

NEW SPECIES OF *PASSIFLORA* SUBGENUS *PASSIFLORA* FROM ECUADOR

L. B. HOLM-NIELSEN² AND J. E. LAWESSON³

ABSTRACT

Four new species of *Passiflora* from Ecuador are described, viz. *P. montana*, *P. palenquensis*, *P. deltoifolia*, and *P. pergrandis*.

A revision of Ecuadorean *Passiflora* subg. *Passiflora* (subg. *Granadilla* sensu Killip) for the *Flora of Ecuador* (Holm-Nielsen et al., in press) has revealed four new species: *P. montana*, *P. palenquensis*, *P. deltoifolia*, and *P. pergrandis*, belonging to "series" *Lobatae*, *Tiliaefoliae*, *Menispermifoliae*, and *Laurifoliae*, respectively. The total number of Ecuadorean subg. *Passiflora* species is 19. Killip (1938) divided the subgenus into 15 series; although these are not validly published, we are following Killip for convenience. The "series" occurring in Ecuador are *Digitatae*, *Incarinatae*, *Kermesianae*, *Simplicifoliae*, *Quadrangulares*, and those mentioned above.

Passiflora palenquensis Holm-Nielsen & Lawesson, sp. nov. TYPE: Ecuador. Los Rios: Quevedo—Sto. Domingo road, km 56, Río Palenque Science Center, 150–200 m, 6 Oct. 1979, C. H. Dodson, A. Gentry & G. Shupp 8854 (holotype, MO). Figure 1.

Liana ubiqua glabra. Caule striato et tereto. Stipulis oblongo-lanceolatis, acutis, 1×0.4 cm, interdum decideosis. Petiolis angulo-alatis, 6.5–9 cm longis cum 3–4 nigris, sessilibus urceolatiisque glandibus, par apice extremo, aliae glandes infra 2–3 cm; laminibus basifixis, late ovatis, ovatis, $14\text{--}19 \times 11\text{--}20$ cm, profunda cordatis, manifeste pinnatinervibus, nitentibus coriaceis, margine integra. Inflorescentia saltem 2 floribus; pedicellis teretis striatisque, 3–4 cm longis; bractee circa 5 mm infra florem portatae, verticillatae, connatae dimidium, oblongo-ovatae, mucronatae, 5×2 cm. Floribus 5–6 cm latis; hypanthium infundibulare, longo 3 cm, ad basin 1 cm lato, ad apicem 2 cm, lavandulo; lobi calycis oblongi, acuti, 2.5×1.3 cm, desinentes in minutam mucronem; petalis oblongis, obtusis, $3 \times 0.6\text{--}1$ cm. Corona simplice, filamentis composita in 2 seriebus ordinatis quae ad apicem extremam tubi calycis locatae sunt; series externa minute liguliformis, apex filiformis, 4 mm longa; serie interna

crassissima, 4-angulata, 2 cm longa, apex filiformis, fasciata purpurea et alba; tubus calycis glaber infra coronam. Operculum positum circa 1 cm supra pavimentum tubi calycis, membranaceum, in superiore parte filiforme, 0.5 cm longum. Inferioris partis 0.5 cm gynophori limini circumcinctae. Ovario glabro.

