Pelagic coelenterates in the waters of the western part of the Egyptian Mediterranean Coast during summer and winter

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Howaida Y. Zakaria

National Institute of Oceanography & Fisheries,
Kayet Bey, Alexandria, Egypt;

e-mail: howaidazakaria@hotmail.com

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Abstract

During August 2000 and February 2001 two cruises were carried out along the Egyptian Mediterranean Coast on the Egyptian r/v 'El-Yarmouk'. The samples collected were used to study the ecology and distribution of hydromedusae and siphonophores during summer and winter.

The density of hydromedusae was high in the inshore waters during summer (av. 71 org × 100 m^{-3}), decreasing to 28 organisms per 100 m^3 in the oceanic waters; in winter they were more abundant in the middle and offshore zones. A total of 9 hydromedusae species were recorded during the present study, 8 of them in summer. The most common of these were *Aglaura hemistoma*, *Olindias singularis*, *Liriope tetraphylla* and *Geryonia proboscidalis*. Only 4 species were recorded during winter, including *Cunina octonaria*, which was not recorded during the summer. The nine species recorded in the present study are circumtropical.

The siphonophore density was high in summer. In winter, the average standing crop of siphonophores fell to about 30% of that recorded in summer. 11 siphonophore species were recorded, 10 of them in summer; *Cucullus campanula* and *Eudoxoides spiralis* were the most common. Only 6 species were recorded in winter. These 11 species are widely distributed – they have been recorded from the Atlantic, Indian and Pacific Oceans.

Strong seasonality is thus a striking feature of Egyptian Mediterranean waters. Temperature is the most variable factor affecting the planktonic community, fluctuating between 26.5 and 27°C in summer and between 16.3 and 17.5°C in winter.

The western part of the Egyptian coast, the area under study in this work, is poorly diversified in comparison with the eastern part.

1. Introduction

Previous studies on the zooplankton population in Egyptian Mediterranean waters have tended to focus mainly on copepods, the major zooplankton component. Other groups such as siphonophores and hydromedusae were regarded as being of secondary importance in terms of numerical abundance and hence not treated in detail.

Dowidar & El-Maghraby (1973) and El-Maghraby & Dowidar (1973) gave some notes on the occurrence and distribution of the permanent zooplankton species with special emphasis on the copepods from samples collected during cruises of the r/v 'Ichthyolog' in the Mediterranean waters of Egypt in 1966. Hussien (1977) carried out an intensive study of zooplankton samples collected in the area between Damietta and Salloum from September 1970 to August 1971. Nour El-Din (1987) investigated the distribution of the zooplankton community in general and the copepod populations in particular in the south-eastern Mediterranean waters overlying the continental shelf off the Egyptian coast between El-Agami and El-Arish. Important as they are, the zooplankton groups other than copepods – siphonophores, hydromedusae, amphipods, decapods, Appendicularia and thaliacae – have received but little attention. Zooplankton production along the Egyptian Mediterranean coast of Alexandria was examined by Abdel-Aziz (1997). Hussien (1997) studied the zooplankton community structure in the offshore neritic area of Alexandria waters. Furthermore, a study of the zooplankton dynamics and ecology of an eutrophic area in Egypt was undertaken by Abdel-Aziz (2000).

Dowidar (1981) performed a qualitative and quantitative investigation on the pelagic coelenterates of Egyptian Mediterranean waters. The ecology and distribution of major zooplankton groups other than copepods, in particular hydromedusae, siphonophores, amphipods, decapods and pelagic tunicates occurring in the Mediterranean shelf waters off the Egyptian coast were studied by Zakaria (1992): this work was conducted within the framework of the project 'Biological productivity of the Southeastern Mediterranean in the post-High-Dam period'.

Despite the ecological importance of the gelatinous marine zooplankton in the marine food web (Purcell & Kremer 1983), our knowledge of the gelatinous zooplankton such as hydromedusae and siphonophores in Egyptian Mediterranean waters is far from complete. Thus, the aim of the present work was to investigate the ecology and distribution of hydromedusae and siphonophores in the Mediterranean shelf waters off the Egyptian coast during summer and winter.

