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MANUEL G. CALUFF

The genus *Odontosoria (Dennstaedtiaceae, Pteridophyta)* in Cuba

Abstract

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A new species, *Odontosoria reyesii,* known from a single locality in the province of Guantanamo, eastern Cuba, is described. A brief characterization of the other four species of the genus known from Cuba, an identification key and data on their distribution are added.

Key words: ferns, *Odontosoria reyesii,* Caribbean, vascular plants, taxonomy.

The species of *Odontosoria* are terrestrial ferns with a thin, creeping, intricately branched, wiry rhizome, which is densely covered with basifix, filiform to linear-ovate, clathrate, brownish golden to reddish brown, lustrous, translucent scales with a filiform apex and usually a truncated to rounded, entire base. The fronds are rampant and of indefinite growth, 2-4 times pinnate, with the last divisions small, flabelliform, cuneiform, variedly lobulate or cleft. The stipe is usually subwoody, straight, almost cylindrical, glabrous, armed with conical to acicular thorns or smooth (not so in the Antillean species). The rhachises, costae and costules are flexuous, with a thin distal fringe on each side, and with thorns that help the plant to climb in the surrounding vegetation. The pinnae and pinnules are numerous, deltate, ovate to linear and shortly petiolate, their veins are forked, free, evident or immersed in the laminar tissue, and ending very near to the margin, the apex sometimes being claviform. The sori are situated terminally on the veins of the last segments or lobes; the indusium is an urceolate, obconical structure that opens at the top and is formed by indusial tissue on one side and lamina tissue on the other side. The spores are triplanate, spherical, with almost smooth or finely granular surface.

Odontosoria comprises ten neotropical species, most with a restricted distribution; the six Greater Antillean species are regional endemics.

In Cuba the genus is represented by five species, of which two are endemic to the island, *Odontosoria wrightiana* Maxon and *O. reyesii* Caluff, the latter described below. *O wrightiana* and *O. aculeata* form impenetrable thickets in open places and are considered as undesirable weeds, called by the common name “Tembladera”. They are occasionally used for handicraft.

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This study is based on field observations and a revision of the specimens in the Cuban herbaria BSC, HAC, HAJB, HIPR and ULV. The treatments of the genus by Maxon (1913) and Proctor (1985, 1989) were consulted, e.g., for information on synonymy and type specimens. The genus concept follows Mickel & Beitel (1988), who consider *Sphenomeris* as an independent genus.

Key to the species of *Odontosoria* in Cuba

1. Medial and distal pinnae, and first order pinnules of the basal pinnae linear to linear-oblong or shortly linear-lanceolate, lax, pendent 2
– Pinnae and pinnules generally deltoid to deltoid-ovate, rigid, patent 3
2. Ultimate segments obovate or oblanceolate, generally apically bilobate, the lobes often variedly bicuspidate; sori 1-3 per lobe, apical; thorns on rhachis sharp, up to 3 mm long . . . . . 1. *O. reyesii*
– Ultimate segments rhombic to deltate, sinuous, the largest sometimes with a basal acroscopic lobe; sori up to 7 per lobe; thorns on rhachis obtuse, less than 1 mm long . . . . . 2. *O. scandens*
3. Ultimate segments linear, linear-cuneiform, shortly oblong or slightly claviform, usually with a single sorus, or, if they are cleft at the apex, each portion with one sorus; blade of skeletal appearance . . . . . 3. *O. wrightiana*
– Ultimate segments cuneiform, deltate, rhombic or obovate, not linear, variedly cleft or lobulate, the lobes or segments generally with more than one sorus; blade not of skeletal appearance 4
4. Ultimate pinnules irregularly rhombic, formed by 2-4 segments, deltate-cuneiform, acutely cleft in the middle, the lobes usually with 2 sori; thorns acicular, patent . . 4. *O. aculeata*
– Ultimate pinnules rhombic or irregularly obcordate, not cleft in the middle, or the biggest with 1-2 free, lateral and one almost rhombic terminal segment with an irregular lobule; lobes with 3-4 sori; thorns shortly conical, retrorse . . . . . 5. *O. jenmanii*

1. ***Odontosoria reyesii*** Caluff, **sp. nov.**

Holotype: Eastern Cuba, Guantanamo Province, Baracoa, Arroyo Blanco, surroundings of the nursery, in red-yellowish, ferralitic soil, 150-250 m, 25.5.1991, *J. Reyes 3058 A/D* (BSC; isotypes: B, HAJB) – Fig. 1-3.