Liana, glabrous throughout. Stem terete, striate. Stipules oblong-lanceolate, acute, 1×0.4 cm, sometimes deciduous. Petioles angular-winged, 6.5–9 cm long, with 3–4 black, sessile urceolate glands, 1 mm long, one pair at extreme apex, other glands 2–3 cm below; blades basifixed, broad-ovate to ovate, $14\text{--}19 \times 11\text{--}20$ cm, deeply cordate, prominently pinnate-veined, lustrous, coriaceous, the margin entire. Inflorescence sessile, with at least 2 flowers collateral with the tendril in the axil of the leaf, 5–6 cm diam.; pedicels terete, striate, 3–4 cm long; bracts verticillate, united halfway, inserted about 5 mm below flower, oblong-ovate, mucronate, 5×2 cm. Hypanthium tube funnel-shaped, 3 cm long, 1 cm wide at base, 2 cm at apex, outside lavender; calyx lobes oblong, acute, 2.5×1.3 cm, ending in a minute mucro; petals oblong, obtuse, $3 \times 0.6\text{--}1$ cm. Corona composed of 2 series situated at the edge of the hypanthium; outer series of short ligulate filaments, 4 mm long, with filiform apices; inner series of very stout, 4-angled, 2 cm long filaments with filiform apices, the inner filaments with shifting purple and white, 4 mm broad stripes; hypanthium smooth below corona. Operculum situated 1 cm above hypanthium floor, membranaceous, 0.5 cm long, split into filiform segments. Trochlea present at the androgynophore opposite the apex of the operculum. Limen surrounding lower 5 mm of androgynophore. Gynophore 1 cm longer than the androgynophore present. Ovary glabrous. Fruit

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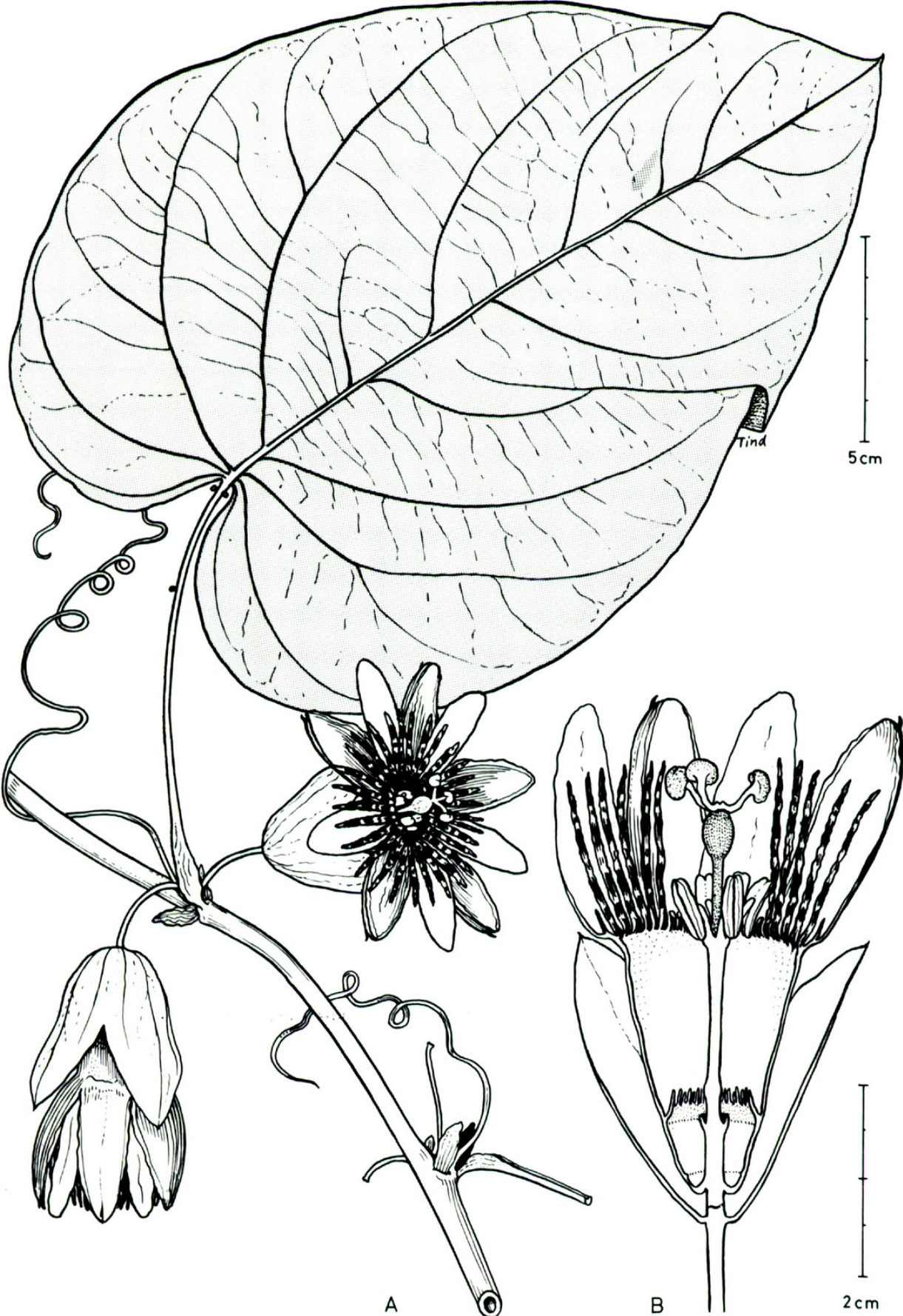


