

Finding of *Systrophia argentina* n. comb. in the Argentine Precordillera (Mendoza province) a century and a half after its description (Mollusca: Gastropoda: Scolodontoidea)

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Abstract: *Systrophia argentina* (Strobel, 1874) n. comb. is here re-described 150 years after its discovery. The specimens were found in the Argentine Precordillera (Quebrada San Isidro, Mendoza province, Argentina), at 2.000 m, near the typical locality of the species, here restricted to the *Angostura* or *garganta* (gullet) of Villa Vicencio and Casa de Piedra. It is the southernmost distribution of the genus. This snail has a shell of medium size, planispiral, with six whorls; radula with central plate tricuspid, and latero-marginal teeth aculeate, formula: 13 – C – 13; vagina short, spermathecal duct reaching the distal extreme of the vagina, near the atrium; penial sheath long, penis occupying most of the penial sheath, *epiphallus* with a retractor muscle adhered to its extreme, large and quadrangular gland attached to the penial sheath; atrium very short. *S. argentina* is the only species of *Systrophia* L. Pfeiffer, 1855 in Argentina, being the most austral distribution of the genus

Key words: Scolodontidae, South America, Andes mountains, Mendoza province, genital apparatus, radula

Resumen: Hallazgo de *Systrophia argentina* n. comb. en la Precordillera argentina, a 150 años de su descripción (Mollusca: Gastropoda: Scolodontoidea). *Systrophia argentina* (Strobel, 1874) n. comb. es redescrita después de 150 años de su descubrimiento. Los ejemplares fueron encontrados en la Precordillera argentina (Quebrada San Isidro, provincia de Mendoza, Argentina), a 2.000 metros sobre el nivel del mar, cerca de su localidad típica. Ésta, aquí es restringida a Villa Vicencio y Casa de Piedra. Presenta una concha de tamaño mediano, planispiral, con 6 vueltas; rádula con placa central tricúspide, y dientes latero-marginales aculeados, fórmula: 13 – C – 13; vagina corta, ducto espermático alcanzando el extremo distal de la vagina, cerca del atrio; bolsa del pene larga, el pene ocupa la mayor parte de la bolsa peniana, epiphallus presenta un músculo retractor en su extremo; glándula cuadrangular grande adherida a la bolsa del pene; atrio muy corto. *S. argentina* es la única especie del género encontrada hasta el momento en la Argentina, siendo la distribución más austral de *Systrophia* L. Pfeiffer, 1855.

Palabras clave: Scolodontidae, South America, Andes mountains, Mendoza province, genital apparatus, radula

INTRODUCTION

In 1868, Pellegrino Strobel wrote his first comments about the continental mollusks of the Argentine *Precordillera* of Mendoza province. A few years later, in the same area, the author described a new species of Scolodontidae H.B. Baker, 1925, *Hyalina* (*Ammonoceras*) *argentina* Strobel, 1874, classified as Streptaxidae Gray, 1860. With no new specimens, Doering (1877) transferred the species to his new sub-genus, *Streptaxis* (*Scolodonta*) Doering, 1877; a few years later, Tryon (1885) combined it to *Streptaxis* (*Ammonoceras*) L. Pfeiffer, 1855 (a synonymous junior of *Happia* Bourguignat,

1889 (Worms, 2020). In 1920, Frenguelli called *Scolodonta argentina* to fossil specimens from Pleistocene and Holocene of Córdoba and Entre Ríos (Argentina), but the specific identity of them is dubious (Miquel & Aguirre, 2011).

The Scolodontidae is an interesting group of landshells inhabiting Central and South America, with numerous living species; recent studies consider it a clade of gastropods pulmonate (Ramírez *et al.*, 2012; Worms, 2020). *Systrophia* L. Pfeiffer, 1855 is a characteristic genus of tropical areas of Venezuela, Colombia, Ecuador, Peru, Brazil and Bolivia (Ramírez *et al.*, 2012, fig. 10), with species of large and thin shells, and spire very low.

