

## Two new species of *Cochlidium* (Polypodiaceae) from Venezuela

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RESUMEN: Con la revisión de especímenes de *Cochlidium* en el herbario del Missouri Botanical Garden, dos especies nuevas fueron descubiertas confundidas con otras especies. *Cochlidium acrosorum* A. Rojas fue descubierta en la carpeta de *C. connellii* (C. H. Wright) A. C. Sm y *C. nervatum* A. Rojas fue encontrada en la carpeta de *C. attenuatum* A. C. Sm. *Cochlidium attenuatum* y *C. connellii* se distinguen porque ambas tienen soro discontinuo, la primera con lámina sinuosa y la segunda con lámina entera, sin embargo, las dos especies nuevas tienen soro continuo en el ápice, entre ellas *C. acrosorum* tiene rizoma robusto (vs. delgado) y escamoso (vs. glabro), lámina cartácea (vs. papirácea) con el ápice abruptamente expandido (vs. gradualmente expandido) y terminando en un margen entero (vs. dentado) y las venas no evidentes (vs. evidentes) en la superficie adaxial.

PALABRAS CLAVE: *Cochlidium*, Polypodiaceae, nuevas especies, Venezuela.

ABSTRACT: With the revision of specimens of *Cochlidium* in Missouri Botanical Garden herbarium, two new species were found that had been confused with other species. *Cochlidium acrosorum* A. Rojas was discovered in the folder of *C. connellii* (C. H. Wright) A. C. Sm. and *C. nervatum* A. Rojas was found in the folder of *C. attenuatum* A. C. Sm. Both *C. attenuatum* and *C. connellii* have discontinuous sori, the first with a sinuate blade and the second with an entire blade, while, the two new species have continuous sori at the apex, of these, *C. acrosorum* has robust (vs. thin) and scaly (vs. glabrous) rhizome, chartaceous (vs. papyraceous) blade with abruptly expanded (vs. gradually expanded) and ending in entire (vs. dentate) blade apex and veins not evident (vs. evident) on adaxial surface.

KEY WORDS: *Cochlidium*, Polypodiaceae, new species, Venezuela.

### INTRODUCTION

The genus *Cochlidium* was proposed by Kaulfuss in 1820, but the name was ignored for a long time and the species recognized as members of the genus were included in the later *Pleurogramme* (Blume) C. Presl or, in the broad concept of *Monogramma* used by Hooker (1864). Christensen (1929) again used *Cochlidium* in the modern concept of the genus, including all the New World grammitid ferns with coenosori (also *C. furcatum* with polypodioid sori). Copeland (1947) transferred several species to the genus *Grammitis* Sw. and retained in *Cochlidium* only the species with coenosoral character.

Morton (1967) used only the genus *Grammitis* for all the grammitid ferns.

Bishop (1978) revised the genus *Cochlidium* and defined it as consisting of Neotropical grammitid ferns with simple and entire or at most sinuate fertile laminae, concolorous rhizome scales, hydathodes, and 2-8-celled hairs which characteristically have thickened intercellular walls and are frequently somewhat catenate.

Ranker *et al.* (2004), in their phylogenetic analysis of grammitid ferns, discovered that *Cochlidium* is sister to two species of

*Grammitis* analyzed, both with sclerified, black leaf margins, a character present in the type of the genus [*G. marginella* (Sw.) Sw.].

***Cochlidium acrosorum*** A. Rojas, sp. nov.

TYPE: Venezuela. Bolivar: Distrito de Piar, Amaruay-tepui, summit on W edge E of Auyan-tepui, W of Aparamán-tepui, 5°55'N, 62°15'W, 1030 m, 27 May 1986, B. Holst et al. 2969 (Holotype: MO). FIGURE 1.

*A Cochlidium connellii* (C.H. Wright) A.C. Sm. lamina abrupte apice dilatata (adversus quasi regulariter dilatatum tota extensione sua) et soro confluyente apice (adversus fragmentatum et dispersum lamina) differt.