2. Material and method of analysis

Two cruises were carried out along the Egyptian Mediterranean Coast using the Egyptian r/v 'El-Yarmouk' during August 2000 (summer) and February 2001 (winter). Extending from Alexandria in the east to Sidi Barani in the west, the area of investigation covered the Khalij al-′Arab and the western part of the Egyptian Mediterranean continental shelf.

Samples were collected from three longitudinal sections perpendicular to the coast: at El-Alameen, Mersa Matruh and Sidi Barani. Fig. 1 illustrates the study area and the locations of the sampling stations. Each section comprised 3 stations covering the following depth zones:

- inshore zone, comprising the coastal zone, of depth < 50 m,
- middle zone, of depth between 50 and 100 m,
- offshore zone lying near the periphery of the continental shelf, of depth > 200 m.

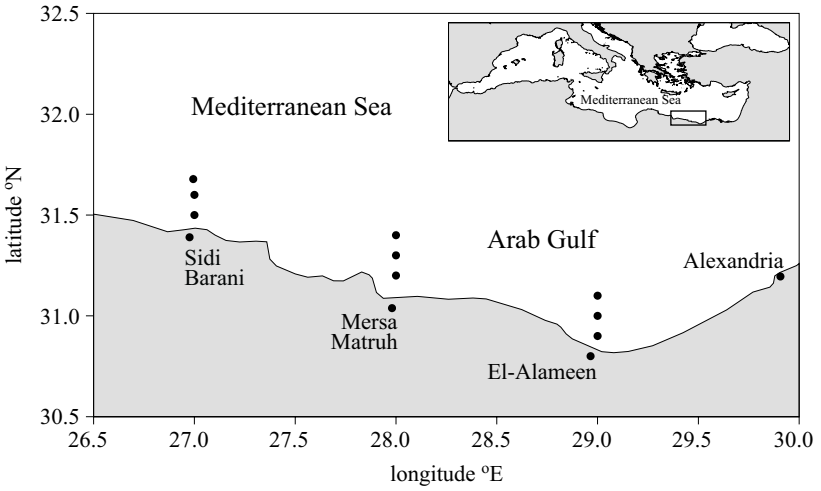

Fig. 1. The area of investigation and the locations of the sampling stations

Vertical hauls of zooplankton were collected (from bottom to surface) with a standard zooplankton net of 55 μm mesh size. All samples were preserved in 5% neutral formalin solution. For quantitative work, the filtration coefficient of the net was considered equal to unity, thus the volume of water filtered was equal to $\Pi r^2 d$, where r is the net diameter and d is the depth of water sampled. The standing stock was determined by counting the number of organisms per 100 m^3.

3. Results

3.1. Hydromedusae

The standing crop of hydromedusae was high during the summer (av. 147 org × 100 m^{-3}). The number of hydromedusae species recorded was also high (8 species):

- *Aglaura hemistoma*
- *Olindias singularis*
- *Liriope tetraphylla*
- *Geryonia proboscidalis*
- *Rhopalonema velatum*
- *Ectopleura dumortieri*
- *Solmundella bitentaculata*
- *Turritopsis nutricula*

During summer, the population density was high in the inshore zone (av. 71 org × 100 m^{-3}) with a maximum value at the Sidi Barani inshore station (186 org × 100 m^{-3}) (Table 1). *A. hemistoma*, *O. singularis*, *L. tetraphylla* and *G. proboscidalis* represented the hydromedusae community in this zone.

