New Records of Two Uncommon Sacoglossans (Gastropoda: Opisthobranchia) from the Coasts of the Iberian Peninsula

by

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Introduction

Four specimens of two uncommon sacoglossan species, *Elysia gordanae* Thompson and Jaklin, 1988, and *Ercolania lozanoi* Ortea, 1981, were collected from several samples along the coasts of the southwestern Iberian Peninsula, during the development of the project "Fauna Ibérica II."

Results and Remarks

Elysia gordanae Thompson and Jaklin, 1988

Two specimens, 8.5 and 8.0 mm in length, were collected in the intertidal zone at Caños de Meca, Spain (southwestern Iberian Peninsula; 36°11′N, 06°01′W) (February, 1990). An additional third specimen, 14 mm in length, was collected on the green algae *Derbesia* sp., also in the intertidal zone at Playa de Santa Maria del Mar, Spain (southwestern Iberian Peninsula, 36°31′N, 06°17′W) (May, 1995). The specimens were deposited at the Laboratorio de Biología Marina of the University of Sevilla. The head and the foot are rounded anteriorly. The rhinophores are inrolled, straight, and relatively short. The dorsal vessels are inconspicuous. The anus is not situated at the end of a papilla. The edge of the parapodia is characterized by the presence of eight to thirteen opaque white protuberances (Figure 1). The 8.5 mm specimen was teratological, as it had partially fused parapodia. The ground color is greenish. A pinkish-white coloration, similar to that which covers the edge of the parapodia, covers the head, rhinophores, and the mid-dorsal region. A small amount of sky-blue pigmentation is scattered on the sides of the head and on the parapodial surface (Figure 1). The radular formula of the smaller specimen was 12 × 0.1.0. Moreover,

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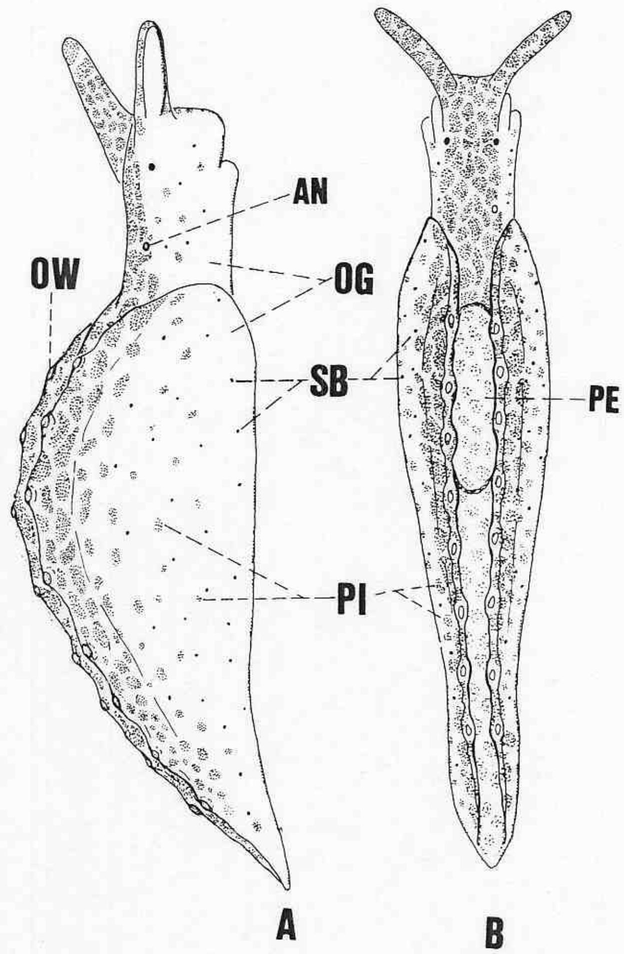

Figure 1

Elysia gordanae. General view of one specimen: lateral (A) and dorsal (B). Length 8.0 mm. AN, anus; OG, olive greenish; OW, opaque white; PE, pericardium; PI, pinkish; SB, sky-blue.

five discarded preradular teeth were observed in the ascus. The radular teeth have minute, but conspicuous, denticles all around the edge (Figures 2A, B, 3A). An egg mass was laid in the laboratory, and two more were collected close to the larger specimen. The most remarkable feature is the possession of orange extracapsular yolk.