Pinnae centrales et distales atque pinnulae pinnarum basalium lineares ad lineari-oblongae vel lineari-lanceolatae, laxae, pendulae, *Odontosoriae scandentis* similes. A *O. scandente* differt petiolibus et rachidibus rectis, non volubilibus, spinis rhachidis acutis ad 3 mm longis, segmentibus ultimis obovatis vel oblanceolatis, frequenter apicibus bilobulatis, lobulis varie bicuspidatis, soris apicalibus, singulis ad ternis in lobis.

Rhizome creeping, branched, tortuous, rigid, nodulous, 2-4 mm thick; *rhizome scales* linear to shortly linear-ovate or linear-lanceolate, 2-4.1 × 0.2-0.3 mm, reddish brown, clathrate, translucid, apex filiform, base truncate to nearly rounded, entire. *Fronds* distant, 0.5-1 cm apart, up to 240 cm long; *stipe* 30-100 cm long and 1-2 mm thick, clearly reddish to dark brown, nearly cylindrical, straight, with simple, pluricellular, brown, 0.1-0.3 mm long trichomes and some few conical thorns less than 0.1 mm long; *blade* ovate-attenuate, 3-pinnate, to 4-pinnate in the proximal portion of the largest pinnae in well developed plants, chartaceous to coriaceous, with spaced, 0.1 mm long trichomes, or glabrescent, apex abruptly narrowed, like a very long lateral pinna; lamina surface dull, abaxially brown, adaxially dark brown; *rhachis* similar to the stipe, with a fringe on each side distally, with retrorsely curved, obtuse to acute, scarce thorns up to 3 mm long; *pinnae* 10-12 pairs, divaricate, opposite to nearly opposite, petiolate up to 7 cm; *proximal pinnae* deltate-attenuate to ovate-attenuate, up to 40 cm long, inequilateral, the basiscopic side larger than the acroscopic one, composed of one or a few pairs of linear-oblong to linear-lanceolate pinnules, when alive lax and pendent, apex abruptly narrowed like a long terminal pinnule, or sometimes very gradually reduced with numerous pairs of pinnules; *medial and distal pinnae* nar-

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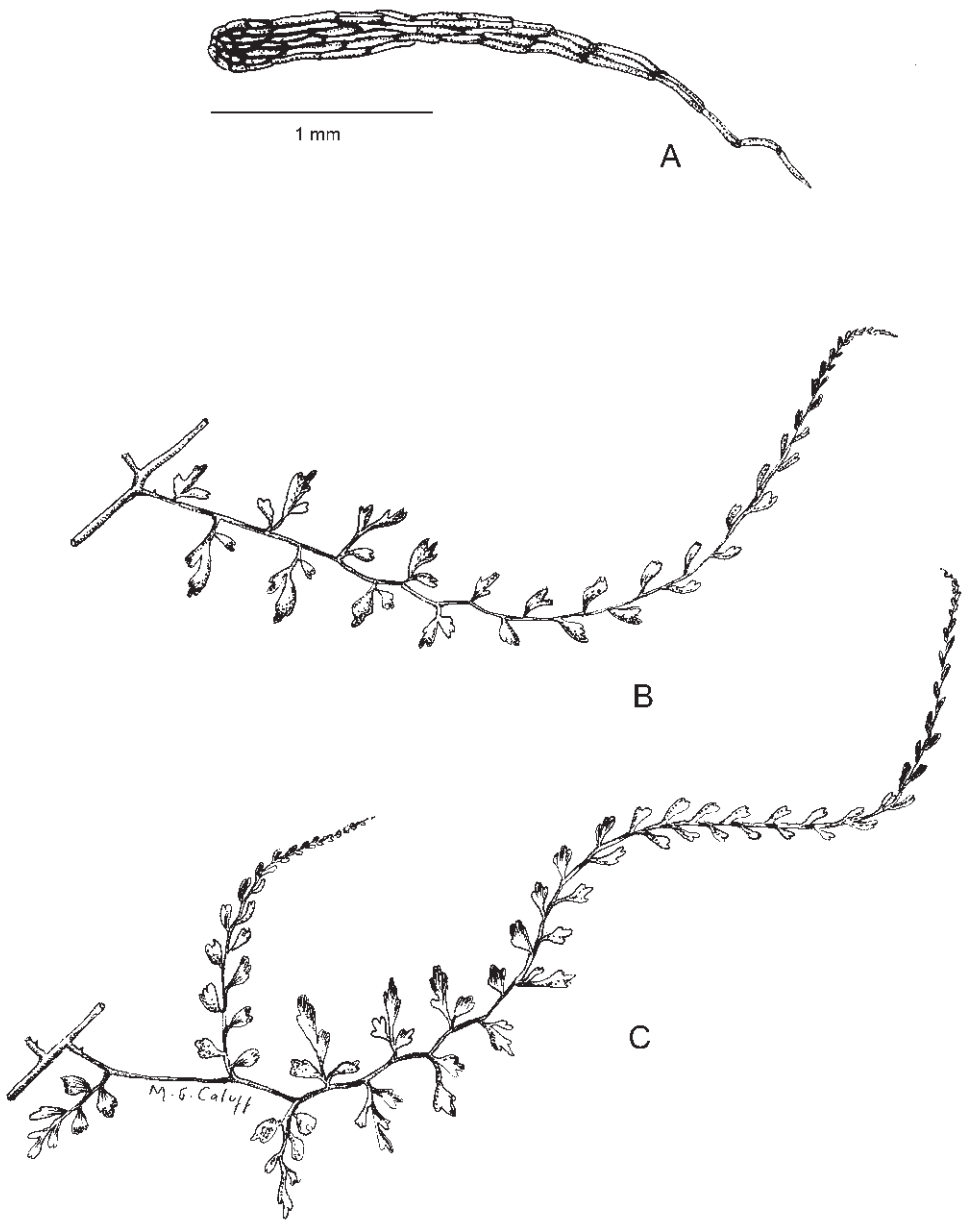