FIGURE 1. *Passiflora palenquensis* Holm-Nielsen & Lawesson. — A. Flowering stem. — B. Longitudinal section of flower.

ovoid, 7×4 cm, green. Seeds ovate, 5×3 mm, finely reticulate.

Passiflora palenquensis is a member of "series" *Tiliaefoliae*, which is characterized by united bracts and entire leaves. *Passiflora palenquensis* has a distinct gynophore 1 cm longer than the androgynophore and differs from all other members of *Tiliaefoliae* by the corona having only two series of filaments. Other species of *Tiliaefoliae* have at least three series. It is closely related to *P. seemannii* Griseb. which superficially appears to have two series. However, the two series of filaments are 1–1.2 cm and 2–2.5 cm long and have several rows of tubercles inside. *Passiflora palenquensis*, on the other hand, has only two series, these being 4 mm and 2 cm, respectively. The tubercles are absent. The new species is also related to *P. tiliaefolia* L., which has more numerous series of filaments and is confined to high altitudes (2,000–3,000 m). *Passiflora palenquensis* is restricted to low elevations.

Additional specimens examined. COLOMBIA. NARIÑO: railroad Tumaco-Diviso km 86, 27 July 1952, *Castaneda 3326* (AAU). ECUADOR. LOS RIOS/PICHINCHA: Sto. Domingo-Quevedo rd., km 45, Patricio Pilar-24 de Mayo rd., km 12, 600 m, Apr. 1980, *Dodson & Gentry 10337* (MO).

***Passiflora montana* Holm-Nielsen & Lawesson, sp. nov.** TYPE: Ecuador. Carchi: Tulcan-Maldonado rd., km 67, 2,600 m, $78^{\circ}04'W$, $0^{\circ}53'N$, 21 May 1973, *L. Holm-Nielsen, S. Jeppesen, B. Løjtnant & B. Øllgaard 6200* (holotype, AAU). Figure 2.

Liana, ubique glabra. Caule striato atque tereto. Stipulis valde magnis, $4-4.5 \times 2$ cm, latoribus quam longioribus, reniformibus mucronatis, ad basin obtusis, margine glandulare-serrata. Petiolis $3.5-4$ cm longis, teretis striatisque, cum duabus glandibus alternis supra medium. Laminibus basifixis, 3-lobatis, interdum 4-lobatis, $9-11 \times 11.5-13$ cm, dimidium lobatum, lobi 3 cm lati, lanceolati, acuti; pedato-venatis, integris cum glandibus in sinibus. Bractae verticillatae, liberae, portatae 5 cm infra florem, ovatae, acuminatae, ad basin cordatae, integrae, $2.5-3.0 \times 1.5$ cm viridibus. Flores solitarii; pedicellis $4.5-6$ cm longis, teretis. Flores $5-6$ cm lati; tubo calycis breve campanulato, $5-6 \times 7-8$ mm; lobis calycis oblongo-lanceolatis, viridibus, 1.5×0.5 cm, obtusis, manifeste carinatis, carina cum arista 6 mm longa quae apicem excedit; petalis oblongis, subacutis, pallido-viridibus, $1-1.5 \times 0.3-0.5$ cm. Filamenta coronae in pluribus seriebus; externae 3 series ex 12 mm longis elementis consistunt, quae numero irregularium serium succeduntur, ex tenuibus et filiformibus elementis consistentium, lilacinis, extensis versus operculum. Operculum membranaceum, recur-

vatum, modice plicatum, 4 mm longum, pars dimidii superioris filiformiter fissum. Limen laxe in base gynophori affixum, margine lobata. Ovario glabro. Styli pallido-virides cum maculis lilacinis. Fructus non visi.

