

NEW SPECIES OF DEMOSPONGIAE (PORIFERA) FROM THE NATIONAL PARK "ARCHIPIÉLAGO DE LOS ROQUES", VENEZUELA*

by

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ABSTRACT

Three new species of Demospongiae from coral reefs of the Archipiélago de Los Roques National Park (Venezuelan Caribbean) and Curaçao (Netherlands Antilles) are described, viz. *Eurypon laughlini* n. sp., *Topsentia roquensis* n. sp., and *Epipolasis reiswigi* n. sp. The new species and the genera to which they have been assigned are discussed, as a result of which the genus *Fasubera* De Laubenfels, 1936, is synonymized with *Eurypon* Gray, 1867, and the genus *Epipolasis* is redefined based on characters of its type-species. Extensive ecological data are provided for each species.

RESUMEN

En este trabajo se describen tres especies nuevas de los arrecifes coralinos del Parque Nacional Archipiélago de Los Roques (Mar Caribe, Venezuela) y Curaçao: *Eurypon laughlini* n. sp., *Topsentia roquensis* n. sp., y *Epipolasis reiswigi* n. sp. Se discuten las nuevas especies y los géneros a los cuales han sido asignadas. Como resultado, el género *Fasubera* De Laubenfels, 1936 es sinonimizado con *Eurypon* Gray, 1867, y el género *Epipolasis* se redefine basándose en las características de su especie tipo. Se suministran datos ecológicos de cada una de las especies.

INTRODUCTION

An ecological study of the sponge community of a fringing coral reef at the Archipiélago de Los Roques National Park was carried out between January 1983 and August 1984 (Alvarez &

Díaz, 1985). Sixty different demosponges were found, of which 33 were described. Three of these species appeared to be new to science. Taxonomic descriptions of the three species as well as additional ecological information are given in this paper.

ACKNOWLEDGEMENTS

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DESCRIPTION OF THE STUDY AREA

The Archipiélago de Los Roques National Park is an insular reef complex located at about 150 km north of the north-central coast of Venezuela (fig. 1). It consists of 42 islands and more than 200 shoals and reefs, irregularly distributed around a shallow lagoon (depth 1-5 m) in its centro-meridional portion.

The archipelago, or more precisely the semi-atoll, rests on a submarine igneous plateau that rises sharply from depths of 900 to 1800 m. The winds and oceanic currents are predominantly from the east-northeast. The climate in the islands can be classified as semi-arid with an average annual precipitation of 300 mm.

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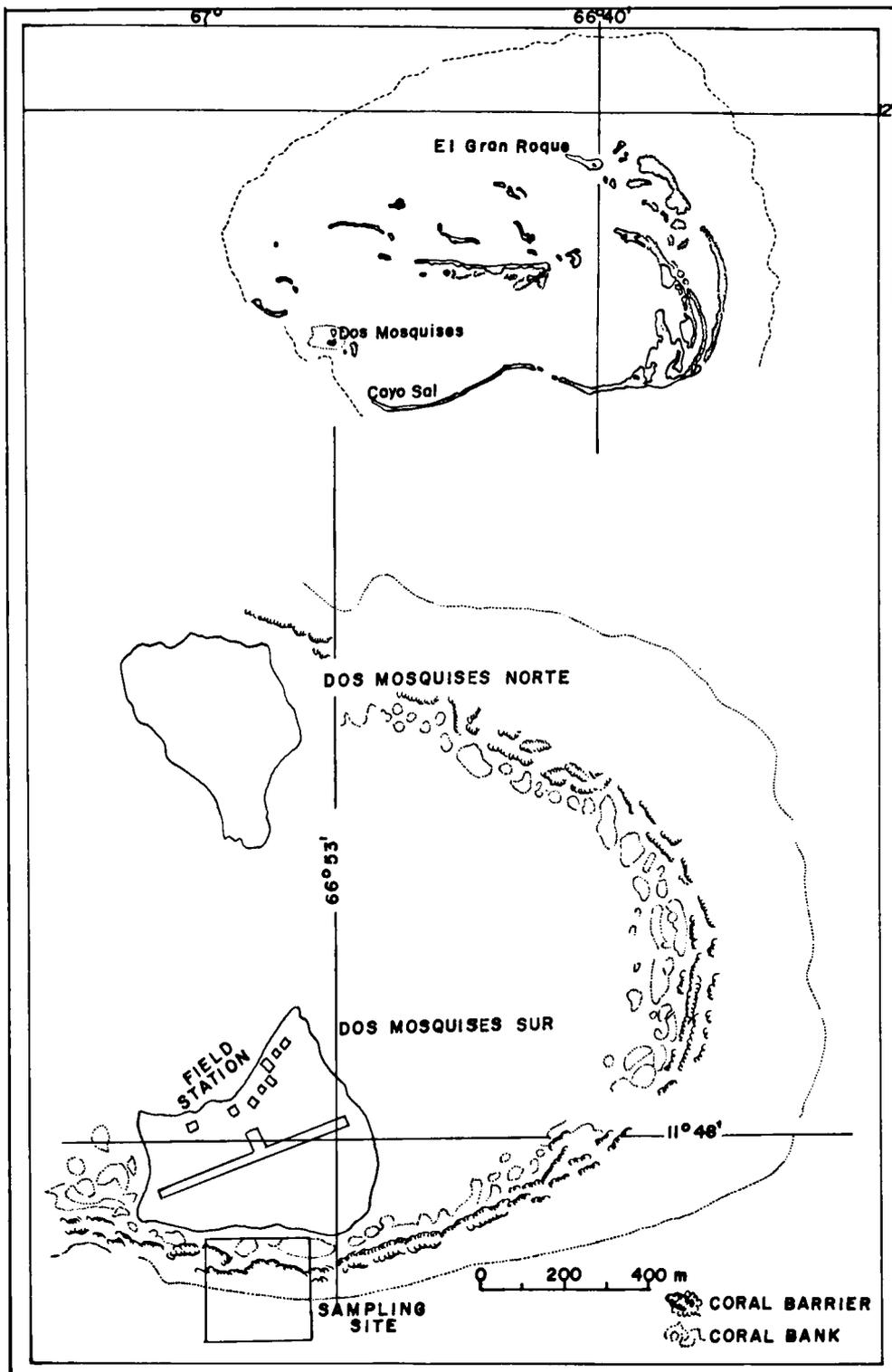


