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Occurrence of the Interstitial Opisthobranch *Unela remanei* MARCUS, in the Caribbean Sea

By

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With 12 Figures and 1 Table

Summary

Five specimens of the opisthobranch snail *Unela remanei* MARCUS were found in a coarse sand beach at Santa Marta, Columbia The animals are briefly described. This is the second of this species, which was hitherto only known from Brazil.

Resumen

5 especimenes del gastropodo opistobranquio *Unela remanei* MARCUS fueron recolectados en una playa de arena gruesa, en Santa Marta. Se describe la morfología de estos animales. Se trata del segundo hallazgo de esta especie, hasta ahora solamente conocida del Brasil.

Zusammenfassung

5 Exemplare des Opisthobrachiers *Unela remanei* MARCUS wurden an einem grobsandigen Strand von Santa Marta (Kolumbien) gefunden. Die Tiere werden kurz beschrieben. Es handelt sich um den zweiten Nachweis dieser Art, die bisher nur von Brasilien bekannt war.

During a survey with the main objective to study the interstitial nemertean fauna of sandy beaches on the Caribbean coast of Colombia also five specimens of a minute opisthobranch belonging to the order Acochlidiacea were found at Punta de Betín, Santa Marta. As there are no records on the occurrence of Acochlidiacea in the Caribbean Sea some attention was paid to the finding and a short note seems to be justified.

The animals were encountered in a sample taken in July 1969 from the intertidal near the low water line of the small beach below the Instituto Colombo-Alemán. The substratum was very coarse sand (the grain size composition is shown in Table 1) and the opisthobranchs, together with nemerteans and archiannelids, were extracted from the sediment with the $MgCl_2$ — washing method. After examination under

a phase contrast microscope and taking photomicrographs of the living animals in squeezed condition, four of the opisthobranchs were fixed and preserved in this state with formalin-glycerin 1:1 (slides A—D) and one animal was squeezed to the point of disintegration to allow better orientation and observation of the radula (slide E). The five whole mount preparations are deposited at the American Museum of Natural History, New York.

Table 1. Grain size composition of sand in which *Unela remanei* was found.

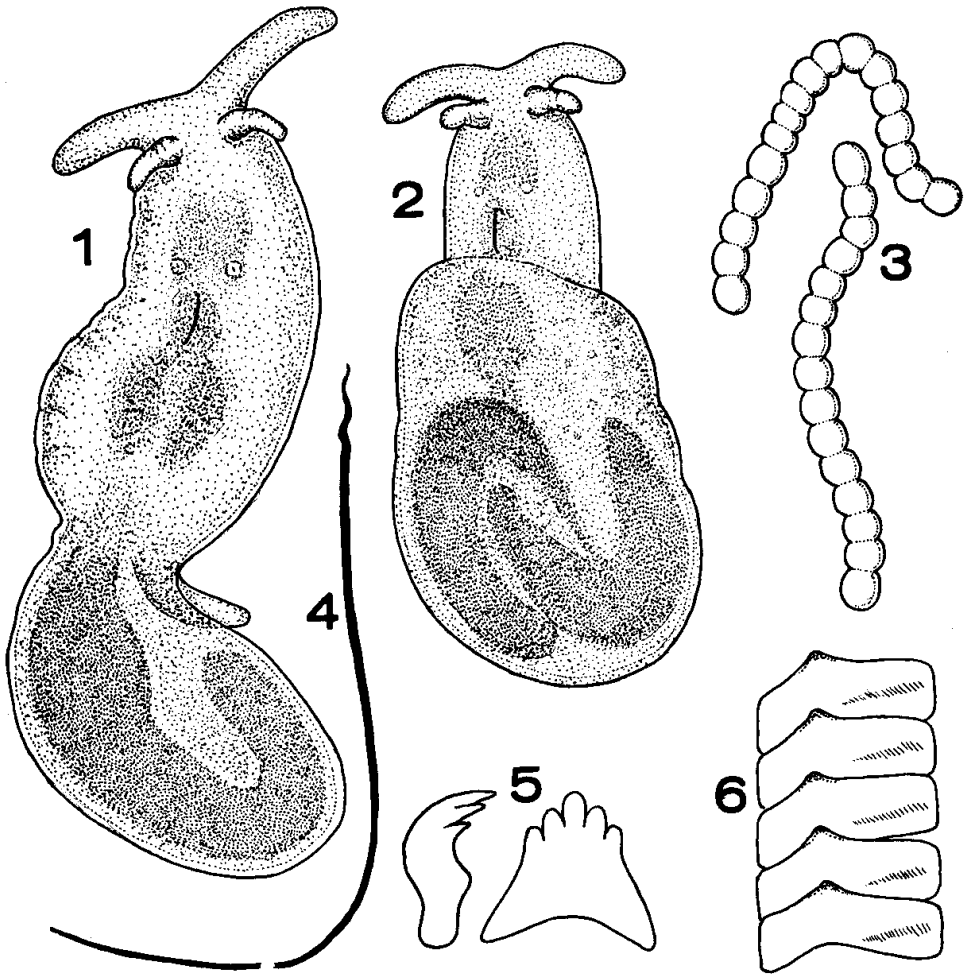
mm	< 0.1	0.1—0.25	0.25—0.63	0.63—1.6	1.6—4	> 4
Dry wt. %	0.5	6.8	15.7	33.9	23.2	19.9

