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Novelties in *Thelypteris* subg. *Goniopteris* (*Thelypteridaceae*, *Pteridophyta*) in Cuba**Abstract**

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Four new species and one new subspecies are described from Cuba: *Thelypteris minutissima*, *T. crassipila*, *T. jarucoensis*, *T. leonina* and *T. sclerophylla* subsp. *latifolia*. New records for Cuba are *T. abrupta*, *T. alata* and *T. alata* var. *subpinnata*, the latter name being a new combination validated here.

***Thelypteris minutissima* Caluff & C. Sánchez, sp. nova**

Holotype: E Cuba, Prov. Guantánamo, “Yunque de Baracoa”, 400-500 m, 22.1.2002, Sánchez & al. PFC 79469 (HAJB; isotypes: B, BSC) – Fig. 1.

Rhizoma breviter repens, 5-10 mm longum, 1.5-2 mm crassum, paleis deltato-acuminatis vel deltato-lanceolatis, 0.7-1 mm longis, 0.2-0.4 mm latis obsitum. *Folia* monomorpha, ad 7 cm longa; petiolus 10-23 mm longus, 2-3 mm crassus; lamina pinnata, 3-5 cm longa, 1.3-1.5 cm lata; pinnae 6-10-jugae, ovatae vel ovato-oblongae, maximae ad 8 mm longae et 4-5 mm latae; nervi liberi, in quaque pinna (2-)3(-4)-jugi; petiolus cum rhachide et lamina pilis 0.7-1 mm longis simplicibus pluricellularibus translucidis abunde pubescens, pilis bifurcatis et stellatis sparsim intermixtis. *Sori* exindusiati; sporangia glabra.

Rhizome short-creeping, 5-10 mm long and 1.5-2 mm in diameter; *scales* basifixed, deltate-attenuate to deltate-lanceolate, 0.7-1 × 0.2-0.4 mm, reddish brown, lustrous, apex gradually attenuate, base truncate, entire, with scattered stellate trichomes 0.1-0.2 mm long. *Leaves* monomorphic, 8-16 per plant, fasciculate, erect-arched, up to 7 cm long; *petiole* 10-23 mm long and 0.2-0.3 mm thick, reddish brown, densely covered with simple, pluricellular, semitranslucent, erect 0.7-1 mm long trichomes and very sporadic, much smaller, forked and stellate ones, also with numerous yellowish red, shortly stipitate glands, and, at the base, with scales similar to those of the rhizome, almost hidden in the dense pubescence; *blade* deltate-attenuate to deltate-lanceolate, 1-pinnate, 3-5 × 1.3-1.5 cm, apex very shortly pinnatifid, non-proliferous, with an apical lobe

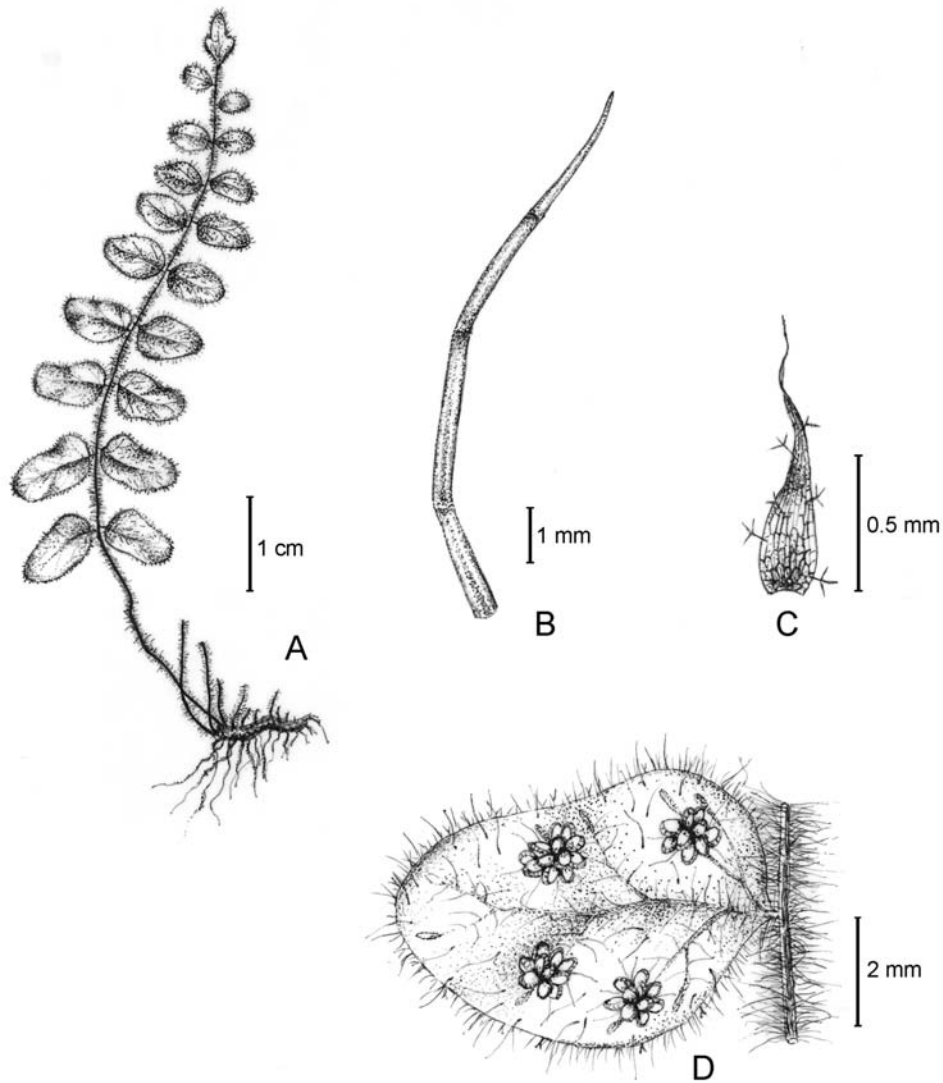


Fig. 1. *Thelypteris minutissima* – A: habit; B: rhachis trichome; C: rhizome scale; D: pinna showing indumentum, venation and sori. – After the isotype at BSC.

and other lateral, or two unequal basal ones, thin-textured, beset in all its parts, on either side, with a pubescence similar to those of the petiole; *rhachis* similar to the petiole in colour; *pinnae* in 6-10 pairs, spaced, ovate to ovate-oblong, the largest 6-8 × 4-5 mm, patent, petiolulate up to 0.5 mm long, distal ones alternate, proximal ones subopposite to opposite, apex and base rounded, the margin with some forked and stellate trichomes and reddish, stipitate glands in addition to the abundant long trichomes; *side veins* (2-)3(-4) per pinna, all free, the basal pair forked, the distal ones generally simple, ending in an elongate, dark hydatode, 0.5-0.7 mm from the margin. *Sori* proximal to medial, spaced, 1-3(-4) per pinna; *indusia* absent; *sporangia* normal, glabrous; *spores* well formed.