Fig. 1. The Archipiélago de Los Roques National Park (top), and the location of the sampling site (bottom).

The fringing reef where the study was conducted is located south of the Dos Mosquises Sur Cay (fig. 1). It consists of a reef flat, a reef terrace and a drop-off which extends to a depth of 30 m. The shallow reef flat (0-2 m) is dominated by the coral species *Acropora palmata* (Lamarck, 1816) and *A. cervicornis* (Lamarck, 1816); other species, viz. *Madracis decactis* (Lyman, 1859), *Porites porites* (Pallas, 1766), and *Montastrea annularis* (Ellis & Solander, 1786) are also found dispersed among large extensions of dead coral fragments and sand. The reef terrace (2-12 m) is dominated by *Montastrea annularis*. The drop-off is characterized by an increased number of coral species although coral boulders are frequent. Below a depth of 28 m sand is the main substrate.

Sponges are practically absent in open areas on the reef flat. They become abundant at depths below 8 m and constitute the most frequent and abundant group in deeper zones.

MATERIAL AND METHODS

Demosponges were collected with SCUBA equipment. Before collection, each individual was characterized in situ by its shape, colour, consistency, and other surface features. The height, cover, and oscule diameter of each specimen were also registered, as well as the substrate type where it was found, and the position occupied.

Once characterized, the sponge was photographed using a Nikonos IV underwater camera provided with a flash and a close-up unit. For taxonomic studies, parts of each specimen were fixed in a 10% formalin-seawater solution neutralized with borax, and then preserved in a 70% alcohol solution. Smaller parts of each sample were dried in the sun. The specimens are stored in the Fundación Científica Los Roques Museum in Caracas (FCLR) and in the Zoölogisch Museum, University of Amsterdam (ZMA). Spicule preparations were made by dissolving small fragments of the sponge in a boiling 20% potassium hydroxide solution. After disintegration of the soft component, a few drops of concentrated nitric acid were added to the preparation, which was then washed twice in distilled water and twice in 70% alcohol.

Length and width measurements of 25 spicules of each type were made for all specimens studied. Skeleton structure was determined from perpendicular and tangential hand sections (200-1000 μm) cut with a razor blade, then treated with dioxane and transferred to distilled water for examination under a stereomicroscope.

Ecological parameters of the species such as distribution, frequency of occurrence, substrate area covered, and

density on the reef were determined using a 1 m² quadrat which was successively moved along a line transect. Five transects were sampled in total; transects were placed perpendicular to the shore and extended to depths of 28-35 m. Substrate cover was determined using a 50 x 50 cm plastic frame subdivided in 13.7 cm² meshes. Details of this methodology are given in Alvarez & Díaz, 1985.

SYSTEMATIC DESCRIPTIONS

Class DEMOSPONGIAE

Order AXINELLIDA

Family RASPAILIIDAE

Genus *Eurypon* Gray, 1867

Eurypon laughlini n. sp.
(Pl. I-A, fig. 2)

Material. — Holotype: DOS MOSQUISES SUR, ARCHIPIÉLAGO DE LOS ROQUES National Park, Venezuela: on coral rock, depth 22 m, 18.II.1983, coll. M. C. Díaz & B. Alvarez (FCLR coll. no. Por. 110).

