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## Notes on *Aristolochia linearifolia* and *A. stenophylla* (*Aristolochiaceae*), a vicarious species pair from the Greater Antilles (Cuba and Hispaniola)

### Abstract

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*Aristolochia linearifolia*, a local endemic of E Cuba, and *A. stenophylla*, restricted to SW Hispaniola (mainly Haiti, but here first reported from the Dominican Republic), are closely related but distinct species even though they have sometimes been lumped together. They are described, contrasted, and compared with their closest relatives, *A. oblongata* and *A. chasmema*. Typification is discussed. For *A. linearifolia* a lectotype is designated, after consideration of the notorious problems that are linked with the Cuban collections of Charles Wright, the discoverer of the species. The holotype of *A. stenophylla* was destroyed in 1943, and although duplicate material exists that was designated as lectotype, it is of a fragmentary nature, so that an epitype is designated in support.

### Historical background

*Aristolochia linearifolia* C. Wright ex Griseb. (Grisebach 1866: 115) was discovered by Charles Wright in eastern Cuba, probably in 1861. Its known area of distribution is very restricted. The species, long known only from the original material (see below), was again collected five times in recent years, in four different localities, all of which lie on the southern slopes of the Sierra de Imías or on the hills between it and the Sierra de Mariana, in the Province of Guantánamo. A distribution map was published by Rankin (1998: 24).

There are notorious difficulties connected with Wright's gatherings, and the reliable identification of localities and dates of collection is often problematic. We found Wright specimens of *Aristolochia linearifolia* in no less than nine different herbaria. If numbered at all, they are all numbered 2617 – which is a species number not a collection number – and most bear no mention of a collecting date or locality but only the general, printed text of the *Plantae Cubenses Wrightianae*: “Coll. C. Wright 1860-1864” (label type 7 of Howard 1988: 86), with the number “2617” and “*Aristolochia linearifolia* M[ihi].” added in Asa Gray's hand. The following exceptions are of note. (1) The two sheets of Grisebach's herbarium (GOET) have printed labels with

“Coll. C. Wright, in Cuba Orientali, prope ... 1860” (Howard’s label type 9), with the year changed, apparently by Grisebach, to 1861; one (1a; Fig. 1) has no locality but a different number, “503”, as the single Gray inscription, all other handwriting being Grisebach’s: “= 2617” “*Aristolochia linearifolia* W[right].”, and two lines of descriptive text; the label of the other specimen (1b) has the epithet written by Grisebach, the species number, genus name, collecting locality (“La Laya”) and date (“May, 10”) were written by Gray. (2) One of the HAC specimens and a fragment in New York (NY) consisting of two leaves bear mention of the same locality, “La Laya”, added in a later hand, but no original Wright label. (3) The Harvard (GH) specimen (Fig. 2) has the general label (type 7) and, in addition, three different original field labels, handwritten by Wright, perhaps corresponding to the three plants glued to the sheet: (3a) “*Aristolochia* / Quemado June 24”, (3b) “*Aristolochia linifolia* [sic!] Fl. dark red – tube greenish externally / Quemado July 20”, and (3c) “*Aristolochia* / La Laja / Fl. dark red & mottled / May 10”.

It thus appears that at least three Wright collections from two localities were originally associated with *Aristolochia linearifolia*. Grisebach saw (and annotated) only the two sheets in his own herbarium, from among which a lectotype must be chosen. Howard (1988) designated the GOET specimen (1a) numbered “503” as holotype, but he did so in a microfiche appendix to his book, not in print, so that this [lecto]type designation is not effectively published and has no standing in nomenclature (see Greuter & al. 2000: Art. 29.1 and 7.10). The other GOET specimen (1b) is indeed not a suitable type since it is sterile. However, sheet (1a) likely represents more than one specimen in the sense of the Code (Greuter & al. 2000: Art. 8.2) so that it cannot, as a whole, serve as nomenclatural type. There are three different plants glued to that one sheet: the middle one is sterile, the lower right-hand one has an open flower (a second, almost identical, separately glued flower and a flower bud perhaps also belong to it), and the upper left one bears a mature fruit (two separate, glued seeds must also be from that fruit). Each of the three plant fragments likely represents a different collection, same as for the GH sheet (which bears one fruiting and two sterile plants). We therefore designate the lower right-hand, flowering specimen of the (1a) GOET sheet as the lectotype of *A. linearifolia*.

