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ET TECHNIQUE
D'Océanographie ET DE Pêche

INSTOP

Vol. 2, N° 4



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1973

Publications de l'Institut national scientifique
et technique d'océanographie et de pêche
INSTOP — Salammbô — Tunisie
(anciennement Station océanographique de Salammbô)

Bulletin :

Le Bulletin de l'Institut national scientifique et technique d'océanographie et de pêche qui fait suite au Bulletin de la Station océanographique de Salammbô paraît depuis 1966 par fascicules séparés à raison de 4 numéros par volume.

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Bulletin de la Station océanographique de Salammbô

n° 1 (1925) à n° 54 (1959)

Bulletin de l'Institut national scientifique et technique d'océanographie et de pêche.

vol. 1 n° 1 et n° 2 (1966), n° 3 (1969), n° 4 (1970)

vol. 2 n° 1 (1971), n° 2 (1971), n° 3 (1972)

Les chercheurs étrangers à l'Institut peuvent publier dans le Bulletin tous travaux concernant des résultats de recherches effectuées en mer Méditerranée et plus particulièrement en Tunisie. Les manuscrits seront adressés au Directeur de l'Institut national scientifique et technique d'océanographie et de pêche — Salammbô — Tunisie.

100 tirages à part seront offerts aux auteurs.

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CLIONID SPONGES FROM THE COAST OF TUNISIA

by

Klaus Rützler (1)

ABSTRACT

Seven species of clionid sponges from Tunisian shallow-water habitats are described and illustrated: *Cliona celata*, *C. viridis*, *C. nigricans*, *C. carteri*, *C. schmidtii*, *C. vastifica* and *Chiothosa hamcocki*. Two of these (*Cliona celata* and *C. carteri*) have not previously been reported from Tunisia. *Cliona nigricans* is considered a distinct species and not a mere growth form of *C. viridis*.

RESUME

Sept espèces d'éponges clionides sont décrites et illustrées, *Cliona celata*, *C. viridis*, *C. nigricans*, *C. carteri*, *C. schmidtii*, *C. vastifica* et *Chiothosa hamcocki*. Deux de ces espèces (*Cliona celata* et *C. carteri*) sont signalées pour la première fois en Tunisie. *Cliona nigricans* est considérée comme une espèce distincte et non une simple forme de croissance de *C. viridis*.

INTRODUCTION

Members of the family Clionidae (Porifera) are well known for their habit of excavating limestone substrates and living more or less cryptically in their burrows. Thus they are easily overlooked but, nevertheless, they play an important part in the erosion of calcium carbonate shorelines. During three recent surveys of Tunisian shallow-water habitats (October 1969, May-July 1970, August-September 1971), the author observed and collected seven species of clionid sponges. Two of these, *Cliona celata* and *C. carteri* have not previously been recorded from Tunisia. The substrata containing the burrowing sponges con-

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sisted mainly of well cemented sandstone with a varying content (7-57% weight) of Hcl-insoluble materials, mostly quartz grains. This did not noticeably impede the excavating efficiency although the size and arrangement of chambers produced by the sponges was sometimes modified.

The following species descriptions are intended as a field guide to permit identification by workers who are not specialists in sponge systematics. The spicule complement of all species is illustrated. The synonymy includes reference to the first describer and to a recent revision or comprehensive description of the species. Ranges of spicule dimensions (50 measurements each) are given, with mean values in parentheses. Spelling of locality names follows that of the Tunisian road map issued by the Service Topographique (Secrétariat d'Etat aux Travaux Publics et à l'Habitat), Tunis (1967). The specimens on which these descriptions are based deposited at the Institut National Scientifique et Technique d'Océanographie et de Pêche (Salammbô, Tunisia). Methods of preparation of burrowing sponges for systematic study are given by Rützler (1974).

Hospitality and assistance provided by the Institut National Scientifique et Technique d'Océanographie et de Pêche (Salammbô) and by the Mediterranean Marine Sorting Center (Khereddine) are gratefully acknowledged. Mrs. C. Sterrer prepared the drawings from photomicrographs. This work was supported by grants SFG-0-CC43 and SRF 430065 (Smithsonian Institution).

