In 1842, the Belgian botanist Michael Joseph François Scheidweiler (1799–1861) described the genus Acianthera to accommodate a Pleurothallid species with connivent sepals, the lateral ones connate and the superior one galeate with a dilated apex, the lip articulated with the column, which is winged, two pollinia, and a pointed anther. Alluding to the anther shape, the generic name was formed from the Greek words ἀκίς, point, and ἀνθέρα, anther. The type species is Acianthera punctata Scheidw., described from a Brazilian plant provided with ovate, obtuse, and glaucous leaves and externally hairy sepals, with the inner surface spotted and ocellated with purple. No type specimen of A. punctata has been found, and Luer (1986) considered it synonymous with Pleurothallis recurva Lindl., described in 1841 from a specimen without known provenance but which the same author considered probably a native of Brazil (Lindley, 1842). Acianthera punctata is neotypified with Lindley’s P. recurva (Luer, 1986). As soon as 1859, John Lindley reduced Acianthera under Pleurothallis, coining the new name P. acianthera (Lindley, 1859) for Scheidweiler’s A. punctata (the specific epithet was occupied in Pleurothallis by P. punctata, published by Ker Gawler in 1823 for a species now included in the distantly related genus Notylia Lindl.). From this time, the genus Acianthera was buried for nomenclatural purposes. It was not until almost 130 years later that Carlyle A. Luer, in his systematic overview of the Pleurothallidinae, resurrected the name Acianthera as a subgenus of the polymorphic Pleurothallis to accommodate a large assemblage of allied species characterized by more-or-less fleshy flowers with connate lateral sepals that are borne singly or in a raceme terminally from the apex of the stem (Luer, 1986).

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On the basis of multiple analyses of DNA sequence data (Pridgeon et al., 2001; Pridgeon and Chase, 2001), Pridgeon and Chase (2001) gave Acianthera generic rank to group a distinct subset of Pleurothallidinae species previously included in Pleurothallis Sw. subgenera Acianthera (Scheidw.) Luer sections Brachystachyae Lindl., Cryptophoranthae Luer, Phloeophilae Luer, Sicariae Lindl., and Tomentosae Luer; Sarracenella (Luer) Luer; Arthrosia Luer; and some species of subgen. Specklinia (Lindl.) Garay sect. Muscosae Lindl. As circumscribed by Pridgeon and Chase (2001), Acianthera includes some 220 species centered in Brazil and distributed from Mexico to Argentina and Uruguay, and the Antilles, where they grow as humid-forest or cloud-forest epiphytes or lithophytes, at elevations ranging from 250 to over 2500 m (Pridgeon, 2005).

Luer (2002) noted the morphological similarity of Acianthera to other infrageneric taxa of Pleurothallis, as well as the existence of many intermediate forms, and considered that Pridgeon and Chase’s (2001) cladograms did not support recognition of Acianthera at the generic level, favoring the treatment of this taxon as a subgenus of Pleurothallis. He included in the subgenus most of the taxa proposed by Pridgeon and Chase as members of Acianthera, among which was Pleurothallis melanochthoda Luer & Hirtz, previously assigned to subgenus Specklinia. The same position was adopted in Luer’s revision of Pleurothallis subgen. Acianthera for 2004, where he basically maintained the circumscription of Acianthera (independently of the taxonomic rank) as suggested by Pridgeon and Chase (2001), but included Brenesia (previously subgen. Acianthera sect. Brachystachyae), subgen. Sarracenella, the species allied to P. oscitans Ames (segregated in subgen. Didactylus Luer), P. aberrans Luer (included in subgen. Aberrantia Luer) and P. lepidota L. O. Williams (previously assigned to subgen. Acianthera sect. Brachystachyae) (Luer, 2004a,c). That same year he eventually accepted the segregation of Acianthera from Pleurothallis (Luer, 2004b), publishing 64 new combinations in Acianthera, giving generic rank to Didactylus, Aberrantia, and Unguella Luer, and resurrecting Brenesia Schltr.