**Plant** epiphytic; **rhizome** 0.5--1 mm diameter, robust, long ascending, scaly, the scales 1.5--2.5 x 0.2--0.3 mm, lanceolate to linear-lanceolate, gold to reddish-brown, not clathrate, the margin entire; **fronds** 1--4 cm long, monomorphic to subdimorphic, the sterile fronds oblong to linear oblong, the fertile spatulate, longer and broader at apex; stipe less than 2 mm in sterile fronds and to 3 mm in fertile fronds, dark grey to blackish; **blade** 1--3 mm wide, oblong to spatulate, chartaceous, straight to curved, flat to slightly conduplicate at apex, basally attenuate, apically obtuse to rounded, marginally entire; **rachis** evident in both sides, dark grey to blackish, straight, evanescent at apex; **veins** simple, not evident, evanescent at apex; **hydathodes** not evident, dark; **sori** ca. 1 mm long, elliptic to oblong, confined to expanded apex in a coenosori of 2--6 mm long.

**Distribution.** Known only from Venezuela in Amaruay-tepui at 550--1100 m.

**Paratype.** Venezuela. Bolivar: Distrito de Piar, summit of Amaruay-tepui, SE quarter of tepui, 5°55'N, 62°13'W, 550--1100 m, 12 May 1986, R. Liesner & B. Holst 20850 (MO).

The new species differs from *Cochlidium connellii* (C. H. Wright) A.C. Sm. by the

blade being abruptly expanded at the apex (vs. gradually expanded in the medium and apical portion of the blade) and by having the sori confluent at the apex (vs. sparse in the blade). Probable it is more related to *C. tepuiense* (A.C. Sm.) L.E. Bishop sori joined at the apex and blade expanded here, but differs in shorter fronds [1--4 cm long vs. (3--5) 5--8 cm], blade narrower (1--3 mm wide vs. 3--4 mm) and distributed to relatively lower elevation (550--1100 m. vs. 1000--2000 m).

**Etymology:** The name of this species refers to sori on blade apex.

***Cochlidium nervatum*** A. Rojas, sp. nov.

TYPE: Venezuela. Territorio Federal Amazonas: Departamento Atabapo, slope of Cerro de Marahuaca, Río Yameduaka arriba, 3°38'N, 65°28'W, 1225 m, 17--18 Feb 1985, R. Liesner 17608 (Holotype: MO). FIGURE 2.

*A Cochlidium attenuato* A.C. Sm. lamina magis dilatata et breviori, soro apice confluenti et nervatione visibili differt.

**Plant** epiphytic; **rhizome** 0.3--0.5 mm diameter, short ascending, thin, black, glabrous; **fronds** 0.8--5.5 cm long, subdimorphic, the fertile to 5 times longer than the sterile and linear-oblongate, only with the apical portion (where the coenosori are) expanded, the sterile fronds oblongate with medium and apical portion broad, the other parts of the blades less than 1 mm broad, glabrous; stipe less than 3 mm in sterile fronds and to 5 mm long in fertile fronds, blackish; **blade** 1--2 mm wide, oblongate to linear-oblongate, papyraceous, straight to falcate, flat, basally attenuate, apically acute, marginally entire to dentate at the apex; **rachis** blackish, slightly flexuous (at least at the apex); **veins** simple to 1-forked in the soral portion, evident in both sides, evanescent at apex; **hydathodes** not evident, dark; **coenosori** 2--8 mm long,

oblong to linear-oblong, confined to distal quarter of the blade.

*Distribution.* Known only from the type collection from Cerro Marahuaca in Venezuela at 1225 m.