Fig. 1. *Odontosoria reyesii* – A: scale of rhizome apex; B: first proximal pinna (natural size); C: second proximal pinna (natural size). – Drawn after the holotype.

rowly triangular-attenuate to linear, or narrowly linear-lanceolate, up to 98 × 4 cm, when alive lax and pendant; *costae* and *costules* medially flexuous, distally wavy or straight, with thorns similar to those of the rhachis, costae with a protuberance in the joint to the rhachis on the acroscopic side; *pinnules of the first order* very numerous, linear to narrowly linear-lanceolate, up to 60 × 3 cm, petiolate 10 mm; *pinnules of the second order* (if present) pinnate (the proximal ones),

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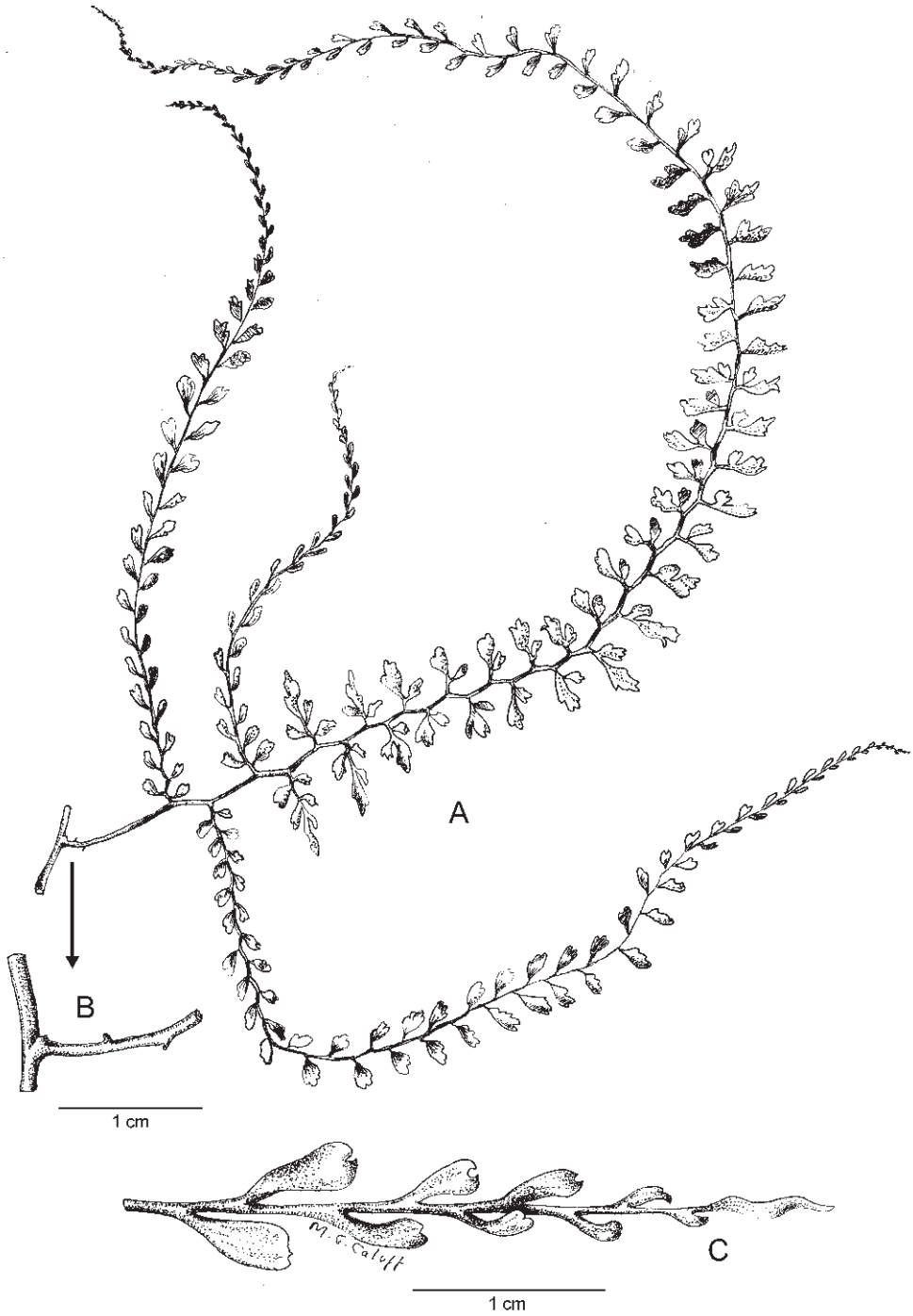