Liana, glabrous throughout. Stem striate, terete. Stipules very large, $4-4.5 \times 2$ cm, reniform, mucronate, obtuse at base, margin glandular-serrate. Petioles $3.5-4$ cm long, terete, striate, with two alternate, stipitate glands above middle, 4 mm long; blades basifixed, 3-lobed, occasionally 4-lobed, $9-11 \times 11.5-13$ cm, lobed halfway; lobes 3 cm wide, lanceolate, acute; pedate-veined, entire except minutely glandular serrate in the sinuses with 2–6 glands per sinus. Bracts verticillate, free, inserted 5 mm below flower, ovate, acuminate, cordate at base, entire, $2.5-3 \times 1.5$ cm. Flowers $5-6$ cm wide, solitary, lateral; pedicels $4.5-6.0$ cm long, terete; hypanthium short campanulate, $5-6 \times 7-8$ mm; calyx lobes oblong-lanceolate, green, 1.5×0.5 cm, obtuse, prominently carinate, with a 6 mm long awn exceeding apex; petals oblong, acutish, light green, $1-1.5 \times 0.3-0.5$ cm. Coronal filaments of several series; outer three series of filiform elements 12 mm long succeeded by about 5 irregular series, of slender filiform elements, 6 mm long, lilac, extending towards operculum. Operculum membranaceous, recurved, slightly plicate, 4 mm long, upper half split into filiform segments. Limen attached to base of androgynophore, the margin lobulate. Nectar ring present, conspicuous. Trochlea absent. Ovary glabrous; styles light green with lilac spots. Fruits not seen.

Passiflora montana as member of "series" *Lobatae* is most clearly related to *P. sprucei* Mast., from which it differs by not having the leaves divided below the middle, by having the stipules twice as large and having two (vs. three or four) petiolar glands 4 mm long and not sessile, and, especially, by the floral composition. In *P. montana* the operculum is recurved and has a filiform upper half and the filaments are 3–4 mm long, whereas the operculum in *P. sprucei* is erect with the lower quarter membranaceous and the upper two-thirds comprising a row of filaments 1 cm long. The corona in *P. montana* has three (vs. two) outer series of long filiform filaments succeeded by four or five inner series of 4–5 mm (vs. 2–3 mm) long filaments. *Passiflora montana* is the highest growing member of "series" *Lobatae* found in Ecuador at altitudes of 2,000–3,000 m; the related *P. sprucei* and *P. resticulata* Mast. & André usually do not occur above 2,000 m.



FIGURE 2. *Passiflora montana* Holm-Nielsen & Lawesson. —A. Flowering stem. —B. Longitudinal section of flower.

Additional specimens examined. ECUADOR. PICHINCHA: Niebly, Pululagua, *Sodiho s.n.* (S).

Passiflora deltoifolia Holm-Nielsen & Lawesson, sp. nov. TYPE: Ecuador. Napo: Baeza-Tena rd., Cosanga, 1,800–1,900 m, 4 Nov. 1980, *G. Harling & L. Andersson 16216* (holotype, GB; isotype, AAU). Figure 3.

