

A NEW RECORD OF SPONGES FROM THE EGYPTIAN
MEDITERRANEAN WATERS

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ABSTRACT

Four sponge species were recorded for the first time from the Egyptian Mediterranean waters. One of them was commercial (*Spongia agarcinia*) and the other three species were non-commercial (*Suberites domuncula*, *Calyx nicaensis* and *Petrosia ficiformis*). The four species were described and their geographical affinity was discussed.

INTRODUCTION

A survey on sponge species along the western Mediterranean coast of Alexandria was carried out in 1981. The area investigated covered a distance of 190 km. It extends from EL-Hammam to Mersa Matrouh. Samples were taken during sponge fishing season from four regions: EL-Hammam, Fukah, EL-Alamain and Matrouh. The total number of specimens collected were 131 (EL-Beshbeeshy, 1983). The commercial specimens out-numbered the non-commercial specimens being 88 and 33 respectively. Eleven species were recorded among them five species were commercial and six were non-commercial. Among the eleven species, four species were recorded for the first time in the Egyptian Mediterranean waters. One of them was commercial whereas the other three species were non-commercial. The present paper aims to describe these four species, together with comments on their geographical affinities.

MATERIAL AND METHODS

1- The Investigated Area, Nature of the Bottom and Sampling Technique:

The study area covers the region west of Alexandria from EL-Hammam to Matrouh. Four regions were chosen for sampling sponges. These regions were at EL-Hammam denoted "A", Fukah "B", EL-Alamain "C" and Matrouh "D". The nature of the bottom of each region, together with sampling of sponges from each region were described by Kheirallah et. al. (In the same Volume).

2- Preparations of Commercial Sponge Specimens:

The commercial specimens were selected from the catch on the fishing boat and numerical tags were attached to them (tagging process). They were then passed through several stages on the boat for preparation.

Stage I- sorting:

The commercial specimens were sorted from the marine plants and rocks which were attached to their base by pulling them out.

Stage II- preparation:

Living tissues were separated from the fresh specimens by squeezing them out by feet to get rid of carbonate substances and sand residues. The squeezed sponges were placed in special baskets hanged on both sides of the ship. When the ship sailed the specimens were washed in the sea water. After washing, the specimens were exposed to sun for a period of 2-8 hours. Each specimen loses about 94% of its original weight after the whole preparation.

Stage III- preservation:

Dried specimens were preserved in plastic bags to be sorted later on.

3- Microscopical Examination:

a- Examination of sponge fibres:

The fibres of the different species were subjected to dehydration, paraffin embedding at a thickness of 8-10 μ and examined microscopically using a camera lucida.

b- Examination of spicules in the non-commercial species:

Small fragments of the sponge were taken and boiled in an aqueous solution of potassium hydroxide which dissolved the cells but not the spicules. A small amount of water was then added to the tube. The spicules were then washed once again with water. They were then transferred to a slide and examined under the microscope. Specimens for species identification were photographed in different views.

TAXONOMY AND DESCRIPTION OF THE SPECIES:

Phylum Porifera comprises about 5000 species (Weisz, 1971). It is divided into three classes on the basis of the skeleton: Class Calcarea (chalk sponges) where skeleton is composed of separate calcareous spicules, Class Hexactinellida (glass sponges) where skeleton is composed of triaxon six rayed siliceous spicules and class Demospongia where skeleton is composed of siliceous spicules not triaxon or horny fiber or both. Demospongia is the only class represented in the present account.

I- Non commercial sponges:

Order: Hadromerina

Family: Suberitidae

Genus: Suberites

Suberites domuncula (Olivi, 1792)

The sulphur sponge or sea orange (Plate 1a & b, Fig.1a)

Description: It is yellow or orange in color. Form is very variable, rounded, globular or elongated. It is up to 300 mm in diameter. Surface is smooth but not velvety. Texture is fleshy but will break if unduly stressed. It is somewhat elastic but when removed from water will contract to about $\frac{3}{4}$ of its original size. This sponge is characterized by presence of megascleres which vary from 5-8 μ in width. It comprises tylostyles which are more than 300 μ long and pointed oxes about 350-400 μ long.

World distribution: Adriatic, coasts of Algeria, coasts of France and Australian seas.

Local distribution: It is collected from El-Hammam region at depth of 40 m.

