

Morphological feature of *Pelagia noctiluca* (Forskål, 1775) (Cnidaria: Scyphozoa) in western Libyan coast, Tripoli

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ABSTRACT

The Jellyfish cnidarians are important consumers of zooplankton in the Mediterranean Sea previously known. The aim of this study is to classification this species of jellyfish and examination morphological structure. The samples were collected from the Tripoli coast of Libya in September 2018 by scoop net. The number of samples was 31 individuals, collected to study the morphological structure measurements and wet weight. The results of the morphological structure showed the diameter of medusa 2.3 - 13.4cm, while the total length was 4.5 - 17cm, and the length of four oral arms was 2.4 - 12.9cm, the length of eight tentacles was 1.8 - 15cm and wet weight was 2.0 - 73g. Based on morphological features and classification, the species was identified as *Pelagia noctiluca* (Forskål, 1775), but the differences between individuals in medusa size and wet weight indicate refers to different ages. So, this species is considered the first appearance on the Libyan coast.

الخصائص الظاهرية لـ *Pelagia noctiluca* (Forskål, 1775) (Scyphozoa :Cnidaria) في الساحل الغربي الليبي، طرابلس

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الكلمات المفتاحية:

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البحر المتوسط
بيلاجيا نوكتيلويكا

المخلص

تتبع قناديل البحر اللواسع وهي من الهوائيم الحيوانية المستهلكة في البحر المتوسط. تهدف هذه الدراسة إلى تصنيف هذا النوع من قناديل البحر و وصف الصفات الظاهرية. جمعت العينات في سبتمبر 2018 من شاطئ طرابلس بواسطة شبكة الجرف. كان عدد العينات 31، تم أخذ القياسات الظاهرية و وزنها الرطب. أظهرت النتائج أن قطر الميدوزا للعينات تراوح بين 2.3-13.4سم، بينما كان الطول الكلي بين 4.5-17سم، و طول الأذرع الأربعة القمية بين 2.4-12.9سم، و طول اللوامس الأربعة بين 1.8-15سم، أما الوزن الرطب بين 2.0-73جم. عند دراسة الشكل الظاهري و الخصائص التركيبية الظاهرية تم تصنيف العينات و حدد النوع *Pelagia noctiluca*. يشير اختلاف طول الميدوزا و الوزن الرطب لهذا النوع إلى اختلاف أعمارها، و تعتبر هذه الدراسة أول تسجيل لهذا النوع في الساحل الليبي.

Introduction

Pelagia noctiluca is a species under the family Pelagiidae. It is known as the common name purple-striped jelly, purple stinger, purple jellyfish, luminous jellyfish, and night-light jellyfish; it is in the class Scyphozoa, the true jellyfish [1]. Although species of *Pelagia* genus are widespread in many areas of the world, the morphological characters of *P. noctiluca* are distinct among other species in this genus [2]. The duration of life's *P. noctiluca* is from two to six months, usually, death is caused by the upheaval of the sea waters. *P. noctiluca* is a small pelagic jellyfish and generally, it's pink, mauve, or light brown colored with a phosphorescent bell measuring (3 to 12) cm in

diameter; while it's transparent, reddish, or pale violet in the adult stage, whose edge is provided with tentacles and lappets. It has four arms around the mouth and the tentacles with crinkled edges, eight fine long tentacles, and sixteen small lobes edge around the medusa. Is spreading, in the Mediterranean and the Atlantic Ocean and it thrives from summer to autumn [1 & 3]. *P. noctiluca* has a toxin that produces intense pain, burning, and red skin rashes. Thus, [4] recommended to use the sea water for the treatment of *P. noctiluca* stings.

In the northwestern Mediterranean the abundances and

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distributions of zooplankton, have been studied for many years [5]. In recent, jellyfish increase in this site, it is related to the influence climatic factors, particularly temperatures [6]. The distributions of the species are related to the nature of the continental shelf [7]. Most abundant jellyfish species in the summer months [8]. This species is abundant on the shelf-slope where concentrations of plankton, *P. noctiluca* occur near the surface, especially at night, as observed in other parts of the Mediterranean [9,10,11]. The vertical distribution coincides of jellyfish with the night migration of zooplankton [12&13]. *P. noctiluca* is considered the most important to the planktonic predator [14]; which feed on mostly zooplankton [15]. This study focused on the definition of this kind of jellyfish species that was found by chance in the Tripoli coast of Libya in the south Mediterranean Sea, it was thriving during September 2018 around a month then disappear from marine water, it was not recorded in the previous study in Libya sea.

Materials and Methods

The samples were collected from the surface of the seawater during the fishing day in Libyan-Tripoli beach. Thirty-one specimens were collected randomly using a scoop net in September 2018 (Fig. 1). All the samples were saved in 5% formaldehyde and stored at the Marine Laboratory, Zoology Department, University of Tripoli. Total length (TL), diameter of medusa and length of arms and bristles were measured to the nearest 0.1 cm, while total weight (wet weight) to the nearest 0.01 g by Mettler PM600. Specimens were photographed using an Olympus TG4 compact camera and it is an automatic stacking feature. The mean and standard deviation of the samples measurements were calculated by Excel 2016.