Liana admodum glabra superficie foliarum. Caule striato, tereto. Stipules reniformibus, 1×2 cm, lobus inferior obtusus, superior lobus cuspidatus, mucrone 2 mm longa, margine glandulare serrataque. Petiolae teretae, 3 cm longae, 4-glandibus, 1–2 mm longis, alternis; lamina basifixi, cordata, integra, circumscriptione deltoidea, 8×9 –10 cm, 5–7-nervata, coriacea. Flores solitarii lateralesque; pedicellis teretis 5–6 cm longis; bracteae 1 cm infra florem feruntur, verticillatae, liberae, ovatae, acuminateae, 0.7×0.3 cm, cum margine glandulare serrata. Flores 7–8 cm lati, tubo calycis breve campanulato, 1×2 cm; lobi calycis atque petali ovate, violacei, 3 – 4×1 –2 cm, lobi calycis carinati sine arista. Filamenta coronalia in 5–8 seriebus; externae duae series ex filamentis ligulatis, 2.5–3 cm longis, consistentes, apex filiformis, secunda series longissima; intimae 3–6 series irregulares quae ex filamentis spathulato-ligulatis vel tuberculatis, 1–5 mm longis, consistunt, tubum ex serie secunda usque ad operculum obtegentibus. Operculum membranaceum, erectum, dense plicatum, 8–9 mm longum, superior spathulato-ligulata. Nectarii annulus sicut crista librata 3 mm infra operculum. Limen arcte circumdans basin gynophori, margine lobata. Ovario glabro. Fructu ovoideo. Semina non matura.

Liana, stems sparsely puberulent, leaves pubescent at lower and glabrous at upper surface. Stem terete, striate. Stipules reniform, 1×2 cm, the lower lobe obtuse, the upper lobe cuspidate with a mucro 2 mm long, the margin glandular and serrate. Petioles terete, 3 cm long, with 4 stipitate, alternate glands 1–2 mm long; blades basifixi, cordate, entire, deltoid, 8×9 –10 cm, 5–7-nerved, coriaceous. Flowers solitary, lateral, 7–8 cm wide; pedicels terete, 5–6 cm long; bracts verticillate, free, inserted 1 cm below flower, ovate, acuminate, 0.7×0.3 cm, margin glandular-serrate; hypanthium short-campanulate, 1×2 cm; calyx lobes and petals ovate to oblong, violet, 3 – 4×1 –2 cm; calyx lobes carinate without an awn. Coronal filaments, violet, in 5–8 series; outer 2 series of ligulate, 2.5–3 cm long filaments with filiform apices, the second series longest; innermost 3–6 series irregular, of spatulate to ligulate or tuberculate filaments 1–5 mm long, covering the interior of the hypanthium from the second series to the operculum. Operculum membranaceous, erect, densely plicate, 8–9 mm long, the upper part split into spatulate or

ligulate segments. Nectar ring a horizontal ridge 3 mm below operculum. Limen tightly surrounding base of gynophore, margin lobulate. Ovary glabrous. Fruit ovoid, 5.5×2 cm.

Passiflora deltoifolia is related to *P. menispermifolia* Kunth and *P. crassifolia* Killip in "series" *Menispermifoliae*. The new species differs from these two species by having leaves as broad as long and not longer than broad. *Passiflora menispermifolia* has three-lobed leaves, whereas *P. deltoifolia* and *P. crassifolia* have unlobed or inconspicuously lobed leaves. The operculum is plicate and there are no awns at the calyx lobes of *P. deltoifolia*. The bracts of *P. deltoifolia* are smaller, 7 mm long and 4 mm broad (vs. 1–2 cm long and 5–8 mm broad) and not cuspidate or long acuminate, as in *P. menispermifolia* and *P. crassifolia*. In addition, the new species lacks the dense indumentum characteristic for *P. menispermifolia* and *P. crassifolia*.

Passiflora pergrandis Holm-Nielsen & Lawesson, sp. nov. TYPE: Ecuador. Zamora-Chinchi: Zamora-Gualaquiza rd., 5 km North of Cumbaraza, 900 m, 20 Apr. 1974, *G. Harling & L. Andersson 13771* (holotype, GB; isotype, AAU). Figure 4.