DESCRIPTION OF SPECIES

Cliona celata Grant

Figure 1

Cliona celata Grant 1826 : 78-81. — Topsent 1900 : 32-55, pl. 1, figs. 5-9; pl. 2, fig. 1. — Volz 1939 : 4-8, fig. 1; pl. 1, figs. 1, 2; pl. 2, fig. 3.

Description. — Color : Yellow to golden yellow, changing to greyish brown or ochre in alcohol. Shape and size : The papillae are circular, well separated from each other, 0.5-3.0 mm in diameter. No papillary canal is developed, chambers start immediately below the surface. Chambers measure 2.5-4.5 mm, maximum penetration observed was 14 mm below the substratum surface. Spicules : Only tylostyles and a few styles occur in the material studied (figure 1a). They are bent in the upper third.

The tylostyles heads are usually subterminal, sometimes removed considerably from the rounded end of the spicule (figure 1b). The spicules measure 220.0-460.0 (323.0) $\times$ 3.2-6.9 (5.4) μ m. The tylostyle heads are 9.6-14.4 (11.5) μ m long, 7.2-11.0 (8.3) μ m wide.

Remarks. — Only the alpha-stage of this sponge was observed. In some specimens the chambers are not well defined, due to a high content of quartz grains in the substratum rock. Inside coralline algal crusts the chambers show the typical development.

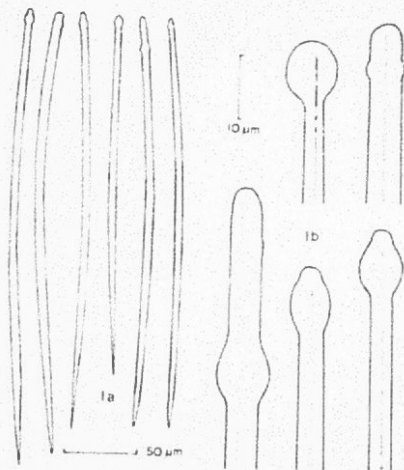


Fig. 1: *Chama celata*, spicules. Tylostyles (a), tylostyle heads (b).

Material. — Rass Maamoura (Northeast of Nabeul), 2 m, 13 May 1970 (in oyster shell; 0.5-1 m, 26 May 1970 (in coralline encrusted rock). Rass Salakta, 2 m, 24 August 1971 (in rock).

Distribution. — Mediterranean Sea, Atlantic Ocean, Indian Ocean, Pacific Ocean.

Cliona viridis (Schmidt)

Figure 2

Vloa viridis Schmidt 1862 : 77, pl. 7, fig. 14.

Cliona viridis. — Topsent 1900 : 84-93, pl. 2, figs. 11-14; pl. 3, figs. 2, 3; pl. 4, fig. 2. — Volz 1939 : 13-16, fig. 3; pl. 2, figs. 1, 2, 4; pl. 4, figs. 2, 4.

Description. — Color : The papillae are light to dark olive greyish green, greyish brown. The color is influenced by the amount of zooxanthellae in the tissue, hence by the exposure of the sponge to light. In alcohol the color changes to greyish olive and light grey. Shape and size : The papillae are basically circular, 0.5-2.5 mm in diameter. In some specimens they are well separated, particularly in those burrowing coralline algal crusts. In others there is a strong tendency of papillary fusion although no beta-stage was ever observed. Fused papillae mea-

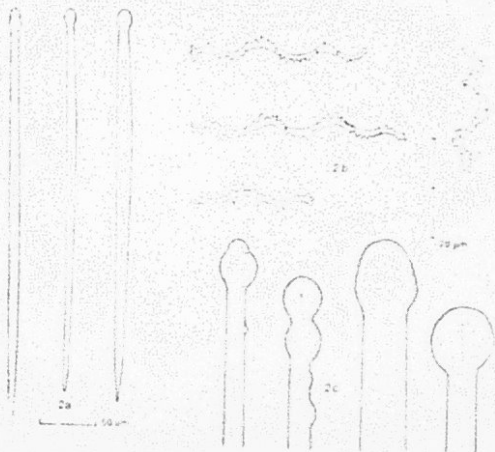


Fig. 2 : *Cliona viridis*, spicules. Tylostyles (a), spirasters (b), tylostyle heads (c).

