First record of *Leucothea multicornis* (Quoy & Gaimard, 1824) off the Syrian coastal water, (eastern Mediterranean Sea)

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Abstract

The present study reports the first record of a lobata ctenophore Leucothea multicornis Quoy & Gaimard, 1824. L. multicornis was sighted off the Syrian coastal waters (the eastern Mediterranean Sea), about 10 km to the north of Lattakia Port, between Raas Ibn Hani (35°35'35.15"N, 35°45'25.37"E) and The High Institute of Marine Research (35°35'34.95"N, 35°44'31.60"E), during the period between December 2018 and April 2019.

Keywords - *Leucothea multicornis, Mnemiopsis leidyi, Ctenophora, Lobata, Leucothidae, jellyfish, Syrian coast, Mediterranean Sea, Levantine Basin.*

I. INTRODUCTION

Ctenophores are fragile gelatinous marine organisms, they can be found in all oceans at all depths, but they mostly inhabit the coastal zone. Most ctenophores are hermaphroditic, they lack the polyp stage found in many cnidarians, and the larvae develop directly into juveniles and adults ([1], [2], [3], [4]).

The most distinctive feature of ctenophores is eight rows of ciliary plates "comb rows", most of them are bioluminescent, and they are used for locomotion. Another unique feature of ctenophores is sticky cells "colloblasts", which serve to capture prey ([4]). Therefore, ctenophores do not sting or harm humans, and no impact on tourism is expected. However, it seems clear that human problems with ctenophores have increased recently, as a result of ctenophores abundance and blooms, which may results in clogging of fishing nets and water-intake screens for power production and desalination ([5], [6], [7]). In addition, ctenophores are exclusively carnivorous, they are an important predator of zooplankton, so they have a significant negative effect on fish stocks; both directly - by preying on fish eggs and larvae, and indirectly - by competing and reducing the food availability for fish ([8], [9]).

During recent decades, the composition of the Mediterranean ctenophores have changed, and a new non-indigenous species invaded many Mediterranean regions due to a variety of factors, such as climate changes, pollution, eutrophication, overfishing, maritime traffic and shipping, and species invasions ([10], [11], [12], [13], [14], [15]).

The ctenophores fauna have not been studied in the Syrian coastal waters, due to their fragility and susceptibility to damage by sampling and sample preservation. Therefore, they are ignored by the Syrian scientists working in marine ecosystem. The first mention of ctenophores in the Syrian coastal waters was by "Shiganova", who noted a *Mnemiopsis leidyi* in the vicinity of Lattakia Port on northern Syrian coast in October 1993 ([16]). Since that time, interest in ctenophores at the Syrian coast was poor compared to other regions.

Leucothea multicornis Quoy and Gaimard 1824, is one of the largest species of ctenophore, order Lobata. The animal reaches a maximum length of 25 cm. This species is widely distributed in subtropical and temperate waters ([17]). It has been recorded recently in the eastern Mediterranean Sea ([18]). Here we present the first record of *Leucothea multicornis* Quoy and Gaimard 1824 species from the Syrian coastal waters, and the second report from the eastern Mediterranean Sea.

II. MATERIALS AND METHODS

From the beginning of December 2018, an unfamiliar large ctenophore species, the size of a hand, has been noticed and photographed by a professional diver. It was observed about 10 km to the north of Lattakia Port, between Raas Ibn Hani (35°35'35.15"N, 35°45'25.37"E) and the High Institute of Marine Research (35°35'34.95"N, 35°44'31.60"E), as shown in (Fig. 1).

Specimens were collected by hand, after many failed attempts, using a plastic jar. Great care should be practiced while collecting specimens, since any slight movement during sampling will always results in tearing the specimens to pieces, so much so that it was impossible to get the specimen intact to the laboratory. In addition, all attempts to preserve the collected specimens were unsuccessful, they disintegrate rapidly at first contact with formaldehyde or alcohol, leaving a gelatinous mass scattered randomly. Therefore, we resorted to documentation of alive specimens under water, using a digital camera.

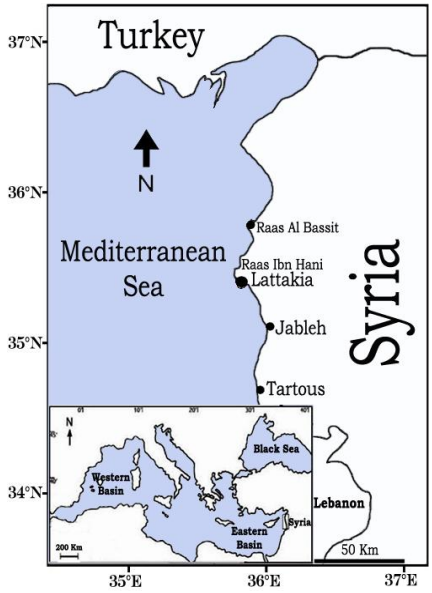

Fig 1: Location of the observed *L. multicornis* species on the Syrian Coast.

As a result to this method of documentation, we have now in the laboratory videos and a good set of photographs of collected specimens available for comparison studies.

Upon examination of the unfamiliar ctenophore, it was identified as *Leucothea multicornis* Quoy and Gaimard 1824, by its unique combination of the remarkable morphological features based on relevant characters as defined in the literature ([19], [18]). (Fig. 2).