Paratypes: DOS MOSQUISES SUR, ARCHIPIÉLAGO DE LOS ROQUES: on coral rock, depth 7 m, 9.XII.83, coll. M. C. Díaz & B. Alvarez (FCLR coll. no. Por. 139); on coral rock, depth 15 m, 9.XII.83, coll. M. C. Díaz & B. Alvarez (FCLR coll. no. Por. A-25); on coral rock, depth 24 m, 9.XII.83, coll. M. C. Díaz & B. Alvarez (FCLR coll. no. Por. A-31); on coral rock, depth 15 m, 12.X.84, coll. M. C. Díaz & B. Alvarez (FCLR coll. no. Por. A-41); on coral rock, depth 24 m, 13.X.84, coll. M. C. Díaz & B. Alvarez (FCLR coll. no. Por. A-43); on coral rock, depth 22 m, 13.X.84, coll. M. C. Díaz & B. Alvarez (FCLR coll. no. Por. A-45); on coral rock, depth 33 m, 13.X.84, coll. M. C. Díaz & B. Alvarez (FCLR coll. no. Por. A-46).

CURAÇAO: Cape Malmeeuw, on dead coral, depth 12-16 m, 23.XII.80, coll. R. W. M. van Soest (ZMA coll. no. Por. 5841); Awa Blancu, on dead coral, depth 10-20 m, 29.XII.80, coll. R. W. M. van Soest (ZMA coll. no. Por. 5842); Malmeeuw, on dead coral, depth 35 m, IX.84, coll. W. Hoppe & M. Reichert (ZMA coll. no. Por. 5706).

Description

Shape: A thin film over dead coral, elevation from the substrate up to 4 mm.

Colour: Light orange in life; light brown in alcohol.

Consistency: Soft.

Surface: Optically smooth, but microscopically hispid, caused by the outward projection of single spicules (mainly tylostyles). Some specimens show coarse elevations made up by spicule tracts.

Oscules: 1-6 mm in diameter, with a collar up to 5 mm in height. Difficult to observe in the field, generally contracted. In life, canals of 1-2 mm in width depart radially from the oscules.

Ectosome: Thin organic skin pierced by large spicules.

Choanosome: Dense. Skeleton formed by spicules, mainly tylostyles, disposed perpendicularly to the surface of attachment, with heads embedded in a thin spongin layer that constitutes the sponge base. Elevations formed by tracts of larger spicules directed outward. Large quantities of coral fragments of various sizes and many foreign spicules in the choanosome. Sponge tissue penetrating slightly the coral rock over which it grows.

Spicules: Tylostyles, size range 126-1855 by 3-24 μm . Individual sizes, means and standard deviations are given in table I. Some specimens with a great diversity and quantity of foreign spicules (oxea, strongyles, styles, cladotylotes, microstrongyles, spirasters, oxyasters, etc.).

Discussion. — The new species is an atypical *Eurypon* because of the absence of acanthostyles. De Laubenfels (1936) erected the genus *Fasubera* for the Indian Ocean species *Hymedesmia lipochela* Dendy, 1922, which like our new species conforms to the type-species of *Eurypon* (i.e. the European *Hymenaphia clavata* Bowerbank, 1866) in architecture and spicule form and sizes. We believe that the mere loss of acanthostyles does not represent a good synapomorphy and propose to abandon the use of *Fasubera*. De Laubenfels, 1954, assigned a second species to *Fasubera*, viz. *F. debrumi*, which does not seem to be related at all to *lipochela* and our new species. On the basis of De Laubenfels' description it could very well be assigned to *Prosuberites* Topsent, 1893 (order Hadromerida).

Several other species of *Eurypon* have been reported from the West Indian region: *Eurypon clavatum* sensu Topsent, 1889 and De Laubenfels, 1950 (probably not conspecific with the European species), *Eurypon tourneti* (Topsent, 1894, as *Hymenaphia*), *Eurypon* spec. bright yellow (Van Soest, 1981) and *Eurypon* spec. dark purple (Van Soest, 1981). All these

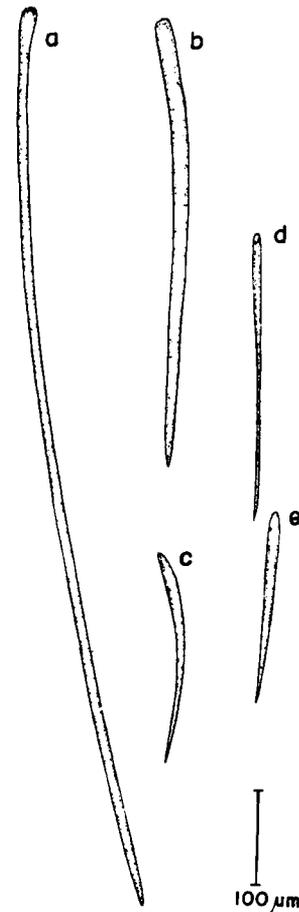


Fig. 2. *Eurypon laughlini* n. sp.: a-e, several size categories of tylostyles.

remain poorly known, but differ from our new species in having acanthostyles.