sure 9×5 mm at the most. Even in undisturbed specimens the papillae do not protrude much above the substratum surface. There is no papillary canal; papillae lead directly into chambers. The small chambers measure 0.2-1.3 mm; however, the separating walls are frequently broken down and fused chambers can often be observed. Spicules: There are tylostyles and spirasters, the latter confined to the chamber tissue. The tylostyles (figure 2 a, c) are straight or a little bent, with fusiform shaft and well developed head. A number of heads are subterminal but never to the extent described for a related species, *Cliona copiosa* Sarà (Sarà 1959, 1961). Tylostyles measure 200.0-410.0 (373.0) $\times$ 5.0-10.5 (8.3) μ m, tylostyl heads 11.3-15.0 (13.5) $\times$ 10.0-13.8 (12.0) μ m. The spirasters (figure 2 b) are long and thin. Some are straight, most of them have 1-6 (3.2) bends. There are numerous delicate spines. Spiraster length: 12.8-42.4 (26.6) μ m width (including spines): 2.4-4.2 (2.9) μ m.

Remarks. — Massive specimens of this sponge as reported by Topsent (1934) are not now believed to be conspecific (see remarks for *Cliona nigricans*).

Material. — Rass Maamoura (Northeast of Nabeul), 1 m, 13 May 1970 (in coralline alga); 0.5-1 m, 26 May 1970 (in rock). Korbous, 1-2 m, 30 May 1970 (in coralline encrusted rock); 0.5-1.5 m, 11 June 1970 (in coralline).

Distribution. — Mediterranean Sea, Atlantic Ocean, Indian Ocean, Pacific Ocean.

Cliona nigricans (Schmidt)

Figure 3

Papillina nigricans Schmidt 1862: 69.

Osculina polystomella Schmidt: 3, pl. 1, figs. 1-12.

Cliona viridis. — Topsent 1933: 34-35 (in part).

Description. — Color: Epithitic portions of the sponge are brownish green; some areas have a yellowish or whitish tinge. The choanosome is dirty yellow. In alcohol the color fades to yellowish or to greyish brown and light gray. Shape and size: Both alpha- (papillate) and beta- (encrusting) stages of this sponge are present in our material. The large, fleshy, irregularly shaped papillae measure 4-10 mm bear either single oscula or groups of ostia. Expanded oscula are 6-8 mm in diameter. Several stages of fusion can be observed whereby the papillae remain distinct but are connected by a tissue crust of 1 mm thickness. Even in preserved specimens the papillae can protrude as much as 5 mm. The largest crust observed covered 65 cm².

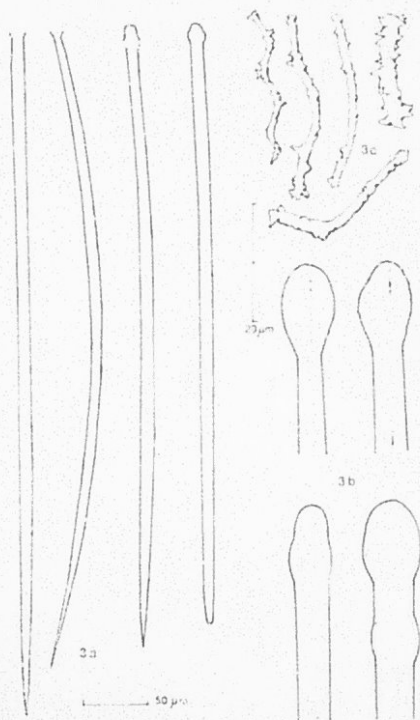


Fig. 3 : *Cliona nigricans*, spicules (a), tylostyle heads (b), spirasters (c).

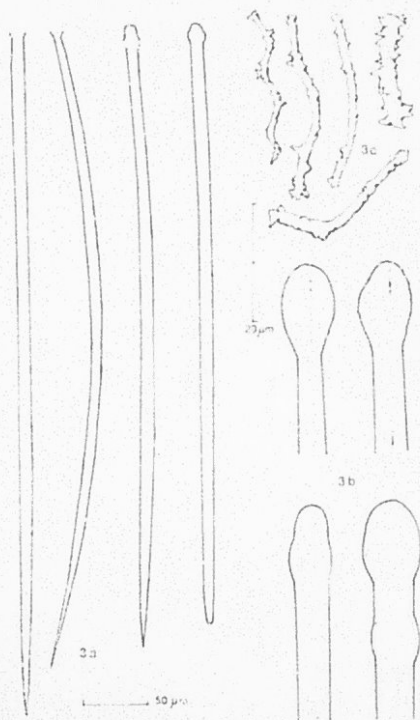


Fig. 3 : *Cliona nigricans*, spicules (a), tylostyle heads (b), spirasters (c).

