex, terete, green, slightly lepidote, *internodes* (2-) 2.5-3.5 cm long; *primary bracts* triangular, acute, (0.6-)1.4-1.9(-3.0) × 0.3-0.5 cm, papyraceous, shorter than the stipe of the branch, erose to spinulose, brownish, multinerved, lepidote adaxially, glabrous to slightly pustulate abaxially; *branches* 20 in number, forming an angle of 70-110° relative to the main axis, (3.5-)10-15 cm long, each with (13-) 30-40 flowers; *stipe* of the branch 1.4-4 cm long, 2.5 mm diameter at the base, terete; *branch rachis* 1 mm diameter, terete; *floral bracts* oblong to oblong-ovate, attenuate and acuminate, 2.3-2.7 × 1.5-1.8 mm, brown with some reddish macules at the base, abaxially and adaxially glabrous, margin erose and hyaline, ca. 5-10 nerved, almost as long than



Figure 1. *Hechtia chameleensis*; A) Inflorescence, note its length of the inflorescence when growing on shady places, Dr. Pablo Carrillo-Reyes (right) and Dr. William Cetzal (left) on the picture; B) same species with shorter inflorescence (pointed by an arrow) when growing on exposed places, this individual is a few meters from the previous one; C) details of the origin of the inflorescence (terminal or central); D) details of adaxial surface of the leaves, color of foliar blade and spines. Photographs: I. Ramírez-Morillo.