Table 1. Seasonal distribution of the total standing crop of hydromedusae (org × 100 m^{-3}) in Egyptian Mediterranean waters during 2000–01

Season \ Section	Depth of zone	El-Alameen	Mersa Matruh	Sidi Barani	Mean of zone	Mean of season
summer 2000	inshore	16	11	186	71	
	middle	57	31	55	48	147
	offshore	34	24	25	28	
Mean of section		36	22	89	–	–
winter 2001	inshore	0	0	0	0	
	middle	14	0	5	6	10
	offshore	9	0	2	4	
Mean of section		8	0	2	–	–

In the middle zone, the average population density was 48 organisms per 100 m^3, where *A. hemistoma* and *O. singularis* were dominant; these species constituted 40.6% and 31.4% respectively of the total hydromedusae community. *L. tetraphylla* and *G. proboscidalis* were frequent, but *R. velatum* and *S. bitentaculata* were rare (Table 2 and Fig. 2).

Table 2. Regional distribution of medusae species in Egyptian Mediterranean waters during 2000–01

Zones:	Inshore				Middle				Offshore			
Seasons:	summer		winter		summer		winter		summer		winter	
Species	org/100 m^3	%	org/100 m^3	%	org/100 m^3	%	org/100 m^3	%	org/100 m^3	%	org/100 m^3	%
Aglaura hemistoma	78	36.6	–	–	58	40.6	13	68.4	25	30.1	9	81.8
Olindias singularis	55	25.8	–	–	45	31.4	5	26.3	24	28.9	–	–
Liriope tetraphylla	41	19.3	–	–	27	18.9	–	–	17	20.5	2	18.2
Geryonia proboscidalis	39	18.3	–	–	10	7.0	–	–	3	3.6	–	–
Rhopalonema velatum	–	–	–	–	2	1.4	–	–	11	13.3	–	–
Turritopsis nutricula	–	–	–	–	–	–	–	–	1	1.2	–	–
Solmundella bitentaculata	–	–	–	–	1	0.7	–	–	1	1.2	–	–
Ectopleura dumortieri	–	–	–	–	–	–	–	–	1	1.2	–	–
Cunina octonaria	–	–	–	–	–	–	1	5.3	–	–	–	–
Total	213	100	–	100	143	100	19	100	83	100	11	100

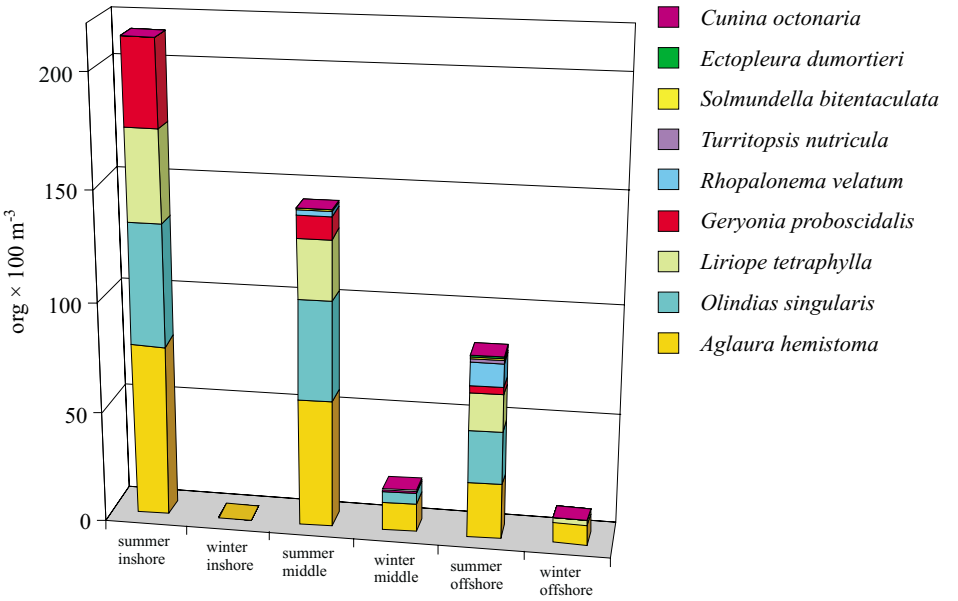

Fig. 2. Distribution of hydromedusae species in the inshore, middle and offshore zones during 2000–01

The population density of hydromedusae decreased in the offshore zone (av. 28 org × 100 m^{-3}). The ratio of the average medusae densities in the inshore, middle and offshore zones was roughly 2.5:1.7:1 respectively. On the other hand, the species diversity increased towards the offshore where 8 species were recorded. *A. hemistoma* and *O. singularis* were the most dominant hydromedusae species (Table 2), *L. tetraphylla* and *R. velatum* were the next most abundant. *T. nutricula* and *S. bitentaculata* were rare and were recorded only at El-Alameen. *E. dumortieri* was found only at Mersa Matruh and constituted 1.2% of the total population in the offshore zone.