There is an average of 2.6 papillae per cm. Contracted specimens show a meandering surface pattern. Chambers of 2-3 mm reach 40 mm into the substratum. Many of the chamber walls are broken down and the burrowed rock is very brittle. Loose sand particles are frequently embedded in the tissue. No true gamma-stage was observed. Spicules: The spiculation of this species is similar to that of *Cliona viridis* but the tylostyles are much more robust. Tylostyles (figure 3 a, b) measure 320.0-600.0 (485.0) $\times$ 8.0-10.0 (9.3) μ m, tylostyl heads 12.5-16.3 (14.5) $\times$ 10.5-16.3 (12.5) μ m. Spirasters (figure 3 c) can be straight, most have 1-5 (3.1) bends. They are 14.4-41.6 (28.5) μ m long, 1.3-4.0 (2.6) μ m wide (including spines).

Remarks. — Studying specimens identified by O. Schmidt, Topsent (1900 : 87-88) could establish the identity of *Papillina nigricans* and *Osculina polystomella*. He also found spirasters in this material which Schmidt (1862, 1868) had overlooked. From the similarity of the spicule complement he concluded that these sponges were merely advanced, free-living stages of *Cliona viridis*. This view is not shared here because the present material includes papillate (alpha-) stages of *Cliona nigricans* which are clearly different from *Cliona viridis*. The papillae are much larger, fleshy, strongly protruding and remain distinct even when connected by encrusting tissue. *Cliona viridis*, on the other hand, forms thin smooth incrustations whenever a number of papillae are fused together. Spicule dimensions and depth distribution are also different. Both species contain zooxanthellae.

Material. — Korbous, 3-10 m, June 1970 (in coralline encrusted rock, in coralline encrusting *Posidonia* rhizome); 5 m, 24 June 1970 (in rock).

Distribution. — Mediterranean (distribution elsewhere uncertain)

Cliona carteri (Ridley)

Figure 4

Cliona carteri Ridley 1881 : 129-130, pl. 11, fig. 2.

Cliona viridis var. *carteri*. — Topsent 1900 : 98-102, pl. 3, fig. 4.

Description. — Color : Scarlet in life, eventually changing to grey in alcohol. Shape and size : The papillae are circular, widely spaced, there is no tendency to fusion. They measure 1-2 mm. Papillary perforations can have a flaring shape and lead directly into the chambers. Papillary canals of 2-4 mm length occur. Chambers are large, ovoid or irregular, and filled

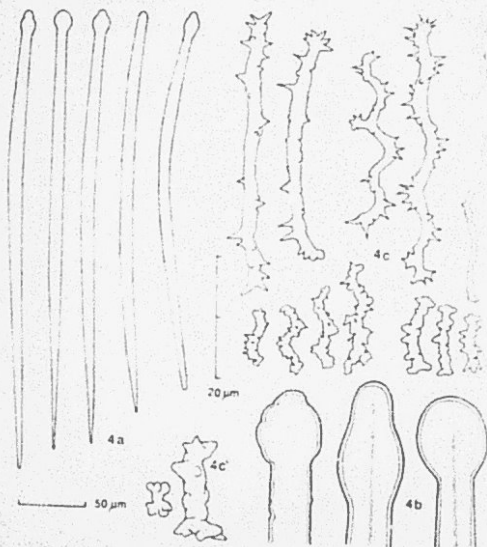


Fig. 4 : *Cliona carteri*, spicules. Tylostyles (a), tylostyle heads (b), spirasters (c).