Etymology. – Named for its diminutive size.

Distribution and habitat. – Known only by the type gathering, from “Yunque de Baracoa”, prov. Guantánamo, Eastern Cuba. Growing on calcareous, humid cliffs in “mogote” vegetation. Very rare, but perhaps overlooked due to its tiny size.

Similar taxa. – By the combination of morphological characters and its small size, this species is unique among the representatives of *Thelypteris* subg. *Goniopteris* in Cuba, and probably anywhere. At first sight the plant might be mistaken for a juvenile or depauperate individual of *T. reptans* (J. F. Gmel.) C. Chr. Macroscopically, it differs in its non-proliferous leaves, each with a short pinnatifid apex; microscopically, it differs in its free venation, the non-indusiate sori and the dense indumentum of simple pluricellular trichomes on all its parts and of stellate trichomes restricted to the scales, petioles and pinna margin. With *T. cordata* (Fée) Proctor, *T. minutissima* shares the pinnate blade with a short-pinnatifid apex, the pinnae outline and the short petiolules, but differs by its very reduced size, indumentum (basically of stellate trichomes in *T. cordata*), thin blade texture (spongy and with sunken sori in *T. cordata*), presence of stipitate glands and absence of indusia. *T. pellita* (Willd.) Proctor & Lourteig also lacks indusia and bears long, pluricellular, semitranslucent trichomes, but the latter are restricted to the petiole, rhachis, costae and abaxial side of the veins, whereas the laminar tissue is stellate-puberulous on either side; also *T. pellita* is larger than *T. minutissima*, has a pinnate-pinnatifid (rather than pinnate) blade, lacks stipitate glands, and its sporangia are setulose. *T. minutissima* at first sight is very similar to *T. abdita* Proctor of Puerto Rico. The main differences among these species are: in *T. abdita* the indumentum is of stellate to merely forked trichomes, whereas basically of simple pluricellular trichomes with very scarce stellate trichomes and numerous stipitate reddish glands in *T. minutissima*; the sori are indusiate in *T. abdita* but lack indusia in *T. minutissima*.

Species of *Thelypteris* subg. *Goniopteris* growing in the same area with *T. minutissima* are *T. cordata* (Fée) Proctor, *T. dissimulans* (Maxon & C. Chr. ex C. Chr.) C. F. Reed, *T. pellita* (Willd.) Proctor & Lourteig, *T. reptans* (J. F. Gmel.) C. V. Morton, *T. retroflexa* (L.) Proctor & Lourteig, *T. sagittata* (Sw.) Proctor, *T. obliterated* (Sw.) Proctor and *T. tetragona* (Sw.) Small.

***Thelypteris crassipila* Caluff & C. Sánchez, sp. nova**

Holotype: Central Cuba, Prov. Sancti Spiritus, “Alturas de Trinidad, Topes de Collantes, Cauburní river”, 600 m, 9.6.1984, *Caluff 841* (BSC; isotype: B) – Fig. 2.

Differt a *Thelypteride leptocladia* (Fée) Proctor foliis monomorphis, nervis lateralibus in quoque segmento 4-6-jugis, pilis stellatis albidis crassis ad 0.3 mm longis, soris indusiatis et sporangiis glabris.

Rhizome short-creeping, branched, up to 4 cm long and 1 cm thick; *scales* basifixed, deltate-attenuate to deltate-ovate, up to 10 × 3 mm, brown, lustrous, gradually narrowed apically, base truncate to cordiform, margin with widely spaced retrorse filaments, adaxially with abundant 2-5-radiate stellate trichomes less than 0.1 mm long. *Leaves* monomorphic, 6-9 per plant, fasciculate, erect-arched, up to 83 cm long; *petiole* 8-30 cm long and 1-3 mm thick, light brown, densely covered with 3-6-radiate stellate trichomes less than 0.1 mm long, and brown, appressed, deciduous, 2-7 cells wide linear scales up to 3 × 0.4 mm, beset with tiny stellate trichomes; *blade* ovate, 1-pinnate to 1-pinnate-pinnatifid, 32-50 × 12-22 cm, papery, narrowed toward the pinnatifid apex; in mature leaves the pinnatifid apical portion $\frac{1}{3}$ of its total length, the base truncate and with 2-3 somewhat reduced pinnae, in juvenile leaves the pinnatifid apical portion $\frac{2}{3}$ or more of its total length, the basal 3-5 pairs of pinnae gradually decrescent, the lowermost reduced up to 1 cm long; *rhachis* similar to the petiole in colour and indumentum, also with some stellate, robust and whitish trichomes, scales much smaller; *free pinnae* in 6-11 alternate pairs, spaced 0.5-2.5 cm between, linear-oblong to linear-lanceolate, 4-12.5 × 0.8-1.8 cm, ascending, subfalcate, sessile, apex acute, base truncate, the basal ones patent, opposite; *costae* on either side with robust, whitish stellate trichomes of variable size, up to 0.3 mm long; *segments*