Etymology. — Named after Dr. R. Laughlin G. in recognition of his important contribution to the present study.

Order HALICHONDRIDA
Family HALICHONDRIIDAE?
Genus *Topsentia* Berg, 1899

***Topsentia roquensis* n. sp.**
(Pl. I-B & C, fig. 3)

Material. — Holotype: DOS MOSQUIS SUR, ARCHIPIÉLAGO DE LOS ROQUES National Park, Venezuela: on coral rock, depth 28 m, 29.III.83, coll. M. C. Díaz & B. Alvarez (FCLR coll. no. Por. 125).

TABLE I

Eurypon laughlini n. sp.: Means (\bar{X}), standard deviations (S.D.) and ranges of length and width of tylostyles and the diameter of tylostyle heads in individual specimens (all data in μm).

Coll. no.	\bar{X}	S.D.	Min.	Max.	N
<i>Tylostyles</i>					
FCLR Por. 110	285.4 × 10.5	132.9 × 3.2	126 × 3	559 × 18	25
FCLR Por. 139	407.4 × 10.8	212.3 × 3.1	171 × 6	1040 × 15	40
FCLR Por. A-25	479.4 × 13.9	215.8 × 4.4	260 × 9	1209 × 24	25
FCLR Por. A-31	531.3 × 8.6	278.5 × 2.6	208 × 3	1300 × 12	25
FCLR Por. A-41	462.9 × 10.9	170.6 × 4.4	182 × 6	1495 × 21	30
FCLR Por. A-43	523.5 × 10.1	303.7 × 2.6	260 × 6	1430 × 15	30
FCLR Por. A-45	574.2 × 9.7	375.5 × 4.0	260 × 3	1677 × 18	30
FCLR Por. A-46	496.6 × 12.3	190.7 × 3.9	234 × 6	832 × 21	30
ZMA Por. 5706	679.5 × 11.0	442.9 × 5.2	232 × 4	1245 × 18	10
ZMA Por. 5841	638.2 × 11.8	389.4 × 3.7	209 × 8	1130 × 15	10
ZMA Por. 5842	1177.4 × 13.4	740.7 × 4.3	202 × 6	1855 × 16	10
<i>Diameter of tylostyle heads</i>					
FCLR Por. 139	16.9	4.4	9	24	28
FCLR Por. A-25	19.8	5.1	12	28	25
FCLR Por. A-41	16.4	3.4	9	21	30
FCLR Por. A-43	15.1	2.8	12	21	30
FCLR Por. A-45	16.1	3.8	9	21	25
FCLR Por. A-46	18.2	5.1	9	27	30
ZMA Por. 5706	16.8	4.5	13	23	10
ZMA Por. 5841	15.2	4.8	9	21	10
ZMA Por. 5842	19.2	3.6	15	23	10

Paratypes: DOS MOSQUISES SUR, ARCHIPIÉLAGO DE LOS ROQUES: on coral rock, depth 29 m, 10.XII.83, coll. M. C. Díaz & B. Alvarez (FCLR coll. no. Por. A-35); on coral rock, depth 25 m, 13.X.84, coll. M. C. Díaz & B. Alvarez (FCLR coll. no. Por. A-49).

CURAAÇO: Playa Kalki, depth 10-20 m, 30.XII.80, coll. R. W. M. van Soest (ZMA coll. no. Por. 5840); buoy 2, 500 m W. of Piscadera Bay, depth 10 m, 2.I.81, coll. R. W. M. van Soest (ZMA coll. no. Por. 5839).

Description

Shape: Massive-amorphous, sometimes forming lobes or upright plates. May reach heights of up to 27 cm. In some specimens there are several sharply pointed elevations at the top, irregularly distributed, with heights of 2-8 cm.

Colour: Rose-purple with brownish tinges in life. Light beige in alcohol. Walnut-brown in dry condition.

Consistency: Hard as a rock but brittle when cut. In dry condition it becomes less brittle.

Surface: Smooth, but rough to the touch. Yellowish coloured zoanthids (probably *Parazoanthus swiftii* Duchassaing & Michelotti, 1860) growing over almost all specimens.

Oscules: Little evident in most specimens. In some cases irregular pores, 3-5 mm in diameter, occur on the surface. Only one of the specimens observed had the oscules aggregated on top of the lobes (pl. I-C).

Ectosome: Not detachable. Skeleton formed by spicules arranged paratangentially and disorderly.

Choanosome: Light beige in life. Skeleton formed by spicules arranged disorderly. As in the ectosome, a skeletal organization is not evident.