Discussion: *E. gordanae* has been recorded exclusively on the Slovenian coasts (ex-Yugoslavia) (Thompson & Jaklin, 1988) and on the Mediterranean coast of the Iberian Peninsula (Marín & Ros, 1988; García-Raso et al., 1992). Our specimens constitute the first record from the Atlantic Ocean and the westernmost record of this species.

Ercolania lozanoi Ortea, 1981

One specimen, 4.5 mm in length, was collected on the green alga, *Valonia utricularis* (Roth) C. Agardh at the

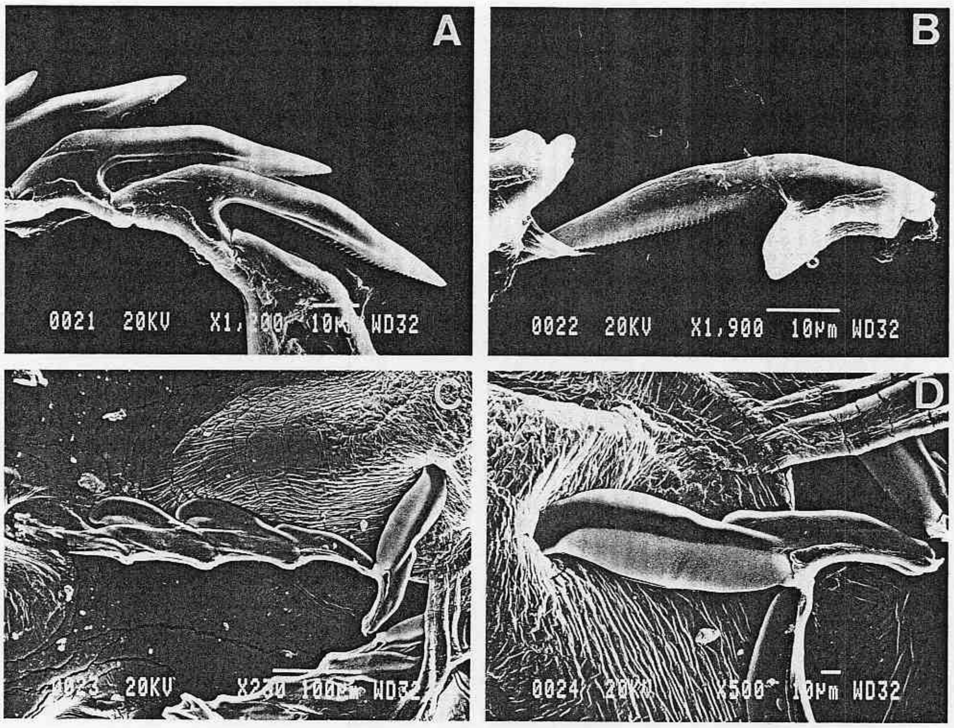

Figure 2

Detail of the radular teeth of *Elysia gordanae* (A, B) and *Ercolania lozanoi* (C, D) from the SEM.

intertidal zone at Caños de Meca (February, 1990). The specimen was deposited at the Laboratorio de Biología Marina of the University of Sevilla. The rhinophores were long, cylindrical, and somewhat widened at their base. The foot was notched and slightly bilobed. The cerata were distributed almost symmetrically, with 25 on the right side and 24 on the left side. The anal papilla was prominent and located on the pericardium (Figure 4A). The ground color of the body is yellowish white. A large, dark, violaceous black spot is present between the rhinophores. It continues on both sides of the head to shape into the mid-lateral zone of the animal. Both extensions of the pigment are interrupted at the level of the genital papilla. There are also two dorsal fringes of this color running from the pericardium to the posterior region of the body where the pigment bands join. The back also has two opaque white fringes, joined at the posterior region of the specimen, that continue to both sides of the anal papilla (Figure 4A). The elongate, globular cerata are olive green. At a greater magnification, the internal ochre green color of the digestive gland branch and its ramifications can be seen, as well as a large number of translucent granules (opaque white at the cerata apex) all around the ceratal surface (Figure 4C). The radular formula was 9 × 0.1.0 (excluding the discarded teeth of the ascus). The radular teeth have a smooth edge (Figures 2C, D, 3B). Data on the reproductive system were provided by Fernández-Ovies et al. (1984).