The new species differs from *Cochlidium attenuatum* A. C. Sm. by broader [2--3 mm broad vs. 0.7--1.5 (--2) mm] and shorter (1--4 cm long vs. 5--15 cm) blade, with confluent sori at the apex (vs. sori sparse in medium and apical portions of the blade) and visible (vs. immersed) veins. It probably is more closely related to *C. wurdackii* L.E. Bishop by thin rhizome, narrow blades and veins evident, but differs in epiphytic (vs. terrestrial) habit, ascending (vs. creeping)

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rhizome, glabrous (vs. scaly) rhizome and acute (vs. obtuse) and dentate (vs. entire) apex.

*Etymology:* The name of this species refers to the visible veins

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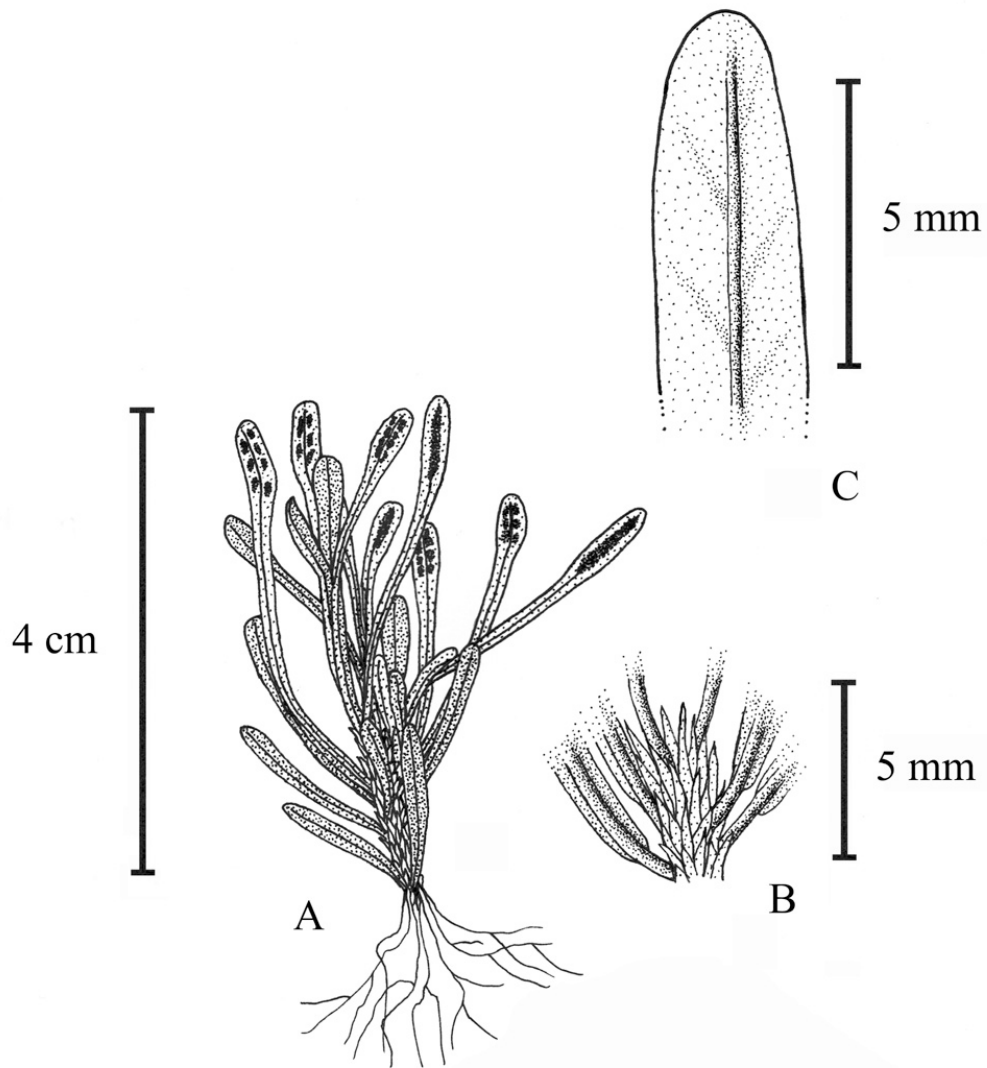


Figure 1. A-B. *Cochlidium acrosorum* A. Rojas (B. Holst et al. 2969, MO). A. Habit. B. Rhizome detail. C. Sterile blade apex detail.

