

PLANTAE MESOAMERICANAE NOVAE.VI.*

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Isoetes tuerckheimii Brause in Urban, was described from Hispaniola and so far is only known from that Caribbean locality. A collection from Guatemala (Keeley & Keeley 7525 & 7527, 24.5 km NW of Quetzaltenango, 2840 m) may well represent this species. The guatemalan specimens have no peripheral strands, stomates are confined to the tips of the leaves and megaspores are 455-470 μ m, with thick, elevated commissures and very low papillae, all surfaces finely covered by minute filiform processes. Microspores have not been seen by me. This plant differs from *I. mexicana* Underwood, which it superficially resembles, by the absence of peripheral bundles and the size of the megaspores. It may well represent an undescribed species of quillwort, worth of closer examination.

Lycopodium orizabae Underwood & Lloyd, described from Veracruz and known also from Chiapas, has been collected in Nicaragua where it is apparently confined to the Cerro La Pimienta's cloud and elfin forest, 900-1180 m, J.J.Pipoly 6077 & A. Grijalva 365, both at MO.

Selaginella tanyclada Alston ex Crabbe & Jermy, has been recently described from Departamento Chocó, Colombia, so its presence in Panama was to be expected. A collection from Campo Tres, 3 miles NE of Altos de Pacora, 500-800 m, by T. B. Croat 22735 (MO), corresponds to this taxon and was erroneously identified as *S. articulata* (Kze.) Spring, which it somewhat resembles but *S. tanyclada* is glabrous throughout.

Selaginella centipediformis sp. nov. Species heterophylla *S. bombycina* Spring affinis, sed foliis mediis acutis valde carinatis, margine anteriore denticulatis, inferiore glabris ad basim pauce ciliatis; foliis lateralibus glabris, minutissime denticulatis, dentibus apicibus mucronatis. Megaspores albae, 319-333.5 μ m, baculato-spinulosae.

Plant up to 30(35)cm tall. Stems glabrous, suberect from a short creeping base, 1.5-2 mm in diameter, always simple, stramineous, covered with homomorphic leaves only in the short, postrate portions, with uniform, heteromorphic leaves throughout the rest, the old leaves are persistent, drying a silvery off-white or very pale cinnamon; rhizophores ventral, restricted to lower third, wiry; foliose part simple, unbranched or with 1-2 short, oblique branch near the apex. Lateral leaves perpendicular to stem, flat, the vein reaching the apex, 9-10 mm long, 1.8-2 mm wide, uniformly oblong, upper base rounded, lower base subtruncate, both with 2-6 teeth, teeth 22-33 μ m long, teeth are mucronate, mucro 6-7 μ m long and not persistent, margins minutely and distantly denticulate, apex rounded-obtuse with 2-3 short teeth. Median leaves overlapping their bases but directed outwards and leaving the stem visible along the middle of the two rows, acute, carinate, unequally cordate, 4 mm long, 2 mm wide, upper base rounded, lower base convex, upper margin denticulate, lower margin denticulate only at

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the base and often near the apex. Strobili 1-1.5 cm long, 1.5-1.8 mm wide, single and perpendicular to stem, tetrastichous, mega and micro-spo-ophylls similar, 1.6-1.9 mm long, deltoid, strongly carinate, acuminate, margins denticulate. Megaspores 319-333.5 μ m, proximal faces with irregular bacilliform processes, these minutely spinulose.

Holotypus: La Fortuna hydroelectric project, in cloud forest along trail uphill behind camp; elev. 1200-1400 m. Terrestrial in forest. Province of Chiriqui, Panama, B. Hammett 2121 (MO).

Etymology: *centipediformis*= in the shape of a centipede, because of the appearance of the simple, uniform fronds.

The new species undoubtedly belongs in the group of *S. bombycina* and *S. tanyclada*. From the former it differs in the lack of cilia, in habit and altitudinal range; from the latter in its simple fronds, characters of the lateral and medial leaves, size and ornamentation of the megaspores.

Athyrium paramicola sp. nov. Herba rheophila parva, rhizomate erecto, compacto, proliferans, dense paleaceo, paleis integris, brunneis, membranosis, anguste deltoideis, clathratis, 8 mm longis, 1 mm latis, vestito; stipitibus fasciculatis, proximis, 8-15 cm longis, 1.5-2 mm crassis, paleis rhizomatis sed lanceolatis ad basim pauciter obtectis. Lamina lanceolata, membranosa, bipinnata, vix 20 cm longa, e parte media 10 cm lata, pinnae 13-15-jugis, 2-3 basalibus oppositis, deinde suboppositis, apicalibus alternis, pinnulae 5-9-jugis, acroscopicae longiores. Rachis laminarum glabra, obscure fractiflexa, costae glabrae, rectae, supra sulcatae, sulci marginibus hyalinis ad insertionem costarum dentis instructi. Indusium tenuiter membranaceum, hyalinum, laciniatum, laciniae tubulosae, 1-5-cellulatae.