Liana, ubique glabra praeter inflorescentiam atque ovarium. Caule terete, striato, partes veticiores 2 cm in diametro. Stipulis non adsunt. Petiolis 2–3 cm longis cum pare glandium ovalium, sessilium, nigrum, 3×1 mm, 1 cm ab base; laminibus basifixis, anguste-ovatis, acuminatis, 15 – 20×9 –10 cm, obtuso-truncatis, crasso-coriaceis. Inflorescentia lateralis, pergrandis, non-terminalis, usque ad 30 cm longa, cum pluribus 15 – 16 cm latis floribus plerumque bracteis foliaceis 4 – 11×1 –4.5 cm. Inflorescentia interdum reductus modo paucis floribus; pedicellis teretis, 3–9 cm longis, puberulis; bracteae 5 mm infra florem portatae, verticillatae, liberae, ovato-oblongatae 5×4 cm, obscure lacinato-lobatae in parte distale, obtusae in base, margo ingra cum pluribus crassis nigrisque glandibus, puberulis. Tubo calycis campanulato 1×2 cm; lobi calycis oblongo-ovati, 6×3.5 –4 cm, obtusi, carinati cum arista foliacea, 4 mm longa, quae apicem non excedit. Petalis lanceolatis-ovatis, 5.5 – 6×2 cm, alba. Filamenta coronalia in 3 seriebus, filamenta primae seriei minute setaceae 2 mm longa, secundae seriei filamenta crassa, ligulata, 5×0.3 cm, cruciatim fasciata colore albo atque atro-violaceo; tertia serie prope operculum minute tuberculata. Operculum membranaceum, recurvatum, margine filamentis brevibus fimbriatis. Limen arcte adhaerens basin gynophori. Gynophorus trochlaean crassam supra limen ferens. Ovarium dense albidocanum tomentosum. Fructus non visi.

Liana, glabrous throughout except inflorescence and ovary. Stem terete, striate, older parts