Spicules: Hastate oxea of three size classes: 108-304 by 3-12 μm , 312-546 by 3-18 μm and 559-975 by 12-36 μm (for means and standard deviations see table II). Some fusiform and hastate styles are found in low frequency.

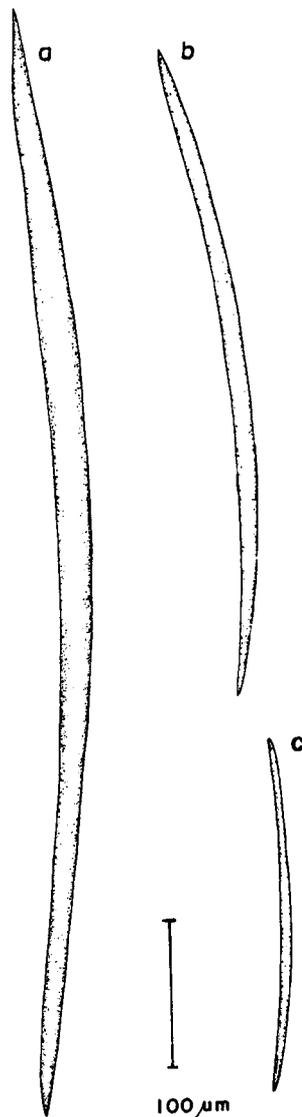


Fig. 3. *Topsentia roquensis* n. sp.: a-c, three categories of oxea.

Discussion. — Up to now only one West Indian species has been formally described in the genus *Topsentia*, viz. the orange *T. gyroderma* Alcolado, 1984; this is a suspect assignment, because the surface characteristics of this sponge remind more of *Myrmekeioderma*, *Didiscus* and *Epipolasis* (see below) than of *Topsentia*. The tantalizingly short description and barely discernible photographic representation make further comparisons impossible. Van Soest (1981) listed a *Topsentia* with “purple digita-

tions” which might prove to be another West Indian species. Furthermore, the black *Epipolasis lithophaga* Wiedenmayer, 1977, possibly constitutes a third West Indian *Topsentia*, at least it cannot be maintained in the genus *Epipolasis* (see below). *Aponastra modesta* Pulitzer-Finali, 1986, from Jamaica, needs comparison with *Topsentia* because the “microrhabds” described in this species might be homologous with the smallest category of oxea found in most *Topsentia* species. *Halichondria lutea* Alcolado, 1984 also needs to be compared with *Topsentia*, on account of the great size range given for the oxea. Finally, the West African *Topsentia porrecta* (Topsent, 1928, as *Coelocalypta*) is known to occur in deep water near Barbados (Van Soest, in preparation); it differs from the present new species in habit (fistulose) and consistency (more fragile).

Topsentia shows affinities with *Spongosorites* Topsent, 1896 (possessing crooked oxea) and *Amorphinopsis* Carter, 1876 (possessing a mixture of oxea and styles) by the size categories found in the spicules, and also by the often twice-curved nature of some of the oxea. Other genera are certainly (*Coelocalypta*) or likely (*Laminospongia* Pulitzer-Finali, 1983) synonymous with *Topsentia*.

Genus *Epipolasis* De Laubenfels, 1936

***Epipolasis reiswigi* n. sp.**
(Pl. I-D, fig. 4)

Material. — Holotype: DOS MOSQUISES SUR, ARCHIPIÉLAGO DE LOS ROQUES National Park, Venezuela: on sand with coral fragments, depth 30 m, 20.I.83, coll. M. C. Díaz & B. Alvarez (FCLR coll. no. Por. 68).

Paratypes: DOS MOSQUISES SUR, ARCHIPIÉLAGO DE LOS ROQUES: on coral rock, depth 30 m, 9.XII.83, coll. M. C. Díaz & B. Alvarez (FCLR coll. no. Por. A-18); on coral rock, depth 32 m, 9.XII.83, coll. M. C. Díaz & B. Alvarez (FCLR coll. no. Por. A-37); on sand with coral fragments, depth 28 m, 13.X.84, coll. M. C. Díaz & B. Alvarez (FCLR coll. no. Por. A-47).

Description

Shape: Massive-amorphous, with lobes on which the oscules are located. Some specimens

TABLE II

Topsentia roquensis n. sp.: Means (\bar{X}), standard deviations (S.D.) and ranges of three size categories of spicules in individual specimens (all data in μm).