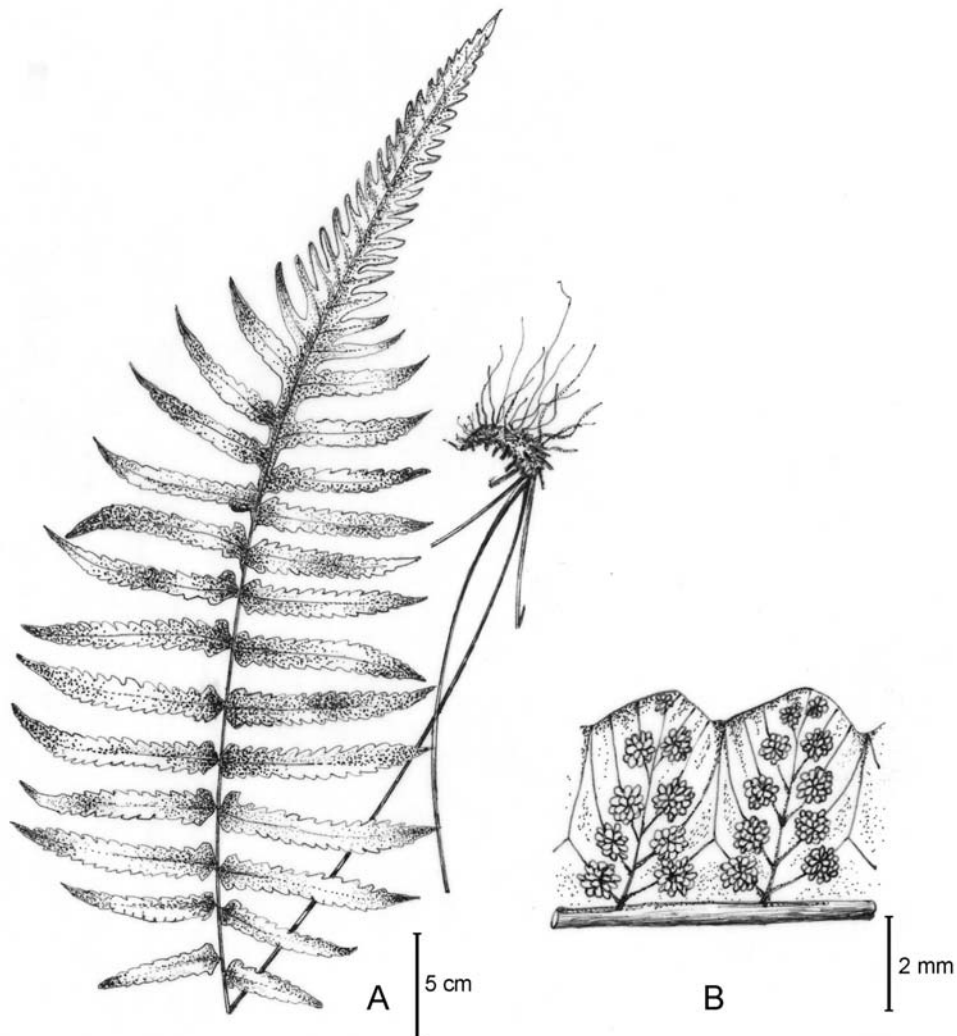


Fig. 2. *Thelypteris crassipila* – A: habit; B: pinna lobes, showing venation and sori. – After the holotype.

in 19-23 pairs, rounded, slightly ascending, 4-5 mm wide, obtuse to subacute, cut to 5 mm from the costa; *midvein* and *lateral veins*, on either side, with spreading stellate trichomes; *lateral veins* 4-6 pairs per segment, slightly raised, oblique, arched, simple, the 1(-2) proximal pairs in adjacent segments united and sending an excurrent veinlet to the sinus, forming a row of costal areoli, the next pair occasionally confluent to the sinus, forming 2 secondary areoli; *blade tissue*, on either side, nearly glabrous or with very few stellate trichomes, eglandular. *Sori* proximal, round, in 4-6 pairs, occupying the whole segment; *indusium* round-reniform, brown, pubescent and ciliate with short, persistent, stellate trichomes, protruding in the centre above the sporangia when dry; *sporangia* normal, glabrous; *spores* well formed.

Etymology. – Named for the robust, whitish trichomes on the abaxial face of the blade.

Distribution and habitat. – Restricted to the Alturas de Trinidad and Alturas de Sancti Spiritus, Central Cuba. Growing in gallery forest, on calcareous, humid, shaded cliffs, at 400-600 m. Infrequent.

Other specimens seen. – CENTRAL CUBA: PROV. SANCTI SPIRITUS: Alturas de Trinidad, Topes de Collantes, headwater of Caburní river, 600 m, 27.4.1985, *Caluff 1362* (BSC); id., Caburní river, 9.6.1984, *Caluff & Díaz 810* (HAJB); Alturas de Sancti Spiritus, El Naranjal Protected Area, La Sabina, Pedregal del Cafetal de Boletto, 400-500 m, 5.12.1994, *Caluff & Shelton 3989* (BSC); Sierra de Banao, S flank of Sierra del Caballete, 7.8.1916, *León 6491* (HAC).

Similar taxa. – Among the Cuban species of *Thelypteris* subg. *Goniopteris*, *T. crassipila* resembles *T. leptocladia* (Fée) Proctor in its non-proliferous, ovate to ovate-oblong blade largely narrowed into a pinnatifid apex. *T. leptocladia* has an erect habit, dimorphic leaves, simple, acicular trichomes, in addition to the stellate ones, on the costae and veins, up to 10 pairs of veins per lobe, sori without indusia and setulose sporangia; also, it is a terricolous species on rocky soils, growing in partially sunny places, rather than on calcareous, shaded cliffs.

Species of *Thelypteris* subg. *Goniopteris* growing together with *T. crassipila* are *T. alata* (L.) C. F. Reed var. *alata*, *T. leonina* Maxon ex Caluff & C. Sánchez, *T. reptans* (J. F. Gmel) C. V. Morton, *T. retroflexa* (L.) Proctor & Lourteig, *T. sclerophylla* (Poepp. ex Spreng.) C. V. Morton subsp. *sclerophylla*, *T. sclerophylla* subsp. *latifolia* Caluff & C. Sánchez, *T. obliterated* (Sw.) Proctor and *T. tetragona* (Sw.) Small.

***Thelypteris jarucoensis* Maxon ex Caluff & C. Sánchez, sp. nova**

Holotype: W Cuba, Prov. Habana, “Alturas de Jaruco, headwaters of Jaruco river, some 2 km from the camping house”, 250 m, 29.3.1996, *Caluff & Sánchez 4307* (BSC) – Fig. 3.

Rhizoma breviter repens vel ascendens. *Folia* subdimorpha, fasciculata, sterilia arcuata, ad 71 cm longa, fertilia erecto-arcuata, ad 70 cm longa; lamina lanceolata, infra pinnato-pinnatifida, in tertia vel media parte superiore pinnatifida, 21-47 cm longa, (3-)6-11 cm lata; pinnae liberae 9-15-jugae, breviter acuminatae, subacutae vel acutae, basi dilatatae, inter nervos glabrescentes vel utrinque pilis stellatis minutis, tenuibus pubescentes, inferiores minores, ad 0.5 cm longae, deltatae vel sagittatae, petiolulo 1 mm longo suffultae; costa pubescens, subtus pilis stellatis robustis, albidis, ad 0.7 mm longis abunde tecta, supra pilis stellatis sparsis minoribus obsita; nervi in quoque lobulo 4-5-jugi. *Indusia* rotundato-reniformia, brunnea, pilis stellatis brevibus pubescentia et ciliata. *Sporangia* glabra.