Not only is it impossible to reliably link any of the three plants of GOET (sheet 1a) with a definite collecting date and locality; it is moreover difficult to make out where Wright’s two localities are situated. “Quemado” is a designation that, in Cuba, is widely applied to burnt land, sometimes only temporarily. A modern atlas (Ibarra Martín & al. 1978) lists 13 places named Quemado (plus a dozen Quemada, Quemadito, Quemaditos, and Quemados). On the topographical map of Cuba (1: 250 000) one can in addition find an “El Quemado” c. 15 km SE of Monte Verde, the place where Wright used to be based and where he is said (by Howard 1988, App. 2: 5) to have been staying on 24 June 1861 (we assume that 1861 is indeed the collecting year of all three specimens). “La Laya” is unknown as such and is probably a misspelling. León & Alain (1951: 86) cite the locality as “La Yaya”, a place name that exists a number of times in Cuba but not apparently in the Province of Guantánamo. The GH specimen bears the spelling “La Laja”. There are two places named Lajas in that province; however, neither lies anywhere close to a known locality of *Aristolochia linearifolia*. Howard (1988, App. 3: 5) suggests that “La Laja” may stand for La Laza, but this does not help as we cannot find any such place. The last remaining option, perhaps the most likely one, is that Wright misspelled or misheard the name of the hamlet La Maya, situated north of San Antonio del Sur, c. 20 km E of El Quemado and just about 2 km away from a recent collecting site for the species.

*Aristolochia stenophylla* Urb. was described by Urban (1902: 281) from a single specimen, *Picarda 1281* from southern Haiti, Anse à Veau (B), which was destroyed in 1943. In the protologue, Urban compared his new species in the first place with *A. bilabiata* L., then a mystery name based solely on a 17th century Plumier drawing of a plant from Haiti (see Rankin & Greuter 1999 for the story of its rediscovery in 1926 and its subsequent misapplication to a different species, *A. oblongata* Jacq.). Urban apparently interpreted *A. bilabiata*, at least in part, through a specimen so identified by Swartz (1791: 342-342), which he had seen in Willdenow’s