with tissue. Their longest diameter is usually parallel to the substratum surface, thus recalling the burrow of *Cliona vermifera*, a species not found in Tunisia. The chambers measure $2.2 (8.6) \times 2.7 (5.0) \times 2.5 (3.6)$ mm (length $\times$ width $\times$ height); the burrow extends 12 mm into the substratum. Spicules : The tylostyles (figure 4 a, b) are robust, with fusiform shafts, and distinct heads which are frequently mucronate or subterminal. They measure $250.0-370.0 (302.0) \times 6.3-12.0 (9.3)$ μ m, heads $11.3-14.0 (13.0) \times 11.5-15.0 (13.0)$ μ m. There are two categories of spirasters (figure 4 c). Short and comparatively thick ones occur in the papillae : $7.5-30.0 (15.3) \times 3.8-6.3 (4.5)$ μ m (including spines). A few are straight, most have 1-4 (2.4) bends. The chambers contain longer and thinner spirasters, straight

with 1-5 (4.0) bends 27.5-45.5 (36.8) $\times$ 2.5-5.0 (3.8) μ m (including spines).

Remarks. — Color, burrow size and shape and size and position of the spirasters make this a distinct species with can not be confused with *Cliona viridis*. It has only rarely been recorded in the literature and only one specimen was found during the present study. *Cliona carteri* has recently been found in the Gulf of Taranto and in the Channel of Otranto (Italy) (Sarà 1964 : 306); no description was given.

Material. — Korbous, 4 m, 24 June 1970 (in coralline encrusted rock).

Distribution. — Mediterranean Sea, Atlantic Ocean (off South Brasil only).

Cliona schmidtii (Ridley)

Figure 5

Vioa schmidtii Ridley 1881 : 130.

Cliona schmidtii. — Topsent 1900 : 77-84. pl. 2, fig. 15; pl. 3, fig. 5. — Volz 1939 : fig. 4; pl. 3, fig. 3.

Description. — Color : Both papillae and chambers are deep purple, a color that remains in alcohol preserved or dry specimens. Shape and size : Papillae are circular, do not fuse and measure 0.3-1.5 mm. There is a short papillary canal of 0.5-2.0 mm. Chambers measure 1-2 mm. The burrow extends 17 mm in to the substratum. Spicules : The tylostyles (figure 5 a, b) are straight or slightly bent. Their heads are distinct but frequently mucronate. Tylostyles measure 222.0-300.0 (261.0) $\times$ 5.0-7.5 (5.8) μ m, heads are 6.3-17.5 (12.0) $\times$ 7.5-11.3 (9.8) μ m. Microscleres (figure 5 c) are of two types. Short, stout spirasters occur mainly in the papillae : 35.0-62.5 (43.0) $\times$ 10.0-17.5 (13.5) μ m (including spines). Longer and rather thin spiny rods, straight, irregularly bent or wavy are found mainly in the choanosome. They measure 25.0-90.0 (52.5) $\times$ 2.5-7.5 (4.5) μ m (including spines).

Material. — Korbous, 0.5-1.5 m, 11 June 1970 (in coralline rock); 3 m, 24 June 1970 (in coralline encrusted rock). Caves d'Ennaines (West of El Haouaria), 10 m, 14 June 1970 (in coralline encrusted rock). Ile Plane, 1 m, 5 September 1971 (in base of *Stroides calycularis*).

Distribution. — Mediterranean Sea, Red Sea, Indian Ocean, Pacific Ocean, Tropical West-Atlantic Ocean.



Fig. 5 : *Cliona schmidtii*, spicules. Tylostyles (a), tylostyles heads (b), spirasters (c).

Cliona vastifica Hancock

Figure 6

Cliona vastifica Hancock 1849 : 342, pl. 15, fig. 12. — Topsent 1900 : 56-70, pl. 2, figs. 3-9. — Topsent 1932 : 558-559, fig. 3. — Topsent 1934 : 99-101. — Volz 1939 : 8-12, fig. 2; pl. 1, fig. 3; pl. 2, fig. 3; pl. 3, fig. 1.