Rhizome short-creeping to erect, up to 6 cm long and 1 cm thick; *scales* basifixed, deltate-attenuate to deltate-lanceolate, up to 10 × 2 mm, brown, lustrous, gradually narrowed toward apex, base truncate, ciliate with stellate trichomes and widely spaced, usually retrorse filaments with catenular cells, adaxially pubescent with 4-6-radiate stellate trichomes less than 0.1 mm long. *Leaves* subdimorphic, 6-25 per plant, fasciculate, the sterile ones arched, up to 51 cm long, the fertile ones erect-arched, up to 70 cm long; *petiole* (4-)10-27 cm long and 1-2 mm thick, light brown, densely covered with uniform, 5-6-radiate stellate trichomes 0.1 mm long and scales similar to those of the rhizome but smaller; *blade* lanceolate to narrowly ovate, their distal 1/3 or 1/2 pinnatifid, the proximal portion 1-pinnate to 1-pinnate-pinnatifid, 21-47 × (3-)6-11 cm, papery, gradually narrowed toward apex and base; *rhachis* similar to the petiole in colour and indumentum, with small, linear, appressed, sparse scales 2-5 cells wide; *free pinnae* in 9-15 pairs, oblong-lanceolate from an enlarged base, 2-6.3 × 0.5-1.5 cm, patent or slightly ascending, subfalcate, adnate to sessile, opposite to subopposite, rarely alternate, shortly acuminate, apex subacute to acute, base auriculate on either side, crenate to segmentate; basal pinnae markedly decrescent, the lowermost up to 0.5 cm long, deltate, nearly sagittate, petiolulate up to 1 mm long; *costae* abaxially with abundant robust, whitish, 4-6-radiate stellate trichomes of variable size, up to 0.7 mm long, adaxially with scattered, short-stellate trichomes and tiny linear, appressed scales; *segments* in 14-18 pairs, slightly ascending, 2-3 mm wide, apex obtuse to acute, cut to 2-4 mm from the

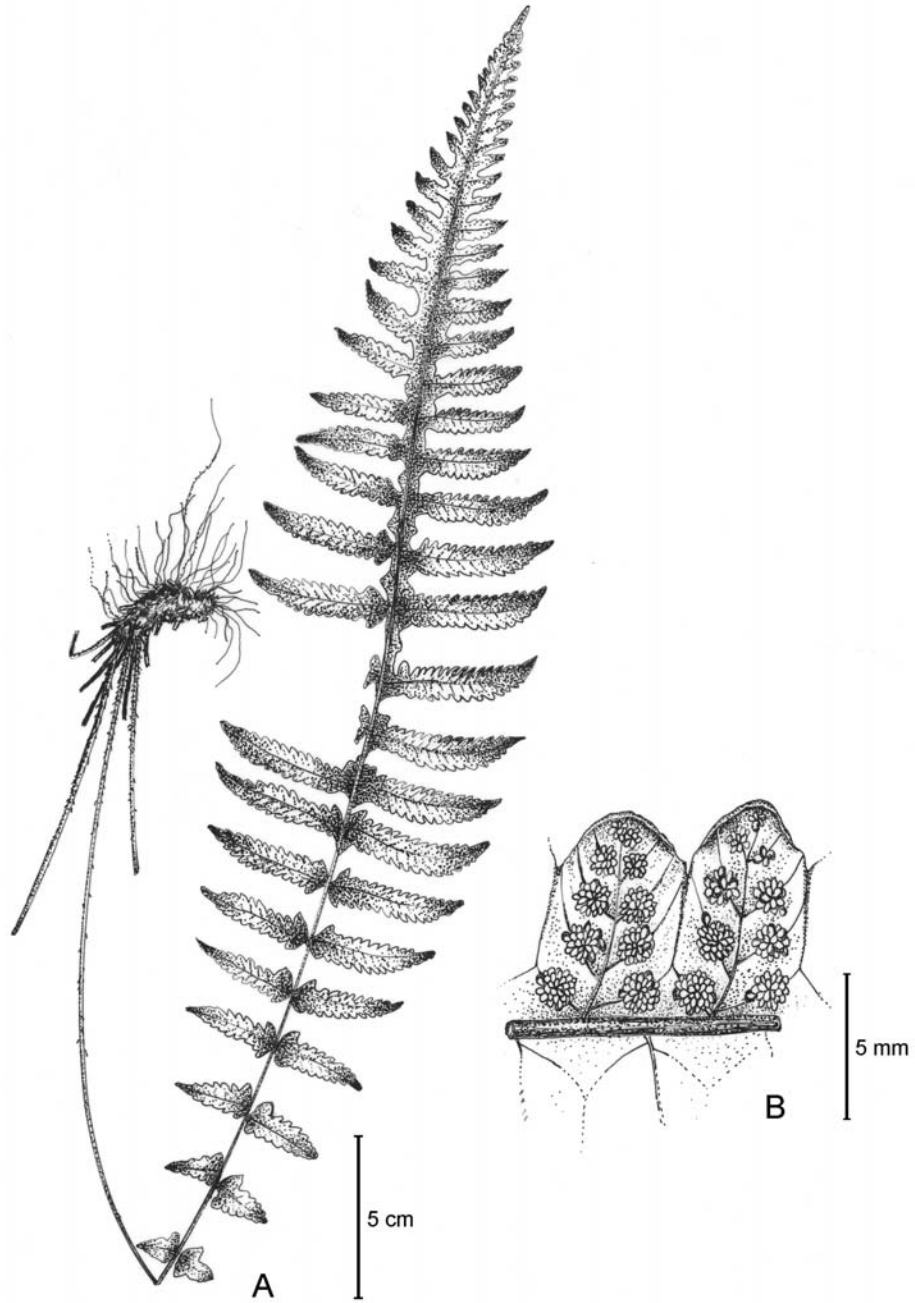


Fig. 3. *Thelypteris jarucoensis* – A: habit; B: pinna segments, showing venation and sori. – After the holotype.

costa, ciliate with distant stellate and simple trichomes, more abundant along the sinus; midvein with scattered stellate trichomes abaxially, glabrous adaxially or with occasional deciduous stellate trichomes; *lateral veins* 4-5 pairs per segment, slightly raised, oblique, arched, simple, the proximal pair in adjacent segments united and forming an excurrent veinlet running to the sinus, forming a row of costal areoli, the next following pair occasionally confluent at the sinus, forming 2 secondary areoli; abaxially with delicate, scattered stellate trichomes, adaxially glabrous; *blade* tissue on either side with scattered, small, delicate stellate trichomes, or glabrous. *Sori* inframedial, round, in 4-5 pairs occupying the whole segment; *indusia* rounded-reniform, brown, pubescent and ciliate with short, stellate, generally persistent trichomes, protruding in the centre above the sporangia when dry; *sporangia* normal, glabrous; *spores* well formed.

Etymology. – Named for the locality where the plant was first identified as new.

Distribution and habitat. – Restricted to W Cuba, Prov. Pinar del Río and La Habana (Alturas de Jaruco and Alturas de Tapaste). Growing in gallery forest and “mogote” vegetation, on cliffs or calcareous rocky banks with abundant semidecayed humus, in humid, partially sunny places. Locally frequent.

Other specimens seen. – W CUBA: PROV. PINAR DEL RÍO: Sierra del Rosario, El Salto de Soroa, 200 m, 24.1.1985, *Caluff 913* (BSC); Candelaria, Soroa, Arroyo Manantiales, 300 m, 25.10.1997, *Caluff & Shelton 4647* (BSC); Viñales, banks of Ancón river, 100 m, 15.3.2003, *Caluff & Shelton 4708* (BSC); Cerro de Guane, 15.9.1990, *M. Luis & al.* (BSC, HAJB). — PROV. HABANA: Alturas de Jaruco, c. 2 km from the camping house, 250 m, 1.7.2003, *Caluff & Sánchez 4774 A, B* (BSC); *ibid.*, 10.4.1996, *Sánchez & Caluff 72614, 72643, 72647, 72650* (HAJB); *ibid.*, 29.3.1996, *Caluff & Sánchez 4297* (B); surroundings of La Habana, 14.2.1912, *León 3502* (HAC); near Mendoza, Lomas de Tapaste, 25.3.1913, *coll. ignot.* (HAC).