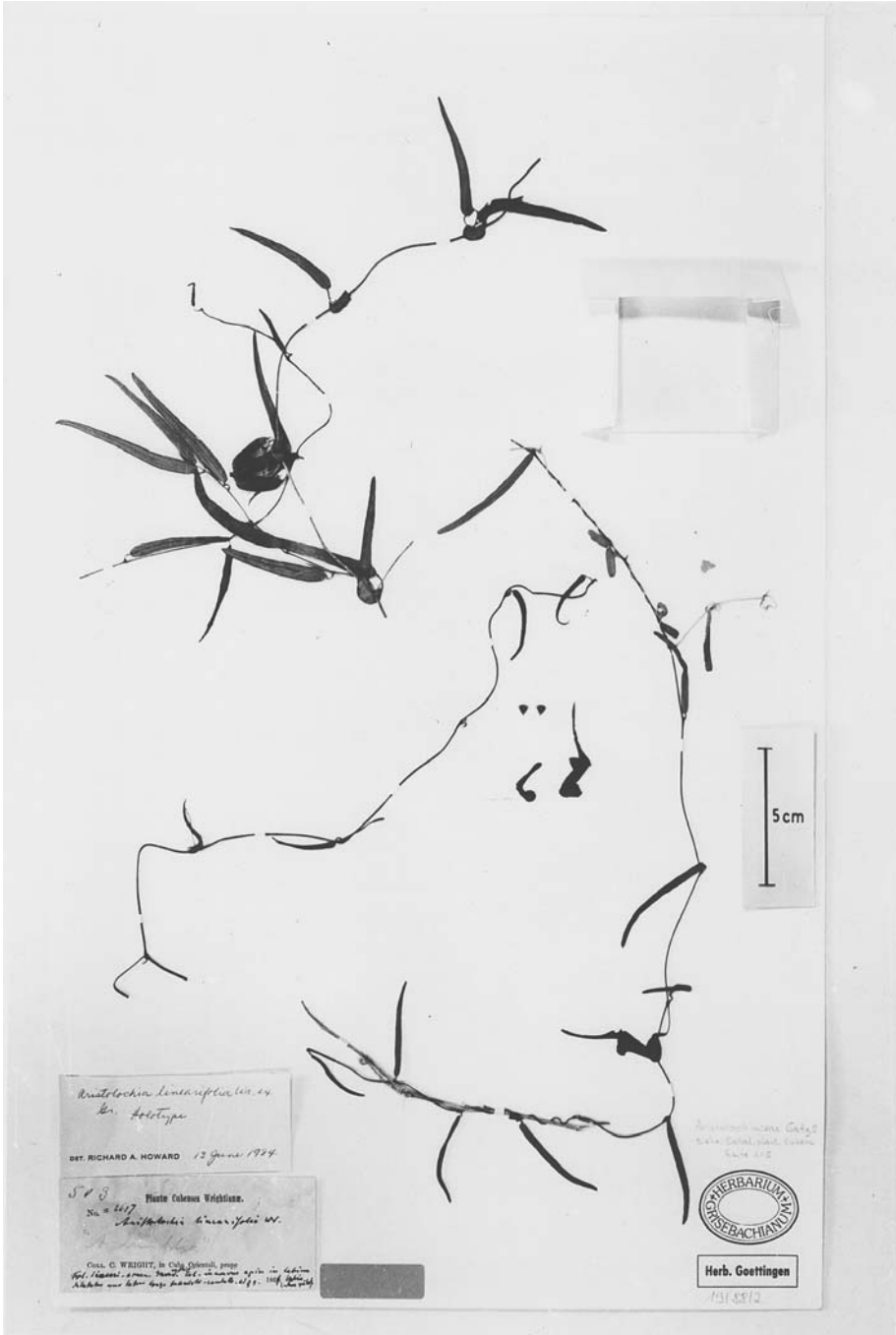


Fig. 1. *Aristolochia linearifolia* – the Wright sheet at Göttingen (GOET) that bears the lectotype specimen, which is the flowering plant in the lower right corner.