During winter, the population density of hydromedusae was low (av. 10 org × 100 m^{-3}), constituting 6.8% of that recorded during summer. The diversity of the hydromedusae community in winter was poor, with only 4 species being recorded: *A. hemistoma*, *O. singularis*, *L. tetraphylla* and *Cunina octonaria.* During this season, the inshore neritic zone was completely devoid of hydromedusae.

The middle zone maintained the highest density in the area (av. 6 org × 100 m^{-3}) with a maximum value in the El-Alameen section (14 org × 100 m^{-3}), where *A. hemistoma* dominated the population. The most common hydromedusae species in this middle zone were *A. hemistoma* (68.4%) and *O. singularis* (26.3%). *L. tetraphylla* and *C. octonaria* were

rare. While *A. hemistoma* was the most dominant at El-Alameen, it was absent at Mersa Matruh and Sidi Barani.

The hydromedusae density in the offshore zone was about 66% of that in the middle zone (av. 4 org × 100 m^{-3}). The ratio of the average hydromedusae density in the inshore, middle and offshore zones was roughly 0:6:4 respectively. In the offshore zone, the hydromedusae density was high at El-Alameen (9 org × 100 m^{-3}), where *A. hemistoma* (81.8%) was the dominant species.

3.2. Siphonophores

The average density of siphonophore species in summer was high (179 org × 100 m^{-3}). The number of the recorded siphonophore species during this season was also high (10):

- *Lensia subtilis* and its eudoxid *(Eudoxia elongata)*
- *Chelophyes appendiculata* and its eudoxid *(Cucullus campanula)*
- *Eudoxoides spiralis*
- *Lensia campanella*
- *Sphaeronectes gracilis*
- *Agliasma cuboides*
- *Bassia bassensis* and its eudoxid *(Sphaenoides australis)*
- *Hippopodius hippopus*
- *Rosacea plicata*
- *Sulculeolaria chuni*

During summer, the standing crop of siphonophores (Table 3) in the coastal area was high (av. 84 org × 100 m^{-3}) with a maximum value

Table 3. Seasonal distribution of the total standing crop of siphonophores in Egyptian Mediterranean waters during 2000–01

Season \ Section	Depth of zone	El-Alameen	Mersa Matruh	Sidi Barani	Mean of zone	Mean of season
summer 2000	inshore	34	31	187	84	
	middle	35	35	49	40	179
	offshore	51	49	68	56	
Mean of section		40	38	101	–	–
winter 2001	inshore	0	0	52	17	
	middle	23	8	26	19	54
	offshore	31	0	22	18	
Mean of section		18	3	33	–	–

(187 org × 100 m^{-3}) at Sidi Barani. The most important species in the inshore zone were *C. campanula* (49.2%) and *E. spiralis* (22.6%). *C. appendiculata*, *A. cuboides*, *B. bassensis* and its eudoxid (*S. australis)* were frequent.

In the middle zone, the highest density was also recorded at Sidi Barani (av. 49 org × 100 m^{-3}); the lowest was 35 org × 100 m^{-3} at El-Alameen and Mersa Matruh. *E. spiralis*, *C. appendiculata* and its eudoxid (*C. campanula)* dominated the siphonophore population in the middle zone (Table 4 and Fig. 3). *S. australis* was found in considerable numbers. The following species were rare: *B. bassensis*, *L. subtilis*, *S. chuni* and *L. campanella*. The last one was recorded only at Mersa Matruh (2 org × 100 m^{-3}).

