

A New Aeolid (Gastropoda: Nudibranchia) from the Atlantic Coasts of the Southern Iberian Peninsula

by

J. L. CERVERA

Laboratorio de Biología, Facultad de Ciencias del Mar, Universidad de Cádiz, Apdo. 40, 11510 Puerto Real (Cádiz), Spain

J. C. GARCIA-GOMEZ AND P. J. LOPEZ-GONZALEZ

Laboratorio de Biología Marina, Departamento de Fisiología y Biología Animal, Facultad de Biología, Universidad de Sevilla, Apdo. 1095, 41080 Sevilla, Spain

Abstract. A new species of aeolid nudibranch, *Cuthona willani*, is described from the Atlantic coasts of the southern Iberian Peninsula. The swellings of the rhinophores and oral tentacles, the shape of cerata, and the coloration separate *C. willani* from the remaining Lusitanian, Mediterranean, and Mauretanian known species of the genus.

INTRODUCTION

A new species of the aeolid genus *Cuthona* Alder & Hancock, 1855, has been described recently from the Atlantic coasts of the southern Iberian Peninsula by GARCÍA *et al.* (1991). In this paper, we describe another species of the same genus from the same geographical area.

Family TERGIPEDIDAE Thiele, 1931

Cuthona Alder & Hancock, 1855

Cuthona willani Cervera, García-Gómez & López-González, sp. nov.

(Figures 1-3)

Material: Holotype: One specimen, 12 mm in length, collected intertidally, El Portil (Huelva, Spain) (37°12'40"N, 7°7'50"W), September 1986. This specimen, which was not dissected, has been deposited in the collections of the Museo Nacional de Ciencias Naturales (MNCN) of Madrid, catalogue number 15.05/0763.

Paratypes: One specimen, 11 mm in length, collected concurrently with the holotype, has been deposited in the Laboratorio de Biología Marina (LBM), Departamento de Fisiología y Biología Animal, Universidad de Sevilla. One specimen, 3 mm in length, collected by SCUBA at 20 m depth in Sagres, Portugal (37°N, 8°55'W), during the International Expedition "ALGARVE 88," May 1988. This specimen has been deposited in the LBM, Departamento de Fisiología y Biología Animal, Universidad de Sevilla. A color slide of this living specimen of *Cuthona willani* is on file at the LBM, Universidad de Sevilla.

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Description: The body is typically aeolidiform (Figure 1A, B) and slightly narrower than the foot, tapering posteriorly in a relatively long and pointed tail. The foot corners are square. The oral tentacles are cylindrical, with a slight swelling in their middle part, and long, nearly as long as the rhinophores (Figure 1A, B, E). The rhinophores are long, smooth, and slightly enlarged at their base. They have a similar swelling to that of the oral tentacles at the apical half (Figure 1A, B). The cerata are arranged in 10 to 13 dorsolaterally oblique rows on either side of the body (Figure 2A). The postcardial rows of cerata on each side are arranged alternately with regard to those on the opposite side. The ceratal half formula is I 1-2, II 2-3, III 3-4, IV 3-5 (precardial), V 4-5, VI 4-5, VII 4-6, VIII 3-7, IX 2-6, X 1-4, XI 2-4, XII 3, XIII 3 (postcardial). The cerata have a conspicuous subapical globular enlargement, which is more developed in the largest (medial) cerata than in the smallest (lateral) ones. The cerata have another less conspicuous swelling before narrowing at the base (Figure 1C). The tips of the cerata may appear rounded (when an animal is undisturbed, the apex of the cnidosac is retracted) (Figure 1D, a) or pointed (when an animal is disturbed, the apex of the cnidosac is extended) (Figure 1D, b). The anus is acleiproct and the genital pore is under the second row of cerata on the right side (Figure 2A).