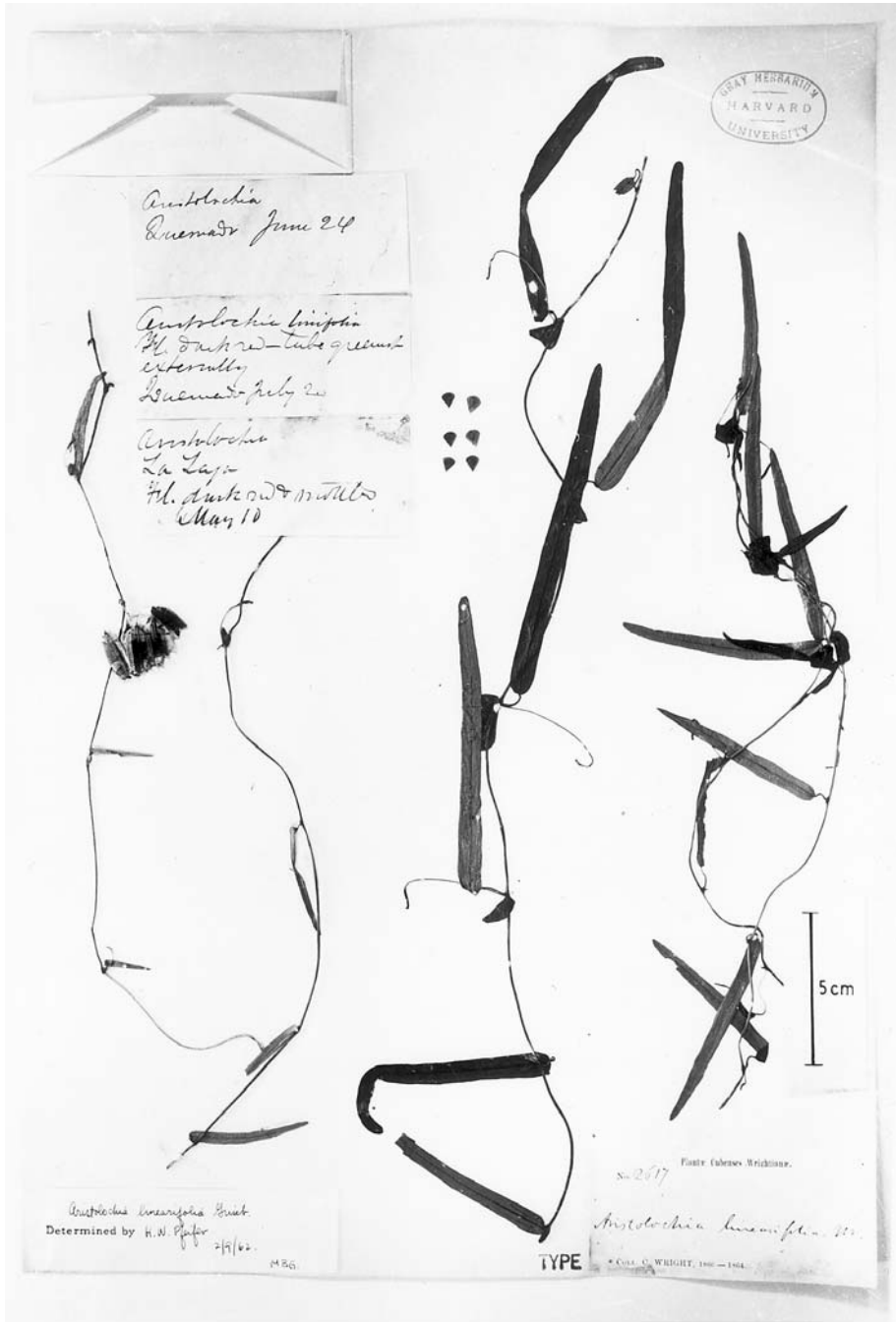


Fig. 2. *Aristolochia linearifolia* – the sheet at Harvard (GH) with Wright’s three original field labels, which show that more than one gathering is involved.

herbarium (B-W No. 17056), and in so far he was mistaken because that specimen is taxonomically indistinguishable from *A. stenophylla*. The latter species is not, however, closely related to the true *A. bilabiata* of Linnaeus, another endemic of largely the same area in south central Hispaniola, now known as *A. chasmema* Pfeifer (owing to Pfeifer, *A. bilabiata* has become a confused name). In the second place, Urban in the protologue contrasted *A. stenophylla* with *A. linearifolia*, its Cuban counterpart. The differences he gave, not only in pseudostipule size and leaf shape but also in flower morphology, still hold true (see below).

Pfeifer (1966: 170) cited *Aristolochia stenophylla*, with “(Type: *Jicarda* [sic!] 1281, NY)”, as a synonym of *A. linearifolia*, giving “Cuba and southern Haiti” as the distribution of that species. He specified that “The linear-leaved representatives are from Cuba, the triangular-leaved ones from Hispaniola”, and suggested that “It may seem reasonable to some to give them subspecific status”. As he did not then have sufficient material available, he refrained from validating a new combination. In fact, the lack of material concerned the Cuban taxon alone (of which Pfeifer saw only three sheets, all collected by Wright). Pfeifer (1966: 188-194), in addition to the type, studied no less than six different collections from southern Haiti (including Gonave Island), all collected by Ekman between 1924 and 1927. Pfeifer’s wide concept of *A. linearifolia* was accepted by Alain (1983: 29) but not by Rankin (1998: 23).

The revision of the relevant material kept in a large number of herbaria showed that only two duplicates of *Picarda 1281*, the burnt holotype of *Aristolochia stenophylla*, survive: one in GH and one in NY. Both are isotypes, and one of them must necessarily serve as lectotype. The trouble is that both are exceedingly inadequate, as they consist of sterile, loose material only: nine leaves and two stem fragments in the NY duplicate (Fig. 3), obviously a gift with original label “ex Herbario Krug et Urban”; and two leaves in the specimen in GH, lacking original label and apparently “sampled” by W. Buch on the holotype. Pfeifer’s statement of type cited above is tantamount to designation of the NY specimen as lectotype. In view of the poor state and inadequate interpretability of the surviving type material, we are here designating an epitype specimen in addition.