Tind

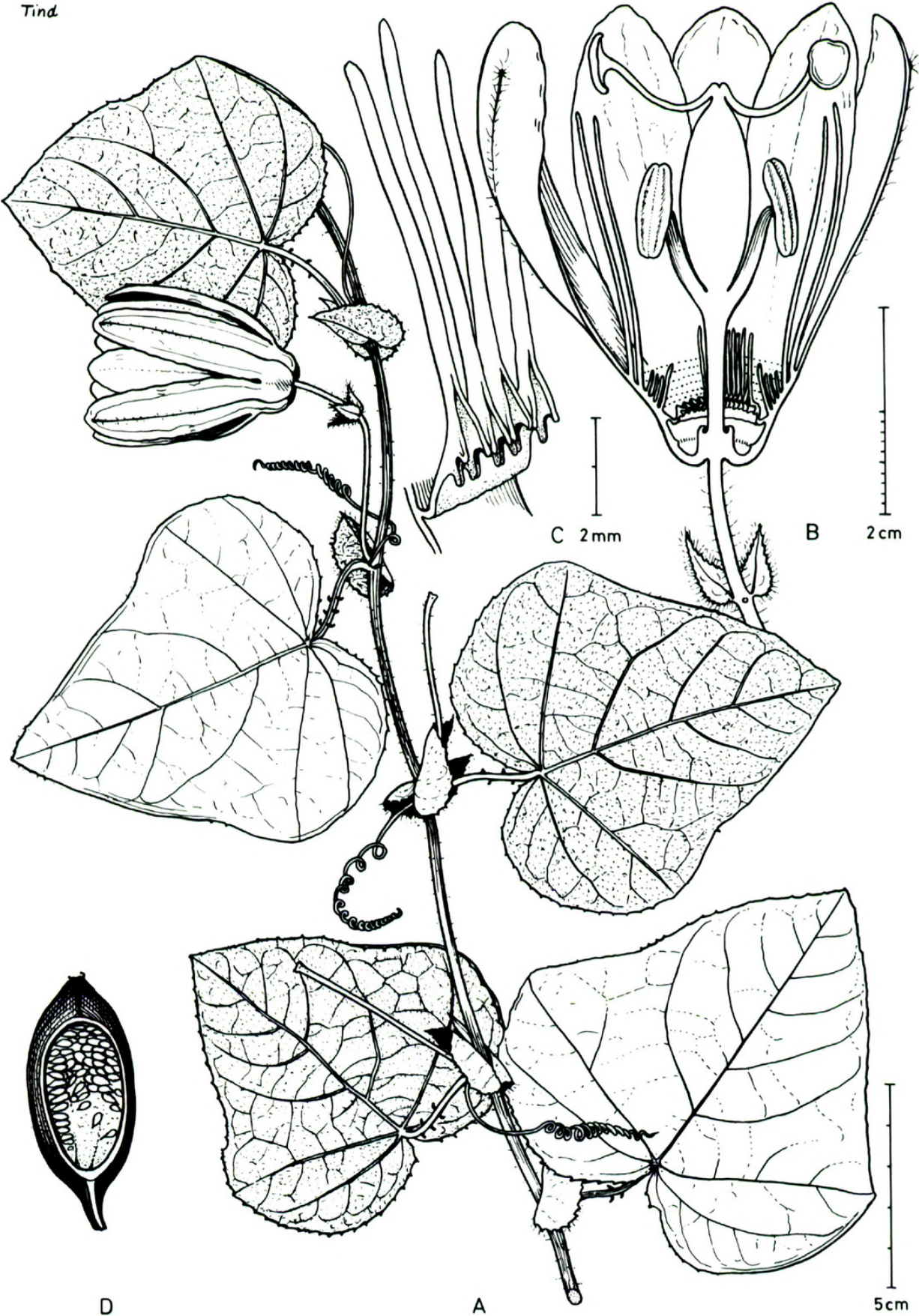


FIGURE 3. *Passiflora deltoifolia* Holm-Nielsen & Lawesson.—A. Flowering stem.—B. Longitudinal section of flower.—C. Operculum, densely plicate.—D. Fruit.

