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## A NEW SPECIES OF COSSURIDAE (ANNELIDA: POLYCHAETA)

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### FROM VENEZUELA

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Ildefonso Liñero-Arana and Óscar Díaz-Díaz

#### SUMMARY

A new species of the polychaete family Cossuridae is described from Venezuela. The main characteristic of *Cossura ginesi* n. sp. is the presence of a pair of well developed anterior lateral horns on the prostomium. The branchial filament arises from

the posterior border of setiger 2. *C. ginesi* was collected from shallow muddy sediments (4m deep) close to the coast of the Paria Peninsula, Venezuela.

## UNA NUEVA ESPECIE DE COSSURIDAE (ANNELIDA: POLYCHAETA) DE VENEZUELA

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#### RESUMEN

Se describe una nueva especie de poliqueto perteneciente a la familia Cossuridae de Venezuela. La principal característica de *Cossura ginesi*, nueva especie, es la presencia de cuernos laterales bien desarrollados en el extremo anterior del prostomio. El

filamento branquial emerge del margen posterior del setígero 2. *C. ginesi* fue recolectado en sedimentos fangosos en aguas someras (4m de profundidad) muy cerca de la costa de la Península de Paria, Venezuela.

## UMA NOVA ESPÉCIE DE COSSURIDAE (ANNELIDA: POLYCHAETA) DA VENEZUELA

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#### RESUMO

Descreve-se uma nova espécie de poliquetas pertencente à família Cossuridae da Venezuela. A principal característica de *Cossura ginesi*, nova espécie, é a presença de cornos laterais bem desenvolvidos no extremo anterior do prostômio. O fila-

mento branquial emerge da margem posterior do setígero 2. *C. ginesi* foi recolhido em sedimentos fangosos em águas someras (4m de profundidade) muito perto da costa da Península de Paria, Venezuela.

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#### Introduction

Cossurids were originally included in the Cirratulidae Ryckholdt, 1851, until Day (1963) established the family Cossuridae, composed solely by the genus *Cossura*. Later, Hartman (1976) proposed the genus *Cossurella* for those species with acicular spines on the abdomen, instead of capillary setae. *Heterocossura*, proposed by Wu and Chen (1977), was synonymized

with *Cossurella* (Gardiner and Wilson, 1979). Hilbig (1996) identified 22 known species of cossurids, 17 in the genus *Cossura* and five species in *Cossurella*. Subsequently, Read (2000) disputed the validity of the genus *Cossurella* on the grounds that it included species with thick abdominal spines as well as those with pilose or hirsute capillary setae, and concluded that *Cossurella* and *Heterocossura* are junior synonyms

of *Cossura*. Rouse and Pleijel (2001), however, did not take into account Read's proposal, and suggested that cossurids should be placed into either *Cossura* or *Cossurella*, the first with 18 named species and the latter with five.

Cossurids are small worms living in soft sediments from shallow to abyssal depths (Ewing, 1984) and are particularly abundant on deep-sea bottoms (Hilbig, 1996). A long branchial filament on the

dorsum of one of the anterior setigerous segments is exclusive to this family. Taxonomic features of cossurids are scarce, and refer principally to the number of asetigerous anterior segments, the origin of the branchial filament, the number of setigers in the anterior region, the structure of the pygidium, and types of setae. Nevertheless, some of these characters have been interpreted in different ways. For example, as regards the

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number of anterior asetigerous segments, Laubier (1963) reported two for *Cossura soyeri* Laubier, 1963, naming the anterior one as the buccal segment or peristomium. This statement disagrees with that outlined by Eliason (1920) and Thulin (1921), according to Jones (1956), who mentioned that the prostomium had a transverse furrow, giving the erroneous impression that the proximal part was an asetigerous segment. Fournier and Petersen (1991) stated that *Cossura longocirrata* Webster and Benedict shows a subdivided prostomium in contracted specimens, but not in relaxed ones, an interpretation that was also adopted by Hilbig (1996) and Rouse and Pleijel (2001).

