J. Black Sea/Mediterranean Environment
Vol. 21, No. 1: 96-101 (2015)

SHORT COMMUNICATION

The new location record of *Cassiopea andromeda* (Forsskål, 1775) from Asin Bay, Gulf of Güllük, Muğla, Aegean coast of Turkey

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Abstract

The present paper reports the northernmost location record of the "upside-down jellyfish", *Cassiopea andromeda* (Forsskål 1775), (Cnidaria: Scyphozoa, Rhizostomeae) from the coasts of Turkey. Six individuals were observed and one of them was photographed in shallow coastal waters of Asin Bay (depth of 0.5m) in the Gulf of Güllük, on 13 and 18 October 2014.

Keywords: *Cassiopea andromeda,* upside-down jellyfish, alien species, Asin Bay, Gulf of Güllük, Aegean Sea

Increases in jellyfish populations and expanding distributions of both native and invasive jellyfish species have been reported all around the world, often considered as stressors on marine ecosystems, important nuisance species impacting fisheries, injuring swimmers, and clogging the intakes of power plants (Mills 2001; Brotz and Pauly 2012; Condon *et al.* 2012; Boero 2013; Bayha and Graham 2014).

Among thirteen Scyphozoan species reported from the coasts of Turkey (*Aurelia aurita* (Linnaeus, 1758), *Cassiopea andromeda* (Forsskål, 1775), *Chrysaora hysoscella* (Linnaeus, 1767), *Cotylorhiza tuberculata* (Macri, 1778), *Discomedusa lobata* (Claus, 1877), *Drymonema dalmatinum* (Haeckel, 1880), *Nausithoe punctata* (Kölliker, 1853), *Paraphyllina ransoni* (Russell, 1956), *Pelagia noctiluca* (Forsskål, 1775), *Periphylla periphylla* (Péron & Lesueur, 1810), *Phyllorhiza punctata* (Lendenfeld, 1884), *Rhopilema nomadica* (Galil, Spanier & Ferguson, 1990), *Rhizostoma pulmo* (Macri,

1778)), three are alien species for the Mediterranean Sea (*C. andromeda*, *P. punctata*, *R. nomadica*) and *C. andromeda* is the first known Lessepsian scyphomedusa (Çınar *et al.* 2014; İşinibilir *et al.,* submitted). Apart from Turkey, *C. andromeda* was reported from Cyprus (Maas 1903), Greece (Neokameni Island (Schäfer 1955), Paros Island and S. Evvoikos (Zenetos *et al.* 2011)), Lebanon (Goy *et al.* 1988), Israel (Spanier 1989; Galil *et al.* 1990), and Malta (Schembri *et al.* 2010).

There have been five location records of *C. andromeda* reported from the Mediterranean and Aegean coasts of Turkey; a single specimen from Sarsala Bay (Bilecenoğlu 2002), six specimens from the Gulf of İskenderun (Çevik *et al.* 2006), an established population from Ölüdeniz Lagoon (Özgür and Öztürk, 2008), one specimen from the Gulf of Antalya (Çardak *et al.* 2011), and four specimens from Hisarönü Bay (Gülşahin and Tarkan 2012). The present paper reports the northernmost location of the species from Asin Bay, Gulf of Güllük (Aegean Sea) (Figure 1).

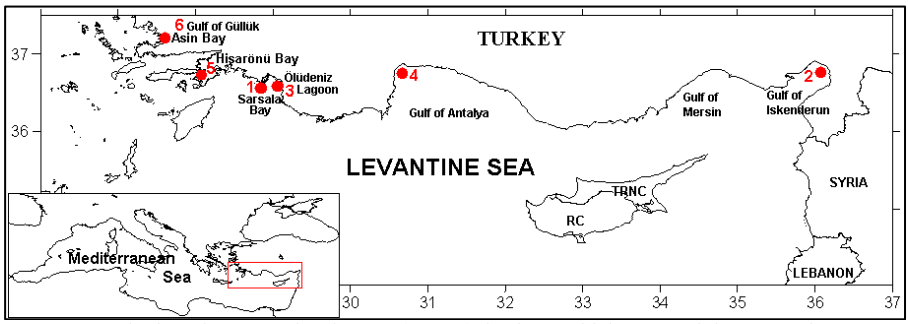

Figure 1. The location records of *C. andromeda* in the Turkish coast of the Levantine Sea (1. Bilecenoğlu 2002; 2. Çevik *et al.* 2006; 3. Özgür and Öztürk 2008; 4. Çardak *et al.* 2011; 5. Gülşahin and Tarkan 2012; 6. Present study)