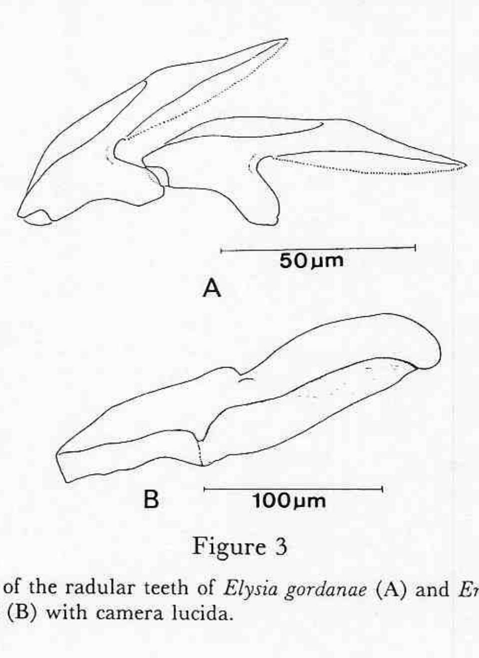

Figure 3

Detail of the radular teeth of *Elysia gordanae* (A) and *Ercolania lozanoi* (B) with camera lucida.

Discussion: Recently, K. Jensen (personal communication) has stated that she considers it possible that *E. lozanoi* is simply a color variation of *E. funerea* (Costa, 1867). According to her, this may be one of the cases where

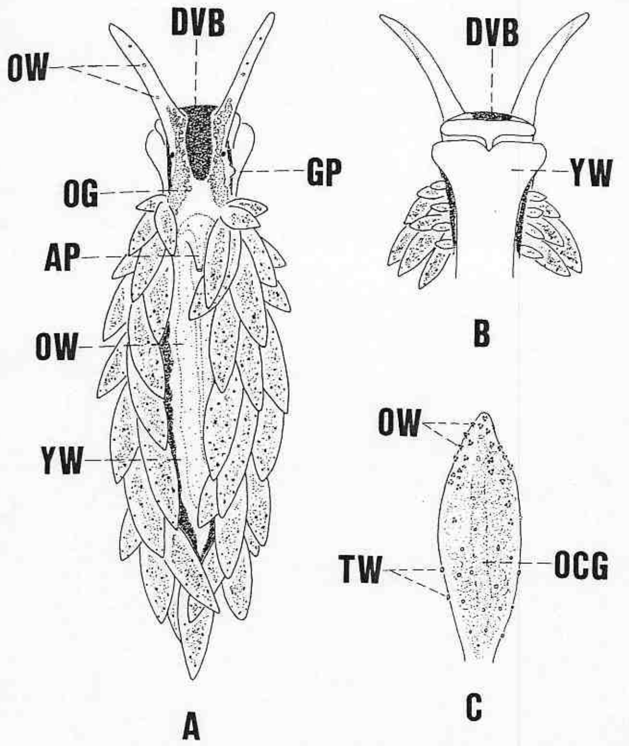

Figure 4

Ercolania lozanoi. A. Dorsal view of specimen. B. Ventral view of the anterior region. C. Detail of one ceras. Length 4.5 mm. AP, anal papilla; DVB, dark violaceous black; GP, genital papilla; OCG, ochre green; OG, olive green; OW, opaque white; TW, translucent white; YW, yellowish white.

molecular biology could prove useful. However, we agree with Ortea (1981) that the body and ceratal coloration of *E. lozanoi* is sufficiently different from *E. funerea* [= *E. viridis* (Costa, 1866)]. Moreover, these color differences were consistently observed when comparing Canarian and Iberian specimens with those attributed to *E. funerea* (as *E. viridis*) by García-Gómez (1987) from the Algeciras Bay (Strait of Gibraltar). We prefer to retain *E. lozanoi* as a separate species until additional material can be examined.

To date, *E. lozanoi* has been recorded exclusively from the Canary Islands (Ortea, 1981; Fernández-Ovies et al., op. cit.). Our specimen constitutes the first record of this species from the Iberian Peninsula and European mainland and the northernmost record of this species.

Acknowledgments

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Preference of Adults of the Dorid Nudibranchs *Archidoris montereyensis* (Cooper, 1862), *Diaulula sandiegensis* (Cooper, 1862), and *Triopha catalinae* (Cooper, 1863) for Shaded over Lighted Conditions

by

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Biermann et al. (1992) discovered higher mortality rates among embryos of the dorid nudibranch *Archidoris montereyensis* (Cooper, 1862) in egg masses exposed to the light than in the shade. This conclusion suggests that the location of egg mass deposition may have profound effects on populations and life histories of at least one kind of dorid nudibranch.