Other authors (Ewing, 1984; Read, 2000) have suggested that the first segment posterior to the prostomium, or peristomium, is dorsally subdivided, and includes two segments, a position that we agree with, due to the fact that in *C. ginesi* n. sp. the transverse mouth is located midventrally between the two peristomial incomplete rings.

The body is divided into three regions. The number of setigers in the anterior region has been utilized as a taxonomic character; even though some authors dispute the usefulness of this trait, owing to the lack of a clear division between this region and the mid-region (Granados-Barba and Solís-Weiss, 1997; Read, 2000). Differences between these regions are based on the anterior region being dorsoventrally flattened and more rigid than the abdomen (Hilbig, 1996); segments of the anterior region are wider than long, their setal fascicles emerge immediately behind the segmental division, gametes are absent, and the longitudinal musculature fills their body cavity (Read, 2000). The median region is cylindrical and soft, with segments that are about as long as wide, and the setae emerge near the middle of each segment, longitudinal musculature

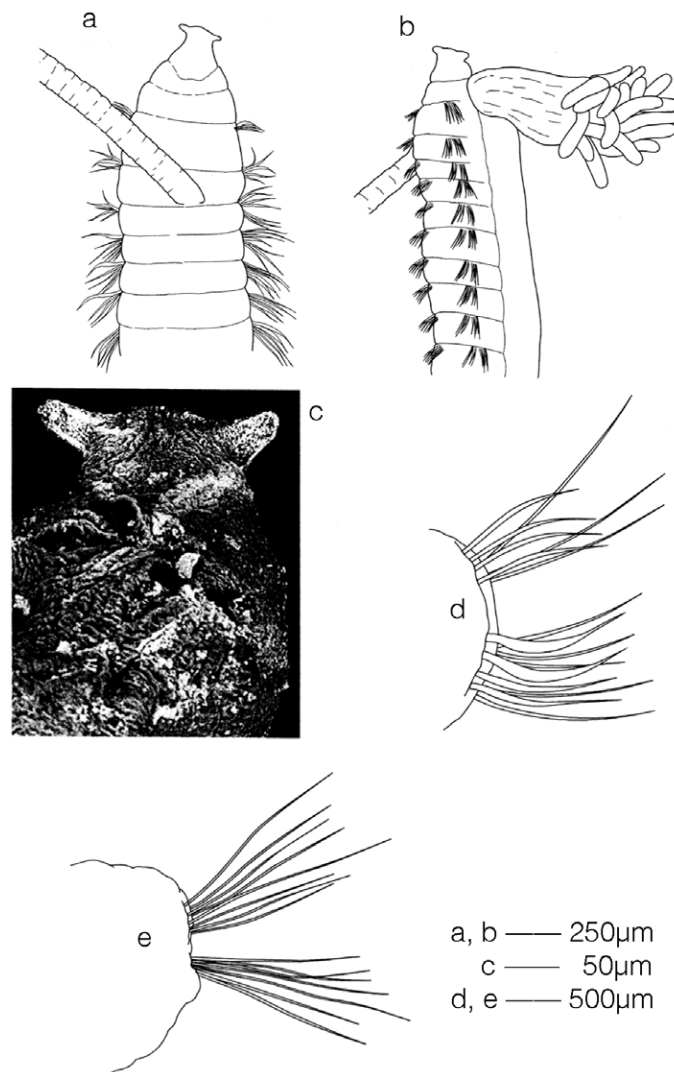


Figure 1.- a, c) Anterior end in dorsal view, b) anterior end in lateral view showing pharynx partially everted, d) anterior setiger, e) posterior setiger.

is absent and the coelomic cavity is occasionally filled with gametes. The posterior region has segments as long as those of the middle region, but with a more bead-like appearance, the last few narrow, and with 2-3 asetigerous segments before the anal pad (Read, 2000).