Up to the present, 14–17 species of Acianthera sensu lato have been recorded from Costa Rica (Pupulin, 2002a,b; Dressler, 2003), where they mostly grow as epiphytes in the humid forests of high mountain chains up to 2500 m, although some taxa range to the basal belt of premontane forests at about 500 m (Pridgeon, 2005). Notwithstanding the current debate about generic circumscription within the Pleurothallidinae, botanical exploration continues to disclose new species close to the core of Acianthera that need to be described. Hereafter we will describe three new species from Costa Rica.

**Acianthera hamata** Pupulin & G. A. Rojas, sp. nov. **TYPE:** COSTA RICA. Without specific locality, a plant collected by Adolfo Quesada Chanto, flowered in cultivation at Jardín Botánico Lankester, Universidad de Costa Rica, accession No. JBL-11485, 22 September 2005 (Holotype: CR; Isotype: USJ-Spirit). Fig. 1.

*Species Aciantherae cogniauxianae* (Schltr.) Pridgeon & M. W. Chase similis, folia lanceolata base rotunda erecta, multo angustioris, rhachidi hamata, floribus minoribus, petalis integris lobo rotundo parte inferna instructis, labelli disco duabus carinis magis late flabellatis ornato dignoscenda.

*Plant* epiphytic, erect to repent, with a thick rhizome concealed by scarious sheaths, producing secondary stems (ramicauls) every 12–15 mm. *Roots* flexuous, glabrous, 1.0–1.5 mm in diam. *Stem* stout, compressed, broadened toward the apex, triangular in section, with sharp margins, centrally grooved, 5.5–10.5 cm long, 0.6–0.9 cm wide at apex, basally provided with 3 slightly loose sheaths, apically monophyllous. *Leaf* fleshy, sessile, lanceolate, acute, tridenticulate, the base rounded, suberect to erect, 8–14 cm long, 2.4–3.7 cm wide. *Inflorescence* an abbreviated, few-flowered (to 5 flowers) raceme, to 6.5 cm long, the rachis uncinate, produced at the base of the leaf from a papyraceous spathe 10–12 mm long, the spathe fugacious. *Floral bract* infundibuliform, acute, 2.0–2.5 mm long. *Pedicel* cylindric, to 1.5 mm long. *Ovary* articulate with the pedicel, glabrous, 2 mm long. *Flowers* with greenish cream sepal, spotted with dark purple, the petals translucent cream, spotted purple, the lip whitish to pale yellow, spotted purple. *Dorsal sepal* oblongolate, obtuse to rounded, 5.5 mm long, 2.7 mm wide. *Lateral sepals* connate almost to the apex into an obovate-suborbicular synsepal, emarginate...
**Figure 1.** *Acianthera hamata* Pupulin & G. A. Rojas. **A,** habit; **B,** detail of the inflorescence; **C,** flower, three quarters and lateral views; **D,** dissected perianth; **E,** column and lip, lateral view; **F,** lip, adaxial and lateral views; **G,** pollinarium and anther cap. Drawn by G. Rojas from the holotype.
at apex, 3.7 mm long, 4.4 mm wide. Petals obovate-rhombic, subacute, asymmetric, the inferior side provided with a rounded lobe, 2.3 mm long, 1.4 mm wide. Lip clawed, obovate, obtuse-subrounded, 4.5 mm long, 3 mm wide, provided at the base with two small, retorse horns; the disc with 2 thin, sharply edged, trapezoidal-flabellate, spreading, emarginate-erose keels. Column slender, terete, with a short foot, 4 mm long, provided at apex with 2 broad, rounded wings. Anther cap cucullate, elliptic, 2-celled. Pollinia 2, obovate-suborbicular, with caudicle.


Etymology: from the Latin hamatus, hooked, in reference to the characteristically barbed rachis of the inflorescence.

Distribution: known only from Costa Rica.