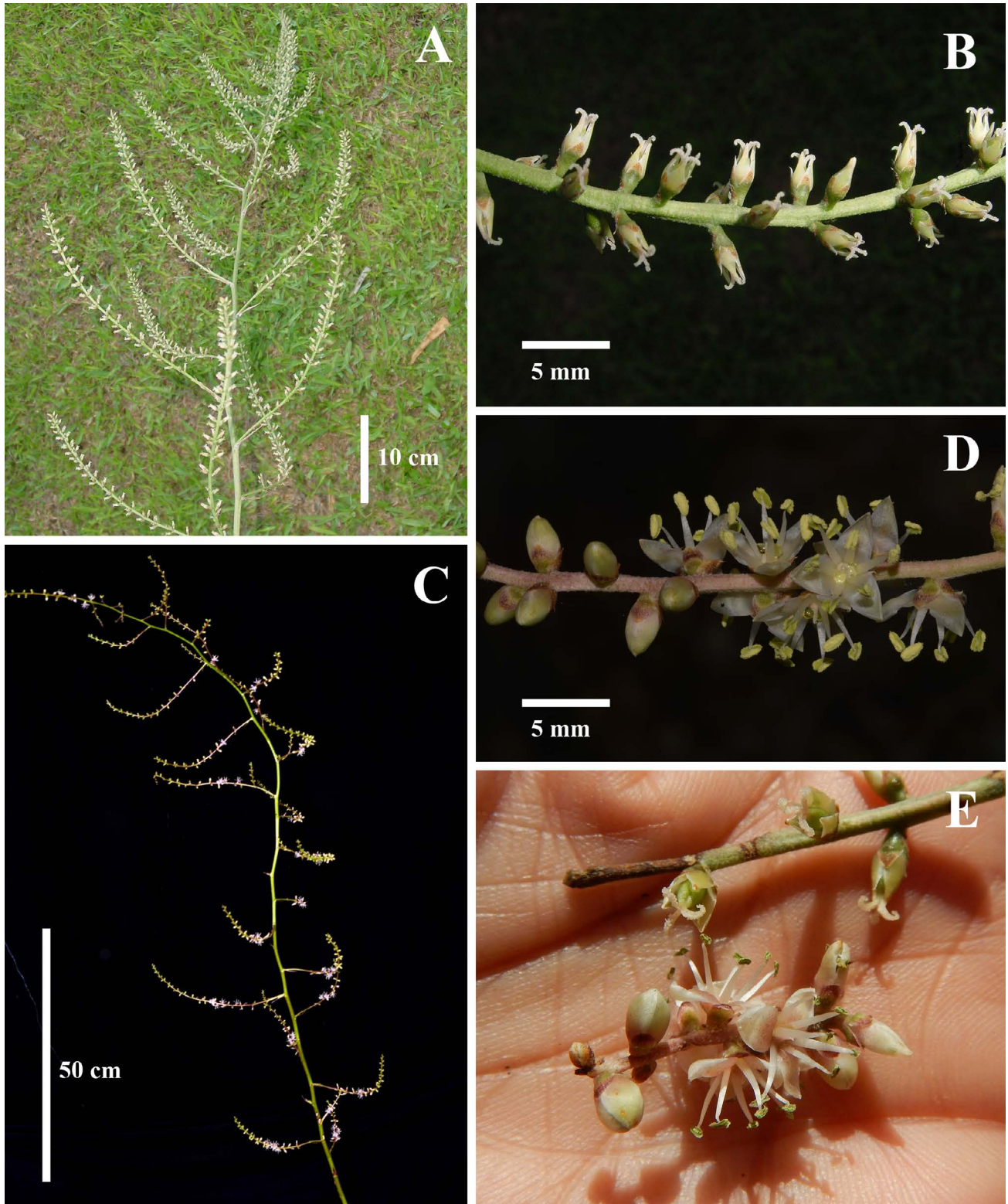


Figure 2. *Hechtia chamelensis*; A) pistillate inflorescence; B) a branch with pistillate flowers in anthesis; C) staminate inflorescence; D) a branch with staminate flowers; E) a comparison of staminate and pistillate flowers. Photographs: A-B and E: I. Ramírez, C: G. Carnevali, D: C. Ramírez-Díaz.