Several species of this family have an almost transparent shell, with a very colored body (white, yellow, orange or red). These species are carnivorous; they eat worms and other snails, being active and voracious (Ramírez, 1993). In Argentina, the family Scolodontidae includes the genera *Scolodonta* Doering, 1875, *Happia* Bourguignat, 1889, *Drepanostomella* Bourguignat, 1889, *Miradiscops* H.B. Baker, 1925 and *Wayampia* Tillier, 1980 (Fernández, 1973; Ramírez, 1993; Miquel *et al.*, 2007; Hausdorf, 2006). *Wayampia* was later synonymized to *Scolodonta* (Bank, 2017). *Happiela* H.B. Baker, 1925 has been recorded by Ramírez (1993) for Argentina, but this mention is dubious. Here, *Systrophia argentina* (Strobel, 1874) n. comb. is re-described, based on new materials from the *PreCORDILLERA* of Mendoza province, Argentina. This is the first record of the species in the last 150 years and the first reliable cite of the genus *Systrophia* L. Pfeiffer, 1855.

MATERIALS AND METHODS

The specimens were housed in the Invertebrates Division of the Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" (MACN-In), Buenos Aires, Argentina. They are stored in ethanol 70%. The images of the radula were obtained in the Service of Scanning Electronic Microscopy of the MACN (Phillips XL Series 30), previously metalized with gold-palladium. The classification of Worms (2020) is followed; the number of whorls was counted according to Kerney & Cameron (1979).

RESULTS

Scolodontidae

Systrophia L. Pfeiffer, 1855

Systrophia argentina (Strobel, 1874) n. comb. (Figs. 2-3)

Hyalina (*Ammonoceras*) *Argentina* Strobel, 1874: 9, Tav. 1, Fig. 1.

Streptaxis (*Scolodonta*) *Argentina* Doering, 1877: 310.

Streptaxis (*Scolononta*) (*sic*) *Argentina* Doering, 1878: 229.

Streptaxis (*Ammonoceras*) *Argentina* Tryon, 1885: 66, pl. 13, Figs. 58-60.

? *Scolodonta argentina* Frenguelli, 1920: 162, 249.

? *Scolodonta argentina* Miquel & Aguirre, 2011: 123, Fig. 35.

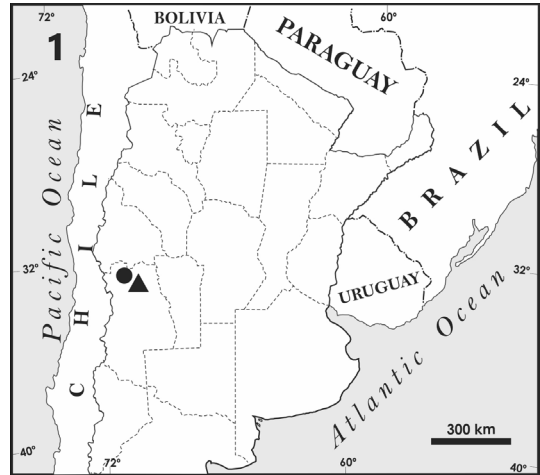


Fig. 1: Location of area where the species were found (▲) and the typical locality restricted ("Angostura" or "garganta" of Villa Vicencio and Casa de Piedra, PreCORDILLERA, Argentina) (●).

Diagnosis. Shell small, planispiral, 5- 6 whorls, protoconch with almost 2 whorls; radula with teeth aculeate, formula: 13 - C - 13; vagina and atrium short; spermathecal duct reaching the distal extreme of the vagina; penial sheath with some circumvolutions; penis occupying most of the penial sheath; large and quadrangular gland ("penial gland") attached to the distal extreme of the penial sheath.