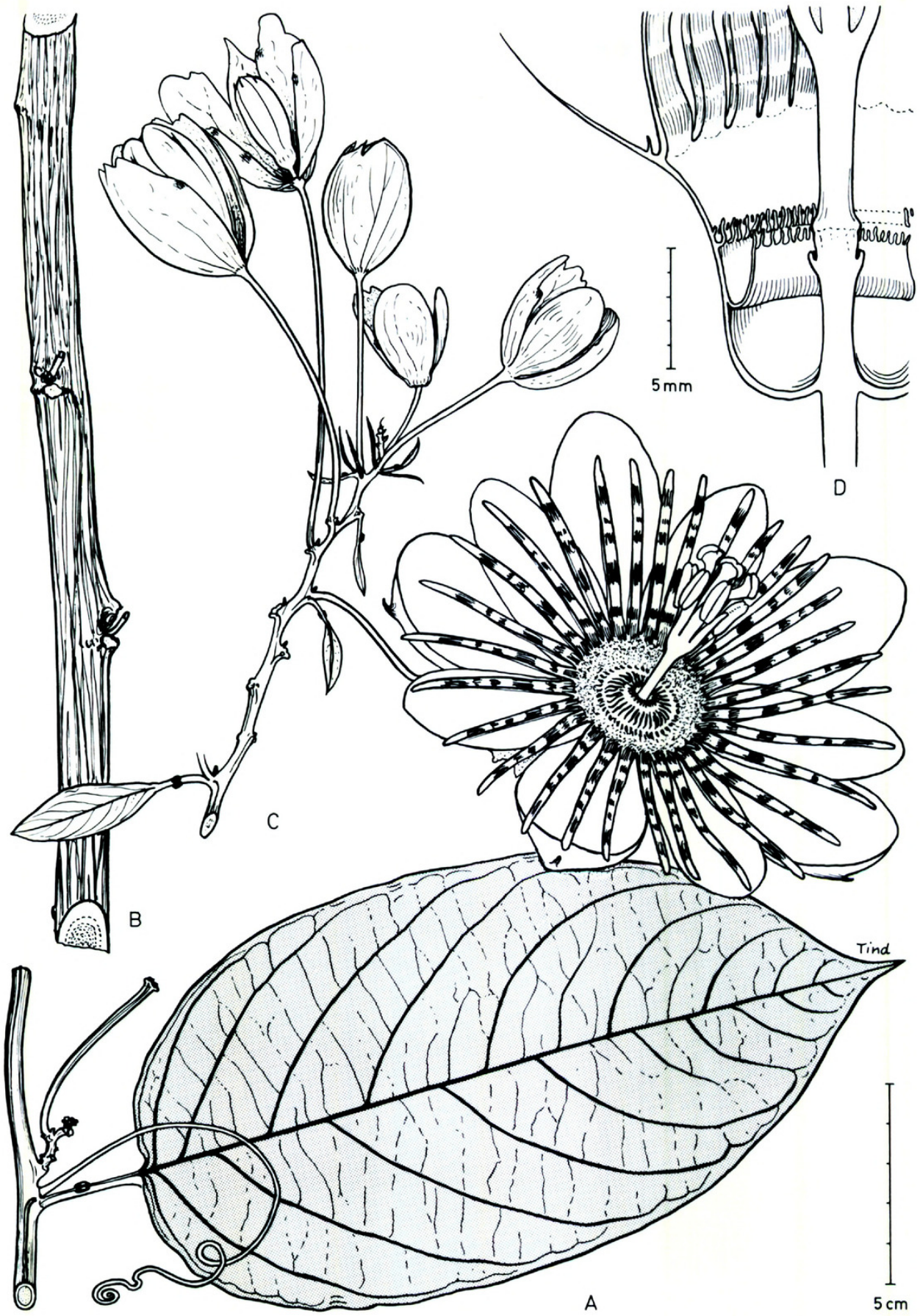


FIGURE 4. *Passiflora pergrandis* Holm-Nielsen & Lawesson.—A. Leaf and reduced inflorescence.—B. Old stem.—C. Inflorescence with several flowers and bracts.—D. Longitudinal section of flower with recurved operculum.

2 cm diam. Stipules reduced. Petioles 2–3 cm, with one pair of ovate, sessile, black glands 3×1 mm, 1 cm from base; blades basifixed, narrow-ovate, acuminate, $15\text{--}20 \times 9\text{--}10$ cm, obtuse to truncate at base, prominently pinnate-veined, entire, thick-coriaceous. Laminar nectaries absent. A distal bud developing to a short shoot, this forming a conspicuous indeterminate inflorescence to $30 \times 15\text{--}16$ cm with several flowers (or sometimes reduced with few flowers), the lowermost flowers developed first, the flowers subtended by $4\text{--}11 \times 1\text{--}4.5$ cm reduced leaves; pedicels terete, 3–9 cm long; bracteoles verticillate, free, inserted 5 mm below flower, ovate to oblanceolate, 5×4 cm, obscurely laciniate-lobed at distal part, obtuse at base, margin entire with several stout black glands. Hypanthium campanulate, 1×2 cm; calyx lobes oblong-ovate, $6 \times 3.5\text{--}4$ cm, obtuse, carinate with a foliaceous awn 4 mm long, not exceeding apex; petals narrow-ovate, $5.5\text{--}6 \times 2$ cm, white. Corona filaments of 3 series; filaments of outer series minutely setaceous, 2 mm long; filaments of second series stout, ligulate, 5×0.3 cm, cross-banded with white and dark violet; third series close to operculum, minutely tuberculate 1–2 mm. Oper-

culum membranaceous, recurved, the margin with short fimbriate filaments. Limen tightly adherent to androgynophore between the prominent nectar ring and trochlea. Ovary densely whitish-gray tomentose. Mature fruits not seen.

Passiflora pergrandis is a member of "series" *Laurifoliae* and is related to *P. ambigua* Hemsl., which is also present in Ecuador. *Passiflora pergrandis* differs in several aspects from *P. ambigua*, these being much larger inflorescence and longer pedicels, larger leaflike bracts, calyx lobes and petals only twice as long as broad (vs. three or four times longer), and much shorter outer coronal filaments. The awn in *P. pergrandis* does not exceed the apex of the calyx lobe as it does in *P. ambigua*. *Passiflora ambigua* is known from Central America.

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