Coll. no.	\bar{X}	S.D.	Min.	Max.	N
<i>Small oxea</i>					
FCLR Por. 125	248.9 × 8.0	24.3 × 2.1	189 × 6	300 × 12	23
FCLR Por. A-35	195.2 × 7.6	40.7 × 2.8	108 × 3	273 × 12	25
FCLR Por. A-49	199.4 × 7.1	49.1 × 2.7	123 × 3	300 × 12	25
ZMA Por. 5839	235.0 × 6.4	53.7 × 1.7	109 × 4	304 × 8	10
ZMA Por. 5840	197.4 × 5.7	33.3 × 1.0	145 × 5	226 × 7	10
<i>Medium oxea</i>					
FCLR Por. 125	431.6 × 10.0	50.5 × 2.5	338 × 6	520 × 12	25
FCLR Por. A-35	391.1 × 11.9	71.5 × 2.4	312 × 9	546 × 18	24
FCLR Por. A-49	406.4 × 14.1	59.2 × 5.0	325 × 3	507 × 18	25
ZMA Por. 5839	421.5 × 11.0	41.8 × 1.4	385 × 9	481 × 12	10
ZMA Por. 5840	420.3 × 10.8	82.3 × 1.7	346 × 9	530 × 13	10
<i>Large oxea</i>					
FCLR Por. 125	682.0 × 20.9	77.0 × 4.7	559 × 12	845 × 27	25
FCLR Por. A-35	675.4 × 19.4	80.6 × 4.3	559 × 12	845 × 27	25
FCLR Por. A-49	689.0 × 21.8	96.1 × 7.3	559 × 12	975 × 36	25
ZMA Por. 5839	727.0 × 21.2	106.3 × 3.6	575 × 16	845 × 26	10
ZMA Por. 5840	770.1 × 26.7	47.6 × 1.1	700 × 25	825 × 28	10

with thick and amorphous branches rising up to 10 cm over the substrate. Channeled depressions (5 mm in diameter), of diverse length and shape, located on the surface.

Colour: In life, bright orange in depressions and choanosome; due to the presence of epiphytes and sand on the sponge surface it presents a grey colour. In alcohol between greyish and beige. In dry condition, the choanosome and depressions have a walnut-brown colour, while the elevations turn to a beige colour. The specimens exude an orange substance and expel a disagreeable odour.

Consistency: In life slightly compressible. In dry condition it turns hard.

Surface: Due to the large quantity of sediment over the surface it is difficult to judge the texture. Channeled depressions are smooth.

Ectosome: In many specimens the channeled depressions are covered by a fine skin that tears easily. In elevations the ectosome presents a layer of tissue with accumulation of spicules tangentially arranged; the largest spicule category occurs in low frequency in that layer.

Choanosome: Cavernous, with canals of 1-8.4 mm in diameter. Skeleton formed by vague spicule tracts (120-280 μm in diameter) disorderly arranged, which may run obliquely or parallel to the surface; in some areas the skeleton is formed by a mass of spicules.

Spicules: Two size classes of hastate-fusiform oxea and one of small fusiform oxea: 390-910 by 15-36 μm , 182-520 by 3-20 μm , and 84-416 by 3-12 μm ; microscleres abundant, curved or vermiform trichodragmata: 80-102 by 3-8.5 μm . Means and standard deviations of spicule sizes are given in table III.

Discussion. — The new species is close to the type-species of *Epipolasis*, i.e. the Indo-West Pacific *Spongosorites suluensis* Wilson, 1925. It shares the surface peculiarities and the vermiform trichodragmata, while spicule sizes are comparable. *E. suluensis* differs in details of the channeled depressions and in life colour which appears to be rosy-red (based on recent observations of the species in Indonesian waters).

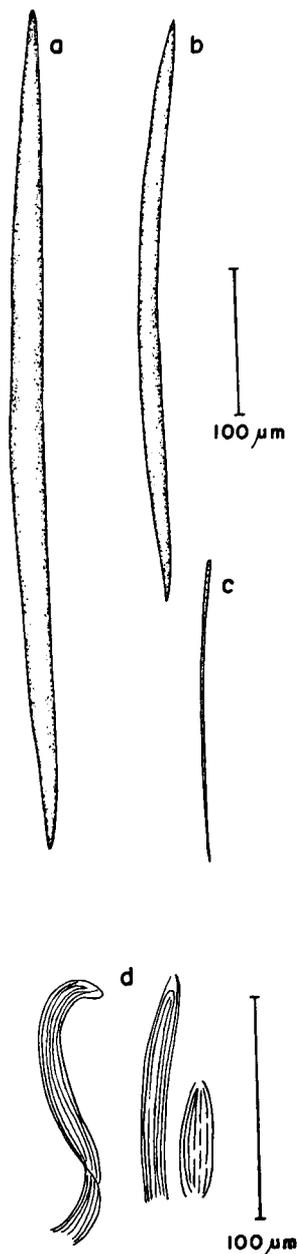


Fig. 4. *Epipolasis reiswigi* n. sp.: a, hastate oxea; b, hastate to fusiform oxea; c, fusiform oxea; d, curved and vermiform trichodragmata (a, b, and c drawn to the same scale figured above; d drawn to scale figured below).