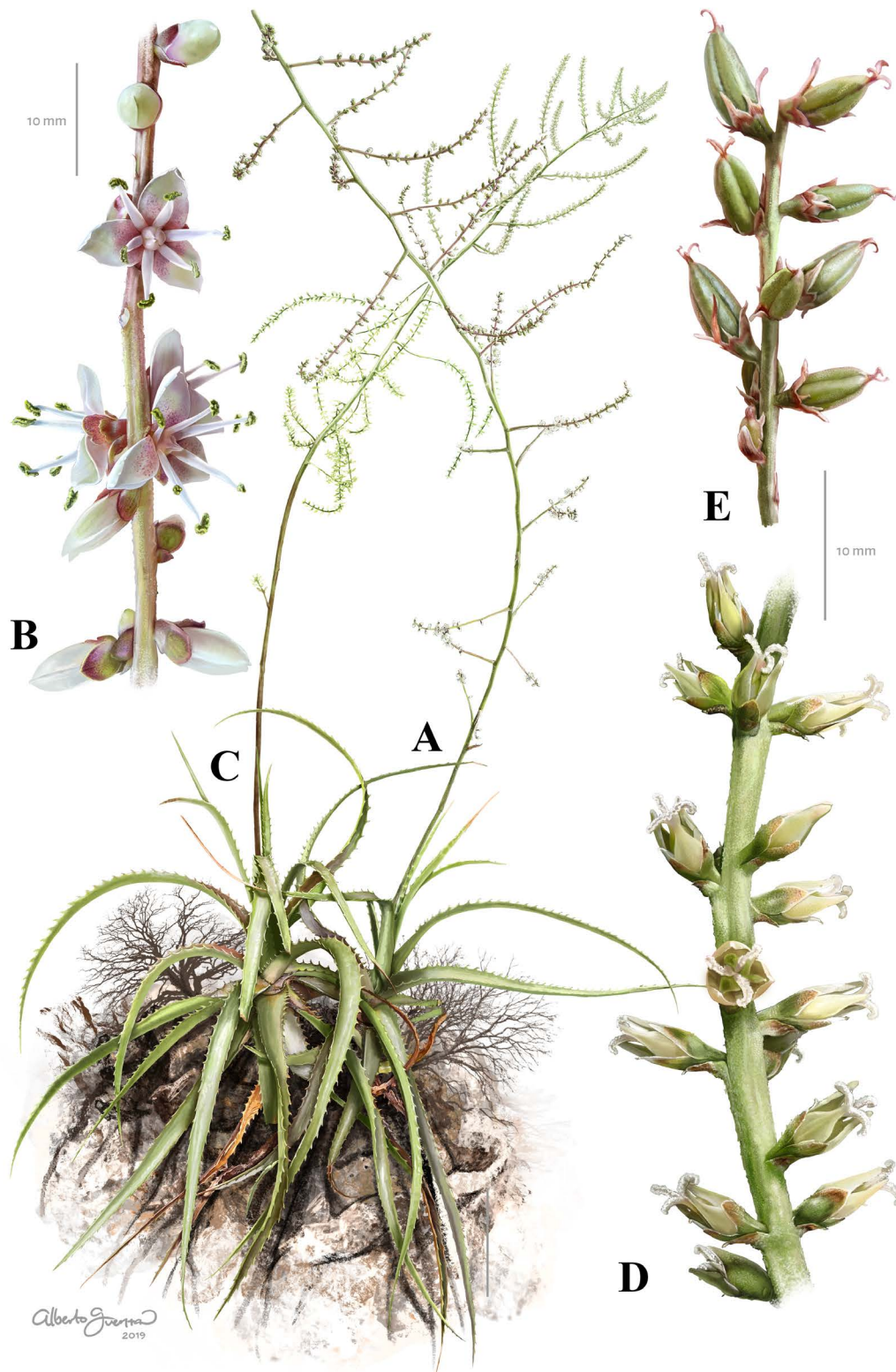


Figure 3. *Hechtia chamelensis* in bloom; A) staminate inflorescence; B) staminate flowers; C) pistillate inflorescence; D) pistillate flower; E) fruits. Illustration by Alberto Guerra based on photographs provided by Ivón M. Ramírez-Morillo.

Hechtia chamelensis (Bromeliaceae) from Jalisco

sepals at anthesis. *Flowers* subsessile, slightly fragrant with a sweet aroma, erect, 6-8 mm long, 7-9 mm diameter, actinomorphic, alternate or verticillate; *pedicels* 0.5-1 mm long, 1-1.5 mm diameter; *sepals* oblong, acuminate to rounded, green, apically brown-reddish, 2-2.5 × 1.2-1.5 mm, slightly erose, lepidote, 5-nerved, shorter than petals; *petals* oblong to oblong-elliptic, acuminate, 4.3-4.8 × 2.8-3.2 mm, widely spread, apically white, basally light pink, 7-nerved; *stamens* with triangular filaments, flattened, 3-4 mm long, white, adnate to the base of pistillode; *anthers* oblong, ca. 0.7-1 mm long, dorsifixed, green-yellowish; pistillode reduced, white, ca. 1.5 × 1.2 mm, stigmatic lobes reduced, erect, ca. 0.5 mm long.