Description. Shell small (6 - 4.55 mm in adult stage), planispiral, 5.00 - 5.50 whorls, semitransparent (height low (2.00 - 1.69 mm), almost smooth, slow growth, suture deep, umbilicus large and perspective (1.95 - 1.82 mm), aperture circular (1.43 - 1.30 mm), peristome slightly expanded, superior edge of the peristome a bit descendent and oblique, growth lines scarcely marked, more marked on the first adult whorls, body yellowish, protoconch with almost 2 whorls, smooth (Fig. 2A-D, Table 1). Radula with central plate tricuspid, and latero-marginal teeth aculeate, typical of the family: 13 - C - 13 (Fig. 2E-F). Genital tracts very long and slim. Gonadal hermaphrodite acini cream, spermatheca (or seminal vesiculae) and hermaphroditic duct typical ones; spermioviduct, albumen gland and prostate elongated; fertilization sac medium size; long and convolutioned free oviduct; vagina short (oviduct + vagina: 2.75 mm aprox.); spermatheca claviform, spermathecal duct very long (3.5 mm aprox.), reaching the distal extreme of the vagina, near the atrium; long penial sheath,

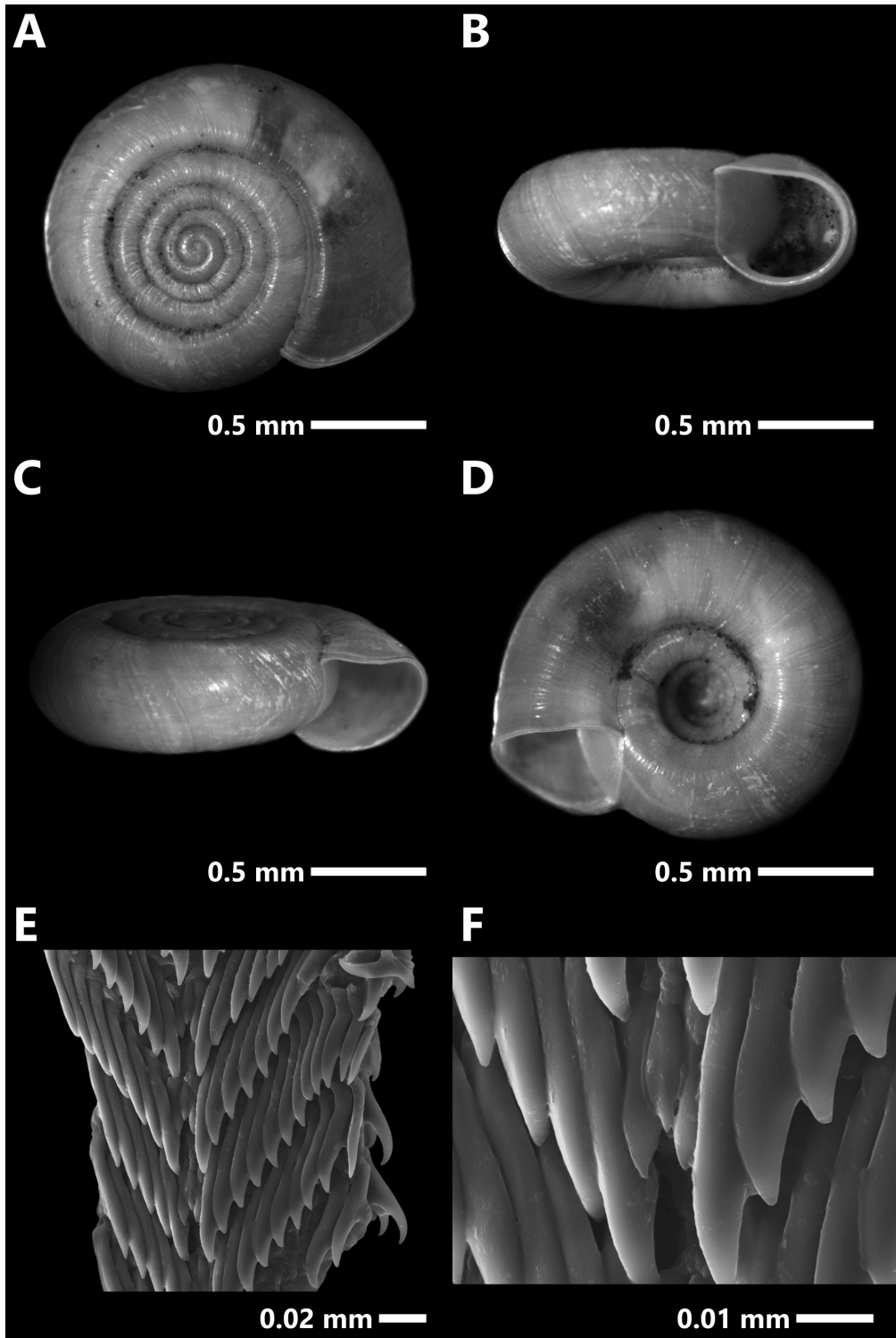


Fig. 2 A-F: *Systrophia argentina* (Strobel, 1874). MACN-In 42446. Quebrada San Isidro, 2.050 masl. Precordillera Mendoza province, Argentina. A. Apical view. B-C. Apertural view. D. Umbilical view. Radula. E. General view. F. Detail of central plate.

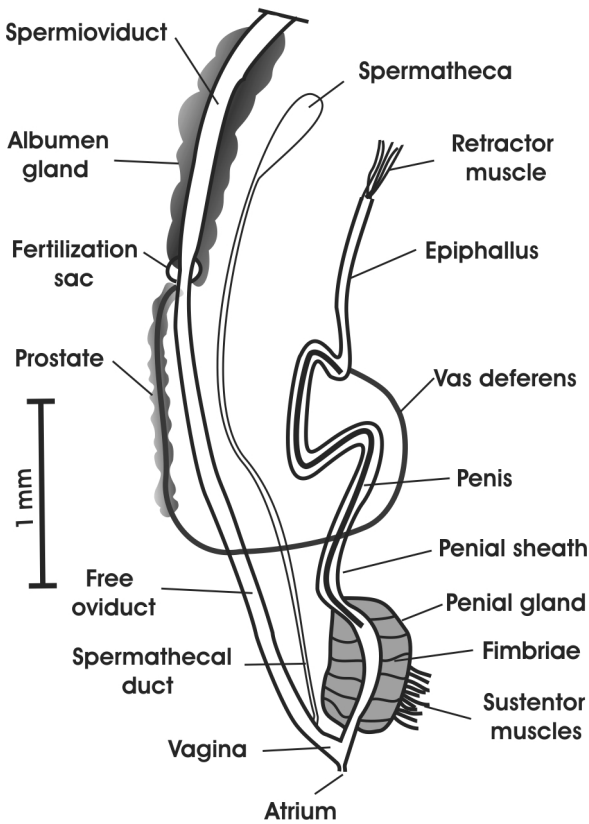