A specimen of Acianthera, collected somewhere in Costa Rica by the staff of Jardín Botánico Lankester at the beginning of the 1990s, and somewhat reminiscent of an aberrant form of A. cogniauxiana, has flowered in the living collection of the center for many years now. This accession shows consistent differences in vegetative and floral morphology when compared with A. cogniauxiana, but we were reluctant to name a new taxon on the sole basis of a single, cultivated specimen. Now, three more plants from a different source, unfortunately without collecting locality, were obtained from the collection of Costa Rican orchids of Adolfo Quesada Chanto, and we feel therefore more confident in describing it as a new species. Acianthera hamata is closely related to A. cogniauxiana, with which it shares general habit and flower morphology. However, A. hamata has distinctly lanceolate, erect leaves (vs. broadly ovate, horizontal to slightly decumbent in A. cogniauxiana), rounded at the base (vs. cordate), less than 4 cm wide (vs. more than 6 cm), a characteristically hooked rachis (vs. straight), with up to 5 flowers (to 14 in A. cogniauxiana), smaller flowers (the sepals < 6 mm vs. > 10 mm long), the dorsal sepal obtuse-rounded (vs. acute), the petals entire (vs. serrulate at the apical margins), provided with a rounded lobe on the lower margin, and the disk of the lip with two large, flabellate keels (vs. small, linear). The original locality data associated with the new species remain, unfortunately, unknown, but we hope the formal description of A. hamata will reveal more plants in cultivation and help to gather further information on its ecology.

Acianthera fecunda Pupulin, G. Rojas & J. D. Zuñiga, sp. nov. TYPE: COSTA RICA. Cartago: Turrialba, La Suiza, road between Pacayitas and La Suiza, 2 km South of Pacayitas, 9°52'29.9"N 83°35'03.6"W, 1150 m, premontane rain forest, epiphytic in secondary vegetation along pastures, 8 March 2006, D. Bogarin 2650, R. L. Dressler, A. Karremans & F. Pupulin (Holotype: CR; Isotype: JBL-Spirit). Fig. 2.

Herba epiphytica perpusilla ramicaulibus quam foliis brevioribus, folia anguste ovata, inflorescentia biflora, flores semper cleistogami, sepulum posticum oblum, synsepulum late ovatum, petalis lanceolatibus, labellum 3-lobatum, hastatum, lobulis lateralis rotundatis, lobo intermedio obtuso, daubus carinis subquadratis ornato.

Plant epiphytic, caespitose, small, up to 2.5 cm tall. Roots slender, flexuous, 0.5 mm in diam. Stem short, subtriangular in section, grooved, dilated toward the apex, 6–10 mm long, enclosed at the base by 2–3 infundibuliform, tubular, membranaceous bracts to 5 mm long. Leaf narrowly ovate, acute, minutely emarginate, provided with a small abaxial apicule, 16–17 mm long, 5–6 mm wide. Inflorescence a 2-flowered, suberect raceme borne at the base of the leaf from a membranaceous spathe 2 mm long. Floral bract membranaceous, globose-infundibuliform, acuminate, to 0.5 mm long. Pedicel clavate, to 1 mm long. Ovary elliptic, longer than the pedicel, to 5 mm long, 2 mm wide. Flowers always cleistogamous, yellowish green, sparsely spotted purple on the petals and the keels of the lip. Dorsal sepal oblong, acute, 2.7 mm long, 1.2 mm wide, abaxially carinate. Lateral sepals conuate in the basal two-thirds into a broadly ovate synsepal, obtuse to subacute, 2.8 mm long, 2 mm wide. Petals lanceolate, acute, the distal margins irregularly erose-denticulate, 1.5 mm long, 0.6 mm wide. Lip articulate with the column foot, clawed, obscurely 3-lobed, hastate, 1.6 mm long, 1 mm wide, the lateral lobes rounded, the midlobe obtuse, subcrenulate,
Figure 2. *Acianthera fecunda* Pupulin, G. Rojas & J. D. Zuñiga. A, habit; B, ovary and flower; C, dissected perianth; D, column and lip, lateral view; E, lip, adaxial view; F, column, ventral view. Drawn by G. Rojas from the holotype.
Acianthera cabiriae Pupulin, G. Rojas & J. D. Zuñiga, sp. nov. TYPE: COSTA RICA. Cartago: Turrialba, CATIE, in the Cabiria fruit trees collection of CATIE at Turrialba. 26 September 2006, A. Karremans 1433 (Holotype: CR). Fig. 3.