Pistillate inflorescences a 1-divided panicle, some basal branches 2-divided, in general shape ovoid (larger branches at the middle part of the axis), erect, ca. 1 m up to 2 m long when growing on the shade and then, elongated and then longer and gangly; *peduncle terete*, 30-40 cm long, 6-11 mm diameter at the base, glabrous; *internodes* 3.5-6 cm long, green, glabrous, sparsely white lepidote where bracts are inserted; *peduncle bracts* with blades and laminae without a clear division, wide-triangular, acute, acuminate, 5.5-9 mm long, 1.5 cm wide, drying light brown, entire, margins thin, multinerved, glabrous above, basally white lepidote below, larger to equaling the length of the internodes; *rachis* 60-90 cm long, ca. 1 cm diameter at the base, terete, light green, *internodes* 1.5-3.5(-5) cm long; *primary bracts* triangular, long acuminate, 3-4.5 cm long, 4-10 mm wide, longer to equaling the length of the stipe; *stipes* (1.5-)3-4.5 cm long, flattened; *branches* 20-22 in number, pedicellate, ascending, (3-12)20-25 cm long, with 20-50 flowers; *branch rachis* terete, glabrous, smooth, slightly ribbed when dry, green; *floral bracts* triangular-oblong, acuminate, 2.8-3 × 1.8-2.2 mm, margin erose, 5-nerved, brown, sparsely white lepidote. *Flowers* with sepals and petals adnate to the ovary, fragrant during the morning, sweet aroma; *pedicel* terete, ribbed when dry, 3 mm long, ca. 1 mm diameter; *sepals* triangular, acuminate, 1.5-2.2 × 1.4-1.8 mm, basally green, apically brown, entire, sparsely white lepidote, 5-nerved; *petals* narrowly triangular, rounded, cucullate, entire, 4.5-5 × 2-2.5 mm, white, 7-nerved,

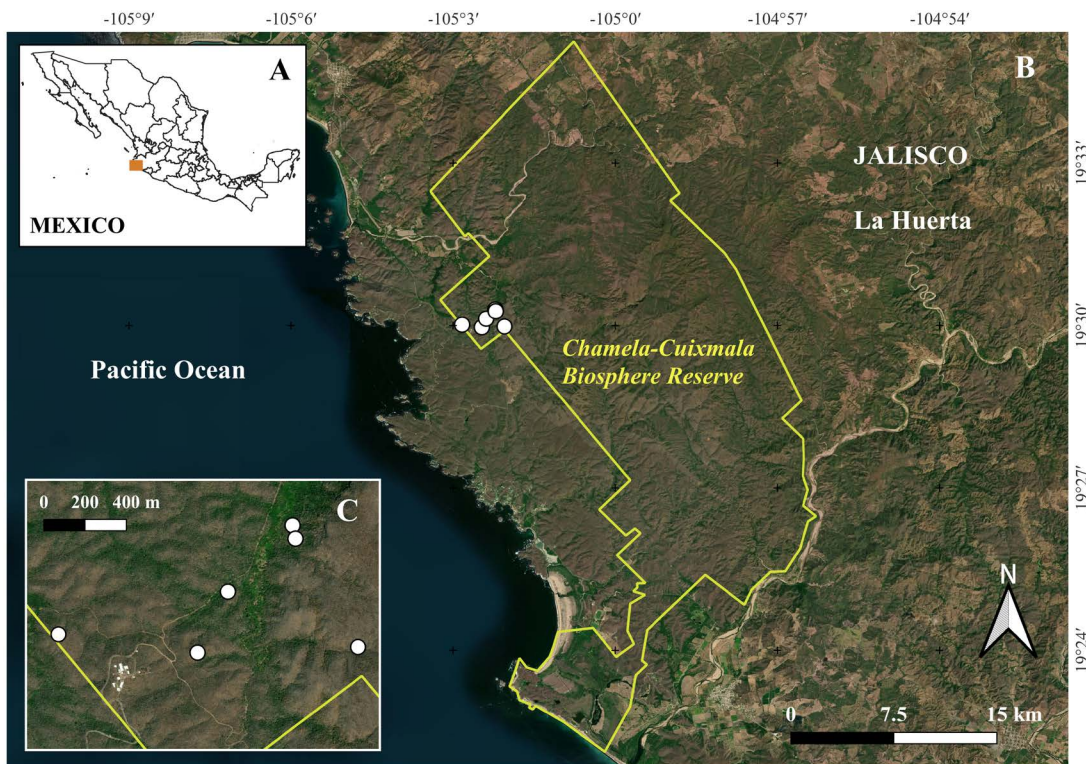


Figure 4. Distribution of *Hechtia chamelensis* in Jalisco state, Mexico; A) location of the study area in the west coast of Mexico (orange square); B) collections of *H. chamelensis* inside the protected natural area Chamela-Cuixmala Biosphere Reserve (white circles), the yellow line indicates the boundaries of the reserve; C) close up of the collection locations of this species.