Order: Haplosclerida

Family: Renieridae

I- Genus: *Petrosia* (Vacelet, 1960)

Petrosia fisiformis (Poiret) (Plate 1c, Fig. 1b & c)

Description: It is more or less grey in color, particularly in dry condition. It is lamellar, erect, flabelliform or radially folded, sometimes pedunculate. The free margin of the lamella is generally continuous or slightly undulating in small young specimens, frequently lobed in large ones. Prominent and very conspicuous oscula which are 1.5-4.0 mm wide, regularly scattered over one face of the lamellar sponge. The sponge is more fragile in spirit than in the dry state.

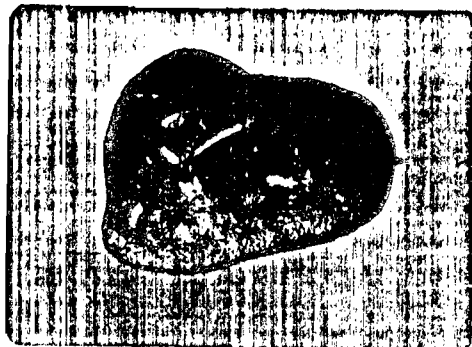
World distribution: Adriatic Sea and Mediterranean coasts of France.

Local distribution: Fukah region at a depth of 21 m and Matrouh region at a depth of 20 m.

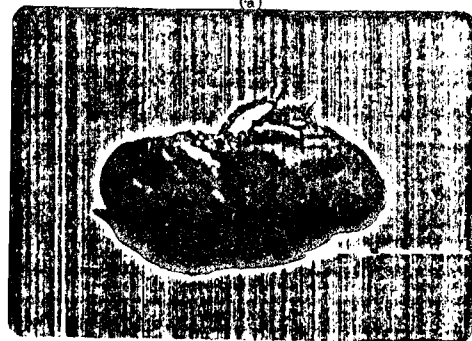
II- Genus: *Calyx* (Vacelet, 1960)

Calyx nicaensis (Risso, 1826) (Plate 2a & b, Fig.1d-e)

Description: Polymorphic sponge, more or less cup-shaped with a short and dense stem. Sometimes it is composed of a number of dense tubes. It may attain 25-30 cm in height. The outer surface of the ectosome consists of a number of layers in the form of unispicules reticulum with nodes of spongin. On the surface of the inner wall of the osculum, there is alternate zones of circular depressions. The spiculation of the skeleton contains the multispicules types which enable the walls of the sponge to be highly resistant and not



(a)



(b)



(c)

PLATE 1.
Non commercial sponges.
(a-b) *Suberites domuncula*;
(c) *Petrosia fisiformis*

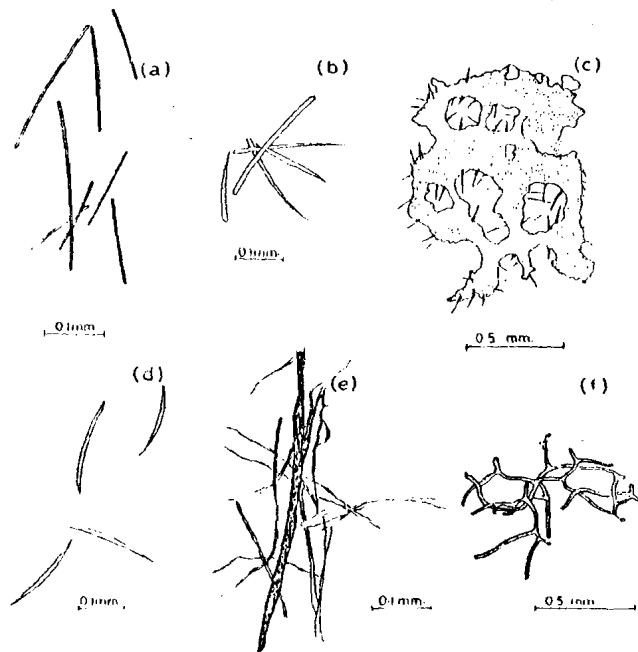


FIG. 1.
 Spicules and fibres of the four new recorded sponge species.
 (a) spicules of *Suberites domuncula*; (b) spicules of *Petrosia ficiformis*; (c) fibres of *Petrosia ficiformis*; (d) spicules of *Calyx nicaensis*; (e) fibres of *Calyx nicaensis*; and (f) spongin fibres of *Spongia agarcinia*.



(a)



(b)

PLATE 2.
Non commercial sponge.
(a-b) *Calyx nicaensis*.

compressible. Also, the skeleton contains oxeas which are joined by spongin and are arranged vertically. The strongest oxeas attain 200 μ in width within water.