Similar taxa. – *Thelypteris jarucoensis* has no close affinity with any other Cuban species of *T.* subg. *Goniopteris* with lanceolate or narrowly ovate blade. From *T. dissimulans* (Maxon & C. Chr. ex C. Chr.) C. F. Reed and *T. sagittata* (Sw.) Proctor it differs mainly in its much larger size and in having proximal pinnae occasionally subsagittate, with the auricles blunt, whereas proximal pinnae are acutely sagittate in *T. sagittata* and *T. dissimulans*. *T. scolopendrioides* (L.) Proctor and *T. guadalupensis* (Wikstr.) Proctor differ from *T. jarucoensis* mainly in their less divided blade, being pinnatifid throughout in the first, and for the most part, with but 1-4 pairs of free pinnae in the second one (*T. jarucoensis* has 9-15 pairs of free pinnae). From *T. sclerophylla* (Poepp. ex Spreng.) C. V. Morton, *T. jarucoensis* differs in the pinnatifid blade apex, which is less than 12 cm long in *T. sclerophylla* but 12-20 cm long in *T. jarucoensis*; they differ, also, in the abaxial indumentum of uniform stellate trichomes, less than 0.2 mm in *T. sclerophylla*, and of stellate trichomes of variable size, up to 0.7 mm long in *T. jarucoensis*. Finally rhachis and costae of *T. jarucoensis* have tiny linear, reddish, appressed scales, which are absent in *T. sclerophylla*.

Species of *Thelypteris* subg. *Goniopteris* growing in the same area with *T. jarucoensis* are *T. guadalupensis* (Wikstr.) Proctor, *T. leptocladia* (Fée) Proctor, *T. pellita* ((Willd.) Proctor & Lourteig, *T. reptans* (J. F. Gmel.) C. V. Morton, *T. sclerophylla* (Poepp. ex Spreng.) C. V. Morton subsp. *sclerophylla* and *T. tetragona* (Sw.) Small.

***Thelypteris leonina* Maxon ex Caluff & C. Sánchez, sp. nova**

Holotype: Central Cuba, Prov. Sancti Spiritus, “Alturas de Sancti Spiritus, El Naranjal Protected Area, La Sabina, Pedregal del Cafetal de Boletó”, 400-500 m, 5.12.1994, *Caluff & Shelton 3994-A/B* (BSC) – Fig. 4.

Rhizoma breviter repens, ad 15 cm longum, 1.5 cm crassum; squamae pilis stellatis densis et pilis simplicibus sparsis vestitae. *Folia* monomorpha, ad 105 cm longa; petiolus 36-60 cm longus; lamina ovato-acuminata, pinnato-pinnatifida, 33-54 cm longa, 25-40 cm lata, chartacea, apicem versus abrupte angustata et pinnatifida, basi truncata; pinnae 13-15-jugae; costa cum nervo

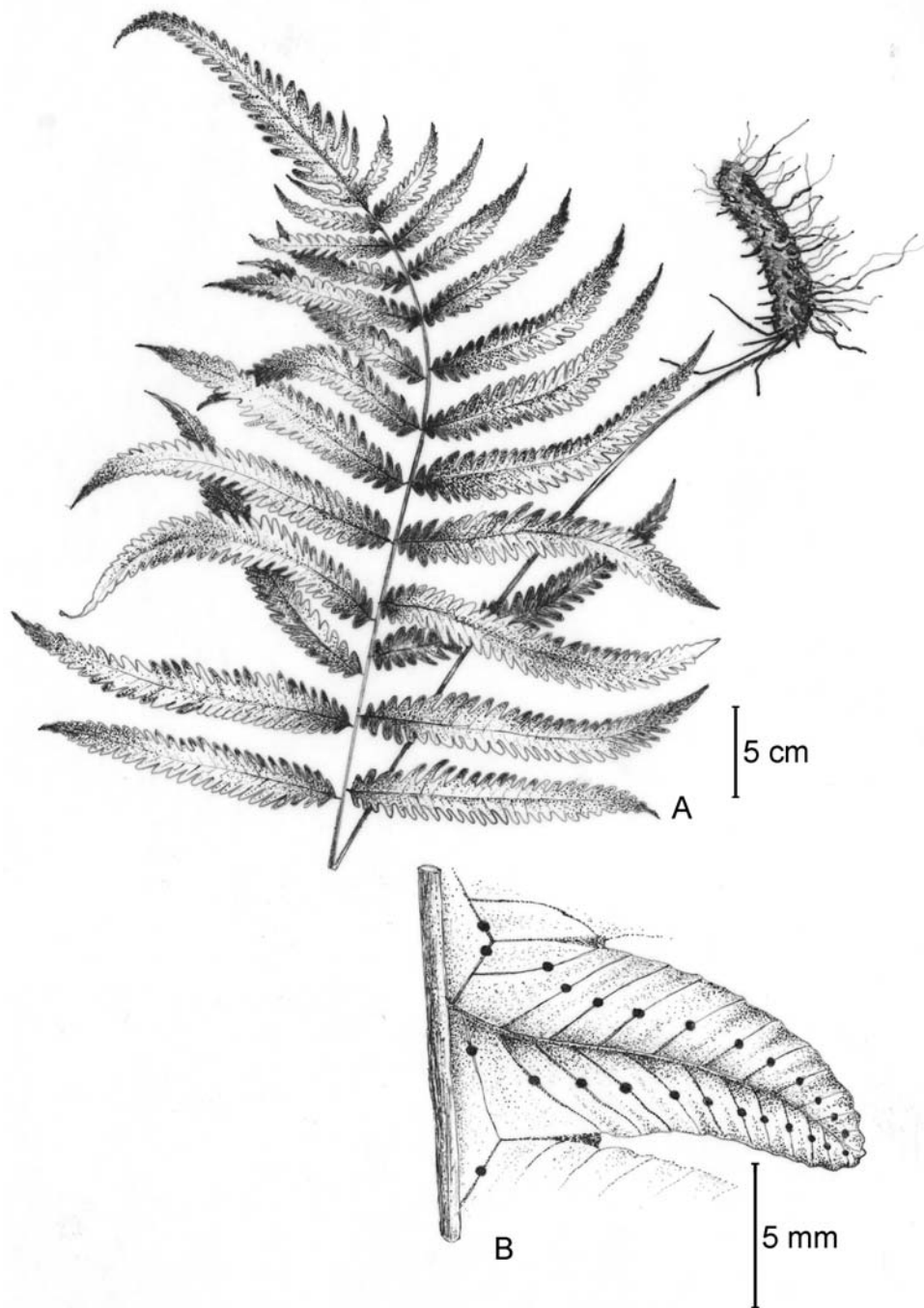


Fig. 4. *Thelypteris leonina* – A: habit; B: pinna segments, showing venation and position of the sori (sporangia removed). – After the holotype.

medio lateralibusque subtus pilis stellatis minutis vestita, supra pilis stellatis et in parte distali insuper pilis simplicibus acicularibus obsita; nervi in quoque lobulo 11-15-jugi. *Indusia* rotundato-reniformia, pilis stellatis minutis pubescentia et ciliata.