Fig. 2. *Odontosoria reyesii* – A: third proximal pinna; B: insertion of the third proximal pinna; C: apex of a pinnule. – Drawn after the holotype.

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Fig. 3. *Odontosoria reyesii* – apex of a frond (almost natural size). – Drawn after the holotype.

segmentate (the medial ones) or lobulate (the distal ones), petiolate up to 5 mm; *segments* (or lobes) obovate-oblanceolate, apically bilobulate, lobules often variedly bicuspidate, those of the distal portion on pinnae and pinnules very widely decrescent, strongly ascending, the apical ones minute, confluent, seemingly of indefinite growth; *veins* 4-7 per segment, with clavate apex, ending before the margin, abaxially almost indiscernible, adaxially evident. *Sori* 1-2(-4) in the apex of the ultimate lobes; *indusium* obconic, more delicate than the opposed portion of the lamina tissue, apex bilabiate, the lips often broken.

Eponymy. – This species is devoted to its first collector, Dr Orlando Joel Reyes, phytocoenologist of the Eastern Ecosystems and Biodiversity Centre (BIOECO).

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Distribution and habitat. – Endemic; restricted to a single locality in eastern Cuba, Guantanamo Province, near Baracoa, where it is locally abundant on the banks of the Arroyo Blanco river, on yellowish to reddish ferralitic soil, in full or slightly filtered sun light, between 150 and 250 m of altitude.

The arboreal vegetation accompanying *Odontosoria reyesii* is composed of *Bactris cubensis* Burret, *Calyptrogine* sp., *Calophyllum antillanum* Britt., *Calophyllum utile* Bisse, *Carapa guianensis* Aubl., *Clusea rosea* Jacq., *Didimopanax morototтonii* (Aubl.) Dec. & Planch., *Guateria neglecta* (Griseb.) P. Wills, *Ocotea cuneata* (Griseb.) Urb., and *Tabebuia angustata* Britt. Accompanying terrestrial pteridophytes are *Lycopodiella cernua* (L.) Pic.-Serm., *Selaginella cordifolia* (Desv.) Spring, *S. heterodonta* (Desv.) Hieron., *S. plagiochila* Baker, *S. plumierii* Hieron., *S. plumosa* (L.) C. Presl, *S. undata* Caluff & Shelton, *S. serpens* (Desv.) Spring, *S.* sp. 2, *Trichomanes osmundoides* Poir., *Dicranopteris pectinata* (Willd.) Underw., *Sticherus remotus* (Kaulf.) Crysler, *Cyathea arborea* (L.) J. Sm., *C. parvula* (Jenman) Domin, *Alsophila minor* (D. C. Eaton) R. M. Tryon, *Pteridium aquilinum* var. *caudatum* (L.) Sadebeck, *Odontosoria aculeata* (L.) J. Sm., *Olfersia alata* C. Sánchez & Caluff, *Thelypteris lonchodes* (D. C. Eaton) Ching and *T. wrightii* (Mett.) C. F. Reed. Epiphytic pteridophytes include *Huperzia linifolia* (L.) Trevis., *H. funiformis* (Spring) Trevis., *Elaphoglossum wrightii* (Mett.) T. Moore, *Oleandra articulata* (Sw.) C. Presl, *Campyloneurum angustifolium* (Sw.) Fée, *C. brevifolium* (Link) Link, *C. costatum* (Kunze) C. Presl and *C. phyllitidis* (L.) C. Presl; in addition numerous epiphytic bromeliads and bryophytes are present.

