



Research Article

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**A First record on population of the alien venomous jellyfish, *Cassiopea andromeda* (Forsskal, 1775) (Cnidaria: Scyphozoa: Rhizostomea) in the Nayband Lagoon from Bushehr-Iran (Persian Gulf)**

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**ABSTRACT**

A population of *Cassiopea andromeda* was observed in the Nayband Bay, nearby Assaluyeh, from Bushehr province- Iran, in spring 2014. It was the first record of this invasive species in Iran. The enormous Swarming was commonly located at depths of 0.5–3 m, on muddy–sand bottom in declared lagoon in Northwest of the Persian Gulf. These aggregations were including about 4-5 cases in every one m<sup>2</sup>, different in size, typically between 6–15 cm in diameter. The venomous jellyfish *C. andromeda* can cause envenomation with their nematocysts and occurrence of certain signs like pains, swellings, rashes, itching, vomiting and other toxicological effects, depending on sensitivity of the victims to the venom.

**Key words:** *Cassiopea andromeda*, Venomous jellyfish, Bloom, Nayband Bay, Persian Gulf.

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**INTRODUCTION**

Persian Gulf is habitat of various species of jellyfish, both native and invasive. Particular jellyfish due to, some anthropogenic effects like global warming, eutrophication, overfishing, bottom-trawling, Mari-culture, coastal developments, shipping and marine transports can invasively enter the other coastal waters [1].

The so called ‘upside-down jellyfish’, *Cassiopea andromeda* (Forsskal, 1775), was not native the Persian Gulf before 2014; but invasively entered the coastal waters in the Nayband Lagoon, Assalouyeh, from Bushehr- Iran.

The upside-down jellyfish *Cassiopea* is a globally distributed, semi-sessile, planktonically dispersed scyphomedusa. *Cassiopea* occurs in shallow, tropical inshore marine waters on sandy mudflats and is generally associated with mangrove-dominated habitats [2].

It possesses pelagic larvae, surface currents in some region of world travel west to east.

According to the first documented surveys of Hawaiian island scyphozoans, *Cassiopea* were not present 100 years ago [3], until reports from the island of O’ahuin Pearl Harbor (leeward O’ahu) between 1941 and 1945 [4, 5].

It has been presumed that *Cassiopea* was accidentally introduced to these islands from the South Pacific, Indo-Pacific [2], or Southeast Asia during the Second World War by U.S. Navy vessels.

There were a number of observations, in the eastern Mediterranean, in the Aegean Sea [6], Lebanon, Cyprus [7] and Malta [6]. Several Turkish records were in Sarsala Bay [8], Skenderun Bay [9], and Ölüdeniz Lagoon [10]. In addition, some of them were lately observed in Paros Island and S. Evvoikos [11]. It seems their spreading out will continue [9, 10]. The wide distribution of *C. andromeda* in the world was shown in figure (1).

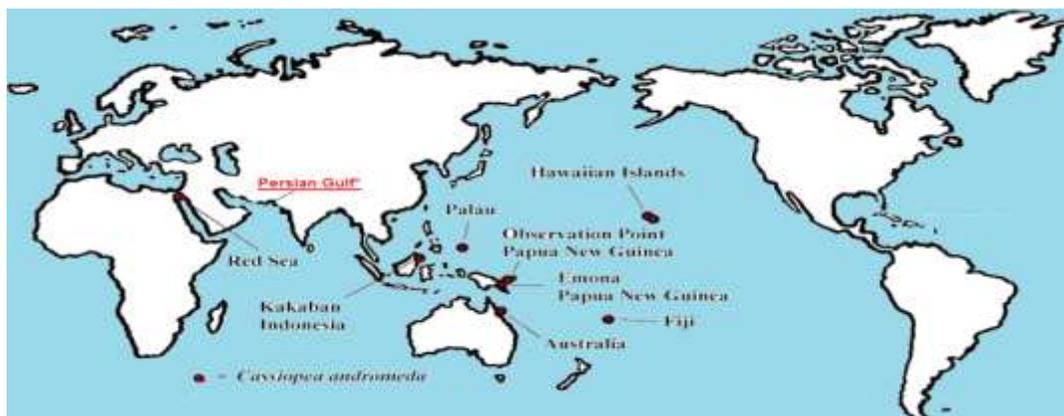


Fig.1. Distribution of *C. andromeda* (●) in some area of the world, according to Holland *et al.*, (2004) with some modifications

## RESULTS AND DISCUSSION

An population of *C. andromeda* were observed by a group of investigators from the Persian Gulf Marine Biotechnology Research Center, Bushehr University of Medical Sciences, Bushehr-Iran, in the Nayband Bay, near to Assaluyeh in the North ( $27^{\circ} 30' S$ ,  $52^{\circ} 35' E$ ), on spring 2014 (Fig. 2).