The siphonophore density in the offshore zone was 56 org × 100 m^{-3}. The ratio of average densities in the inshore, middle and offshore zones was roughly 2.1:1:1.4 respectively. The siphonophore density reached a maximum value at Sidi Barani offshore station (68 org × 100 m^{-3}); the lowest density was found at Mersa Matruh (49 org × 100 m^{-3}). *E. spiralis* (35.1%), *C. campanula* (22%), and *S. australis* (13%) were the most dominant siphonophore species in the offshore zone (Table 4). *B. bassensis*, *C. appendiculata*, *L. campanella* and *H. hippopus* were frequent. Of the rare species *R. plicata* was recorded only at Sidi Barani and *Eudoxia elongata* at El-Alameen and Mersa Matruh.

In winter, the average standing crop of siphonophores was about 30% of that recorded during summer. Only six siphonophore species were recorded during this season:

- *Chelophyes appendiculata* and its eudoxid *(Cucullus campanula)*
- *Lensia subtilis* and its eudoxid (*Eudoxia elongata)*
- *Bassia bassensis* and its eudoxid (*Sphaenoides australis)*
- *Eudoxoides spiralis*
- *Sphaeronectes gracilis*
- *Nanomia bijuga*

Except for Sidi Barani inshore station (52 org × 100 m^{-3}), siphonophores were absent from the coastal waters of the study area. *C. campanula* (80.8%) and *B. bassensis* (19.2%) represented the siphonophore species in the inshore zone.

In the middle zone, the highest density was recorded at Sidi Barani (26 org × 100 m^{-3}) and the lowest density at Mersa Matruh (8 org × 100 m^{-3}). The siphonophore population in the middle zone was dominated by *E. spiralis* (42.1%) and *C. campanula* (31.6%). *S. gracilis* (10.5%) and

Table 4. Regional distribution of siphonophore species in Egyptian Mediterranean waters during 2000–01

Zones:	Inshore				Middle				Offshore			
Seasons:	summer		winter		summer		winter		summer		winter	
Species	org/100 m^3	%	org/100 m^3	%	org/100 m^3	%	org/100 m^3	%	org/100 m^3	%	org/100 m^3	%
Chelophyes appendiculata	24	9.5	–	–	8	26.8	–	–	9	5.4	1	1.9
Cucullus campanula	124	49.2	42	80.8	32	26.9	18	31.6	37	22.0	16	30.2
Eudoxoides spiralis	57	22.6	–	–	38	31.9	24	42.1	59	35.1	15	28.3
Sphaeronectes gracilis	–	–	–	–	–	–	6	10.5	3	1.8	6	11.3
Bassia bassensis	10	4.0	10	19.2	6	5.0	–	–	11	6.5	1	1.9
Sphaenoides australis	8	3.2	–	–	21	17.7	2	3.5	22	13.0	3	5.7
Sulculeolaria chuni	5	2.0	–	–	6	5.0	–	–	4	2.4	–	–
Lensia subtilis	3	1.2	–	–	6	5.0	5	8.8	3	1.8	5	9.4
Eudoxia elongata	–	–	–	–	–	–	2	3.5	4	2.4	5	9.4
Lensia campanella	–	–	–	–	2	1.7	–	–	7	4.2	–	–

Table 4. (*continued*)

Zones:	Inshore				Middle				Offshore			
Seasons:	summer		winter		summer		winter		summer		winter	
Species	org/100 m^3	%	org/100 m^3	%	org/100 m^3	%	org/100 m^3	%	org/100 m^3	%	org/100 m^3	%
Agliasma cuboides	21	8.3	–	–	–	–	–	–	–	–	–	–
Hippopodius hippopus	–	–	–	–	–	–	–	–	7	4.2	–	–
Rosacea plicata	–	–	–	–	–	–	–	–	2	1.2	–	–
Nanomia bijuga	–	–	–	–	–	–	–	–	–	–	1	1.9
Total	252	100	52	100	119	100	57	100	168	100	53	100