Additional specimens seen (all in BSC). – CUBA: GUANTANAMO: Arroyo Blanco, Baracoa, surroundings of the nursery, 150-250 m, 25.5.1991, *J. Reyes 3059, 3060 A/C, 3061 A/B;* same locality, 6.3.2001, *Caluff & Shelton 4552, 4553, 4554, 4555, 4556 A/B, 4558 A/B, 4559 A/B, 4560 A/D, 4563 A/H.*

Notes. – Besides by the differences given in the key, *Odontosoria reyesii* differs from *O. scandens* in the rhachis, which is upward and straight, leaning on the surrounding vegetation in the beginning, but is winding later, so that the frond grows intimately wound in the plant that sustains it. In *O. reyesii,* furthermore, the lamina tissue is not spongy, the sori are superficial and the indusium is bilabiate, whereas in *O. scandens* the lamina tissue is spongy, the sori are immersed and the margin of the indusium is not bilabiate.

Unique among the Carribean species of *Odontosoria* are the obovate-lanceolate, apically bicuspidate ultimate divisions as well as the architecture and the pendent habit of the pinnae and pinnules of *O. reyesii.*

2. *Odontosoria scandens* (Desv.) C. Chr., Ind. Fil.: 354, 465. 1906
≡ *Humata scandens* Desv. in Mém. Soc. Linn. Paris 6: 324. 1827. – Type: "Peru", *J. de Jussieu* (P, photo US).
= *Davallia uncinella* Kunze in Bot. Zeitung (Berlin) 8: 213. 1850 ≡ *Odontosoria uncinella* (Kunze) Fée, Mém. Foug. 5: 326. 1852 ≡ *Microlepia uncinella* (Kunze) Mett., Fil. Hort. Bot. Lips.: 103. 1856 ≡ *Lindsaea uncinella* (Kunze) Krug in Bot. Jahrb. Syst. 24: 92. 1897. – Type: St Yago de Cuba, *Linden 2175* (BM, US, isotypes; photo US).

Rhizome 2-4 mm thick; *rhizome scales* narrowly linear-lanceolate, 1-1.9 × 0.2-0.3 mm, reddish brown. *Fronds* up to 2 m long; *stipe* with some conical, < 0.1 mm long thorns or almost smooth; *blade* 3-4-pinnate, apex abruptly narrowed, like a very long lateral pinna; *rhachis* winding, with thorns similar to those of the stipe; *pinnae* deltate-attenuate to ovate-attenuate (the proximal ones) or linear to linear-lanceolate (the distal ones), laxly patent or pendent, 15-40 cm long; *costae* and *costules* flexuous to wavy, with thorns similar to those of the stipe; *pinnules of first order* in 1-4 pairs, shortly linear to linear-lanceolate, up to 60 × 2 cm, with a similar terminal one, very elongate, mostly 1-pinnate over the entire length; *pinnules of second order* rounded-trapeziform to obliquely ovate-oblong or deltate-ovate, contiguous, the external margin slightly