The keys given by MARCUS (1953) and SWEDMARK (1971) were used to identify the animals which, in addition, were also compared with quite recently described species of Acochlidiacea (CHALLIS, 1970) not included in the latter key. Although the organization of the reproductive system could not be ascertained in the present specimens, other features such as a cylindrical visceral sac distinctly demarcated from the anterior portion of the body, as well as a narrow foot, which is anteriorly only a ciliated band but terminates posteriorly in a short free end beneath the visceral sac, and a digestive gland in form of an unbranched tube with its distal part bent forward, leave no doubt that the animals belong to the family Microhedylidae. Within this family the possession of rhinophores combined with a radular formula of 1.1.1 places them into the genus *Unela* which comprises two species, *U. remanei* MARCUS, 1953, and *U. odhneri* (DELAMARE DEBOUTTEVILLE) MARCUS and MARCUS, 1955, and because of the lack of eyes the present animals conform with the first species.

Unela remanei, the type of the genus, was discovered by MARCUS (1953) in the intertidal zone of a coarse sand beach at Ilhabela on the Island of São Sebastião, Brazil. Soon afterward more material of the species was recovered from the same locality and the original description (loc. cit.) was supplemented with some further anatomical and biological details (MARCUS and MARCUS, 1954). Up to now the species has not been reported from other localities.

The living animals from Colombia are 2.5—3 mm long when fully extended and gliding. The color in life is a grayish white. The digestive gland is not shining through under normal circumstances, however, in squeezed animals observed under the microscope the gland becomes distinctly visible as a rather dark, tubular mass. In extended animals it is straight with only the posterior portion bent forward (fig. 1) but in partially contracted specimens it may show a sinuous form (fig. 2). The oral tentacles are slightly flattened and usually they arch laterad or lateroposteriad but occasionally they were observed to point terminad

into the direction the animal moved. The rhinophores are cylindrical and have a thicker basal region which is more pronounced in contracted specimens. Stiff sensory cilia of about 6 μ length occur along the anterior margin of the tentacles and the distal portion of the rhinophores. The relative length of the rhinophores has not been particularly mentioned for the Brazilian animals but the sketches accompanying the original description (MARCUS, 1953, pl. 1, figs. 1, 2) give the impression that rhinophores and tentacles are equally long. In the present specimens, however, the rhinophores attain only three quarters the length of the tentacles. The foot is in its anterior region indicated by a densely ciliated longitudinal band of about 60 μ width, and its



Figs. 1—6. *Unela remanei:* 1—2, Aspects of extended and partially contracted specimens in squeezed condition (from photographs of living animals). 3, Epidernal inclusions as seen in fixed specimens. 4, Spermatozoon. 5, Median radular tooth in side and face view. 6, Five lateral plates of the radula.