Description. — Color : Orange in life, pale gray in alcohol. Shape and size : The papillae are inconspicuous, well spaced, circular, 0.2-0.8 mm in diameter. No papillary canal is developed. Chambers are 0.6-1 mm, depth of substratum penetration 8 mm. Spicules : Tylostyles (figure 6a) are straight, slender, with spheroid terminal heads. They measure 197.5-277.5 (231.8)

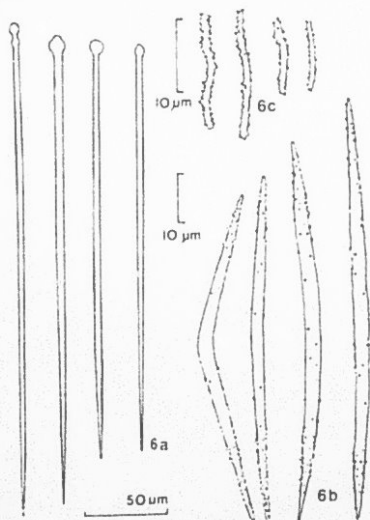


Fig. 6 : *Cliona vastifica*, spicules. Tylostyles (a), microspined axes (b), spiny microthabds (c).

Cliona vastifica Hancock

Figure 6

Cliona vastifica Hancock 1849 : 342, pl. 15, fig. 12. — Topsent 1900 : 56-70, pl. 2, figs. 3-9. — Topsent 1932 : 558-559, fig. 3. — Topsent 1934 : 99-101. — Volz 1939 : 8-12, fig. 2; pl. 1, fig. 3; pl. 2, fig. 3; pl. 3, fig. 1.

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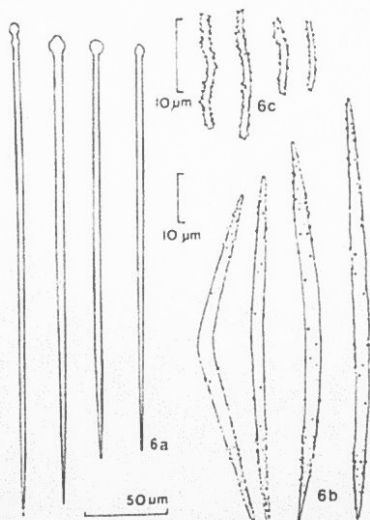


Fig. 6 : *Cliona vastifica*, spicules. Tylostyles (a), microspined axes (b), spiny microthabds (c).

$\times 3.0-4.0$ (3.5) μm , heads: $7.2-8.0$ (7.8) $\times 4.8-8.0$ (6.2) μm . Tylostyles are not very abundant. More numerous micro-spines (figure 6 b) measure $48.0-92.8$ (67.0) $\times 1.6-3.2$ (2.2). They only occur in the chambers and are slightly bent in the center. Spiny microhabds (figure 6 c) are found in the papillae and in the chamber tissue. They are straight or slightly bent once or twice and have blunt ends. Microhabds (including spines) measure $9.6-19.2$ (14.4) $\times 1.0-1.6$ (1.1) μm .

Remarks. — The present material contains only one specimen which is typical for the species. Aberrant forms as previously described from the Gulf of Gabès (Topsent 1932, 1934) were not encountered.

Material. — Rass Salakta, 2 m, July 1970 (in coralline encrusted rock).

Distribution. — Mediterranean Sea, Black Sea, Atlantic Ocean, Indian Ocean, Pacific Ocean.

Cliothosa hancocki (Topsent)

Figure 7

Thoosa Hancocki Topsent 1888 : 81, pl. 7, fig. 12.

Cliothosa hancocki. — Topsent 1928 : 1-7, fig. 1. — Volz. 1939 : 25-29, fig. 8; pl. 4, figs. 2-4.

Description. — Color : The papillae are bright yellow; some specimens with an orange tinge. Color in alcohol light brown. Chamber tissue is yellow, greyish ochre in alcohol. Shape and size : The papillae are circular, well spaced, rarely fused, 1.2-5.5 mm in diameter. A conspicuous papillary canal can reach 12 mm in length. The chambers are minute, 0.3-1.2 mm and densely spaced. Infested rock appears soaked with yellow tissue. Maximum penetration of the burrow is 15 mm. Spicules : Robust tylostyles (figure 7 a, b) have a fusiform shaft and a distinct spheroid head, which is mostly mucronate or even subterminal. Tylostyles measure $280.0-490.0$ (423.3) $\times 7.5-13.0$ (10.8) μm , their head $13.8-20.0$ (16.0) $\times 10.0-15.0$ (13.3) μm . The microscleres consist of two kinds of amphiasters. Rameous amphiasters (figure 7 c) occur in the choanosome only. They have a thin shaft and 4-11 (6.3) long slender rays with furcated tips. They measure $20.0-32.5$ (25.8) $\times 13.8-30.0$ (20.5) μm (including rays), the shafts are 2.5-5.0 (3.5) μm thick. The second kind of microscleres, nodulose amphiasters (figure 7 d), only occurs in the papillae or can be absent in certain specimens. Nodulose amphiasters measure $15.0-25.0$ (21.3) $\times 12.5-16.3$ (14.8) μm ; there are 6-10 (7.3) nodules.