adnate to the ovary; *staminodes* six, triangular, laminar, 3.2-3.5 mm long, as long at the ovary and attached to its base, white; *ovary* superior, oblongoid, 3.5-3.7 mm long, 2-2.3 mm diameter, green, slightly lepidote, stigmatic lobes recurved, 2-2.5 mm long, adnate at their bases, white, equaling the length of the petals in anthesis; *placentation* central, *ovules* white greenish. *Fruits* conical to cylindrical, 6-13 mm long, 2-3(-5) mm diameter, 1-2 cm apart, brown, smooth, glossy, with a conspicuous mid nerve in each carpel, sepals, petals and staminodes remnant, *pedicel* obconical, 1-2 mm long, ca. 1 mm diameter. *Seeds* fusiform, 5-7 cm long, dorsal wing with two cauda at each end, brown.

Distribution and ecology. *Hechtia chamelensis* is currently known only from the Chamela-Cuixmala Biosphere Reserve in the Mexican state of Jalisco, but it could be found in localities near the reserve, along the coast, due to the similarity of the vegetation type. The distribution of this species occurs within the biogeographic province of the Pacific Lowland (*sensu* Morrone *et al.* 2014), characterized by dry weather at elevations below to 300 meters. Plants of *Hechtia chamelensis* have been found in dense groups of rosettes, growing as lithophytes, mainly on sun-exposed rocky slopes, inside tropical deciduous forest vegetation (Rzedowski 1978), also sometimes in thicket of secondary vegetation, frequently accompanied in the tree layer by *Plumeria rubra* L. (Apocynaceae), *Bursera* spp. (Burseraceae), *Cordia alliodora* (Ruiz & Pav.) Oken (Cordiaceae), *Forchhammeria pallida* Liebm. (Resedaceae), *Leucaena lanceolata* S. Watson, *Libidibia sclerocarpa* (Standl.) Britton & Rose, *Lonchocarpus* sp. (Fabaceae), *Ruprechtia fusca* Fernald (Polygonaceae), *Thouinidium decandrum* (Bonpl.) Radlk., *Thouinia paucidentata* Radlk. (Sapindaceae), *Vitex hemsleyi* Briq. (Lamiaceae); in the shrub layer species such as *Comocladia engleriana* Loes. (Anacardiaceae), *Cnidioscolus spinosus* Lundell, *Jatropha* sp., *Acalypha langiana* Müll. Arg., *Croton niveus* Jacq. (Euphorbiaceae), *Coursetia caribaea* (Jacq.) Lavin (Fabaceae), *Piper* sp. (Piperaceae); in the understory or herb layer *Agave colimana* Gentry (Asparagaceae), *Commelina erecta* L. (Commelinaceae), *Encyclia adenocarpos* (Lex.) Schltr. (Orchidaceae), *Tillandsia paucifolia* Baker subsp. *schubertii* F. Ebel & J. Röth (Bromeliaceae), *Elytraria imbricata* (Vahl) Pers. (Acanthaceae), *Lasiacis ruscifolia* (Kunth) Hitchc. (Poaceae), *Mirabilis russellii* Le Duc (Nyctaginaceae), *Desmodium procumbens* (Mill.) Hitchc. (Fabaceae), *Salvia languidula* Epling (Lamiaceae), and some climbing species such as *Ipomoea trichocarpa* Elliott (Convolvulaceae), *Melothria pendula* L. (Cucurbitaceae), *Cardiospermum halicabum* L., *Paullinia cururu* L. (Sapindaceae), and *Ruehssia lanata* (Paul G. Wilson) L.O. Alvarado (Apocynaceae).