Holotypus: Along creek in paramo of Cerro de la Muerte, 3200 m, Prov. San Jose, L.D. Gomez & R. Moran 18357 (CR). Isotypus: ILLS. Paratypes: MO, ILLS, R. Moran 2370, ILLS.

Etymology: *paramicola*= inhabiting the paramo. Of the group of *Athyrium filix-foemina* Roth, it resembles *A. asplenoides* (Michx.) Eaton in the characters of the indusium. The subflexuose rachis suggests affinity to *A. palmense* (Christ) Lellinger and its pink stipes and rachises and subopposite pinnae bring it close to *A. skinneri* (Baker) Diels but both *palmense* and *skinneri* have creeping, non-proliferous rhizomes and more divided fronds.

Grammitis bufonis sp. nov. Planta epiphyta, rhizomate repens, 3 mm crassum, paleis clathratis, angustissime lanceolatis, acuminatis, 3.5 mm longis, ferrugineis, dense vestito; stipitibus fasciculatis, numerosis, proximis, 4-8.5 cm longis, 1-1.5 mm crassis, glabris. Lamina integra, glabra, carnosula, plana sed in siccitate pauciter repanda, 15-19 (20) cm longa, 11-13 mm lata, marginata, margo fusce-nigrescens, apicem acuta, basim angustata longissime decurrens modo alae, basibus stipitibus attingens. Venae steriles simplices, 7-8 per cm, fertiles supra basim furcatae, venulae soriferae curtae sori 3-4 mm longi, elongati, costam obliqui.

Holotypus: Epiphyte. Cerro Sapo, up to 3600 ft (1085 m), Prov. de Darien, Panama, B. Hammel 1171 (MO). Paratypus: C. Sapo, Hammel 1180 (CR).

Closely related to *G. bryophyla* (Maxon) Seymour, but differs from it in the distant fronds, these of greater dimensions. With this combination of characters it is easily distinguished from the other known species of *Grammitastrum*. Etymology: *bufonis* = of the frog, C. Sapo.

Thelypteris (*Amauropelta*, *Apelta*) *pseudoaspidioides* sp. nov. Herba rheophila, rhizomate erecto, apicem paleis membranaceis, cinnamomeis, panduratis, subclathratis (cellulis anisodiametricis), sparse setosis (setae 1-cellulatae, rigidae), amplio-ellipticis pauciter oblecto; stipitibus fasciculatis, 5-12 cm longis, brunneo-nitentes, paleis rhizomatis basalibus. Lamina lanceolata, 4-6 cm lata, $\pm$ 25 cm longa, pinnata, pinnae 9-12-jugis inferiores petiolulatae ($\pm$ 0.5-1 mm), apicem pinnatisecta (9-10 seg. + segmentum apicali, caudatum); pinnae 2.3-2.8 (3) cm longae, 4-6 mm latae, integrae, oblongae, apices obtusae, basibus inaequalibus, superiore elongata, excavata, inferiore rotundata, reducta; venis 10-12-jugis, 1-furcatis, margines attingentes, marginibus membranosis (callosis), pauci pilosis. Sori exindusiati, parvi, elliptici, submarginali, sporangiis glabris. Sporae brunneae, (35) 42.95 $\times$ (24.8) 27.69 μ m.

Holotypus: Bajo La Hondura, Prov. San Jose, 1000-1200 m, L.D. Gomez 520 (CR). Paratypi: Rio Chitaria, Cartago, 565 m, R. Moran 2227 a & b, (ILLS); Rio Claro, La Hondura, 1000 m Burger & Stolze 4888 (F; CR).

The new species superficially resembles *T. aspidioides* (Willd) Tryon which, like all other species in sect. *Uncinella*, has uncinulate hairs totally lacking in our plant. Etymology: *pseudoaspidioides* = the false [*Thelypteris*] *aspidioides*.

Known also from Panama: Valle de Anton, 1000 m, H. Kennedy et al 3180 (MO, CR); headwaters of Rio Coleveborita above Sta. Fe, 500 m, Veraguas, Sytsma & Anderson 4757 (MO); 1 km E of Quebrada Amarillo in La Mesa, Cocle, 2600 ft, Sytsma & D'Arcy 3587 (MO, CR); La Fortuna, Chiriqui river, 1025 m, Chiriqui, Hammel 2291 (MO, CR).