Fig. 3: *Systrophia argentina* (Strobel, 1874). MACN-In 42446. Quebrada San Isidro, 2.050 msnm. Precordillera, Mendoza province, Argentina. Genital apparatus.

with some circumvolutions; penis occupying most of the penial sheath, vas deferent penetrating laterally at the base of the penis; epiphallus with a retractor muscle adhered to its extreme (*epiphallus* + penial sheath: 4 mm aprox.); large and quadrangular gland (“penial gland”) attached to the distal extreme of the penial sheath, with some sustentor muscles, the walls of this gland are internally fimbriated; atrium very short (Fig. 3; Table 1).

Typical locality. “*Angostura*” or “*garganta*” (gullet) of Villa Vicencio and Casa de Piedra, Precordillera, Argentina (here restricted) (Fig. 1).

Distribution. Argentina: Mendoza province: Precordillera, ca. 2,000 m. Found on the ground with *Artemisia echegarayi* Hieron. (Asteraceae) and specimens of *Scolodonta semperi* Doering, 1875 (Fig. 1).

Materials studied. *S. argentina*: MACN-In 42446. Argentina: Precordillera, Mendoza province. Quebrada San Isidro, 2,050 m asl. 4/IV/1983. C. and A. Roig. 3 exs. in ethanol (1 ex. complete, 2 exs. dissected with their soft parts, and 1 radula metallized). *S. semperi*. MACN-In 42284. Similar locality. 2 exs. in ethanol. *S. cere-*

onitens Haas, 1951. MACN-In 29466. N-Peru, to the south of San Ignacio, valley of the Chinchipe river. Col. and det. W. Weyrauch. 5 exs.