$\times 3.0-4.0$ (3.5) μm , heads: $7.2-8.0$ (7.8) $\times 4.8-8.0$ (6.2) μm . Tylostyles are not very abundant. More numerous micro-spines (figure 6 b) measure $48.0-92.8$ (67.0) $\times 1.6-3.2$ (2.2). They only occur in the chambers and are slightly bent in the center. Spiny microhabds (figure 6 c) are found in the papillae and in the chamber tissue. They are straight or slightly bent once or twice and have blunt ends. Microhabds (including spines) measure $9.6-19.2$ (14.4) $\times 1.0-1.6$ (1.1) μm .

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Thoosa Hancocki Topsent 1888 : 81, pl. 7, fig. 12.

Cliothosa hancocki. — Topsent 1928 : 1-7, fig. 1. — Volz. 1939 : 25-29, fig. 8; pl. 4, figs. 2-4.

Description. — Color : The papillae are bright yellow; some specimens with an orange tinge. Color in alcohol light brown. Chamber tissue is yellow, greyish ochre in alcohol. Shape and size : The papillae are circular, well spaced, rarely fused, 1.2-5.5 mm in diameter. A conspicuous papillary canal can reach 12 mm in length. The chambers are minute, 0.3-1.2 mm and densely spaced. Infested rock appears soaked with yellow tissue. Maximum penetration of the burrow is 15 mm. Spicules : Robust tylostyles (figure 7 a, b) have a fusiform shaft and a distinct spheroid head, which is mostly mucronate or even subterminal. Tylostyles measure $280.0-490.0$ (423.3) $\times 7.5-13.8$ (10.8) μm , their head $13.8-20.0$ (16.0) $\times 10.0-15.0$ (13.3) μm . The microscleres consist of two kinds of amphiasters. Rameous amphiasters (figure 7 c) occur in the choanosome only. They have a thin shaft and 4-11 (6.3) long slender rays with furcated tips. They measure $20.0-32.5$ (25.8) $\times 13.8-30.0$ (20.5) μm (including rays), the shafts are 2.5-5.0 (3.5) μm thick. The second kind of microscleres, nodulose amphiasters (figure 7 d), only occurs in the papillae or can be absent in certain specimens. Nodulose amphiasters measure $15.0-25.0$ (21.3) $\times 12.5-16.3$ (14.8) μm ; there are 6-10 (7.3) nodules.

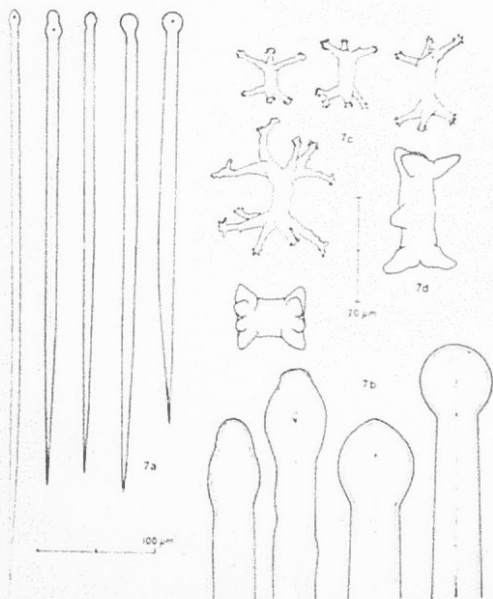


Fig. 7 : *Cliothisa hancocki* spicules. Tylostyles (a), tylostyle heads (b), ramoso amphirasters (c), nodulose amphirasters (d).