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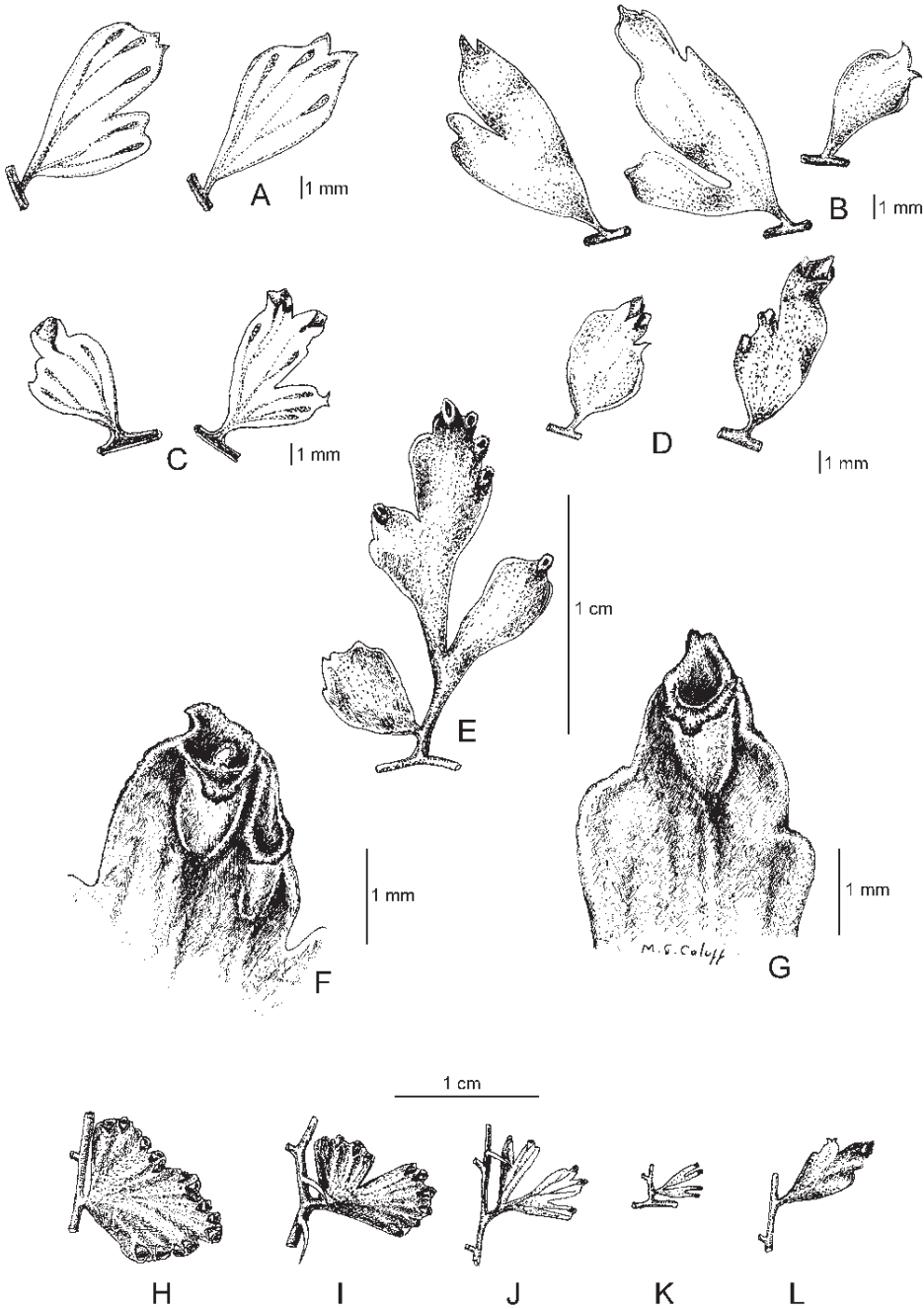


Fig 4. A-G. *Odontosoria reyesii* – A: sterile segments, adaxially; B: sterile segments, abaxially; C: Fertile segments, adaxially; D: fertile segments, abaxially; E: fertile pinnule; F: apex of a segment with two sori; G: apex of a segment with one sorus; drawn after the holotype. – H: *O. scandens*, segment. – I: *O. jenmanii*, segment. – J: *O. aculeata*, segment. – K: *O. wrightiana*, segment. – L: *O.reyesii*, segment.

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crenate, lobulate or at the proximal side sometimes pinnately divided; *veins* 6-7 in each lobule. *Sori* up to 7 on each lobule, totally immersed; *indusium* indiscernible, apex irregularly erose.

Distribution and habitat. – Cuba, Hispaniola and Puerto Rico. Present in the eastern Cuban provinces Granma, Santiago, Holguín and Guantanamo. Found in montane and submontane rainforest, pine forest and sclerophyllous rainforest on serpentine, growing twining on the trunks of small trees and bushes in sunny, light places, forest margins or road banks, between 0 and 1200 mm altitude; at low altitudes prefering high rainfall and serpentine soil. Common.

Selected specimens (all in BSC). – Cuba: Granma: La Bayamesa Heigh, montane zone, on yellowish soil with abundant humus, in "monte fresco", 1700 m, 13.9.1986, *J. Reyes 2230.* — Santiago De Cuba: SE side of Loma del Gato, 800 m, 31.8.1985, *Caluff 1563.* — Guantanamo: Headwaters of Toa river, Cupeyal del Norte, common, partially shaded, gallery forest, 400-600 m, 27.8.1986, *Caluff & J. Fagilde 2079.*

3. *Odontosoria wrightiana* Maxon in Contr. U.S. Natl. Herb. 17: 164. 1913.
Holotype: Cuba, Pinar del Rio prov., in an open bushy ravine near Pinar del Rio, 22.2.1900, *W. Palmer & J. H. Riley 42* (US).