If light-dependent differential survival is a long-term selective force, then adults may respond to this pressure by showing preference for shaded areas over unshaded ones. This idea led us to the following question: Do adult *Archidoris montereyensis* and other dorid nudibranchs prefer shaded conditions over unshaded ones? We tested the null hypothesis that adult dorid nudibranchs show no preference for either shaded or unshaded conditions. We here report on a laboratory experiment testing that null hypothesis.

In January 1995, we collected three species of dorid nudibranchs from the floating dock and pier pilings at the Friday Harbor Laboratories, San Juan Island, Washington, USA. *Archidoris montereyensis* and *Diaulula sandiegensis* (Cooper, 1862) were collected primarily from tires attached to the laboratory's floating dock, and *Triopha*

Table 1

Preference for shaded versus unshaded conditions by adults of three species of dorid nudibranchs based on the number of test specimens in shaded conditions at the end of 60-minute test runs.

Species	n	No. in shaded end of tank	χ^2 value	Level of significance
A. montereyensis	12	11	8.34	$P < 0.005$
D. sandiegensis	5	5	5.00	$P < 0.05$
T. catalinae	18	15	8.00	$P < 0.005$

Table 2

Effect of drain location on the final location of test specimens in the experimental apparatus for each species tested.

Species	n	No. in drain end of tank	χ^2 value	Level of significance
A. montereyensis	12	5	0.33	$P > 0.50$
D. sandiegensis	5	2	0.20	$P > 0.50$
T. catalinae	18	10	0.22	$P > 0.50$

catalinae (Cooper, 1863) were collected from pilings supporting the laboratory's pier. All specimens were kept in a holding tank with running seawater, in the laboratory, until they were tested, usually within a day or two. We know that our *A. montereyensis* specimens were adults because we observed several pairs of them copulating in the holding tank. We have no such supporting observations for the other species, but we believe that our *D. sandiegensis* and *T. catalinae* specimens were also most likely adults due to their size.

The apparatus used to test for light versus shade preferences comprised an opaque seawater table approximately 60 cm wide by 130 cm long, with a drain at one end and a tygon tube supplying water to the center of the table. One end of the seawater table was covered with an opaque black plastic sheet so that half of the tank received light from the overhead fluorescent lights of the laboratory, and the other half of the tank was shaded. Windows of the laboratory were covered during testing so that the only light entering the seawater table was from overhead lights.

An experimental run began when we placed three individuals of the same species in the middle of the experimental seawater table. The nudibranchs were oriented so that the longitudinal axis of each specimen coincided with the line where the shaded and unshaded areas of the tank met. Thus, at the beginning of a run, one side of each nudibranch was in the shade and the other side was in the light. In addition, we randomized the anterior-posterior orientation of each specimen along that line in order to eliminate possible confounding effects of genetic predispositions for turning to the left or right. A run ended 60 minutes later when the location of each individual was recorded. We did four runs of three individuals each for *Archidoris montereyensis,* one run of three individuals and one run of two individuals for *Diaulula sandiegensis,* and six runs of three individuals for *Triopha catalinae.*

The seawater table was drained and cleaned with a rubber squeegee after every run in order to remove mucous trails and any residual scents left by test specimens from prior runs. The black plastic cover was then moved to the opposite end of the tank so that the shaded and unshaded halves of the tank alternated from one run to the next. This was done in order to minimize possible effects of water flow due to the location of the drain at one end of the tank.

We used the chi-square analysis to test for differences between the number of individuals that moved to the shaded end of the tank versus the unshaded end, for each species. We also tested for water-flow effects on slug movement via chi-square analysis by comparing the number of individuals that moved to the drain-end of the tank to the number moving to the non-drain end.

Significantly more individuals of each of the three species tested moved to the shaded end of the tank than to the unshaded end: 11 of 12 (91.7%) *Archidoris montereyensis,* 5 of 5 (100%) *Diaulula sandiegensis,* and 15 of 18 (83.3%) *Triopha catalinae* (Table 1). These results led us to reject our null hypothesis, that equal numbers of animals would move to the light and dark areas, and to accept an alternative hypothesis—that the nudibranch species tested prefer shaded conditions over unshaded conditions. The effect of drain location on final location of test specimens was not significant for any of the three species (Table 2). This is, to our knowledge, the first time a preference for shaded conditions has been reported for adult dorid nudibranchs.