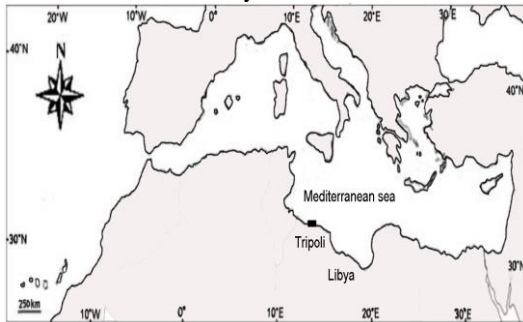


Fig 1: Map of the Mediterranean Sea showing the location of specimen' collection from Tripoli coast.

Results

Thirty-one specimens of *P. noctiluca* were caught in the coastal waters of Tripoli-Libya in September 2018 (Table 1). The samples of jellyfish were of hemispherical shape with an umbrella

component, and the surface was covered with small warts (Fig. 2). The fresh live specimens showed a reddish violet coloration in the gonads. It had four oral arms thick and short around the mouth and equal in length, and from an umbrella margin, eight thin to long tentacles arose between lappets of 16 small edge lobes (Fig. 3). The results of the measurements morphological characteristics are as follows wet weight are 2-73 g (14.5 ± 16.7), the diameter of medusae is 2.3-13.4 cm (6.1 ± 2.4), While the total length of *P. noctiluca* is 4.5-17 cm (9.8 ± 2.4) and the length of four oral arms is 2.4-12.9 cm (6.4 ± 2.1). Also, the range of length of the eight tentacles is 1.8-15 cm (4.6 ± 3.9). According to the morphological classification, indicate that all individuals of jellyfish are *P. noctiluca*.

Table 1: The morphological measurements of *P. noctiluca*.

No. Samples	Wet weight(g)	Total length (cm)	Diameter of medusae (cm)	Length of arms (cm)	Length of bristles(cm)
1	7	11	5	7	3
2	8	10	5.7	6.7	3.2
3	4	7	3.4	4.6	2.4
4	5	9.3	5.2	5.6	3.3
5	9	7.6	5.4	4.3	2.1
6	5	7	4.6	4.9	2
7	7	10	5.3	6.2	3.9
8	4	8	4.9	4.8	3.1
9	4	7	5.4	4.7	2.1
10	9	8	5	5.2	2.3
11	7	6	3.6	3.8	2
12	4	4.5	2.3	2.4	1.8
13	2	8.2	5.1	5.7	2.3
14	33	12.5	9.2	8.1	10.4
15	73	14.4	12.3	11.2	13.2
16	68	17	13.4	12.9	15
17	23	9.4	8.6	6.4	6.3
18	18	11.3	8.4	8.2	11.2
19	24	12	8.2	8.7	10.6
20	27	10.7	9.1	7.2	12.3
21	13	10.2	6.9	7.4	2.6
22	14	8.6	5	4.8	2.4
23	8	10.8	4.8	7.8	2.3
24	14	9.2	5.6	6.2	2.4
25	16	10.8	5.7	5.8	2.9
26	8	10.2	5.2	7.2	2.6
27	7	10.5	4.8	6.3	2.9
28	8	9.8	5.4	5.2	2.5
29	5	10.4	4.2	6.1	4
30	6	9.6	4.9	5.4	2.3
31	8	10.3	5.2	6.3	2.7
Mean	14.5	9.8	6.1	6.4	4.6
SD	16.7	2.4	2.4	2.1	3.9



Fig. 2: General morphology of *Pelagia noctiluca*.