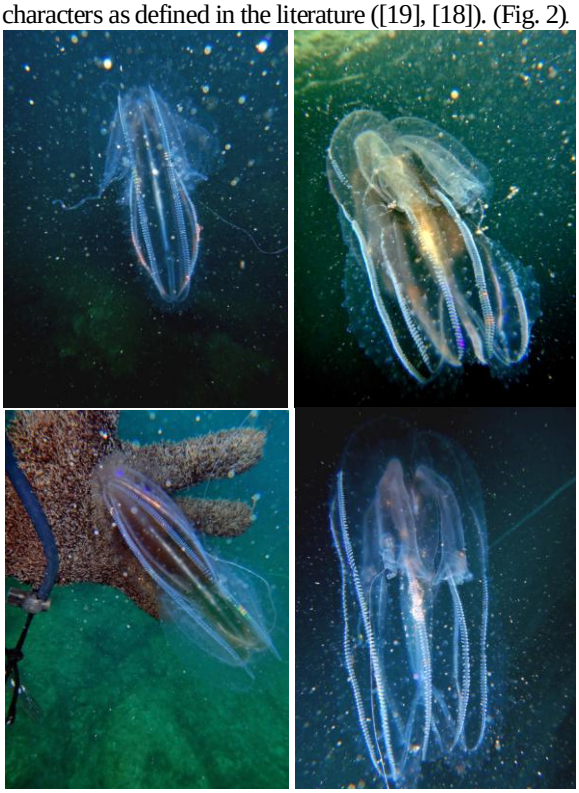

Fig 2: *Leucothea multicornis* off the Syrian Coast

During the period between December 2018 and June 2019, almost a daily diving was performed at the same area, for sightings of *L. multicornis* species. The temperature and salinity of the coastal surface of seawater during the period between December 2018 and June 2019 ranged between 17.7 °C to 26 °C and between 37.8 ‰ to 39.1 ‰, respectively.

III. RESULTS AND DISCUSSION

Leucothea multicornis Quoy and Gaimard 1824 (Order Lobata Eschscholtz, 1825; Family Leucotheidae Krumbach, 1925; Genus Leucothea Mertens, 1833) is an oval-shaped animal with two very large oral lobes, which are about half of the total animal length, connecting to the body at the forward end. The animal folds its oral lobes compactly, when touched, affecting a marked change in its general appearance. *L. multicornis* is almost unique among ctenophores in having transparent finger-like protrusions, or "papillae", distributed widely over the outer surface. The colouration is completely translucent to milky white. The average specimen length was between 15 cm and 20 cm. The two long extendable axial tentacles near the mouth at each side can be up to three times longer than the body, with their measurement being difficult due to their fragility.

L. multicornis individuals were observed by a professional diver at various levels from the surface to a depth of 5 m, either as single individuals or in few numbers and never as dense aggregations or swarms. *L. multicornis* species was usually associated with *Mnemiopsis leidyi*, the most abundant ctenophore in the Syrian coastal waters (Fig. 3). *L. multicornis* was observed during the period between December 2018 to the end of April 2019, and then it suddenly disappeared at the beginning of May 2019, the time when the first *Pelagia noctiluca* outbreak was observed off the Syrian coast at the same area ([20]).

Fig 3: *Mnemiopsis leidyi* off the Syrian Coast

L. multicornis is widely distributed in subtropical and temperate waters ([17]). It has been recorded in the Atlantic Ocean ([21], [22], [23]); the western Indian Ocean ([22]), the southwestern Pacific Ocean ([24]), the western and central Mediterranean Sea ([25], [26], [21], [27], [28]), and recently in the eastern Mediterranean Sea ([14]). Here we present the first record of *Leucothea multicornis* Quoy and Gaimard 1824 species from the Syrian coastal waters, and the second report from the eastern Mediterranean Sea.

L. multicornis was probably introduced to the eastern Mediterranean Sea a while ago, but remained unrecorded until its abundance became apparent. Galil et. al., ([14]) argued that the sudden appearance of *L. multicornis*

species is indeed a new record in the eastern Mediterranean Sea as it is highly unlikely that such a large species, markedly different from known ctenophores in the region, would remain unreported till the 21st Century. The Syrian coastal waters (eastern Mediterranean Sea) has been affected significantly by a new arrivals and establishment of non-indigenous jellyfish of the following species *Rhopilema nomadica*, *Phyllorhiza punctata*, *Aequorea globosa*, *Cassiopea andromeda*, *Marivagia stellate*, *Pelagia noctiluca* and *Porpita porpita* ([29], [30], [31], [32], [33], [34]). These alien jellyfish species mostly of Indo-Pacific and Red Sea origin, and may be a consequence of the general warming trend of Mediterranean waters in recent years ([35], [36], [37], [38]).

IV. CONCLUSION

The present study documented the first record of a lobata ctenophore *Leucothea multicornis* Quoy & Gaimard, 1824, off the Syrian coastal waters (the eastern Mediterranean Sea). The reason for the uncertainty in explaining the appearance of *L. multicornis* species can be attributed to a lack of data on observations of ctenophores distribution and abundance in the Eastern Mediterranean Sea.

The Improvement on observation methods, by documentation of alive specimens underwater, using a digital camera, will be an important motivation for studying the ctenophores fauna in the Syrian coastal waters.

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