Rhizome short-creeping, up to 15 cm long and 1.5 cm thick; *scales* basifixed, linear-lanceolate, up to 17 × 2.5 mm, brown, lustrous, subclathrate, gradually narrowed apically, base truncate to cordate, ciliate with stellate trichomes and spaced retrorse filaments, adaxially with abundant 2-4-radiate stellate trichomes less than 0.1 mm long and sparse simple trichomes. *Leaves* monomorphic, 11-16 per plant, fasciculate, erect-arched, up to 105 cm long; *petiole* 36-60 cm long and 3-5 mm thick, light brown, densely beset with 2-4-radiate stellate trichomes less than 0.1 mm long and brown, appressed, linear, deciduous scales up to 2 × 0.2 mm, 2-4 cells wide, the margin with scarce filaments, pubescent and ciliate with tiny stellate trichomes; *blade* ovate, 1-pinnate-pinnatifid, 33-54 × 25-40 cm, papery, abruptly narrowed into a pinnatifid, shortly acuminate apex, base truncate; *rhachis* similar to the petiole in colour and indumentum; *pinnae* in 13-15 alternate pairs spaced by 3-5 cm, oblong-attenuate to oblong-lanceolate, 12-21 × 2-3.7 cm, patent or slightly ascending, straight to subfalcate, 1-5 mm petiolulate, shortly acuminate, base truncate, the proximal pinnae subopposed, base narrowed; *costae*, *midvein* and *lateral veins* abaxially with tiny stellate trichomes; *costae* and *midvein*, in addition, with small, appressed scales similar to those of the rhachis; adaxially with stellate trichomes, occasional simple, erect, 0.1 mm long trichomes toward the veins apex, scales similar to those of the abaxial face, and abundant stipitate whitish glands; *segments* in 18-25 pairs, deltate to oblong, ascending, subfalcate, 4-7 mm wide, apex rounded to truncate, sometimes subacute, margin very slightly crenulate toward the apex, ciliate with simple and stellate trichomes, cut to 4-8 mm from the costa; *lateral veins* in 11-15 pairs per segment, oblique, arched, slightly raised, simple or distally forked, the basal pair in adjacent segments united below the sinus and producing an excurrent veinlet gradually thickened and cartilaginous toward the sinus and there forming a prominence, rarely the next 1-2 veins confluent to the sinus; *blade tissue* on either side with stellate trichomes and whitish, stipitate, spreading glands. *Sori* proximal to medial, round, in 11-15 pairs, occupying the whole segment and almost confluent at maturity; *indusia* round-reniform, light brown, pubescent and ciliate with short, persistent, stellate trichomes, protruding in the centre when dry; *sporangia* normal, glabrous; *spores* well formed.

Etymology. – W. R. Maxon intended to dedicate this new species to Brother León, eminent Cuban botanist, but never published it.

Distribution and habitat. – Restricted to Central Cuba, provinces Sancti Spiritus (Alturas de Sancti Spiritus and Alturas de Trinidad) and Cienfuegos (Sierra de San Juan). Growing in montane rainforest, evergreen forest, gallery forest and secondary vegetation (abandoned coffee plantations and sideways), on carbonated humiferous soil, rocky soil with semi-decayed humus, under trees, in filtered sunlight, at 300-1100 m. Infrequent.

Other specimens seen. – CENTRAL CUBA: PROV. SANCTI SPIRITUS: Alturas de Trinidad, Escambray, Cudina, headwaters of Cañas river, 600 m, 17.1.1986, *Caluff 1982* (BSC); Alturas de Sancti Spiritus, Caja de Agua rivulet, 400-500 m, 12.4.1994, *Caluff & Shelton 3581, 3583* (BSC); *ibid.*, El Naranjal Protected Area, ascent from Hoyo del Naranjal to Loma Gavilanes, Vereda del Tibicial, 300-600 m, 2.12.1994, *Caluff & Shelton 3895, 3899* (BSC); *ibid.*, El Naranjal Protected Area, way from Hoyo del Naranjal to La Sabina, Loma de Pepe, 400-500 m, 3.12.1994, *Caluff & Shelton 3928 A/B* (BSC); *ibid.*, El Naranjal Protected Area, La Sabrina Pedregal del Cafetal de Boleto, 400-500 m, 5.12.1994, *Caluff & Shelton 3961, 3964, 3986-A/C, 3994-A/B* (BSC), 3966 (B, BSC); *ibid.*, El Naranjal Protected Area, old route between La Sabina and Jarico, 350 m, 6.12.1994, *Caluff & Shelton 3998* (BSC). – PROV. CIENFUEGOS: Pico San Juan, 1000-1100 m, 14.1.1986, *Caluff 1915* (BSC); Sierra del Escambray, Cumanayagua, on the route between Cien Rosas and Pico El Tuerto, 8.11.1997, *Gutiérrez & al. 63091* (HAJB, 4 sheets).

Similar taxa. – Among the Cuban *Thelypteris* subg. *Goniopteris*, *T. leonina* is near to *T. nephrodioides* (Klotzsch) Proctor in size and habitat, but differs in the apex of the blade (largely pin-

natifid in *T. nephrodioides*, shortly pinnatifid in *T. leonina*) and fewer pinnae (14-22 pairs in *T. nephrodioides*, 13-15 pairs in *T. leonina*). The costae and veins of *T. nephrodioides* adaxially have numerous simple, acicular, incurved trichomes 0.7 mm long, in addition to the stellate ones; also, the stellate trichomes of the adaxial blade tissue are sessile; in *T. leonina* costae and veins have few erect, acicular trichomes, less than 0.1 mm long in addition to the stellate ones, confined near the margin; also the stellate trichomes of adaxial blade tissue are stipitate. With *T. sclerophylla* (Poepp. ex Spreng.) C. V. Morton the new species shares the whitish stipitate glands on either side of the blade surface. Large individuals of *T. sclerophylla* subsp. *latifolia* differ from *T. leonina* in the gradually narrowed blade apex, in the lower number of veins (5-10 pairs per segment), as well as in the predominant simple and forked, long, erect trichomes in the rhizome apex scales. In *T. leonina* the blade apex is abruptly narrowed, the segment have 10-15 pairs of veins, and the rhizome scales have a pubescence basically of stellate trichomes and very few short, simple trichomes.