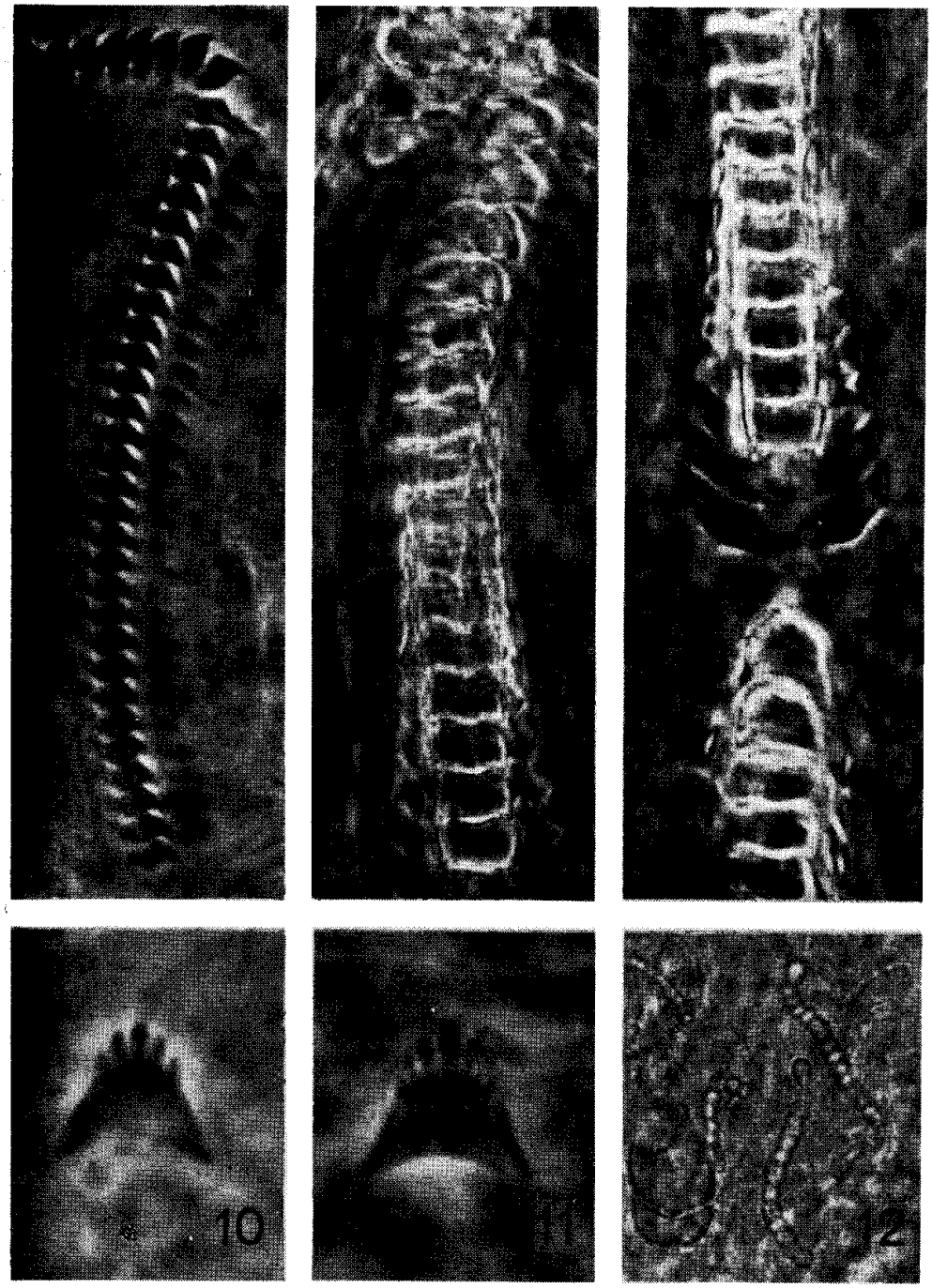
posterior, freely set off part extends backward for approximately one third the length of the visceral sac in gliding animals.

Spicules are lacking in *Unela remanei* (MARCUS, 1953) but for the second lot of animals collected from the type locality it is reported (MARCUS and MARCUS, 1954) that serpentiform concrements occurred in the epidermis. Their size and structure was not described. Similar concrements, found by MARCUS (1953) in *Ganitus evelinae*, are compared with the ones BERGH (1905) had observed in species of *Oscaniella*, where, according to the illustrations (loc. cit., pl. 11, figs. 11, 13; pl. 12, fig. 16), they are irregularly wound threads of various length with a smooth surface. In the present specimens from Colombia the epidermal inclusions measure 10—20 μ in length and about 1 μ in diameter, and resemble a short string of beads (figs. 3, 12). They are found all over the body, including the tentacles and rhinophores. Large epidermal glands of spherical or oval shape are present and are more numerous on the visceral sac than on the remaining part of the body. They contain a colorless homogenous secretion and are of brillant appearance when observed with transmitted light.