On the other hand, specimen identification may be complicated due to the fact that most of the specimens collected are incomplete, which has impeded the correct identification of the number of setigers in the anterior-region, the structure of both the median and posterior regions and the pygidium. According to Read (2000), descriptions of 16 of the 23

known cossurids are based on incomplete specimens, and nine of these, from inadequate material, with less than 10 incomplete individuals of each species.

Until the present study, cossurids were unknown from Venezuelan waters. In this paper a new species of Cossuridae is described, based on 40 anterior fragments and one posterior fragment.

#### Methods and Study Area

Sampling was conducted aboard the oceanographic vessel *Guaiquerí II*, belonging to the Instituto Oceanográfico de Venezuela, as part of an interdisciplinary base-line gasiferous project (Proyecto

Gran Mariscal Sucre) between 03/01/2005 and 10/07/2005 at 28 sampling sites on the sea bottom along the north coast of the Paria Peninsula (North-eastern Venezuela). Macrofauna was collected with a 0.1m<sup>2</sup> Van Veen grab and screened through a 0.5mm mesh sieve. The polychaetes were sorted and preserved in 70% ethanol after fixing in 8% formalin in seawater. Thirty three anterior fragments and one posterior fragment of *Cossura ginesi* n. sp. were collected at station 4 (10°41'27"N - 63°15'33"W), from mud at a depth of 4m. Later (07/04/2007) six specimens were collected from the same sampling site.

Measurements of the prostomium are expressed in mm, first of the holotype, followed (in brackets) by the paratypes (mean ± standard deviation, range, and number of measurements taken). Measurements of the setae are expressed in μm.

#### Results and Discussion

##### *Family Cossuridae emended after Day, 1963*

**Diagnosis.** Prostomium conical pointed or rounded anteriorly or with well developed anterior lateral horns. Eyes absent, although a pair of nuchal lateral organs is present. Eversible pharynx soft, unarmed, and lobed or digitated. Peristomium subdivided by a transverse furrow. Single long tentacle or branchial filament arising from the dorsal surface of setigers 2 to 5. First or first few anteriormost setigers generally uniramous, biramous thereafter with inconspicuous parapodial lobes. Body indistinctly divided into three regions (anterior or thoracic, median or abdominal, and posterior). All setae simple, smooth, limbate, hairy or finely serrated, arranged in one or two vertical rows in each fascicle. Abdominal acicular spines present (*Cossurella*). Pygidium with dorsal anus with three short to long slender cirri that may be accompanied by papillae or finger-like processes.

**Diagnosis.** Prostomium pointed or rounded anteriorly or with well developed anterior lateral horns. Peristomium subdivided by a dorsal transverse furrow. Single branchial filament arising middorsally between segments 2 and 5. Simple capillary bilimbate or hirsute and heavy sickle-shape setae.

*Cossura ginesi*, n. sp.

Figure 1, a-e; Figure 2, a-e

**Material examined.** Holotype (MOBR-I-1174) 07/10/05 and five paratypes (MOBR-I-1175), deposited in the Museo Oceanológico Hermano Benigno Román, Margarita Island, Venezuela. Two paratypes (MNCN 16.01/10825) deposited in the Museo Nacional de Ciencias Naturales, Madrid. six paratypes (MMUDO-IP-0231), 01/03/05, deposited in the Museo Marino de Cumaná-Universidad de Oriente. Twenty paratypes (LBP-Co0012) deposited in the Laboratorio de Biología de Poliquetos, Instituto Oceanográfico de Venezuela, Universidad de Oriente.

**Type locality.** North of the Paria Peninsula, Venezuela, 10°41'27"N, 63°15'33"W.

**Description.** Body small, threadlike. Prostomium trap-ezoidal, dorsoventrally flattened, with well developed anterior lateral horns (Figure 1a, c). Length of prostomium 0.120mm (0.103-0.156, 0.130 ± 0.018, n = 15); width between horns: 0.179 (0.137-0.260, 0.202mm ± 0.028, n = 37), narrowest width of prostomium: 0.119 (0.009-0.168, 0.130 ± 0.024, n = 29). Eyes absent. A pair of nuchal organs as lateral ciliated furrows. Peristomium subdivided by a dorsal transverse furrow into two rings similar in length. Transverse mouth slit located midventrally between the two peristomial rings. Pharynx, when everted, basally cylindrical and with approximately 20 ciliated digitate lobes (Figure 1b). Single median branchial