We had the opportunity of exploring parts of the Dominican Republic (Hispaniola) in December 1999, mainly in search of critical *Aristolochia* species. There, at a gunshot from the frontier of Haiti, we collected *A. stenophylla*, a species not previously recorded from the Dominican Republic, although a so far unidentified, sterile specimen of it had been collected more than 20 years earlier in the same area by brother Alain. Our find gave us the opportunity to reconsider the taxonomy and distribution of this species, its affinities with and differences from *A. linearifolia*, its close eastern Cuban ally with which the first author has long been familiar.

### Taxonomic treatment

*Aristolochia linearifolia* and *A. stenophylla* have a number of important features in common, indicating their close relationship and distinguishing them from other, less closely related species, thus justifying the assumption that they are vicarious sister taxa. The following description applies to both species. The differences between them are mostly quantitative, concerning dimensions and hairiness, but also the venation reticulum and corolla shape; they are summarised in Table 1, and are sufficiently clear-cut, in our opinion, to justify the recognition of two separate species.

*Woody vines.* Pseudostipules present. *Leaf* blade linear to narrowly oblong, several times longer than wide, subcoriaceous when adult; base rounded to cordate, apex blunt and usually apiculate; venation campylodromous, equally prominent on both faces; basal primary veins 3(-5). *Flowers* solitary in the leaf axil. *Pedicel* ebracteolate. *Perianth* pubescent outside; utricle obovoid; tube almost straight, trumpet-shaped, with a widened, transversely cut mouth; limb consisting of a single dorsal lobe, glabrous and smooth ventrally, with a longitudinal inward fold or groove along the spine. *Stamens* 6; anthers adnate to the stylar column, thus forming a 6-lobed gynostemium.