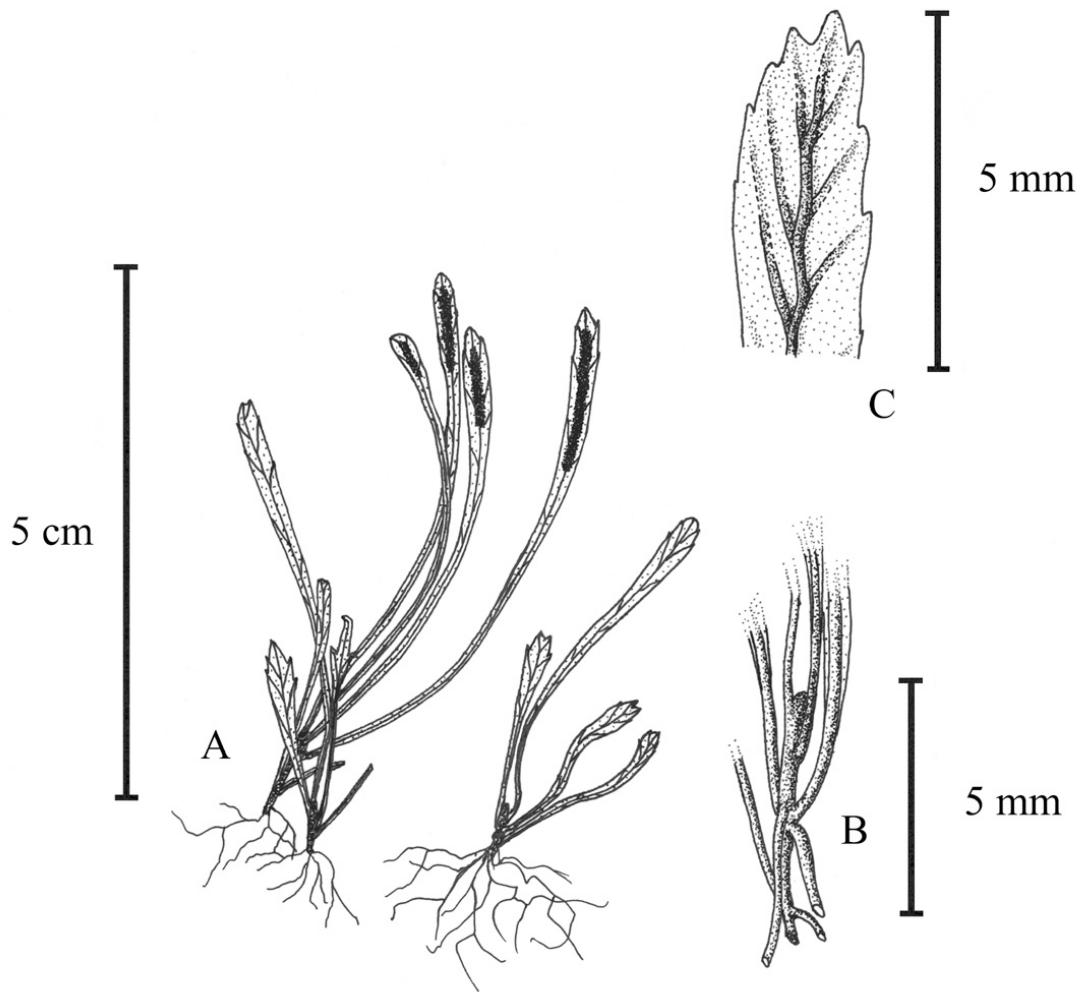


Figure 2. A-B. *Cochlidium nervatum* A. Rojas (R. Liesner 17608, MO). A. Habit. B. Rhizome detail. C. Sterile blade apex detail.