Thelypteris (*Amauropelta*) *mombachensis* sp. nov. Herba rhizomate erecto, 2-3 cm crasso, paleaceum, paleis membranosis, fusco-ferrugineis, deltoideo-lanceolatis, sparse setosis, apicem vestito. Lamina 30-45 cm longa, vix 17 cm lata, pinnata, pinnis (13) 15-17-jugis basim abrupte reductis deflexisque; stipes avellaneus, 5-10 cm longus, paleis rhizomatis et pilis (0.1 mm) praesertim retroadpressis; rachis utroque simile pilosis; pinnae alternae, 7.5-12 cm longae, 1.7-2.8 cm latae, latitudine ca. 0.8 incisae (pinnulae 13-22, 4-5 mm latae), non falcata, apicem rotundato-obtusa; costae costulaeque utroque pilosae, pagina inter venas utrimque glabra, eglandulosa; venis 6-7-jugis, infimae margine supra sinus attingens; sori mediali, oblongi, exindusiati; sporangium glabrum.

Holotypus: Upper slopes of Volcan Mombacho, ca. 15 km S of Granada,

in cloud forest, 1100 m, Granada, Nicaragua, T. Croat 39122 (CR). *Isotypus*: Croat 39122, MO. *Paratypi*: summit of Mombacho, Atwood et al. 6726 (MO); Plan de las Flores, Mombacho, 1200 m, Atwood 294 (MO). Other materials: Atwood 298, A304a (MO, US).

Related to *Thelypteris linkiana* (Presl) Tryon, from which it differs by its basal veins reaching the margins above the sinus and the lack of hamate hairs, and to *T. atrovirens* (C.Ch.) Reed whose laminar surfaces are hamate pilose below and have numerous, adpressed hairs above.

Sciaphila (Sc., *Hermaphroditantha*) *paradoxa* sp. nov.

Plantae floribus femineis et etiam floribus hermaphroditis ferentes. Flores hermaphroditis: stamina 1-5(6), carpella numerosa; antheris bithecis; Polygynia subsectio nova pertinentes.

Herba mycorrhizophila, saprophyta, glaberrima, rubra (siccando purpureo-caerulea), radicibus filiformibus, strictis, glabris, jugis oppositis vel verticillatis. Caulis rigidus, simplex vel ramosus, strictus, 1-1.2 mm crassus, obscuriter angulatus, cum racemo 30-35 cm altus, pauce squamatus, squamis (bracteae) distantibus caules amplexantes, lanceolatis, acutis, concavulis ascendentibus, 4-5 mm longis, 1.5-2 mm latis, sursum in bracteae decrescentibus. Racemus erectus, 40-70-floratus; flores hermaphroditi etiam feminei; pedicellati (pedicellus arcuato-reflexus, 4.5-8 mm longus), bracteatus, bracteae lanceolatae 2-2.2 mm longae, 0.7-0.8 mm amplae, membranosae, apicem rotundato-incrassatae. Perianthum utriusque sexus plerumque 6-partitum, tepala aequalia, carnosa, deltoidea, 2-2.5 mm longa, 0.6-0.8 mm lata, intus minutissime papillata extus glabrata, apicem copiosissime barbata, pilis vermiformibus, 1-3-cellulatis, 0.9-1.2 mm longis, 12-15 μ m crassis. Flores hermaphroditi 1-6-andri; antherae sessiles, bithecae; grana laeves, 3-nucleata, $\pm 30 \mu$ m, quasi sphaerica, sulcoidata. Carpella numerosa, ± 20 . Flores feminei ovariis numerosis (± 20) instructi. Carpella obovata, papilloso-bullata, 0.8-1.2 mm alta; styli supra basim ovariorum inserti, clavati, picem versus pilosi, pilis 1-cellulatis, rigidulis; ovaria parum superantes. Carpella matura apice gibboso-cristata. Fructus indehiscens, fuscus, seminibus 1, oblongis, 1 mm longis, atrofuscis longitudinaliter prominenter costatis, transverse celluloso-reticulatis.

Holotypus: Inmediaciones de Laguna Bonilla, Provincia de Limon, 400-500 m; en bosque premontano muy humedo. L.D.Gomez & L. Glicenstein 18466, CR. *Paratypi*: MO, US, K, BM, F.

The closest relative of *S. paradoxa* is *S. picta* Miers, which belongs in subsection *Oligandra*. Unlike any other known species in the genus *S. paradoxa* has all-female flowers and peculiarly, a fluctuating number of stamens in the hermaphroditic flowers, its anthers resemble apothecia and some of them seem to be unithecate. This combination of characters would justify the erection of a new genus of *Triuridaceae* but in spite of the ample material at hand that shall await a better knowledge of the family in general.



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