Six specimens of jellyfish were observed alive and one of them was photographed in shallow coastal waters of Asin Bay (depth of 0.5m) in the Gulf of Güllük, Aegean Sea, on 13 and 18 October 2014, though not collected. The live specimens (Figure 2) were clearly identifiable as *C. andromeda.* The specimens were 2-3 cm in diameter and observed in the middle of seagrass leaves washed ashore.

The Gulf of Güllük is located in the Aegean Sea and is highly susceptible to environmental changes due to the high pressure made by several kinds of land use.

Figure 2. *Cassiopea andromeda* in Asin Bay, lying mouth upward on the bottom (Photographed by Gül Moran)

The Gulf is mainly used for aquaculture, fishing, maritime transport, feldspar mineral export, and various other coastal activities (Yıldız *et al.* 2002). On the other hand, coastal settlements are increasing rapidly in the region and land-based pollutants including agro-industrial wastes reach directly or indirectly to the Gulf of Güllük. Asin Bay is located in the north of the Gulf, adjacent to the Güllük Lagoon. Sarıçay Stream flows into the bay carrying 255,000 tonnes of household waste water per year. The bay is therefore characterized by high amounts of organic matter and low levels of dissolved oxygen (Yıldız *et al.* 2002; Bingel *et al.* 2005).

The alien species introduced to the Levantine Sea, generally first colonized in the lagoons or estuarine habitats and polluted harbours with low biodiversity (Galil 2000). *C. andromeda* is also reported to prefer warm, shallow and sheltered waters (Schembri *et al*. 2010), thus it is possible that it established a breeding population in bays like Ölüdeniz Lagoon (Özgür and Öztürk 2008) and the Gulf of Antalya (E.Ö.Ö., unpublished data). Eutrophication, overfishing, habitat modification for aquaculture, and climate change are all possible contributory factors facilitating plausible mechanisms for the proliferation of jellyfishes. In the absence of improvement in coastal marine ecosystem health, jellyfishes could be sustained and may even spread from the locations in which they now occur (Mills 2001; Dong *et al*. 2010; Condon *et al*. 2012; Bayha and Graham 2014).

Our recent research revealed that *C. andromeda* is also present in Asin Bay, Gulf of Güllük. Like other jellyfish, *Cassiopea* is armed with nematocysts which stings may cause welts, rashes, itching, vomiting and skeletal pains depending on the person's sensitivity to the nematocyst toxin (Eldredge and Smith 2001). Further studies are necessary to determine if the species has adapted and established a population in the region. This is especially of great concern as it may impose considerable socio-economic hardship to net-based fisheries, aquaculture, and tourism.

Acknowledgements

The authors are greatly indebted to Ms. Gül Moran and Mercan Dinçer for sharing the observation information and photographs of the specimen, Drs. Ayaka Amaha Öztürk and Arda M. Tonay for their valuable comments and editing the manuscript. This work is part of the activities of the "National Jellyfish and Gelatinous Organisms Watch Programme- www.yayakarsa.org" conducted by Turkish Marine Research Foundation (TUDAV).

Ters-düz denizanası, *Cassiopea andromeda* (Forsskål, 1775)'nın Güllük Körfezi, Asin Koyu'ndan (Muğla, Ege Denizi) Yeni Lokasyon Kaydı

Özet

Bu çalışmada "Ters-düz denizanası" *Cassiopea andromeda* (Forsskål, 1775), (Cnidaria: Scyphozoa, Rhizostomeae)'nın Türkiye kıyılarında en kuzeydeki yeni lokasyon kaydı bildirilmektedir. Güllük Körfezi, Asin Koyu'nun sığ kıyı sularında (0,5m derinlikte), 13 ve 18 Ekim 2014 tarihlerinde *C. andromeda*'nın en az altı bireyi gözlemlenerek, fotoğraflanmıştır.

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Received: 25.11.2014
Accepted: 30.12.2014