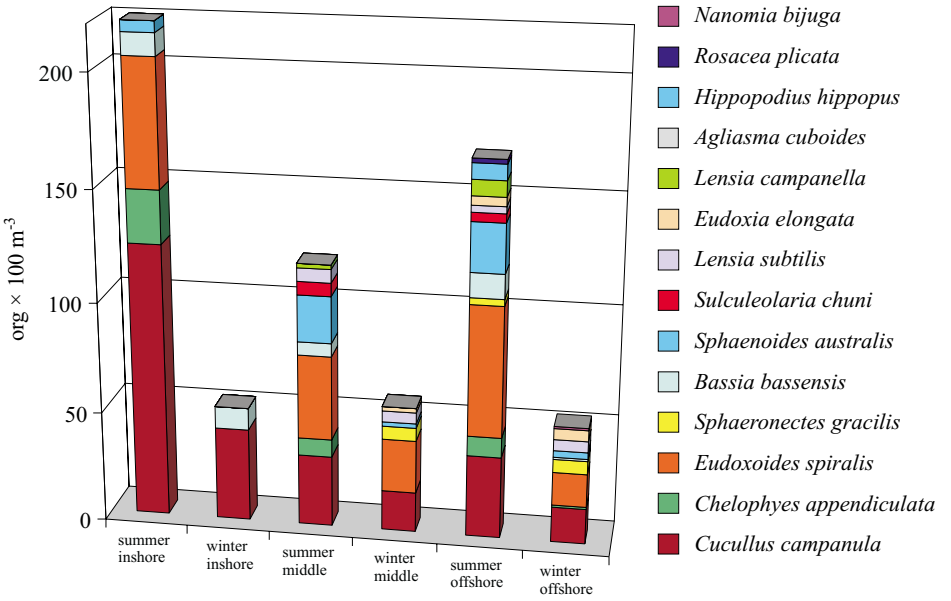

Fig. 3. Distribution of siphonophore species in the inshore, middle and zones during 2000–01

L. subtilis (8.8%) were next in abundance. *E. elongata* and *S. australis* were rare.

In the offshore zone the siphonophore density was high at El-Alameen (31 org × 100 m^{-3}) but was zero at Mersa Matruh. The ratio of the average siphonophore densities in the inshore, middle and offshore zones was roughly 1:1.1:1.1 respectively. The most dominant siphonophore species in the offshore zone were *C. campanula* (30.2%) and *E. spiralis* (28.3%). *S. gracilis*, *L. subtilis* and its eudoxid (*E. elongata)* were also present in considerable numbers. *C. appendiculata*, *B. bassensis* and *N. bijuga* were rare, the last one was recorded only at El-Alameen.

4. Discussion and conclusion

The density of hydromedusae was high in the inshore waters during summer (av. 71 org × 100 m^{-3}), decreasing to 28 organisms per 100 m^3 in the oceanic waters. In winter, they were more abundant in the middle and offshore zones. On the basis of the annual average, Dowidar (1981) reported that hydromedusae were numerous in inshore waters and decreasing with increasing distance from the shore, whereas Zakaria (1992) found that hydromedusae were more abundant in the middle and offshore zones.

The seasonal distribution of hydromedusae in the study area is probably affected by more than one factor, such as the abundance of suitable food,

temperature, salinity or pollution. The effect of salinity may be of minor importance, particularly in the middle and offshore zones, where salinity variations are not significant (39.0–39.1 PSU). The effect of ambient water temperature on the seasonal distribution of hydromedusae is well demonstrated. The highest average density (147 org × 100 m^{-3}) was recorded in summer (26.5–27°C). The lowest concentration (10 org × 100 m^{-3}) was found in winter at the lowest temperatures (16.3–17.5°C). Regarding the species composition in the different zones, the inshore zone was characterized by a low species diversity (4 species). In contrast, the offshore zone showed remarkable species diversity (8 species). Zakaria (1992) recorded a similar trend. During the present work a total of 9 species were recorded, 8 of them in summer. The most common of these were *Aglaura hemistoma*, *Olindias singularis*, *Liriope tetraphylla* and *Geryonia proboscidalis*. During winter, only 4 species were recorded. *Cunina octonaria* was not recorded during summer. Dowidar & El-Maghraby (1973) recorded 5 hydromedusae species in Egyptian Mediterranean waters during 1966, while Dowidar (1981) identified 8 species in the same area during 1970–71. Zakaria (1992) recorded 12 hydromedusae species, 6 of them being reported for the first time from Egyptian Mediterranean waters. Table 5 shows the occurrence of hydromedusae in Egyptian Mediterranean waters over the last 40 years.