Preliminary conservation status. *Hechtia chamelensis* is currently known from seven collections, separated by less than 1 km among them. All collections are inside the limits of the natural protected area Chamela-Cuixmala Biosphere Reserve, in the municipality of La Huerta, Jalisco. Using GeoCAT (Bachman *et al.* 2011) and according to the limited number of localities, the Extent of Occurrence (EOO) is 0.436 km², meanwhile the size of the Area of Occupancy (AOO) is 0.094 km² (based on cells of 1 × 1 km). Following the IUCN (2012) criteria, this species is considered Critically Endangered (CR B1ab(i,ii), B2ab(i,ii)) given the AOO and EOO values, but a preliminary category of Endangered (EN) is proposed following the IUCN (2022) criteria, because the species is found in a protected natural area, which reduces the risk, ensuring its protection.

Phenology. It has been collected in bloom in September, and in fruit from September to March.

Etymology. Herbarium specimens of the new taxon were first identified as a new species by Patricia Magaña (proposing *Hechtia chamelensis* as its name; Magaña-Rueda 1986) but was never described until now. The species epithet refers to the type locality and recognizes the value of the Chamela-Cuixmala Biosphere Reserve on preserving a large area of dry tropical forest, one of the most important, although threatened, vegetation types in Mexico.

Additional specimens examined (paratypes). Mexico: Jalisco: Mun. La Huerta, estación biológica de Chamela, ruta del sendero Calandria, 19° 30' 16" N, 105° 02' 12.8" W, ca. 92 m, matorral xerófilo en una matriz de bosque seco tropical, colectada estéril el 1 julio 2014, por I. Ramírez, P. Carrillo, W. Cetzal & J. L. Tapia, florece en cultivo en 3 agosto 2019, Ivón Ramírez 2429 ♂ (CICY, IBUG); otro espécimen fue recolectado al final del sendero Calandria,