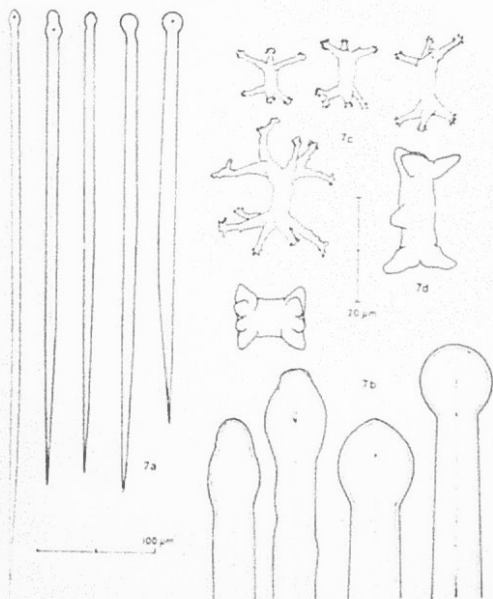


Fig. 7 : *Cliothisa hancocki* spicules. Tylostyles (a), tylostyle heads (b), ramoso amphirasters (c), nodulose amphirasters (d).

Remarks. — The fact that certain specimens of *Cliothosa hancocki* can lack nodulose amphiasters has been discussed by Topsent (1928). These spicules were present only in one specimen of our material. A third small type of amphiasters noted by Volz (1939) was never found.

Material. — Off Adjim, Djerba, 0.5-1 m, 11 October 1969 (in rock), Kerkouane (North of Kelibia), 1 m, 6 June 1970 (in coral-line encrusted rock), Korbous, 0.5-10 m, 10 June, 11 June, 24 June 1970 (in rock and gravel), Rass Maamoura (Northeast of Nabeul), 0.5-1 m, 26 May 1970 (in rock).

Distribution. — Mediterranean Sea, Indian Ocean, Pacific Ocean.

LITERATURE CITED

- GRANT R.E. (1926). — Notice of a new zoophyte (*Cliona celata* Gr.) from the Firth of Forth. *Edinb. New Phil.* 1, 1 : 78-81.
- HANCOCK A. (1849). — On the excavating powers of certain sponges belonging to the genus *Cliona*; with descriptions of several new species, and an allied generic form. *Ann. Mag. Nat. Hist.*, Ser. 2, 3 : 321-348.
- RIDLEY S.O. (1881). — Spongia. Chap. XI. Account of the zoological collections made during the survey of H.M.S. « Alert » in the Straits of Magellan and on the Coast of Patagonia. *Proc. Zool. Soc. London*, 1881 : 107-137, 140-141.
- RUTZLER K. (1974). — The burrowing sponges of Bermuda. *Smithsonian Contrib. Zool.* (in press).
- SARA M. (1959). — Specie nuove di Demosponge provenienti da acque superficiali del golfo di Napoli. *Annali Ist. Zool. Univ. Napoli*, 11 : 1-22.
- SARA M. (1961). — La fauna di Poriferi delle grotte delle isole Tremiti. Studio ecologico e sistematico. *Arch. Zool. Ital.*, 46 : 1-57.
- SARA M. (1964). — Poriferi di acque superficiali (0-3 m) del litorale italiano. *Annali Pontificio Ist. Sci. Let. S. Chiara Napoli*, 14 : 299-317.
- SCHMIDT O. (1862). — Die Spongien des adriatischen Meeres. Leipzig, 88 p.
- SCHMIDT O. (1868). — Die Spongien der Küste von Algier. Leipzig, 44 p.
- TOPSENT E. (1900). — Etude monographique des spongiaires de France. III. Monaxonida (Hadromerina). *Arch. Zool. exp. gén.*, ser. 3, 8 : 1-331.
- TOPSENT E. (1928). — Nouvelle étude sur les *Cliothosa*. *Bull. Inst. océanogr. Monaco*, 525 : 1-7.
- TOPSENT E. (1932). — Notes sur les clonides. *Arch. Zool. exp. gén.* 74 : 549-579.
- TOPSENT E. (1934). — Etude d'éponges littorales du golfe de Gabès. *Bull. Ser. Au. Castiglione* 2 : 69-102.
- VOLZ P. (1939). — Die Bohrschwämme (Cloniden) der Adria. *Thalassia*, 3, 2 : 1-64.

FIN

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VUES