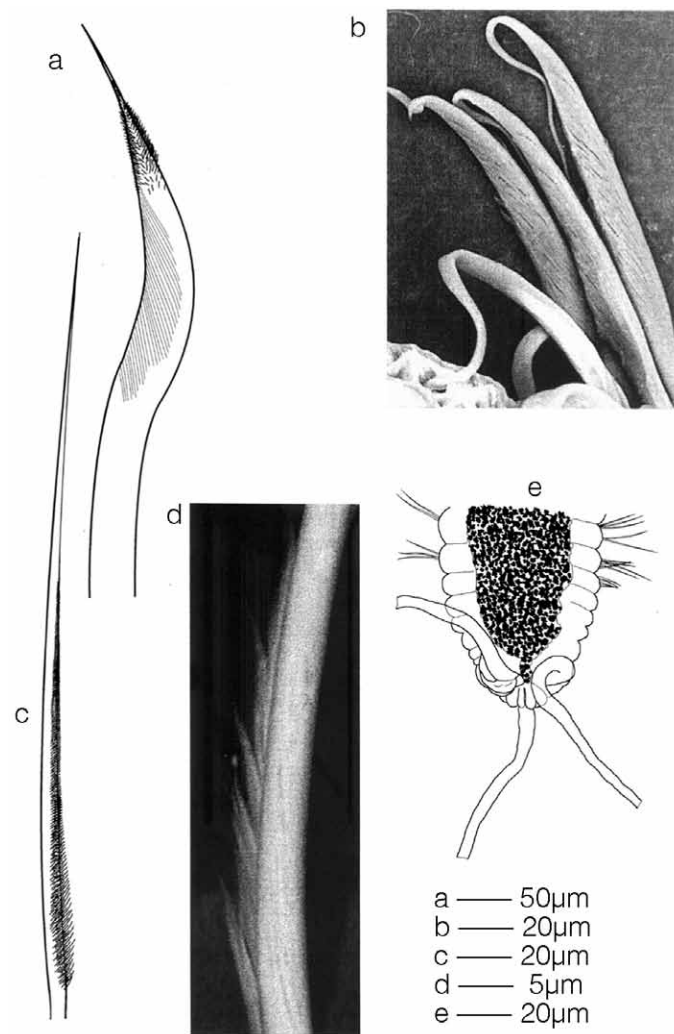


Figure 2. a: coarse sickle-shaped setae; b, c: capillary setae; d: detail of capillary setae; e: posterior end.

filament wrinkled, arising from posterior border of setiger 2, 10.54mm long and 0.101mm wide near the base, in the holotype.

**Anterior region.** First setiger uniramous, thereafter biramous with a relatively broad gap between setal fascicles (Figure 1d). Setal fascicles emerging from anterior segmental edge. From setiger 3-4 until 15-16, segments appear dorsally biannulated by a furrow, inconspicuous on median dorsal zone. Longitudinal musculature arranged in two lateral bundles.

**Median region.** Beginning in setiger 16-17 segments longer than those of the anterior region, setal fascicles arising from mid-setiger (Figure 1e). Longitudinal musculature as

in the anterior region. Gametes were not observed.

Setae of two basic types; first one as curved capillary with long tips and rows of dense fine hairs, giving the erroneous appearance of a limbate condition (Figure 2, Figure 1c, d), as pointed out by Ewing (1984), second one as heavy sickle-shaped setae with a straight smooth basal region, and curved, flattened and coarser median-region, tapering gradually to the distal end, with a long, smooth spine-like tip. Subdistal zone covered with short hairs before the spine-like tip (Figure 1a, b).