Rhizome 2-2.5 mm thick; *rhizome scales* acicular, 1-1.5 × 0.2-0.3 mm, golden-brown. *Fronds* up to 2 m long; *stipe* with numerous acicular, straight, patent thorns, 2-3.5 mm long; *blade* 4-pinnate, apex gradually narrowed; *rhachis* straight, with thorns similar to those of the stipe; *pinnae* deltate to ovate, 15-20 × 8-13 cm; *costae* and *costules* strongly flexuous, with numerous thorns, 3-4 mm long; *pinnules of first order* in the largest fronds 5-6 pairs, deltate to deltate-oblong; *pinnules of second order* of similar contour to those of first order, the axes with scarce or without thorns; *pinnules of third order* composed of 1-2, unequally petiolate segments when large, cuneiform, cleft almost to the base in 2 very thin, almost free or acutely united, linear or slightly clavate lobes, 1.5-4 mm long and 0.5 mm wide or less, petiolate up to 5 mm; *veins* one per segment, or if two, each extending to one of the marginal lobes. *Sori* solitary at the end of the segments or lobes; *indusium* transversely obconic or oval, more delicate and clear abaxially than the lamina tissue, partially free on the sides, the whole margin entire.

Distribution and habitat. – A Cuban endemic, present in western Cuba (province Pinar del Rio and Isla de la Juventud), central Cuba (provinces Cienfuegos and Sancti Spíritus) and eastern Cuba (province Granma: Guisa, Sierra Maestra), growing in evergreen forest, pine forest, gallery forest and secondary vegetation, in sunny, light places, forest margins or road banks, on sandstone soil, silica sand and other very acidic soils, between 0 and 700 m. Common in western Cuba, frequent in central Cuba and only known by one collection in eastern Cuba.

Selected specimens (all in BSC). – Cuba: Pinar Del Rio: Cayo Ratones, Alturas de Pizarras del Sur, San Juan y Martínez, pine forest, 300 m, 4.2.1990, *Caluff & al. 2872;* El Cuzco, Sierra del Rosario, 450 m, 4.5.1984, *Caluff 877;* margins of the El Punto dam, Las Ovas, on white sand, 10 m, 6.12.1982, *Urquiola 424*. — Sancti Spíritus: Jesús Delgado stream, Cudina, Escambray, gallery forest, 500-600 m, 25.4. 1985, *Caluff 1296;* headwaters Jesus Gonzalez stream, Cudina, Escambray, 600 m, 26.4.1985, *Caluff 1350.* — Granma: Maria Tomasa, Guisa, N side of Sierra Maestra, pine forest, 500-800 m, 12.3.1990, *J. Reyes & E. del Risco 2922*.

4. *Odontosoria aculeata* (L.) J. Sm., Cult. Ferns: 67. 1857
≡ *Adiantum aculeatum* L., Sp. Pl. 1096. 1753 ≡ *Davallia aculeata* (L.) J. E. Sm. in Mém. Acad. Cienc. Turin 5: 415. 1793 ≡ *Stenoloma aculeatum* (L.) Fée, Gen. Fil.: 330. 1852 ≡ *Microlepia aculeata* (L.) Mett., Fil. Hort. Lips.: 103. 1856 ≡ *Lindsaya aculeata* (L.) Mett. in Ann. Sci. Nat. Bot., ser. 4, 15: 65. 1861 ≡ *Lindsayopsis aculeata* (L.) Kuhn, Festschr. 50 Jaehr. Jubil. K. Realsch. Berlin: 27. 1882 ≡ [by lectotypification, Proctor (1989: 116), see below] *Davallia dumosa* Sw.,

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Syn. Fil.: 135, 353. 1806 ≡ *Stenoloma dumosum* Fée, Gen. Fil.: 330. 1852. – Lectotype (designated by Proctor 1989: 116): [icon.] Plumier, Traité Foug. Amér.: t. 94, based on material from Léogane, Haití.