Explaining this preference remains problematic, especially since the species tested may move into sunlit areas of intertidal pools from time to time. However, the findings of Biermann et al. (1992) suggest a possible explanation for the tendency of dorid nudibranchs to move into shaded areas—that for at least *Archidoris montereyensis,* there appears to be selection against progeny of individuals that deposit egg masses in unshaded areas compared to those that do so in shaded areas. This differential survivorship may have an evolutionary effect on the reproductive ecology of *A. montereyensis* by favoring individuals that stay in darker areas and deposit their egg masses there. Another possible explanation could be related to the feeding ecology of some dorid nudibranchs. For example, *A. montereyensis* and *Diaulula sandiegensis* prey on sponges, primarily *Halichondria* spp. and *Haliclona* spp. (Bloom, 1976; Elvin, 1976). *Haliclona* spp. prefer shaded microhabitats (Bakus & Abbott, 1980), and nudibranchs that feed on them may consequently move into darker areas to search for sponge prey. *Triopha catalinae,* on the other hand, preys on erect bryozoans (Beeman & Williams, 1980 and references therein). There are no strong data showing that erect bryozoans, as a group, are more common in shaded areas than in unshaded ones. Therefore, a testable hypothesis for the shade preference by *T. catalinae* has yet to be developed.

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International Commission on Zoological Nomenclature

The following applications were published on 30 June 1995 in Volume 52, Part 2 of the *Bulletin of Zoological Nomenclature.* Comment or advice on these application is invited for publication in the *Bulletin* and should be sent to the Executive Secretary, I.C.Z.N., % The Natural History Museum, Cromwell Road, London SW7 5BD, U.K.

Case 2903—*Tropidoptera* Ancey, 1889 (Mollusca, Gastropoda): proposed designation of *Endodonta wesleyi* Sykes, 1896 as the type species.

Case 2946—PLUTONIINAE Bollman, 1893 (Arthropoda, Chilopoda) and PLUTONIINAE Cockerell, 1893 (Mollusca, Gastropoda): proposed removal of homonymy.

The following Opinions concerning mollusks were published on 30 June 1995 in Volume 52, Part 2 of the *Bulletin of Zoological Nomenclature.* Copies of these Opinions can be obtained free of charge from the Executive Secretary at the address given above.

Opinion 1805—*Doris grandiflora* Rapp, 1827 (currently *Dendrodoris grandiflora*) and *Doridopsis guttata* Odhner, 1917 (currently *Dendrodoris guttata*) (Mollusca, Gastropoda): specific names conserved.

Opinion 1806—*Ammonites nodosus* (currently *Ceratites nodosus*; Cephalopoda, Ammonoidea): specific name attributed to Schlotheim, 1813, and a lectotype designated.

MOLLUSCS 97

Symposium on the Mollusks of the Indo-West Pacific and Australasian Region

Rottnest Island, Western Australia
February 1–4, 1997

Organized by The Malacological Society of Australasia Ltd.

The huge Indo-West Pacific and Australasian region has a tremendous diversity of mollusks in all environments—marine, freshwater, and terrestrial. This will be the first meeting to bring together malacologists and other interested scientists working on the mollusks of the region.

The symposium will be held at the Rottnest Environmental Education Centre at Rottnest Island, off the coast of Perth, Western Australia from February 1–4, 1997.

The first two days of the conference, Saturday, February 1st and Sunday, February 2nd, will be devoted to scientific sessions, as will Tuesday, February 4th. Excursions will be held on Monday, February 3rd.

Rottnest Island is on the central coast of Western Australia, where there is a mixture of temperate, tropical, and Western Australian endemic mollusks. An island tour with the opportunity to explore the local rocky shore habitats will be organized for Monday, February 3rd.

The Malacological Society of Australasia expects to make limited travel support available to some student members living in Australasia who present a paper or poster.

Three symposia are planned:

- Mollusks of environmental or economic importance
- Evolutionary studies of mollusks
- Contributed paper sessions

Posters are welcomed as an alternative to papers. The symposium is open to papers and posters on all aspects of Indo-West Pacific and Australasian mollusks, whether marine, freshwater, or terrestrial.

Participants are encouraged, but not required, to publish the papers presented in *Molluscan Research,* the journal of The Malacological Society of Australasia. Papers submitted to *Molluscan Research* will be subject to the normal editorial review process.

Post-Conference Tours

Many of the delegates will be visiting Western Australia for the first time. There will be a five day post-conference tour to Albany on the south coast of the state, pending sufficient interest.

To register for the mailing list for further announcements, please contact:

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