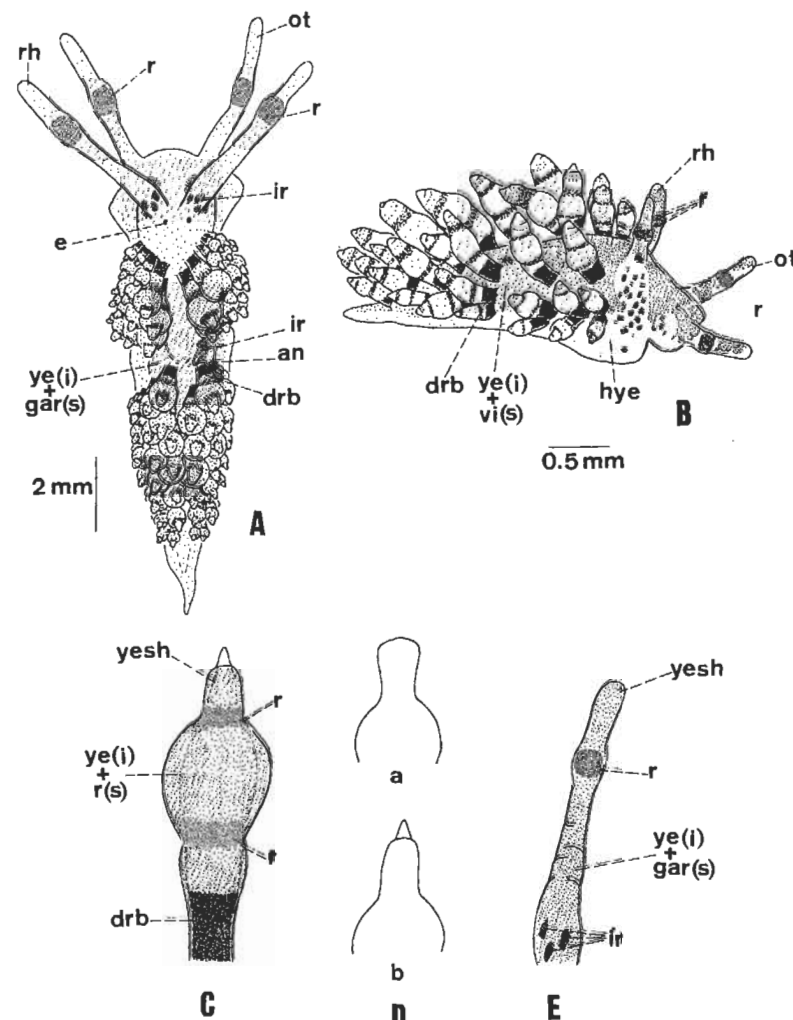


Figure 1

Cuthona willani sp. nov. A. Dorsal view of 11-mm adult specimen. B. Lateral view of 3-mm juvenile specimen. C. Detail of a cerata. D. Variability of the apical shape of the cerata—(a) apex of cnidosac extended, (b) apex retracted. E. Detail of a rhinophore. Key: an, anus; drb, dark reddish brown; e, eye; gar(s), garnet (superficial); hyc, hyaline yellow; ir, iridescent red; ot, oral tentacle; r, red; vi, violet; ye(i), yellow (internal); yesh, yellowish.