Hechtia chamelensis (Bromeliaceae) from Jalisco

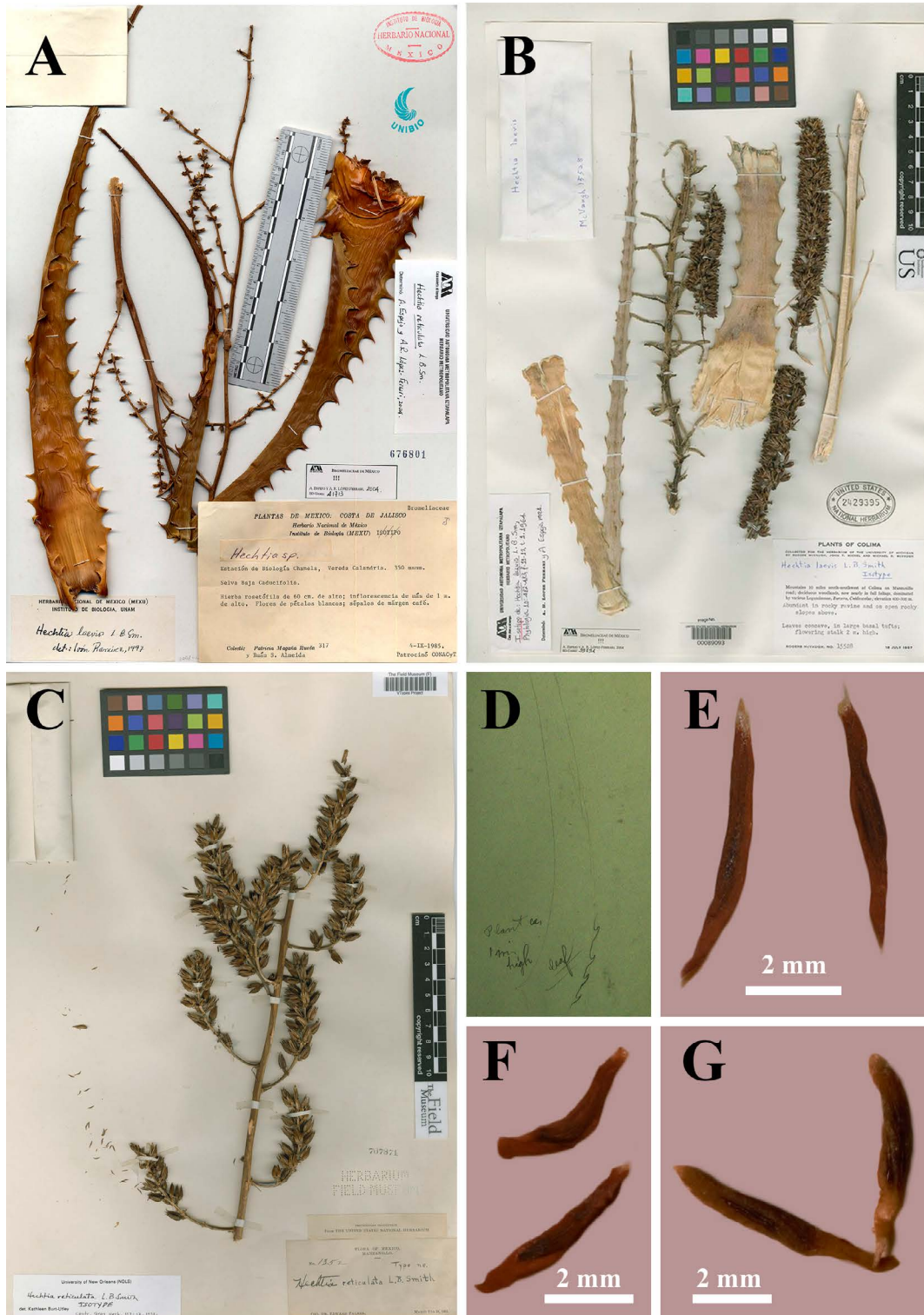


Figure 5. A comparison of some features of *Hechtia chamelensis*, *H. laevis* and *H. reticulata*; A) holotype (MEXU-676801-C!) of *Hechtia chamelensis* showing features of a staminate inflorescence and leaf, especially foliar margins; B) isotype of *Hechtia laevis* (US-2429395!) showing features of leaves, especially foliar margins, immature staminate inflorescence, and branches with fruits; C) isotype of *Hechtia reticulata* (F!), showing a partial inflorescence, with no leaves; D) a handmade drawing of foliar margins made by Lyman Smith on the paratype of *Hechtia reticulata* (GH!); E) seeds of *H. chamelensis*; F) seeds of *H. reticulata*; G) seeds of *H. laevis*.

al NE de la estación biológica de Chamela, 19° 29' 59" N, 105° 2' 3" W, 60 m, 14 October 1997, *J. Calónico S.* 4867 fruits (MEXU-1063806!, MEXU-1030539! [FOTO CICY-067024!]); estación biológica de Chamela, ruta del sendero Calandria, 19° 30' 16" N, 105° 02' 12.8" W, ca. 92 m, matorral xerófilo en una matriz de bosque seco tropical, *I. Ramírez, P. Carrillo, W. Cetzal & J. L. Tapia* 1936 fruits (CICY-071967!, CICY-071966!, CICY-071969!, CICY-071968!, CICY-071970!); en la marca de 800 m en el sendero Calandria, dentro de la estación biológica Chamela, UNAM, 19° 30' 10.5" N, 105° 01' 56.4" W, 110 m, 26 September 1997, *A. Domínguez M.* 565 fruits (MEXU-1026066!, MEXU-1223257!); Bosque de la Enseñanza, estación de biología Chamela UNAM, Latitud: 19.50028°, Longitud: -105.04722°, 40 m, 10 July 1997, *A. Domínguez* 804 fruits (MEXU-1390563!, MEXU-1390564!); El Mirador, vereda Búho, estación biológica Chamela, UNAM, 6 March 1982, *E. J. Lott* 909 fruits (MEXU-321668, MEXU-CHAMELA s.n.).