The genus *Epipolasis* is here employed for sponges similar to the type-species. De Laubenfels (1936) included in the original concept of the genus also *Suberites angulospiculatus* Carter, 1882, but this is now known to be a

senior synonym of *Roosa zyggompha* and belongs to the genus *Plakortis* (order Homosclerophorida) (checked against Carter's type-specimen in the British Museum (Natural History)). Wiedenmayer, 1977 was not aware of De Laubenfels' misinterpretation of the type-species of his new genus *Epipolasis*, which is apparent from Wiedenmayer's discussion of the genus, and also from the assignment of his *lithophaga* to this genus. Because this species has no vermiform trichodragmata it probably belongs to *Topsentia*.

The genus name *Raspaigella* Schmidt, 1868 has been employed for sponges having the characteristics of *Epipolasis* (see Burton, 1959, and Vacelet et al., 1976). The justification for this is not clear: there is nothing in Schmidt's description of the genus or the type-species *R. brunnea* suggesting that trichodragmata are present. There are no recent redescriptions of original material or fresh specimens of *R. brunnea*.

Genera close to *Epipolasis* are *Myrmekioderma* Ehlers, 1870 (cf. discussions in Bergquist, 1965), and *Didiscus* Dendy, 1922. Both genera have a wide size range of oxeote megascleres and channeled surface depressions comparable to those of *E. reiswigi* n. sp. Likewise, *Topsentia gyroderma* Alcolado, 1984, has these depressions, judging from the bad photograph of the type-specimen. *Myrmekioderma* (with West Indian representative *M. styx* De Laubenfels, 1953) has the smaller category of oxea lightly spined and curved trichodragmata are present. *Didiscus* (with West Indian representative *D. oxeata* Hechtel, 1983, senior synonym of *D. flavus* Van Soest, 1984 and *D. habanensis* Alcolado, 1984) has very characteristic discorhabds. The generic assignment of *Topsentia gyroderma* cannot at present be evaluated. It is clear that this group of closely related genera is in urgent need of revision, which will quite likely result in a reduction of the number of generic names.

Etymology. — Named after Dr. Henry Reiswig in recognition of his important contributions to our knowledge of sponge biology.

TABLE III

Epipolasis reiswigi n. sp.: Means (\bar{X}), standard deviations (S.D.) and ranges of three size categories of megascleres and of trichodragmata in individual specimens (all data in μm).

Coll. no.	\bar{X}	S.D.	Min.	Max.	N
<i>Hastate oxea</i>					
FCLR Por. 68	819.5 × 28.2	66.9 × 4.9	624 × 15	910 × 36	25
FCLR Por. A-18	808.6 × 26.9	80.8 × 3.1	520 × 18	910 × 30	25
FCLR Por. A-37	782.1 × 24.8	46.2 × 2.7	650 × 21	832 × 30	25
FCLR Por. A-47	755.6 × 27.7	162.8 × 3.9	390 × 21	910 × 36	25
<i>Hastate to fusiform oxea</i>					
FCLR Por. 68	410.8 × 11.1	97.4 × 2.7	286 × 6	520 × 20	40
FCLR Por. A-18	406.6 × 12.0	64.8 × 2.6	182 × 3	520 × 15	25
FCLR Por. A-37	408.7 × 11.2	48.1 × 1.8	312 × 9	520 × 15	25
FCLR Por. A-47	341.1 × 10.1	36.1 × 2.4	260 × 6	403 × 12	25
<i>Fusiform oxea</i>					
FCLR Por. 68	238.0 × 3.0	35.7 × 0	182 × 3	328 × 3	23
FCLR Por. A-18	225.9 × -	120.8 × -	84 × -	416 × 12	40
FCLR Por. A-37	234.4 × 3.0	52.3 × 0	104 × 3	312 × 3	25
FCLR Por. A-47	250.3 × 3.3	54.3 × 0.9	117 × 3	325 × 6	12
<i>Trichodragmata</i>					
Various specimens	91.7 × 6.2	10.4 × 2.8	80 × 3	102 × 8.5	25

ECOLOGICAL REMARKS

In the reef studied at Los Roques, demosponges are well represented in species number (higher than that of scleractinian corals, see Hung, 1985). Analysis of community structure (richness, density, cover, diversity) shows a tendency towards increase of complexity with depth. The evenness values, however, are more or less comparable along the depth profile (Díaz, Alvarez & Laughlin, in preparation). According to these results, the three new species described in the present paper are among the 27 species that constitute 95% of the area covered and of the total number of individuals. Important ecological remarks on the three new species are given below:

1. *Eurypon laughlini* n. sp.

Frequent species, with a wide depth range (3-35 m). Relatively higher values of area covered and density (number of individuals/m²) were registered toward the deeper zones of the reef. However, the mean area covered per individual

(23 cm², S.D. = 25.4, $n = 100$) and area covered per m² (31.6 cm², S.D. = 29.6, $n = 76$) were relatively low. Nevertheless, because this species grows in cryptic areas, it is believed that the values of area covered were underestimated. The density of this species was relatively low with maximum values of 3 individuals per m². Usually it grows over coral rock.