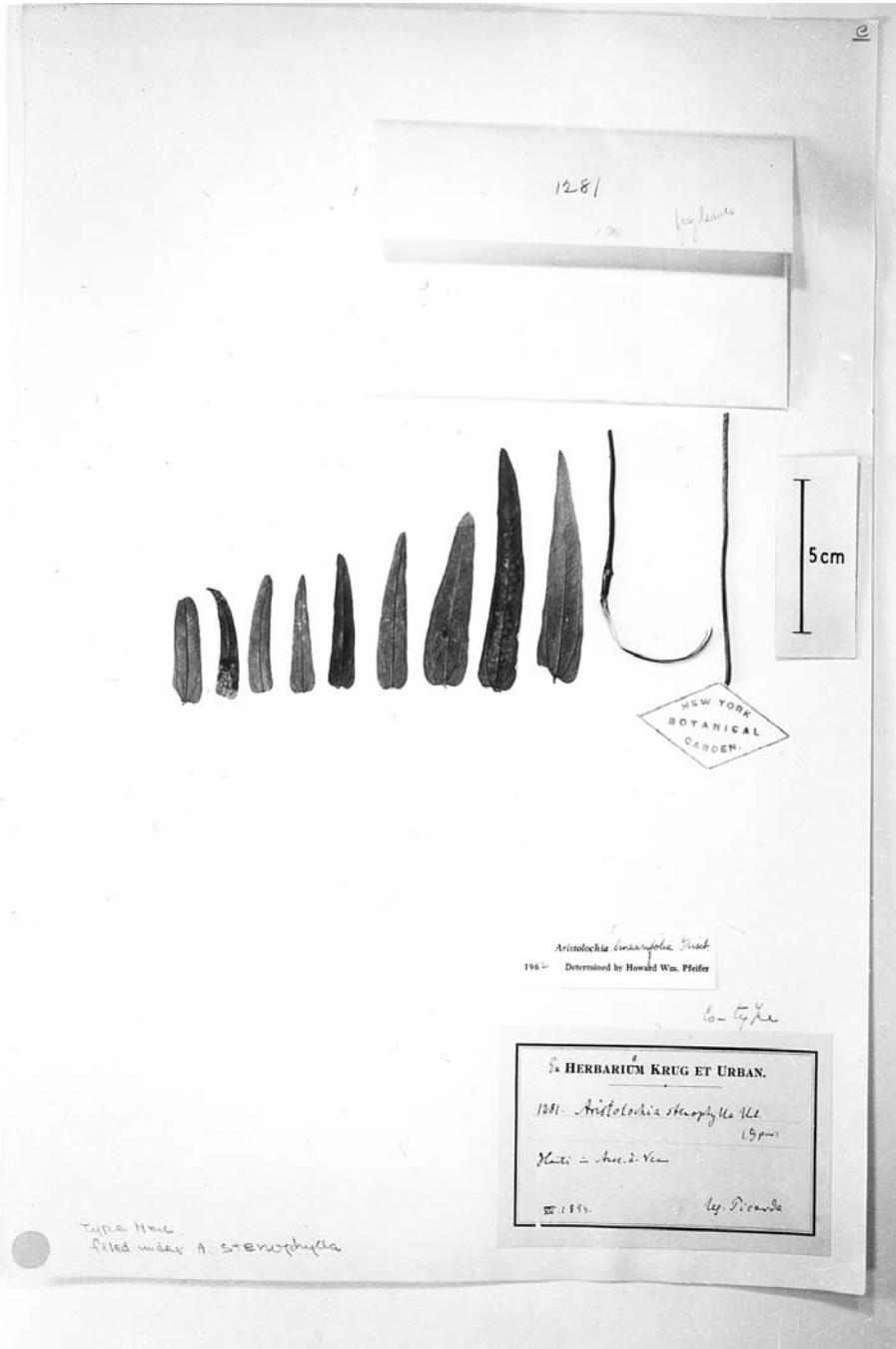


Fig. 3. *Aristolochia stenophylla* – the sterile, fragmentary isotype in New York (NY) that is now the lectotype.

Table 1. Morphological differences between *Aristolochia linearifolia* and *A. stenophylla*.

Characters	<i>A. linearifolia</i>	<i>A. stenophylla</i>
Pseudostipules	obovate, up to 1.5 cm	orbiculate-reniform, up to 1 cm
Petiole	0.2-0.4 cm	0.6-1.4 cm
Leaf blade, length	(5-)6-7.5(-9) cm	(7-)7.5-10(-11.5) cm
id., width	(0.3-)0.4-0.5(-0.6) cm	(1.2-)2-2.2(-2.5) cm
id., adaxial surface	puberulent	subglabrous
id., abaxial surface	pubescent	puberulent
id., meshes of venation reticulum	longitudinally elongate	± isodiametric
Perigon tube, insertion on utricle	oblique, sublateral	almost straight, ± terminal
id., length	c. 1 cm	c. 1.5 cm
Perigon limb, shape	triangular-subulate, straight	broadly linear, usually falcate
id., length	1.5-2.5 cm	1.5-2 cm
id., apex	acute	rounded to truncate
Fruit length	2-2.3 cm	(2.2-)2.5-2.9(-3) cm

Ovary inferior, 6-carpellate. Capsule 6-celled, broadly oblong, with acropetal septicial dehiscence. Seeds flat, triangular in outline, with the body surrounded by a spongy wing.

The species pair described above is most closely related to *Aristolochia oblongata* Jacq. (*A. bilabiata* auct.), a polymorphic species ranging from St Thomas and Puerto Rico to W Cuba and whose E Cuban populations (*A. bilabiata* subsp. *maestrensis* R. Rankin) have leaves that may approach *A. stenophylla* in their dimensions and shape. However, *A. oblongata* is characterised by a leaf venation that is much more prominent abaxially than adaxially, forming a tight and minute alveolar pattern on the lower leaf surface, the dense pubescence being characteristically confined to the veins and veinlets and not evenly spread all over the surface. Also, the perigon limb is significantly shorter (c. 1 cm). *A. chasmema*, which is largely sympatric with *A. stenophylla* and grows in similar habitats (although we did not observe any mixed stands), has a fairly similar leaf shape but the leaves are glabrous, glaucous beneath and thinly papery. This, together with the absence of pseudostipules, makes it easy to distinguish the two species in the vegetative state. The flowers are very different, *A. chasmema* being characterised by a two-lobed perigon limb with a much larger dorsal lobe, so that the species are probably not really closely related.

*Aristolochia linearifolia* C. Wright ex Griseb., Cat. Pl. Cub.: 115. 1866. – Lectotype (designated here [see also Howard, C. Wright 1856-1867, App. 1: 139. 1988]): Wright 503 [= 2617] (GOET!, right-hand plant with flower; see Fig. 1).