Setae arranged in two vertical parallel rows in each ramus. Notopodial and neuropodial capillary setae arranged with the hirsute edges *vis à*

*vis*. Anteriormost notopodial capillary setae coarser and wider than those of the posterior row. Neuropodial setae of two types, the anterior ones sickle-shaped setae in setigers 1 to 12-13, the posterior setae capillary. From setigers 13-14 sickle-shaped setae are replaced by capillary setae.

First setiger with 4 setae in each row, anterior row with two superiormost coarse sickle-shaped setae (8.3µm ± 1.5, 4.8-9.6, n = 13) and two inferior similar but more slender setae; posterior row with 4 capillary setae (4.34µm ± 0.8, 2.4-4.9, n = 13). Setigers 2 to 12-13 with 4-5 anterior notopodial setae and 3-6 posterior thinner setae, less hirsute and with longer tips; neuropodia with 1-3 (normally 2) anterior coarse sickle-shaped setae (11.7µm ± 2.4, 7.5-19.2µm) and two slender setae, situated ventrally; posterior row with 2-5 capillary setae. Median parapodia (Figure 1e) with capillary setae only, 6-9 in the notopodium and 6-11 in the neuropodium, those of the posterior row longer, uniformly thinner, very slender (3-4µm) and less hirsute, as long as body width.

Posterior fragment with 32 segments, 4.6mm long and 0.57mm wide at segment 25 from the pygidium. Coelomic cavity filled with very obscure foreign material, possibly sediment particles and digested food. Posterior end with 15 moniliform-like segments diminishing progressively in width, being approximately 8 times longer than wide. Last 4 preanal segments asetigerous (Figure 2e). The coelomic material prevents the visualization of longitudinal musculature. Setigers from this region biannulated, similar to those of the anterior region. Capillary setae shorter and straight or gently curved. Notopodium with 3-5 and neuropodium with 2-3 short capillary setae; last 3 setigers with 3 notosetae and 1 neuroseta. Perianal pad vertically cleft, with radial corrugations forming lobes, and with three long slender cirri, close to

0.05mm wide at the base and up to 1.8mm long; medial cirrus arising ventrally to anal orifice. Anus slightly dorsal.

**Coloration.** After methyl green staining the prostomium is uniformly stained, with the horns less intensely colored; peristomium less-stained. Across the dorsal body wall numerous pigmented cells are observed, and from setigers 2 to 10 groups of larger cells are disposed on the lateral and central dorsal zones; from setiger 11-13 lateral groups of cells are disposed on the dorsum of the superior setiger lobe. Cells missing from about setiger 24. Ventrally two lateral groups of cells are observed.

**Habitat.** Specimens were collected in muddy bottom at 4m depth.

**Remarks:** The prostomial structure is the principal character that separates *C. ginesi* n. sp. of other cogenetic species. In other *Cossura* species the prostomium is conical to rounded, whilst *C. ginesi* presents anterior lateral well developed horns. The sickle-shaped setae found on the anterior setigers of *C. ginesi* are similar to those described

for *C. heterochaeta* Orensanz (1996). In *C. ginesi* the division of the body into three regions is based on the origin of the setal fascicles and the length and number of rings of each segment. In *C. ginesi*, like in most cossurids, the setal fascicles of the anterior region emerge from the anterior edges of each segment, and the anterior segments are shorter than those of the median region. Gametes were not observed in the specimens, and longitudinal musculature was observed in both anterior and median regions. In *C. ginesi*, the segments of both the anterior and posterior regions appear biannulated. Jones (1956) pointed out that in the examined fragments of *C. pygodactylata* Jones, 1956, fragmentation happens just posterior to the beginning of the midregion; Read (2000) indicated that in *C. consimilis* (Read, 2000) fragmentation does not generally occur in the second, thinner-walled, body region, as for *C. ginesi*, where fragmentation occurs between setigers 20-47 (26.5 ±6.3).

**Etymology:** The species is named in honour of Hermano Ginés, from the Fundación La Salle de Ciencias Naturales

de Venezuela, who has been deeply involved for a long time in the study and conservation of marine biodiversity in Venezuela.

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