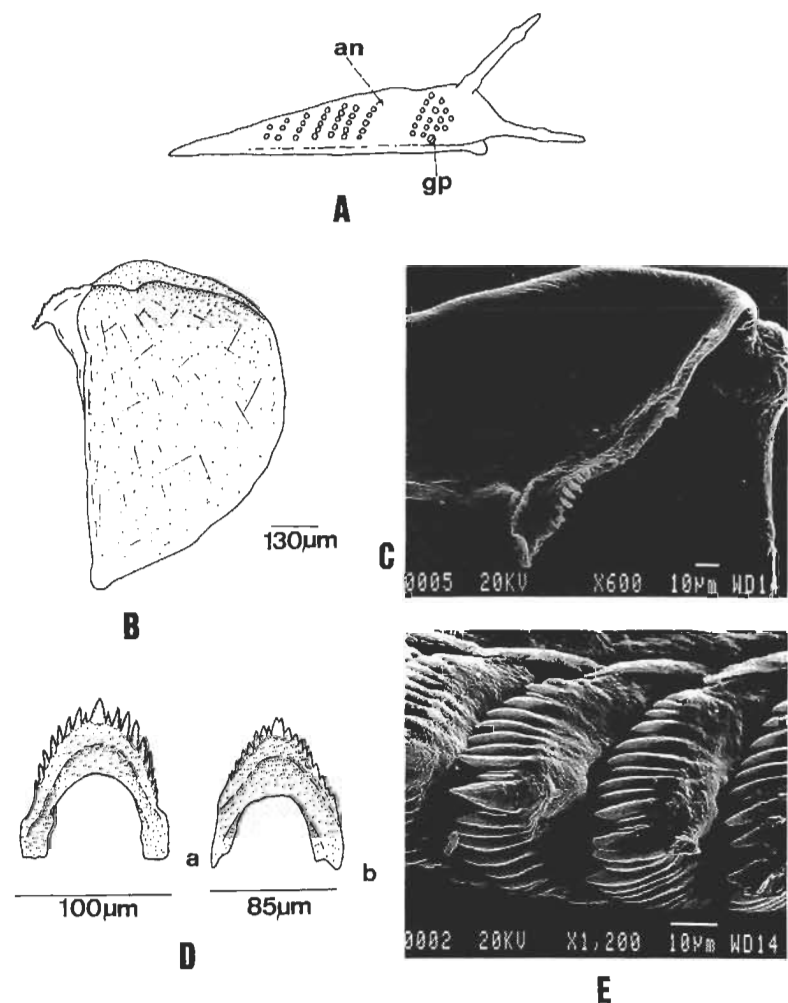


Figure 2

Cuthona willani sp. nov. A. Schematic arrangement of cerata. B. Jaw. C. Detail of the masticatory border of jaw. D. Second (a) and eighth (b) radular teeth of the 11-mm specimen. E. Scanning electron micrograph of some radular teeth of the same specimen. Key: an, anus; gp, genital pore.

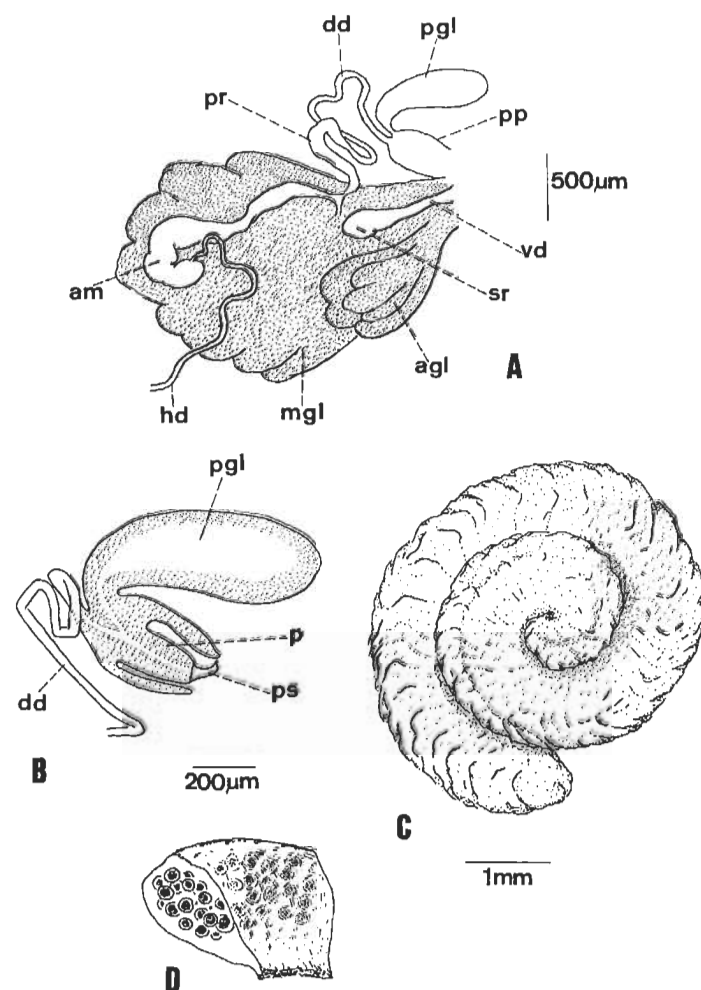


Figure 3

Cuthona willani sp. nov. A. Reproductive system. B. Detail of junction of the penial gland with the penis. C. Spawn. D. Detail of the cross-section of the same. Key: agl, albumen gland; am, ampulla; dd, deferent duct; hd, hermaphroditic duct; mgl, mucous gland; pgl, penial gland; pp, penial papilla; pr, prostate; sr, seminal receptacle; vd, vaginal duct.