Discussion

We propose a new species of *Hechtia* from the biogeographical province of Pacific Lowlands, from the Mexican state of Jalisco. Specimens under this species concept had been previously identified as *Hechtia laevis* or *H. reticulata*. *Hechtia laevis* was described from the Mexican state of Colima, and the holotype (*McVaugh 15528*, MICH!) consists of a fruiting branch, while the isotype (US00089093) has a leaf, a foliar sheath, three loose fruiting branches and a young staminate inflorescence with its branches barely developing. When comparing infructescence of *Hechtia chamelensis* with that of *H. laevis* (holotype and isotypes), the last one has densely arranged fruits, and stipes terete without primary bracts, while in *H. chamelensis* shows a conspicuous primary bract that is longer or rarely equaling the length of the stipe, stipe flattened, and fruits less densely arranged (ca. 5-6 fruits in 5 cm length vs. 40-50 fruits in the same length). Additionally, the very young staminate inflorescences on the isotypes (US00089093 and MICH) of *H. laevis* shows a thicker peduncle differing from that of *H. chamelensis*, staminate branches are impossible to compare since they are extremely young on both isotypes of *H. laevis*. However, leaf features do differ, *H. chamelensis* has wider leaves (1-3(-4) cm vs. 2.6-2.8 cm wide) and glabrous and shiny above (easily seen in the holotype of the species vs. lepidote, glaucous above), spines 1.5-2.5 (-5) mm long, 0.4-1(-1.5) cm apart vs. ca. 3 mm long vs. ca. 1.5 mm apart). All these features support the recognition of two different entities.

On the other hand, *Hechtia reticulata* was described from the Mexican state of Colima. The holotype (*Palmer 1352*, GH!) just shows some loose fruiting branches, while isotypes (F, US) show infructescence's features. Comparing these available characters with those in *Hechtia chamelensis* fruits, in the former there are 8-12 per 5 cm length (vs. 5-6 fruits), length of the fruits is similar (ca. 9 mm long vs. 1 cm long), seeds differ in length (3 mm vs. 5-7 mm). The paratype of *Hechtia reticulata* (*Ferris 6111*, GH!) has fruits and seeds (in a small envelope) and a sketch of leaf margins on the holotype: foliar margin differs between *H. chamelensis* and *H. reticulata*: the margins are serrate in both cases, but spines are different in size (at least proportionately since there is not scale on the drawing on the paratype), and the new taxon shows a more sinuous margins, with concavities between spines ([Figure 5](#)). It is important to comment that *McVaugh* (1989) mentioned that *H. laevis* and *H. reticulata* are almost identical only differing in the texture of the fruits, smooth on the first, reticulate on the second. This species pair needs further investigation in order to circumscribed each one with the aid of more evidence.

Another specimen (*Solis Magallanes 4090*, SLPM!, TEX!) from isla la Pajarera in Chamela Bay, was compared to the new species. The specimen represents a pistillate inflorescence only, and it is very similar to the pistillate inflorescences of the new species, but the flowers are almost sessile (vs. pedicellate) and there is no information on the leaves, fruits, or staminate flowers, so we do not assign it to the new species. Similarly, we studied a pistillate specimen collected on the same island by *Carmen del Río* (75, MEXU) and the branches are ribbed and the flowers are sessile. This specimen was not assigned to the new species either, since in *H. chamelensis* the branches are terete, and the flowers are pedicellate.

Hechtia chamelensis is one the species until now, with the larger staminate flower known in the genus, surpassed by *Hechtia matudae* L.B.Sm. with staminate flowers 1-1.5 cm diameter (*López-Ferrari et al.* 2008). Petals of sta-

minate flowers in the new taxon are white with pink dots at their bases or almost absent and then petals yellowish. Pistillate flowers are very inconspicuous, white petals and these form a cup-like corolla during anthesis, with white stigmatic lobes. Both flowers are fragrant during morning hours and visited by bees (*Apis mellifera* L. and Meliponini bee species).

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