2. *Topsentia roquensis* n. sp.

Restricted to the deep zone of the reef (23-30 m). It showed one of the highest mean values of area covered per individual (166.4 cm², S.D. = 144.6, $n = 6$) and area covered per m² (166.1 cm², S.D. = 144.6, $n = 6$). Nevertheless, the density was never greater than 1 individual per m². The specimens usually grow over coral rocks.

3. *Epipolasis reiswigi* n. sp.

A common species found between 13-30 m. High frequency and abundance values were registered below a depth of 20 m. The mean values of area covered per individual and area

covered per m² (76.5 cm², S.D. = 49.4, *n* = 12; 72.5 cm², S.D. = 45.7, *n* = 12) are intermediate. Density is never greater than 1 individual/m². It typically grows on sandy substrates, and it is usually found covered almost completely by sand.

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PLATE I

- Fig. A. *Eurypon laughlini* n. sp., holotype (FCLR coll. no. Por. 110) from a fringing coral reef at Dos Mosquises Sur Cay, Archipiélago de Los Roques National Park, photographed in situ (photo E. Weil).
- Fig. B. *Topsentia roquensis* n. sp., holotype (FCLR coll. no. Por. 125) from a fringing coral reef at Dos Mosquises Sur Cay, Archipiélago de Los Roques National Park, photographed in situ (photo E. Weil).
- Fig. C. *Topsentia roquensis* n. sp., elevated oscules in another specimen from the same area, photographed in situ (photo E. Weil).
- Fig. D. *Epipolasis reiswigi* n. sp., holotype (FCLR coll. no. Por. 68) from a fringing coral reef at Dos Mosquises Sur Cay, Archipiélago de Los Roques National Park, photographed in situ (photo E. Weil).

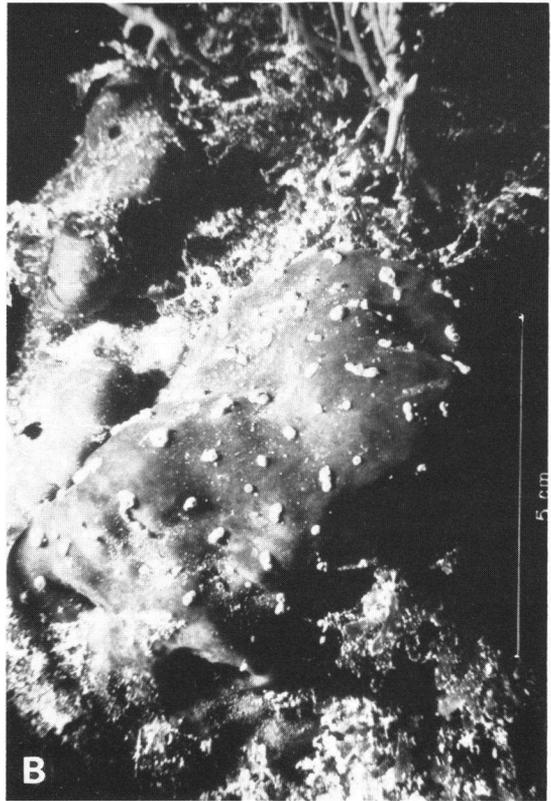
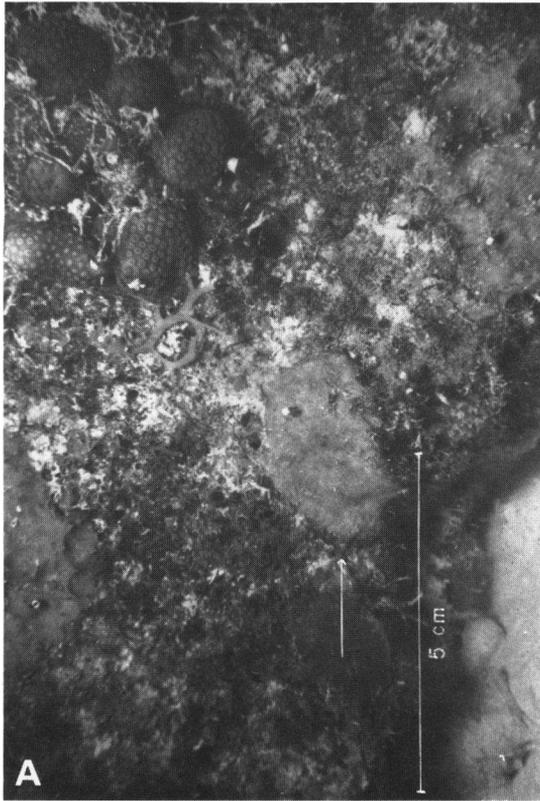


PLATE I