Species of *Thelypteris* subg. *Goniopteris* growing together with *T. leonina* are *T. crassipila* Caluff & C. Sánchez, *T. nephrodioides* (Klotzsch) Proctor (very rare), *T. pellita* (Willd.) Proctor & Lourteig, *T. reptans* (J. F. Gmel.) C. V. Morton, *T. retroflexa* (L.) Proctor & Lourteig, *T. sclerophylla* (Poepp. ex Spreng.) C. V. Morton subsp. *sclerophylla*, *T. sclerophylla* subsp. *latifolia* Caluff & C. Sánchez, *T. scolopendrioides* (L.) Proctor, *T. oblitterata* (Sw.) Proctor and *T. tetragona* (Sw.) Small.

Thelypteris sclerophylla* subsp. *latifolia* Caluff & C. Sánchez, **subsp. nova*

Holotype: Central Cuba, Prov. Sancti Spiritus, "Alturas de Sancti Spiritus, El Naranjal Protected Area, La Sabina, Pedregal del Cafetal de Boletó", 400-500 m, 5.12.1994, Caluff & Shelton 3985 A/B (BSC) – Fig. 5.

Differt a *Thelypteride sclerophylla* subsp. *sclerophylla* lamina 16-22 cm lata, late lanceolata vel late ovata, pinnato-pinnatisecta vel bipinnato-pinnatifida, pinnis basin versus vix decrescentibus, infimis (3-)6-9 cm longis, basi truncatis.

Rhizome ascending to decumbent, up to 7 cm long and 1.5 cm thick; *scales* basifixed, linear-lanceolate, up to 9 × 1 mm, reddish brown, lustrous, gradually attenuate apically, base truncate, entire, ciliate and pubescent with simple and forked, rigidly erect, conspicuous trichomes 0.2-0.3 mm long. *Leaves* subdimorphic, 6-10 per plant, fasciculate, erect-arched, up to 80 cm long; *petiole* up to 24-30 cm long and 3-4 mm thick, light brown, densely covered with uniform stellate trichomes less than 0.1 mm long; *blade* broadly lanceolate, broadly ovate to ovate-oblong, 1-pinnate-pinnatisect to 2-pinnate-pinnatifid in the largest pinnae, 33-51 × 16-22 cm, papery, gradually attenuate toward the short pinnatifid apex, base slightly attenuate and truncate; *rhachis* similar to the petiole in colour and indumentum; *free pinnae* in 15-18 alternate or rarely opposite pairs, deltate-attenuate to ovate-attenuate, inequilateral, the acroscopic side larger than the basiscopic one, up to 9-12 × 3-4 cm, patent or deflexed, straight to subfalcate, 1-3 mm petiolulate, shortly acuminate and subacute, base truncate, slightly narrowed or occasionally enlarged; proximal pinnae in 3-4 pairs, the lowermost (3-)6-9 cm long; *costae* and *veins* on either side with stellate trichomes less than 0.2 mm long and whitish stipitate glands; *pinnules* in 17-22 pairs, deltate-attenuate to ovate-oblong, ascending, the largest 15-24 × 4-8 mm, rounded, obtuse to acute, entire, crenulate to lobulate, margin slightly revolute; occasionally the largest pinnae with 1-2 free, sessile basal pinnules; segments of the pinnules deltate, up to 1.5 mm long and wide; *lateral veins* in 10-12 pairs, raised abaxially, pinnately branched, with 3-5 pairs of veinlets, the basal ones in adjacent segments united below the sinus producing an excurrent veinlet forming a row of costal areoli, the next following pair occasionally confluent to the sinus, forming 2 secondary areoli; *blade tissue*, on either side, with stellate trichomes and stipitate whitish glands. *Sori* supramedial to submarginal, round, generally confined to the distal lobe apex; *indusia* round-reniform, light brown, persistent, pubescent and ciliate with short, stellate trichomes, protruding in the centre above the sporangia when dry; *sporangia* normal, glabrous; *spores* well formed.

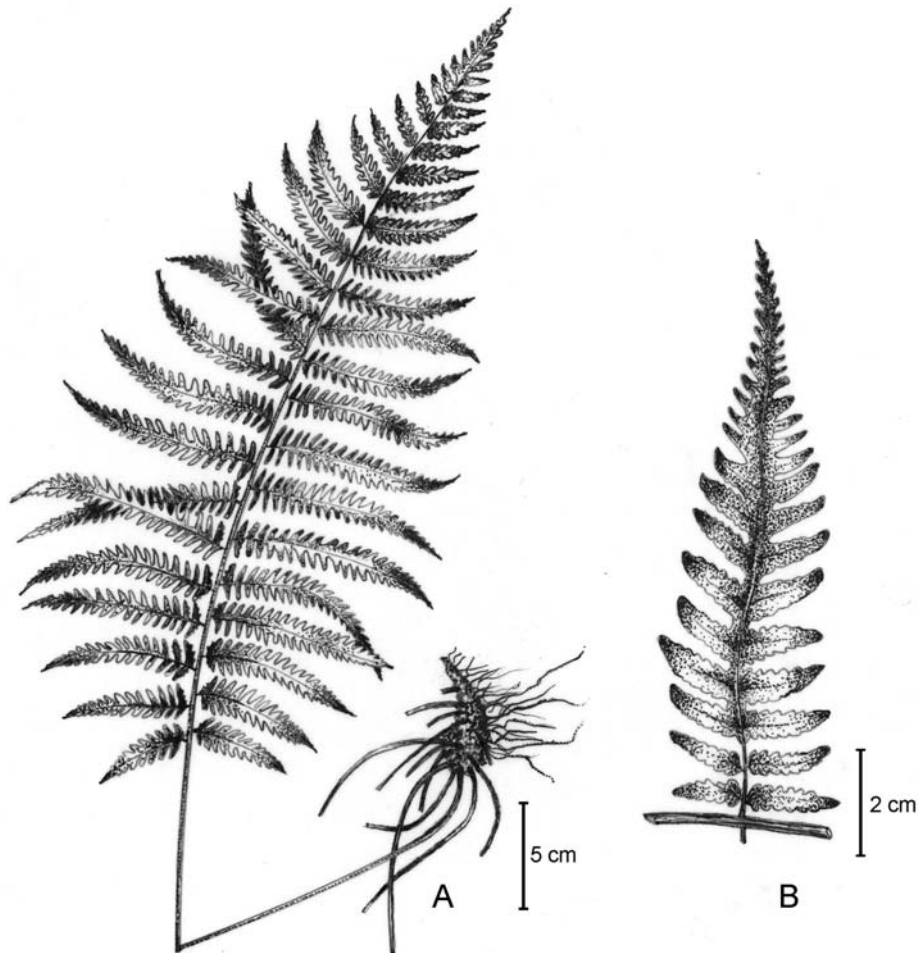


Fig. 5. *Thelypteris sclerophylla* subsp. *latifolia* – A: habit; B: pinna of the middle third. – After the holotype.