Taxonomic remarks. The type series is lost. Strobel (1874) described this Argentine species based on specimens larger than those here analyzed (6 mm). Frenguelli (1920) cited this species for the Ensenadan (“pre-bonaerian”) age-middle Pleistocene- from the cities of Córdoba (Córdoba province) and Paraná (Entre Ríos province), and in recent loess in Paraná; however, the specimens studied by this author are not co-specific with *S. argentina* and could be a species of *Scolodonta* (Miquel & Aguirre, 2011). So far, *S. argentina* has not been found in the other areas indicated by Strobel (1874): Napostá Grande valley and Sierra de la Ventana (Buenos Aires province). Thus, it is considered necessary to restrict the typical locality to the localities of Mendoza province.

Hyalina (Ammonoceras) argentina is included in the genus *Systrophia* due to the following features: shell discoid, whorls that grow slowly, last whorl not larger than previous whorls, apertural teeth absent, genital ducts very long and

Table 1. Measurements of *Systrophia argentina* (Strobel, 1874) (*shell and body lost, dissected for radula and genitalia).

	Main diameter	Height	Whorls	Umbilicus	Aperture
Original material (lost)	6	2	5	---	---
MACN-In 42446 (adult)	4.68	1.82	5.50	1.82	1.30 x 1.30
MACN-In 42446*	4.55	1.69	5.50	1.95	1.43 x 1.43
MACN-In 42446 (young)	3.64	1.30	4.75	1.30	1.17 x 1.30

thin, similar to generic model (Ramírez, 1993). Now, *Hyalina* S. Studer, 1820 is a synonym of *Vitrina* Draparnaud, 1801 (Vitrinidae Fitzinger, 1883), and *Ammonoceras* L. Pfeiffer, 1855 is a synonym of *Happia* (Zilch, 1960; Bank, 2017).

An uncommon feature found in *S. argentina* is the penial gland (Fig. 3). This large gland does not seem to be present in other genera and species of Scolodontidae; an “atrial gland” of similar location has been described in *Tamayoa* sp. (from uncertain locality) (Ramírez, 1993), whereas an “*organe amatorial*” (“organ of love”) has been described in *T. (Tamayops) decolorata* (Drouët, 1859), from Cayenne (French Guiana) (Tillier, 1980). The former structure could be homologous to the gland of *S. argentina*, not so the latter, which has an apparent mechanical, not glandular, function.

Systrophia argentina is different from *Scolodonta* spp. in the larger size, more number of whorls, and the planispiral coiling. *S. semperi*, which inhabits north and central Argentina, has a smaller discoid shell, genital ducts thickened, atrium long, vagina short, and deferent duct inserted in the proximal extreme of the *epiphallus* (Hylton Scott, 1945; Hausdorf, 2006). *S. argentina* is different from the species of *Happia* in the shell morphology, which, in the latter is subcircular to subdiscoidal, with whorls with fast growing (Ramírez, 1993). The species of *Happia* found in Argentina are *H. skiaphila* (d’Orb., 1835) and *H. ordinaria* (Smith, 1881) (Hylton Scott, 1948, 1972). The former species lives in the north of the country, measures 11 mm, has 7 whorls and genital ducts thick and convolutioned, principally those of the male via (Hylton Scott, 1948), and was classified as *Wayampia* by Ramírez (1993). *Happia ordinaria*, from Patagonia, has a width of 3 mm, 3.5 whorls with fast growing, and radula with the formula 12 – C – 12, where there are lateral teeth tricuspid and monocuspid (Hylton Scott, 1972), very different from those of *S. argentina*.

The austral distribution of *Systrophia* reaches Bolivia (Ramírez, 1993; Ramírez *et al.*, 2012), so, *S. argentina* could be considered a relict species, surviving in a warm and slightly humid mountainous area, being the distribution more austral for the genus. According to Strobel (1874), this species coexists with *Bostryx mendocanus* (Strobel, 1874), *B. cordillerae* (Strobel, 1874) and *B. cuyana* (Strobel in Pfeiffer, 1867) (Breure, 1979; Miquel, 1995).

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