World distribution: Adriatic Sea, Gulf of Naples and Mediterranean coasts of France.

Local distribution: El-Hammam region at a depth of 40 m, Fukah region at a depth of 38 m and Matrouh region at a depth of 25 m.

II- The Commercial Sponges

Order: Keratosa

Suborder: Dictyoceratida

Family: Spongiidae

Genus: *Spongia* (Linnaeus, 1759)

Spongia agarcinia (Pallas, 1766) (Plate 3a-d, Fig. 1f)

English name: Elephant ear, wash rag

Local name: Banati

Synonyms: *Euspongia officinalis*, var *lamella* (Schulze, 1879)

Description: Living specimens are dirty brown or black in color while the dry skeleton is chestnut or light brown. It is either cup-shaped or cap-shaped with rather thin walls of uniform thickness or a more or less rolled ear shaped or fan shaped 1-2 cm thick. The oscula are confined to the inside of the cupped forms or the concave faces of the lamellate specimens, and are arranged in groups of 4-6, surrounded by tufts of fibres longer than on the rest of the skeleton. These groups of oscula are generally in radial and concentric rows. The whole of the oscular surface of skeleton often has more or less the appearance of being radially grooved owing to the linear arrangement of the rows of fibrous tufts which cover it. The other or convex surface of the sponge is more uniformly covered with soft fibrous tufts. The epidermis includes sand grains and remains of white reticulum of spicules which vary from 100 to 250 μ . The primary fibres of the skeleton are 50-58 μ thick and filled with sand grains. The secondary fibres are 25-35 μ thick and sometimes 6-10 μ thick.

World distribution: Dalmatian coast, Greek Archipelago, north Africa coast and north coast of Australia.

Local distribution: Fukah region at a depth of 25-40 m and Matrouh region at a depth of 30-42 m.

Geographical affinity of the four recorded sponge species:

Table 1 shows the geographical affinity of the four species. According to this, the four species can be grouped as follows:

- a) species in common with Indian Ocean: *Spongia agarcinia*;
- b) species in common with Indian and Pacific Oceans: *Suberites domuncula*;
- c) endemics: *Calyx nicaensis* and *Petrosia ficiformis*.

DISCUSSION

The four new sponge species recorded in the present investigation fall into three orders: Hadromerina, Haplosclerida and Keratosa. Order Hadromerina is represented in the Mediterranean Sea by five families (Vacelet, 1960). These are: Chondrosiidae, Spirastrellidae, Clinonidae, Polymastiidae and Suberitidae. The latter family is the only family represented in the present investigation and is represented by one species, *Suberites domuncula*. Order



(c)



(e)

(d)

PLATE 3.
commercial sponge.
(a-d) *Spongia agarcinia*.

Table 1.
Geographical affinity of the recorded species.

Species	Geographical affinity				
	Mediterranean		Red sea	Indian Ocean	Pacific Ocean
	East	West			
<i>Suberites domuncula</i>	+	+	+	+	+
<i>Calyx nicaensis</i>	+	+			
<i>Petrosia ficiformis</i>	+	+			
<i>Spongia agarcinia</i>	+	+		+	

Haplosclerida is represented in the Mediterranean Sea by two families: Gelliidae and Renieridae (Vacelet, 1960). The latter family is represented in the Mediterranean Sea by six genera (Vacelet, 1960). Two genera are represented in the present investigation: *Betrosia* and *Calyx*. Each of these two genera is represented by a single species: *Betrosia ficiformis* and *Calyx nicaensis*. On the other hand order Keratosa is divided into two suborders: Dictyoceratida and Dendroceratida. Dictyoceratida is the only suborder represented in the Mediterranean Sea and is represented by two families: Dysideidae and Spongiidae. The latter family is represented in the present collection by *Spongia* and *Spongia* sp. and is sponge of certain.

Comparing the results obtained in the present work with those obtained from the French coast in the western side of the Mediterranean Sea by Vacelet (1959, 1960); it can be stated that all the species recorded in the present collection appear in the French coast. This gives an indication about similarities of our sponge fauna with those occurring in the other regions of the Mediterranean Sea. El-Beshbeeshy (1983) discusses Egyptian sponge species fauna with those occurring in other regions of the Mediterranean Sea.

Generally, it seems that the degree of endemism of our sponges is low as two of the four new recorded species have spread as far as the Indian Ocean as well as the Pacific Ocean.

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