Etymology. – Named for its very broad leaf blade.

Distribution and habitat. – Only known from Central Cuba (provinces Sancti Spiritus and Cienfuegos) and E Cuba (Prov. Santiago de Cuba: Gran Piedra, a single collection). Growing in montane rainforest, gallery forest, evergreen forest, pine forest and “mogote” vegetation, on calcareous, rocky soils and cliffs as well as ferralitic mountain soils, at 150-1000 m. Frequent in Central Cuba.

Other specimens seen. – CENTRAL CUBA: PROV. SANCTI SPIRITUS: Alturas de Banao, ascent to Caja de Agua, 350 m, 15. & 18.5.1984, *Caluff 744* (BSC); Alturas de Trinidad, Topes de Collantes, Guira de Ponce, Vega Grande, 600 m, 7.6.1984, *Caluff 773* (BSC); *ibid.*, Topes de Collantes, Pico Potrerillo, 850 m, 26.3.1985, *Caluff 1168* (BSC); *ibid.*, Topes de Collantes, Cudina, headwaters of Jesús González river, 600 m, 26.4.1985, *Caluff 1348* (BSC); *ibid.*, Topes de Collantes, headwater of Caburní river, 600 m, 27.4.1985, *Caluff 1364* (BSC); Alturas de Sancti Spiritus, Caja de Agua glade, 400-500 m, 12.4.1994, *Caluff & Shelton 3584* (BSC); *ibid.*, ascent

to Tetas de Juana, larger hill, 500-800 m, 13.4.1994, *Caluff & Shelton 3610* (BSC); *ibid.*, Filos de Caja de Agua, Lomas del Manguito, 700 m, 15.4.1994, *Caluff & Shelton 3700* (BSC); *ibid.*, El Naranjal Protected Area, surroundings of La Sabina, 600 m, 17.4.1994, *Caluff & Shelton 3757, 3760* (BSC); *ibid.*, El Naranjal Protected Area, La Sabina, Pedregal del Cafetal de Boletó, 400-500 m, 5.12.1994, *Caluff & Shelton 3976* (B), *3980* (BSC); *ibid.*, ascent to Pico Tuerto, 600-650 m, 1.12.1994, *Caluff & Shelton 3876* (BSC); *ibid.*, Hoyo de Plátano, 550-600 m, 17.5.1995, *Caluff & Shelton 4145* (BSC); *ibid.*, Cayajaná river, 150-300 m, 24.5.1995, *Caluff & Shelton 4211* (BSC). – PROV. CIENFUEGOS: Alturas de Trinidad, Carso de Buenos Aires, Las Lagunas, 650 m, 3.6.1995, *Caluff & Shelton 4035, 4052* (BSC); *ibid.*, Mandulo, northern side of Pico San Juan, 800-1000 m, 3.6.1995, *Caluff & Shelton 4132* (BSC). — E CUBA: PROV. SANTIAGO DE CUBA: Gran Piedra, among La Idalia and La Gran Piedra, 850 m, 26.1.1984, *Caluff 617* (BSC).

Key to the subspecies of *Thelypteris sclerophylla*

1. Blade narrowly lanceolate to narrowly ovate, 1-pinnate-pinnatifid to 1-pinnate-pinnatipar-tite, 4.5-14 cm wide, 3-10 pairs of gradually reduced pinnae in the base, the lower ones 0.6-2 cm long subsp. *sclerophylla*
- Blade widely lanceolate to widely ovate, 1-pinnate-pinnatisect to 2-pinnate-pinnatifid, 16-22 cm wide, 3-4 pairs of slightly reduced pinnae in the base and finally truncate, the lower pinnae (3-)6-9 cm long subsp. *latifolia*

New records for Cuba

Thelypteris abrupta (Desv.) Proctor

Previously known from Jamaica, Hispaniola, the Lesser Antilles, Trinidad, Tobago and in South America from the Guianas to Brazil. Present in E Cuba, in the province of Guantánamo. The morphological characters of the Cuban plants match those described for the species, with buds or plantlets placed 5-6 cm below the pinnatifid leaf blade apex. In Cuba *T. abrupta* is very rare; it grows in “mogote” vegetation on stony, calcareous, humid soil, on and near cliffs.

Specimens seen. – E CUBA: PROV. GUANTÁNAMO: Limonar, La Mina de Monte Rus, 320 m, 15.8.1985, *Caluff 1538, 1539* (BSC); Limonar, Monte Rus, La Luisa Plateau, 350 m, 8.4.1995, *Caluff 4046* (BSC). – Cultivated in the Jardín de los Helechos of Santiago de Cuba, coming from Prov. Guantánamo, Monte Rus, 16.10.1996, *Caluff 4248* (BSC).

Thelypteris alata (L.) C. F. Reed var. *alata*

Known previously from Hispaniola. In the province of Guantánamo (Meseta del Guaso), the species forms large populations in the “mogote” vegetation, growing on humid calcareous cliffs and rarely on the rocky floor. In the province of Sancti Spiritus it is restricted to the very humid calcareous cliffs along the Caburní river. This species is locally abundant.

Specimens seen. – CENTRAL CUBA: PROV. SANCTI SPIRITUS: Alturas de Trinidad, Topes de Collantes, cascade of the Caburní river, 500-600 m, 28.3.1985, *Caluff 1271 A, B* (BSC). — E CUBA: PROV. GUANTÁNAMO: Guantánamo, Monte Rus, Mogotes at the bottom of La Luisa Plateau, 600 m, 20.8.1983, *Caluff 365* (BSC); *ibid.*, Yambeque, 500 m, 7. 4. 1995, *Caluff 3544, 3545, 3551, 3553, 3554* (BSC); road from Guantánamo to Sagua, Limonar, surroundings of the A.C.C. Scientific Centre, 500 m, 27. & 30.1.1994, *Caluff & Shelton 3531* (BSC).

Thelypteris alata var. *subpinnata* (C. Chr.) Caluff & C. Sánchez, **comb. & stat. novi** ≡ *Dryopteris alata* f. *subpinnata* C. Chr. in Kongl. Svenska Vetenskapsakad. Handl., ser. 3, 16(2): 30. 1937.

Previously known from Hispaniola. This variety was found in E Cuba, prov. Guantánamo (Mogotes de Yambeque, Meseta del Guaso), growing in “mogote” vegetation on calcareous, humid cliffs, together with var. *alata*. Locally frequent.

Specimens seen. – E CUBA: PROV. GUANTÁNAMO: Limonar, Monte Rus, Mogotes de Yambeque, 480 m, 16.8.1985, *Caluff 1649* (BSC); id., 500 m, 7.4.1995, *Caluff 3549* (BSC).

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