Many recent papers have substantially modified our knowledge of the composition of the hydromedusan fauna of the Mediterranean, with new records and descriptions of new families, genera and species. Boero & Bouillon (1993) listed 346 hydromedusan species in the Mediterranean. 19.5% of them are endemics, though of debatable origin. The majority of the remaining Mediterranean species is present in the Atlantic, with various world distributions, and could have entered the Mediterranean from Gibraltar after the Messinian crisis. Only 8% of the fauna is classified as Indo-Pacific: these species are restricted mainly to the eastern basin. Some of these presumably migrated from the Red Sea via the Suez Canal, in which case they are classified as Lessepsian migrants.

Along the Egyptian Mediterranean Coast, 21 hydromedusae species were recorded (Table 5). Most of them have a worldwide distribution: they have been recorded from the Atlantic, Indian and Pacific Oceans. All were recorded by Boero & Bouillon (1993). The nine species recorded in the present study are circumtropical.

In the present study, the highest siphonophore density was found in summer. Zakaria (1992) reported similar results. The high densities recorded by El-Maghraby & Dowidar (1973) were found in winter and spring, while Hussien (1977) mentioned that autumn was the most productive season.

Table 5. Occurrence of Hydromedusae in Egyptian Mediterranean waters in the last 40 years

Species \ Years	1961–63	1966	1970–71	1984–85	2000–01
	A	B	C	D	E
Bougainvillia muscus (Allman, 1863)			+		
Lizzia gracilis (Mayer, 1900)			+		
Ectopleura dumortieri (Van Beneden, 1844)			+	+	+
Turritopsis nutricula (McCrady, 1859)			+	+	+
Pandea conica (Quoy & Gaimard, 1827)	+		+		
Oblia spp.	+	+	+	+	
Laodicea undulata (Forbes & Goodsir, 1851)				+	
Clytia hemispherica (Linnaeus, 1767)	+	+			
Eutima gegenbauri (Haeckel, 1864)	+				
Gossea corynetes (Gosse, 1853)	+				
Lovenella cirrata (Haeckel, 1879)	+				
Olindias singularis Browne, 1905				+	+
Pantachogon haeckeli Maas, 1893	+	+			
Geryonia proboscidalis (Forskal, 1775)				+	+
Liriope tetraphylla (Chamisso & Eysenhardt, 1821)	+	+	+	+	+
Rhopalonema velatum Gegenbaur, 1857		+	+	+	+
Rhopalonema spp.	+				
Aglaura hemistoma Peron & Lesueur, 1810			+	+	+
Solmundella bitentaculata (Quoy & Gaimard, 1833)				+	+
Cunina peregrina Bigelow, 1909				+	
Cunina octonaria McCrady, 1857				+	+

Note: A – neritic waters of Alexandria; B, C, D and E – neritic and oceanic waters.