Table 1
Comparison of some features of the Lusitanian, Mediterranean, and Mauretanian species of *Cuthona*.

Species	Radular teeth	Lateral denticles	Pre-cardial rows of cerata	Post-cardial rows of cerata	Ceratal shape	Swelling in rhinophores and oral tentacles	Spawn	References†
<i>Cuthona caerulea</i> (Montagu, 1804)	65-80	5-7	5	6	spindle-shaped	no	small ribbon curling anticlockwise	PF (1954); B (1980); Ba (1980); FO (1981); S & P (1982); T & B (1984); T (1988)
<i>C. foliata</i> (Forbes & Goodair, 1839)	51-65	4-7	4-5	4	spindle-shaped	no	broad semicircular coil	B (1980); S & P (1982); T & B (1984); T (1988)
<i>C. viridis</i> (Forbes, 1840)	35-54	5-6	4-5	4-5	cylindrical (more bulbous in juveniles)	no	small opened coil (one turn and a half)	B (1980); T & B (1984); J & E (1985); T (1988)
<i>C. nana</i> (Alder & Hancock, 1842)	≤30	5		12-14	club-shaped	no	(2) broad semicircular coil, convoluted spiral	A & H (1842) (2); PF (1954); B (1980); T & B (1984); T (1988)
<i>C. concinna</i> (Alder & Hancock, 1843)	25-45	4-5	3-4	6-7	clavate	no	?	PF (1954); B (1980); T & B (1984); T (1988)
<i>C. amoena</i> (Alder & Hancock, 1845)	15-20	5	3-4	5-7	clavate	no	small spiral	PF (1954); B (1980); T & B (1984); T (1988)
<i>C. pustulata</i> (Alder & Hancock, 1854)	15-24	4-7	6	6	club-shaped (may be swollen distally)	no	small coil	B (1980); T & B (1984); J & E (1985); T (1988)

Table 1
Continued.

Species	Radular teeth	Lateral denticles	Pre-cardial rows of cerata	Post-cardial rows of cerata	Ceratal shape	Swelling in rhinophores and oral tentacles	Spawn	References†
<i>C. genovae</i> (O'Donoghue, 1926)	46-57	3-9	1-2	2-3	spindle-shaped	no	coil of one turn	B (1980); S & P (1982); T & B (1984); T (1988)
<i>C. granosa</i> (Schmekel, 1966)	32-34	4-9	2	6	club-shaped	no	ellipsoid/kidney-shaped	S (1966); Sc (1969); S & P (1982)
<i>C. ocellata</i> (Schmekel, 1966)	21	11-14	4	8	club-shaped (apically wider than at the base, rounded above)	no	coil of several turns, wound around the stem of hydroids	S (1966); S & P (1982); Ba (1986)
<i>C. albopunctata</i> (Schmekel, 1968)	58	4	3	4	elavate	no	kidney-shaped/semicircular	S (1968); S & P (1982)
<i>C. ilonae</i> (Schmekel, 1968)	18	6-7	3	3	spindle-shaped (tapering towards the tip)	no	coil of one turn	FO (1981); S (1968); S & P (1982)
<i>C. miniostrata</i> (Schmekel, 1968)	40	3-5	2	5	club-shaped	no	ellipsoid/kidney-shaped	S (1968); S & P (1982)
<i>C. rubescens</i> Picton & Brown, 1978	16-18	8-17	2	9	spindle-shaped with a blunt tip	no	thin, irregularly coiled thread (resembling closely that of <i>C. amoena</i>)	Pi & B (1978); B (1980); T & B (1984); T (1988)
<i>C. thompsoni</i> García, López-González & García-Gómez, 1991	22	14-15	4	6	cylindrical	no	?	G, LG & GG (1991)
<i>C. williamsi</i> sp. nov.	22	8-10	4	9	urn-shaped and slightly knobly	yes	cup-shaped coil of 2-3 turns	present study

† A & H, Alder & Hancock; B, Brown; Ba, Ballesteros; FO, Fernández-Ovies; G, LG & GG, García, López-González & García-Gómez; J & E, Just & Edmunds; PF, Pruvot-Fol; Pi & B, Picton & Brown; S, Schmekel; S & P, Schmekel & Portmann; Sc, Schönerberger; T, Thompson; T & B, Thompson & Brown.