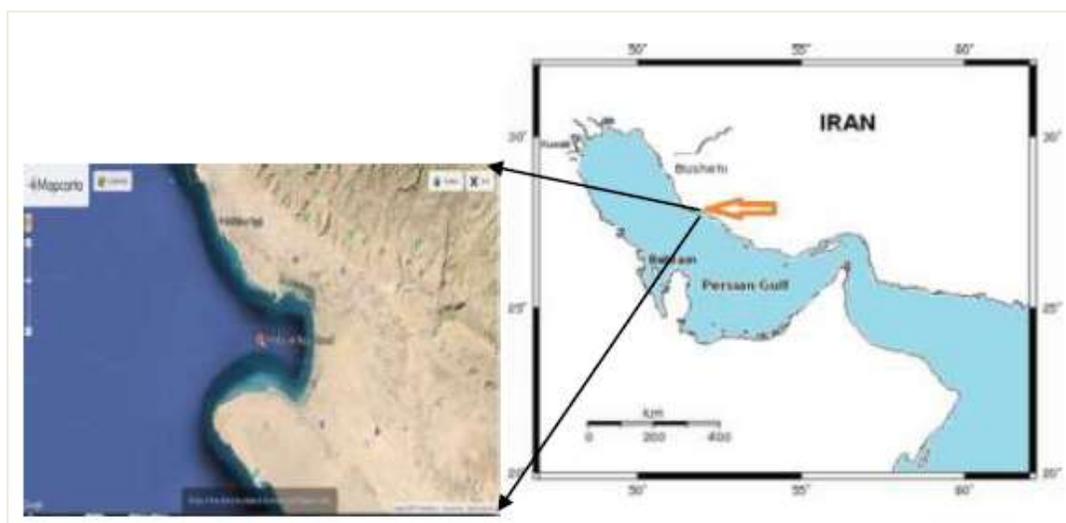


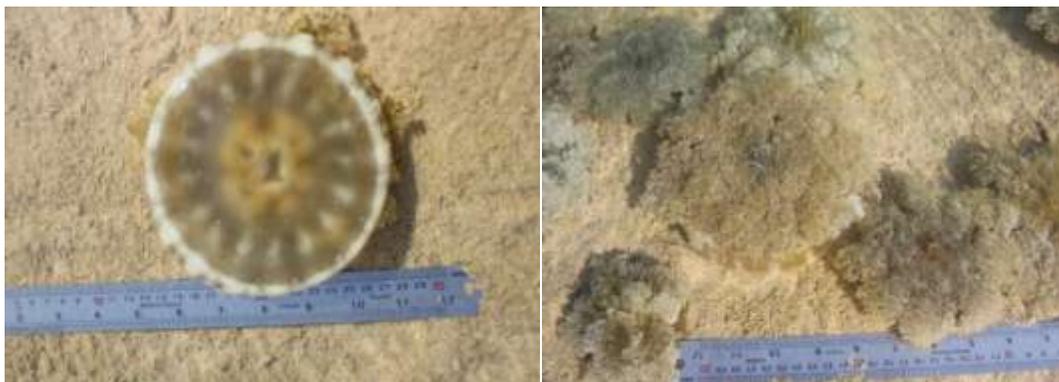
Fig.2. Khalij-e Nayband is a bay in Bushehr, Persian Gulf Region, Iran

Assalouyeh is an industrialized harbor from Bushehr province, Iran. Nayband Bay is a subtropical tidal coast with an estimated tidal range of 3 m. This preserved land is one of the most unique areas in the south of Iran for the habitat and breeding of marine life as well as mangrove trees. The Lagoon is located 14 km south of the Assaluyeh, on the southwestern coast of Bushehr-Iran [12, 13].

In our observation, the bloom mainly was located at in depths of 0.5–1.5 m, on a muddy–sand bottom in Lagoon, moreover their aggregations were including about 4-5 individuals in each m<sup>2</sup> and different sizes, but typically more ranges between 6–15 cm in diameter.

It seems the upside-down jellyfish prefer to warm, shallow and sheltered waters with muddy or sand.

Out and underwater photographs of the accumulation were taken (Fig.3).



**Fig.3. A bloom of the upside-down jellyfish *Cassiopea andromeda* in Nayband Bay, Bushehr-Iran**

Specimens were collected from mentioned locality and guessed right by marine biologist Mahdi Moradi, and Professor Iraj Nabipour from our institute. Then, the identities of the species were verified by Professor Brenden Holland from the University of Hawaii.

This protected biodiversity area is also a popular tourist purpose that visited by a large number of tourists, especially in springs, as well as bathers in summers. *C. andromeda* is a venomous species and its nematocysts may cause welts, rashes, itching, vomiting and skeletal pains depending on the person's sensitivity to the nematocyst toxin [14]. The crude venom produced severs pain in their victims. It was shown to have some manifestations like vasopermeability and dermonecrosis to lethality in mice. Some biological activities like phospholipase A<sub>2</sub> and hemolytic activities for the venom were also perceived [15, 16].

The high abundance of the species in the Nayband may possibly annoy bathers and impact on tourism as well as envenomation in native peoples. So, since that time, our studies on biochemical, pharmacological and toxinological effects of the venom are in progress.

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