11 siphonophore species were recorded in the present study, 10 of them in summer; *Cucullus campanula* and *Eudoxoides spiralis* were the most common. Only 6 siphonophore species were recorded in winter. Strong seasonality thus characterizes Egyptian Mediterranean waters. Temperature is the most variable factor affecting the planktonic community, ranging from 26.5–27°C in summer to 16.3–17.5°C in winter. Boero & Bouillon (1993) mentioned that strong seasonality is a striking feature of

Table 6. Occurrence of siphonophores in Egyptian Mediterranean waters in the last 40 years

Years / Species	1961–63 A	1966 B	1970–71 C	1984–85 D	2000–01 E
Sphaeronectes gracilis (Claus, 1873)			+	+	+
Hippopodius hippopus (Forsskal, 1776)			+	+	+
Rosacea cymbiformis (Delle Chiaje, 1822)			+		
Rosacea plicata (Quoy & Gaimard, 1833)				+	+
Abyla trigona Quoy & Gaimard, 1827				+	
Abylopsis tetragona (Otto, 1823)		+	+	+	
Abylopsis eschscholtzi (Huxley, 1859)		+			
Bassia bassensis L. Agassiz, 1862		+	+	+	+
Sulculeolaria biloba (M. Sars, 1846)			+	+	
Sulculeolaria chuni (Lens & Riemsdijk, 1908)			+	+	+
Sulculeolaria quadrivalvis Blainville, 1834			+	+	
Sulculeolaria angusta Totton, 1954		+		+	
Chelophyes appendiculata (Eschscholtz, 1829)	+	+	+	+	+
Chelophyes contorta (Lens & Riemsdijk, 1908)			+	+	
Diphyes dispar Chamisso & Eysenhardt, 1821			+	+	
Eudoxoides spiralis (H. B. Bigelow, 1911)	+	+	+	+	+
Lensia campanella (Moser, 1925)			+	+	+
Lensia conoidea (Keferstein & Ehlers, 1860)			+		
Lensia subtilis (Chun, 1886)	+	+	+	+	+
Lensia subtiloides (Lens & Riemsdijk, 1908)			+	+	
Lensia multicristata (Moser, 1925)	+	+			
Muggiaea kockii (Will, 1844)	+	+			
Nanomia bijuga (Delle Chiaje, 1841)		+	+	+	
Agalma elegans (Sars, 1846)			+		
Forskalia edwardsi Koelliker, 1853			+		

Symbols A–E as in Table 5.

the Mediterranean. They reported that temperature is the most variable factor, and is accompanied by variations in a number of other physical factors, including nutrient concentrations, water movements and light penetration. A warm season (May–June to October–November) thus alternates with a cold season (November–December to April–May). Planktonic and benthic primary and secondary production shows sharp seasonal cycles reflecting this alternation of climatic conditions (Boero & Bouillon, 1993).

Historically, Dowidar & El-Maghraby (1973) recorded 9 siphonophore species from Egyptian Mediterranean waters during 1966, while Dowidar (1981) identified 18 species in the same area during 1970–71. Zakaria (1992), during her work in the area between El-Agami and El-Arish in 1984–85, recorded 20 siphonophore species; 4 of them were recorded for the first time in the Egyptian Mediterranean waters. Table 6 shows the occurrence of siphonophores in Egyptian Mediterranean waters in the last 40 years. Considering these previous records, the list of siphonophore species identified from Egyptian Mediterranean waters over the last 40 years consists of 25 different siphonophore species. Four of these species were common in the periods between the records from extensive surveys during 1966, 1970–71, 1984–85 and 2000–01: *Chelophyes appendiculata*, *E. spiralis*, *Bassia bassensis* and *Lensia subtilis*. Of the siphonophore species listed by Dowidar (1965), Dowidar & El-Maghraby (1973), Dowidar (1981) and Zakaria (1992), 14 were not found in the present study. The majority of the species recorded (23 species) are present in the Atlantic Ocean and entered the Mediterranean through the Straits of Gibraltar. The other two species (*Abyla trigona* and *Sulculeolaria angusta*) belong to the Indian Ocean, and migrated from the Red Sea through the Suez Canal. The 11 species recorded in the present study are widely distributed, and have been reported from the Atlantic, Indian and Pacific Oceans.

The study area, the western part of the Egyptian Mediterranean coast, is of great interest from the biogeographical point of view. Unfortunately, it has been poorly studied and little information on the gelatinous plankton is available. Accordingly, further studies are very necessary.

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