The ground color of the body is hyaline yellowish white. The body exhibits a very delicate yellow pigmentation and, overlying it, another one of garnet color, less dense than the first. Iridescent red patches are present in some regions of the body, principally on the sides of the head and the right side of the pericardial zone. The oral tentacles have the same ground color as the body from base to the swelling, which has an internal red (violet in the 3-mm specimen) ring. From this level up to the tip, the yellow color is present but the garnet becomes less intense (Figure 1A, B). The rhinophores have a coloration similar to that of the oral tentacles. They exhibit some iridescent red patches at their base, and the enlargements also have an internal red (violet in the 3-mm specimen) ring. From this point up to the tip, the garnet color becomes less intense. The surface of the cerata has a yellow internal pigmentation and a red superficial pigmentation, which becomes denser at both ends of the bigger ceratal enlargements, forming two rings of this color. The yellow pigmentation becomes denser from the upper ring towards the ceratal tip, whereas the red becomes fainter. The ground color of the digestive gland is brown, but at the ceratal base it darkens to reddish brown. The garnet pigmentation is rather violet in the 3-mm specimen. This specimen lacks the lateral patches observed in the remaining specimens, and the tips of the cerata also lack red or violet pigmentation (Figure 1C, E). The preserved specimens conserve the color of the internal rings of the rhinophores and oral tentacles, as well as the dark color of the digestive gland at the base of the cerata.

The broad jaws of the 3-mm and 11-mm paratypes have a delicately denticulated masticatory border (Figure 2B, C). The radular formula of the two paratypes is $21 \times 0.1.0$ and $22 \times 0.1.0$, respectively. The teeth are horseshoe-shaped with a prominent and strong central cusp; the teeth have 8–10 narrow denticles on either side of them in the larger specimen (Figure 2D, E) but only 5 or 6 denticles in the smaller. The larger specimen has 6 teeth with a bifid central cusp (Figures 2D[b], E).

The reproductive system of the 11-mm paratype is illustrated in Figure 3A. The long ampulla is U-shaped. The prostate is curved, and the deferent duct is thin and relatively long; the penis terminates in a penial spine (Figure 3B). There is an ovoid penial gland (Figure 3A, B). The seminal receptacle is elongate, with an enlarged duct that connects with the mucous gland near the genital pore. The nacreous albumen gland also connects with the mucous gland near the genital pore.

Biology: Three egg masses were laid in the laboratory by the El Portil specimens (September 1986). These consisted of 2–3 whorls that formed a cup (Figure 3C). They were triangular in section (Figure 3D) and their surfaces were rough. The width of the string was about 1 mm. Each capsule contained one spherical, white egg. The diameter of the capsules was 136.5–165.7 μm and that of the eggs was 97.5–117 μm .

Discussion: Our specimens are assigned to the genus *Cuthona* Alder & Hancock, 1855, on the basis of their jaws and radulae, despite the similarity in ceratal shape to that of many species of the genus *Eubranchius* Forbes, 1838.

Cuthona caerulea (Montagu, 1804) is the only known species from Lusitanian, Mediterranean, and Mauretanian waters with red ceratal bands. However, despite the high degree of variability of the color pattern of *C. caerulea* (PRUVOT-FOL, 1954; BROWN, 1980; SCHMEKEL & PORTMANN, 1982; THOMPSON & BROWN, 1984; THOMPSON, 1988; CATTANEO-VIETTI *et al.*, 1990), our specimens cannot be considered as specimens of this species because *C. caerulea* lacks the superficial garnet pigmentation, the iridescent red patches present in some regions of the body, and the red-violet internal ring of the swellings of the oral tentacles and rhinophores. Moreover, the cerata of *C. caerulea* are spindle-shaped, not urn-shaped and slightly knobby, and the oral tentacles and rhinophores have no swellings. Other external and internal differences between *C. caerulea* and *C. willani* are presented in Table 1.

Etymology: The specific name *willani* is chosen to give recognition to our colleague Dr. R. C. Willan from the University of Queensland (Australia) for his excellent contributions to the knowledge of opisthobranch mollusks.

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