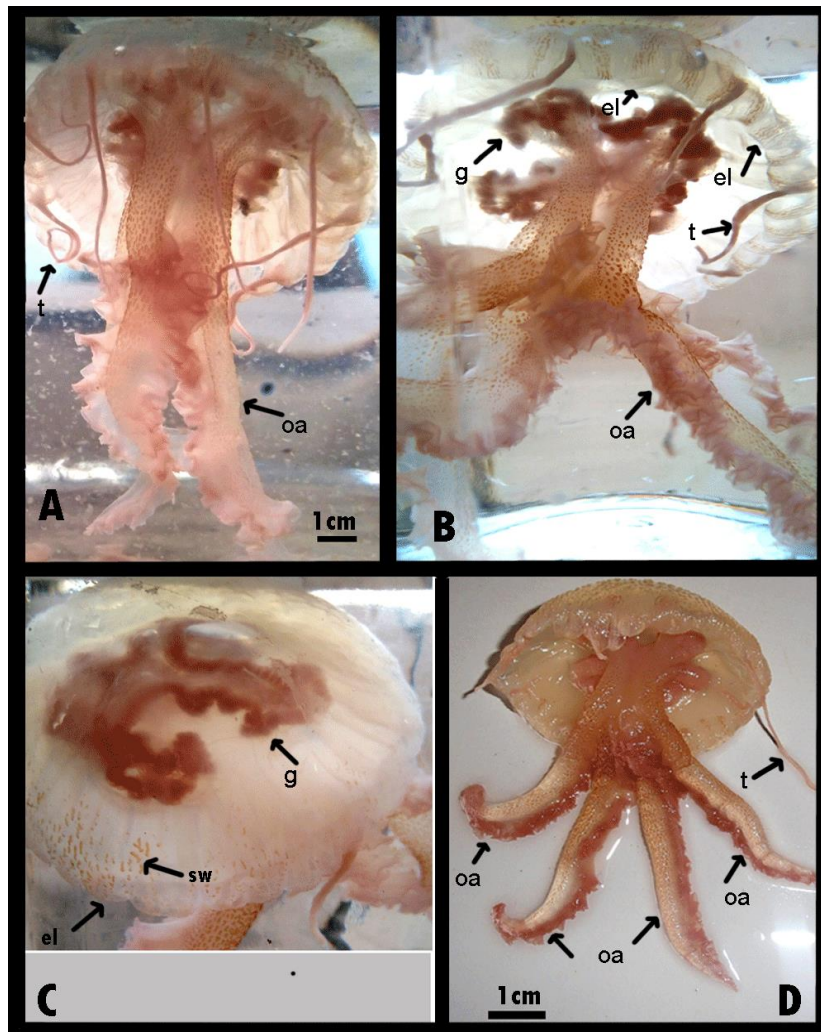


Fig. 3: Preserved specimens of *P. noctiluca* to show four oral arms (oa), eight tentacles (t), 16 small edge lobes (el), the top of medusa and gonads (g) and small warts (sw).

Discussion

In the Mediterranean, *P. noctiluca* had been reported to be distributed from surface to 640 m depth [16]. According to observations, this species was most abundant in the upper 5 m layers, in the autumn season; according to previous studies the temperature structure of the seawater did appear to be a major factor affecting the vertical distribution of the jellyfish populations [16]. However, it was found that buoyancy of *P. noctiluca* is active movements depends on the specific density of the individuals [16]. According to [17], the color of *P. noctiluca* is a light pink with reddish-violet spots. The shape of the medusa same the bell is hemispherical; it is marginal edge is divided into sixteen lappets and carries eight long tentacles. Also, there are four oral arms are present beneath the bell [18]. These characteristics are completely identical to the samples were collected on the western Libyan coast in this study. In previous studies, the population density was observed that swarms drifting offshore rarely contained more than 20 individuals per cubic meter; this agrees with a critical swarm density computed by [19]. It should be added that *P. noctiluca* has enough mobility; so that it never stays more than a few minutes just at the sea surface. In this study appeared that a swarm of *P. noctiluca* for one time and did not record any appearance again to collect more accurate information in the Libyan marine environment.

The morphological measurements of *P. noctiluca* are shown the high and less wet weight (2-73 g), but no references were mentioned to the wet weight of this species. The results showed the largest and youngest diameter of medusae was 2.3-13.4 cm, which is in agreement with [17]; whereby, the ephyrae usually increases in the winter season, but the young medusae can be found in early spring. According to [10], the size of the medusae's diameter increased more than 12 mm, and *P. noctiluca* has been classified into the size classes using measurements of bell diameter was less than 1.0 to < 3.5 cm of immature medusa, 3.5 to < 6.0 cm of conditionally mature, and 6.0 to > 8.5 cm of mature [19]; therefore, the individuals have different ages

in this study. While the measurements showed the total length is 4.5-17 cm, the length of four oral arms that is 2.4-12.9 cm, and the length of eight tentacles is 1.8-15 cm this finding is in agreement with [20], those who found the length of eight tentacles is more than 8.5 cm.

Widespread of *P. noctiluca* have been recorded at intervals in the Eastern Mediterranean, such as in tropical and subtropical seas [21], Syria [22], Spain [23], and Egypt [24], which were recorded irregular invasions of this species. In Tunisian coast, *P. noctiluca* was reported to be normally frequent from November to May and disappears in the spring; were recorded during 1993 and 1994 [24] and [17]. Also, [25] recorded *P. noctiluca* in a rockpool on the South coast of Sardinia, Italy. Thus, it is normal to be in the Libyan marine environment but for the lack of research, there are no previous studies on the jellyfish in the Libyan marine environment. The jellyfish bloom in the Mediterranean occurring from the late 1970s to the early 1980s [26]. Before 1976, in the Adriatic Sea, this jellyfish was exceptionally recorded [27].

Conclusion

The morphological structure of *P. noctiluca* (Forskål, 1775) indicates differences in the medusa size of the individual samples and which appeared for the first time (they suddenly show up *P. noctiluca* in Tripoli coast, west Libyan) and did not record once again in the same area. At the same time, there are no previous studies that addressed morphological structure. The presence of this species in the Tripoli coast area may be due to transportation via the ballast water of oil tankers and other ships as alien jellyfish. So, if this species is recorded again, researchers will monitor and distribute it along the Libyan coast, as well as, how to appeared in a small quantity and disappeared.

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