The radula (fig. 7) has an upper ramus of 33—35, and a lower ramus of 6—8 transverse rows. The maximum number of rows counted in the material from Colombia is 41. Each row consists of a median tooth and one lateral plate on either side of it. In face view the median tooth is triangular in outline and about 10 μ high (figs. 5, 10, 11). It bears a central denticle which is followed on each side by two lateral denticles. In side view these denticles are pointed (fig. 5, 7, 8). The lateral plates (figs. 6, 9) are slightly curved, approximately 12 μ high and 3.5 μ broad, and have a small, blunt protrusion on their anterior margin. The radula agrees in general wiht MARCUS' (1953) description. The existing minor differences in the number of rows and in the dimensions of the radular components are presumably due to the smaller size of the Colombian animals.

Other features recognizable in the whole mount preparations are the paired, voluminous salivary glands, which extend from the buccal bulb about half way back to the beginning of the visceral sac, and the two statocysts, which are attached to the pleural ganglia and contain one spherical statolith. In the specimen mounted on slide B all ganglia are distinctly visible and their arrangement is the same as depicted by MARCUS (1953, pl. 1, fig. 7).

One animal (slide D) carries a spermatophore on the right side of the visceral sac. It is a thin-walled, translucent, spindle-shaped container of about 200 μ length and 25 μ maximum diameter, which is filled with threadlike sperm. Some of the spermatoza had entered the animal and can be seen inside the visceral sac, it is, however, impossible to detect oocytes in the specimen. MARCUS and MARCUS (1954) men-



Figs. 7—12. *Unela remanei:* 7, Upper and lower ramus of radula, median teeth in side view. 8, Radula with upper portion showing median teeth and pointed denticles in side view. 9, Dorsal view of radula with lateral plates pressed sideways in middle portion of picture. 10—11, Isolated median radular teeth in face view. 12, Epidermal inclusions.

tioned already the presence of spermatophores in *Unela remanei* and described the sperm as being very fine threads on which the short head is not demarcated from the tail, but did not say by what features the sperm head was recognized. The present, fixed sperm (fig. 4) have a length of 95 μ and under phase contrast an about 3 μ long, corkscrew-shaped anterior region can be distinguished from an approximately 14 μ long portion, which is slightly ticker and optically denser than the remaining tail filament. It is not discernible whether the short spiral region is the acrosome followed by an elongate, thin nucleus, or whether it represents the whole head such as in the sperm of *Hedylopsis suecica* (FRANZÉN, 1955, fig. 98). By their nearly uniform, threadlike shape they are, however, distinctly different from the sperm in other species of marine Acochlidiacea (KOWALEVSKY, 1901, pl. 2, fig. 30; pl. 5, fig. 69) except *Ganitus evelinae*, which has the same type of sperm as *Unela remanei* (MARCUS and MARCUS, 1954).

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Bibliography

BERGH, R.: Die Opisthobranchiata der Siboga-Expedition. — Siboga-Exped. Monogr., **50**, 1—248, Leiden 1905.

CHALLIS, D. A.: *Hedylopsis cornunta* and *Microhedyle verucosa*, two new Acochlidiacea (Mollusca: Opistobranchia) from the Solomon Islands Protectorate. — Trans. R. Soc. N. Z., Biol. Sci. **12**, 29—40, Wellington 1970.

FRANZÉN, A.: Comparative morphological investigations into the spermiogenesis among Mollusca. — Zool. Bidr., **30**, 399—456, Uppsala 1955.

KOWALEVSKY, A.: Les Hedylidés, étude anatomique. — Mem. Imp. Acad. Sci. St. Pétersbourg, Cl. Phys.-Math., **12**, 1—32, St. Pétersbourg 1901.

MARCUS, E.: Three Brazilian Sand-Opisthobranchia. — Bol. Fac. Filos. Cienc. Univ. São Paulo, Zool., **18**, 165—203, São Paulo 1953.

— and E. MARCUS: Über Philinoglossacea und Acochlidiacea. — Kieler Meeresforsch., **10**, 215—223, Kiel 1954.

— Über Sand-Opisthobranchia. — Kieler Meeresforsch., **11**, 230—243, Kiel 1955.

SWEDMARK, B.: A Review of Gastropoda, Brachiopoda, and Echinodermata in Marine Meiobenthos. In N. C. HULINGS (edit.) Proceedings of the First International Conference on Meiofauna. — Smithsonian Contrib. Zool., **76**, 41—45, Washington 1971.

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