Rhizome 3-4.5 mm thick; *rhizome scales* acicular, 3-3.5 × 0.2-0.3 mm, reddish brown. *Fronds* up to 3 m long; *stipe* with numerous acicular, straight, patent thorns, 2-4 mm long; *blade* 4-pinnate, towards the apex gradually reduced; *rhachis* straight, with thorns similar to those of the stipe; pinnae deltate-ovate, 20-45 × 12.5-21 cm; *costae and costules* flexuous, with thorns similar to those of the stipe; *pinnules of first order* numerous, deltate-oblong to deltate-ovate; *pinnules of second order* irregularly rhombic, of 2-4 cuneiform-obdeltate segments, cleft in the middle, each lobe emarginate and with 2 sori; *veins* 2 in each lobe. *Sori* usually 2 in the end of each lobe of the segments, if 1, often served by 2 veins; *indusium* obconic or oval, more delicate abaxially, paler than the lamina tissue, the whole margin entire.

Distribution and habitat. – Cuba, Hispaniola and Puerto Rico. Present in central Cuba (provinces Cienfuegos and Sancti Spíritus) and eastern Cuba (provinces Granma, Santiago, Holguín and Guantanamo). Growing in montane and submontane rainforest, evergreen forest, pine forest, gallery forest, serpentine rainforest and secondary vegetation, in sunny places, clearings, forest margins or road banks, between 0 and 1200 m. Frequent in central Cuba, common in eastern Cuba.

Selected specimens (all in BSC). – Cuba: Sancti Spíritus: Cayajana stream, Alturas de Sancti Spiritus, in road bank, in the sun, gallery forest, 150-300 m, 7.12.1994, *Caluff & Shelton 4025*. — Cienfuegos: El Palomar, Cumanayagua, 650 m, 28.4.1985, *Caluff 1385*. — Granma: Pino del Agua Arriba, La Bayamesa Granma, pine forest, 1200 m, 15.11.1986, *J. Reyes 2240*. — Santiago De Cuba: Alto del Ermitaño, Gran Piedra, common in clearings and in pine forests, 700-800 m, 10.12.1985, *Caluff 1753*. — Holguín: Pinares de Mayari, pine forest, 700 m, 5.10. 1981, *Caluff 218*. — Guantánamo: Margin of Duaba river, Yunque de Baracoa, in pine forest, common, 100-150 m, *Caluff 1853*.

5. *Odontosoria jenmanii* Maxon in Contr. U.S. Natl. Herb. 17(2): 162, t. 2. 1913.
Type: Cinchona, parish of St Andrew, Jamaica, *Maxon 1594* (US).
– *Davallia aculeata* sensu Jenman in Bull. Bot. Dept. Jamaica no. 23: 6. 1891 (excl. refs.), non *Adiantum aculeatum* L.

Rhizome 2.5-4 mm thick; *rhizome scales* narrowly lanceolate, 2-3 × 0.6-0.8 mm, brown. *Fronds* 2-6 m long; *stipe* with numerous acicular, straight or curved, retrorse thorns, 2-4 mm long; *blade* 4-pinnate, apex gradually attenuate; *rhachis* straight, with numerous conical, robust thorns, less than 1 mm long; *pinnae* deltate, 30-50 cm long, 20-35 cm wide at the base; *costae* and *costules* strongly flexuous to wavy, with numerous sharp, acicular, retrorse thorns, 1-2 mm long; *pinnules of the first order* 4-8 pairs, deltate; *pinnules of the second order* 6-10 pairs, deltate; *ultimate pinnules* numerous, sessile or shortly petiolate, of very variable contour, rhombic to irregularly obcordate, simple or the largest with 1-2 free lateral, obcordate segments, the terminal segment almost rhombic, with 1-2 irregular lobes; *veins* 3-4 in each lobule. *Sori* 3-4 per lobule; *indusium* shortly obconic, open only at the end, the whole margin entire.

Distribution and habitat. – Cuba and Jamaica. Present in eastern Cuba (provinces Granma, Santiago, Holguín and Guantanamo). Growing in cloud forest, montane and submontane rainforest, pine forest and gallery forest, in clearings, forest margins and road banks, commonly in full sun, between 400 and 1900 m, at low altitudes in places with high rainfall. Common in the Sierra Maestra only, above1000 m altitude.

Selected specimens (all in BSC). – Cuba: Granma: Nuevo Mundo river, La Bayamesa, in gallery forest, 1000 m, 17.3.1987, *Caluff 2342*. — Santiago De Cuba: SE side of Loma del Gato, Sierra del Cobre, in rainforest, 800 m, 31.8.1985, *Caluff 1564*.

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— 1989: Ferns of Puerto Rico and the Virgin Islands. – Mem. New York Bot. Gard. **53.**

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