Acianthera fecunda has apparently no close relatives within the genus, with the exception of the species described hereafter as A. cabiriae. It can be recognized by the very reduced habit size (less than 3 cm tall), the 2-flowered, short inflorescence, and the cleistogamous nature of the flowers. The broadly ovate synsepal, the lanceolate petals with irregularly erose-denticulate margins, and the hastate, obscurely 3-lobed lip provided with subquadrate, laminar keels easily distinguish the flower among Acianthera species.

Acianthera cabiriae Pupulin, G. Rojas & J. D. Zuñiga, sp. nov. TYPE: COSTA RICA. Cartago: Turrialba, CATIE, in the Cabiria fruit trees collection, ca. 600 m, with blossoms and developing fruits at Jardín Botánico Lankester, 26 September 2006, A. Karremans 1433 (Holotype: CR). Fig. 3.

Species Aciantherae fecundae Pupulin, G. Rojas & J. D. Zuñiga similis, atque illae floribus cleistogamis, sed statura duplo majore, foliis ellipticis, inflorescentia tribus vel plus floribus, sepalo dorsalibus elliptico, synsepalo ovato, labello ovato-sublanceolato obscure 3-lobato truncato marginibus laterali-ibus integris carinis diminutis, columna elliptica-subrhomboica clainandrio reducto differt.

Plant epiphytic, caespitose, small, up to 6 cm tall. Roots slender, flexuous, less than 1 cm in diam. Stem subequal to the leaf, triangular in section, grooved, dilated toward the apex, distinctly keeled abaxially, 1–3 cm long, enclosed at the base by 3–4 infundibuliform, tubular, membranaceous bracts to 12 mm long. Leaf elliptic, acute, minutely emarginate, provided with a small abaxial apicule, 3.0–3.5 cm long, 0.8–1.0 cm wide. Inflorescence a 3–(–4-)flowered, prostrate raceme borne at the base of the leaf from a membranaceous, eventually papyraceous, spathe to 3.5 mm long. Floral bract membranaceous, tubular-cylindric, amplictant, obtuse, to 1.8 mm long. Pedicel cylindric, to 1 mm long. Ovary subclavate, longer than the pedicel, to 2.5 mm long, 1.3 mm wide. Flowers always cleistogamous, yellowish green. Dorsal sepal elliptic, acute, minutely subrounded, 3 mm long, 1.5 mm wide, abaxially carinate. Lateral sepals connate into an ovate synsepal, subacute, 3 mm long, 2.3 mm wide. Petals lanceolate, acute, the distal margins irregularly denticulate, 1.8 mm long, 1 mm wide. Lip articulate with the column foot, clawed, obscurely 3-lobed, ovate-sublanceolate, 2 mm long, 1.5 mm wide, the lateral lobes rounded, erect, forming a small cuniculus, the midlobe truncate, provided with 2 low, crenulate, laminar keels. Column semi-terete, elliptic-subrhombic, 1.7 mm long, provided with 2 linear wings, the apex rounded-erose. Anther cap cucullate, obovate, minutely papillose.

Ecology: epiphytic on remnant patches of very wet premontane secondary forest at 1150 m elevation. The cleistogamous flowers have been observed during October and November, corresponding to the rainy season. Acianthera fecunda is closely related to A. cabiriae, and like it, has cleistogamous flowers. A fresh blossom was opened to illustrate the type, in which the pollen was already extruded from the anther and beginning to germinate into the stigmatic fluid. The new species is at least twice the size of A. fecunda, it has elliptic leaves (vs. narrowly ovate), and the inflorescence bears three to four flowers (vs. two). The lateral sepals are connate to the apex into an ovate synsepal (vs. broadly ovate, the apex free in A. fecunda), and the lip is ovate-sublanceolate and truncate (vs. hastate, acute), with low, linear, and inconspicuous adaxial keels (vs. large, flabellate). Moreover, the column of A. cabiriae is elliptic-subrhombic, with a reduced clainandrium, whereas in A. fecunda it is terete with a distinctly petaloid clainandrium.
FIGURE 3. Acianthera cabiriae Pupulin, G. Rojas & J. D. Zuñiga. A, habit; B, apex of the inflorescence and buds; C, dissected perianth; D, column, ventral and lateral views; E, anther cap; F, apex of leaf, abaxial view. Drawn by G. Rojas from the holotype.
LITERATURE CITED