Distribution and habitat: Endemic to the area W and S of the Sierra de Imías, Prov. Guantánamo, E Cuba. Growing in microphyllous evergreen and deciduous woodland or in arid scrub, where rendzina and cinnamon-coloured soils rich in humus and carbonate predominate, among a very diverse xero-thermophilous flora (Borhidi 1991).

Specimens seen: CUBA: PROV. GUANTÁNAMO: “In Cuba Orientali” [“La Laya”, 10.5.1861, or “Quemado”, 24.6. or 20.7.1860-1864], Wright 2716 (BM, G [2×], GH, GOET [2×], HAC [3×], K, MO, MA, NY, S); Imías, cerca de paso de La Yegua, 4.1968, Bisse & Köhler 8830 (HAJB, JE); Imías, en el valle del arroyo San Ignacio, 6.2.1976, Areces & al. 29746 (HAJB, JE); San Antonio del Sur, 4 km al oeste del pueblo, 200-400 m, 10.2.1976, Areces & al. 29917 (HAJB); San Anto-



Fig. 4. *Aristolochia stenophylla* – one flowering and one fruiting branch from the epitype collection (Greuter & Rankin 24893).

nio del Sur, Abra de Mariana, loma al este del barranco, 6.2.1978, *Bisse & al.* 36553 (HAJB, JE); San Antonio del Sur, Abra de Mariana, loma al oeste del barranco, 6.2.1978, *Bisse & al.* 36594 (B, HAJB, JE, K).

*Aristolochia stenophylla* Urb., *Symb. Antill.* 3: 281. 1902. – Holotype: *Picarda 1281* (B<sup>†</sup>). – Lectotype (Pfeifer 1966: 171): *Picarda 1281* (NY!; isotype: GH!). – Epitype (designated here to support the lectotype): *Greuter & Rankin 24893* (JBSD!; isoepitypes: B!, GH!, GOET!, HAJB, JE!, MO!, NY!, US!, herb. Greuter!). – Fig. 4.

Distribution and habitat: Endemic to SW Hispaniola, from the Massif de la Hotte and Gonave Island in Haiti to the border region of the Dominican Republic N of Pedernales (map in Pfeifer 1966: 171, disregarding the [anyway misplaced] dot for Cuba). Growing in thickets and evergreen or semi-deciduous woodland of hills and lowland, on calcareous soil.

Specimens seen: HAITI: Anse-à-Veau, 7.1899, *Picarda 1281* (GH, NY); Massif de la Hotte, Grand-Gouave, Carrefour Fouché, 50 m, in thickets, common, 10.11.1924, *Ekman H2443* (IJ, S); Massif de la Hotte, Morne Rochelois, Miragoane, ab. Icard, 750 m, in thickets, 25.7.1926, *Ekman H6495* (S); Massif de la Hotte, gr. Morne des Commissaires, Anses-à-Pitre, limestone hills at Banane, in thickets, 200 m, 26.8.1926, *Ekman H6744* (S); Massif de la Selle, group Morne des Commissaires, Anses-à-Pitre, at Rio Pedernales / towards Banane, c. 50 m, 8.9.1926, *Ekman H6927* (US); Massif de la Hotte, Central group, Acquin, towards St. Louis du Sud, in



coastal thickets, 24.12.1926, *Ekman H7408* (U); Ile La Gonave, Pte-à-Raquettes, road to Lotormé, c. 100 m, 2.8.1927, *Ekman H8801* (S). — DOMINICAN REPUBLIC: PROVINCIA DE PEDERNALES: Pedernales, 6.3.1978, *Alain 9043-3* (JBSD); al norte de Pedernales, km 13 de la carretera hacia Los Arroyos, 330 m, 18°07'00"N, 71°44'00"W, bosque siempreverde alterado y borde de la carretera, en suelo aluvial calizo, 16.12.1999, *Greuter & Rankin 24893* (B, GH, GOET, HAJB, JBSD, SE, MO, NY, US, herb. Greuter). — WITHOUT EXACT LOCALITY: “*A. bilabiata*”, Hispaniola [or: India occ.], *Swartz* (B-W No. 17056, BM, S [3×]).

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