

**A NEW CONTRIBUTION OF BIODIVERSITY OF SAPANCA LAKE: *Craspedacusta sowerbyi* LANKESTER, 1880 (CNIDARIA: HYDROZOA)****Reyhan Akçaalan, Melek İşinibilir\*, Cenk Gürevin, Adnan Sümer**

Istanbul University, Fisheries Faculty, Istanbul-TURKEY

**Abstract:** The freshwater jellyfish *Craspedacusta sowerbyi* Lankester, 1880 (Cnidaria: Hydrozoa) has a worldwide distribution. It was seen in Sapanca Lake between early August and late September, 2009. *C. sowerbyi* was recorded in the eastern part of the lake. All individuals captured were with bell diameters ranging from 4-11.6 mm. Tentacle numbers ranged from 200 to 480.

**Keywords:** *Craspedacusta sowerbyi*, fresh water medusa, Sapanca Lake, Turkey

**Özet:** **Sapanca Gölü Biyoçeşitliliğine Yeni Bir Katkı: *Craspedacusta sowerbyi* LANKASTER, 1880 (Cnidaria: Hydrozoa)**

*Craspedacusta sowerbyi* Lankester, 1880 (Cnidaria: Hydrozoa) dünyadaki tüm iç su kaynaklarında yaygın olarak bulunmaktadır. Sapanca Gölünde Ağustos 2009'un başından Eylül 2009 sonuna kadar gölün doğusunda kaydedilmiştir. Yakalanan bireylerin çapları 4-11.6 mm, tentakül sayıları ise 200-480 arasında değişmektedir.

**Anahtar Kelimeler:** *Craspedacusta sowerbyi*, tatlı su medüze, Sapanca Gölü, Türkiye

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\* **Correspondence to:** Melek İŞİNİBİLİR, Istanbul University, Fisheries Faculty, 34470, Istanbul-TURKEY

**Tel:** (+90 212) 455 57 00 – 16416 **Fax:** (+90 212) 514 03 79

**E-mail:** [melekis@istanbul.edu.tr](mailto:melekis@istanbul.edu.tr)

## Introduction

In recent times, *Craspedacusta sowerbyi* Lankester, 1880 (Cnidaria: Hydrozoa) has been found sporadically and often in large numbers in ponds, lakes, reservoirs and rivers in the north temperate regions of the world (Rayner, 1988). This freshwater planktonic medusa was first discovered in 1880 in Regent's Park, London, in a pond containing a water plant from Brazil (Payne, 1924). In following years, *C. sowerbyi* has been registered in several European countries: Italy, France, Sweden, Spain and recently Portugal (Seworby, 1941; Ferreira, 1985), 31 states of the USA specially eastern states (De Vries, 1992), Canada, Hawaii and Australia of the south (Thomas, 1950), the Islands of the Philippines, China, Japan, Asia Centrals and South America (Acker, 1976), as well as New Zealand (Didžiulis, 2006; Boothroyd et al., 2002)

In Turkey, Dumont (1994) mentioned that *C. sowerbyi* was observed two localities in Turkey: one in Istanbul (aquarium occurrences), the other in the Euphrates-Tigris region (probably Keban Reservoir). Balık et al. (2001) was also reported *C. sowerbyi* in Topçam Reservoir (Aydın, Turkey). *C. sowerbyi* medusae occur sporadically within freshwaters and are thus generally ignored in the monitoring studies of water quality, which explains the lack of studies and the paucity of records. *C. sowerbyi* was observed in Sapanca Lake since the beginning of 1990's but has received very little attention.

## Materials and Methods

Sapanca Lake is located in the northwestern part of Turkey (Figure 1). Its surface area is 46.8 km<sup>2</sup> and maximum depth is 55 m. The lake water is used as a source of drinking water by the city and district of Adapazarı, which has a population of more than 500000, and as a recreational area. The lake was classified oligotrophic till the end of 1990's and has gradually changed to mesotrophy after that (Aykulu et al., 2006; Akcaalan et al., 2007).

Samples were collected by both vertical towing using a plankton net (50 µm mesh size, 0.25 m mouth diameter) from bottom to surface and using hand net from the surface water. Water temperature, pH and dissolved oxygen were measured by YSI 650 multiparameter.

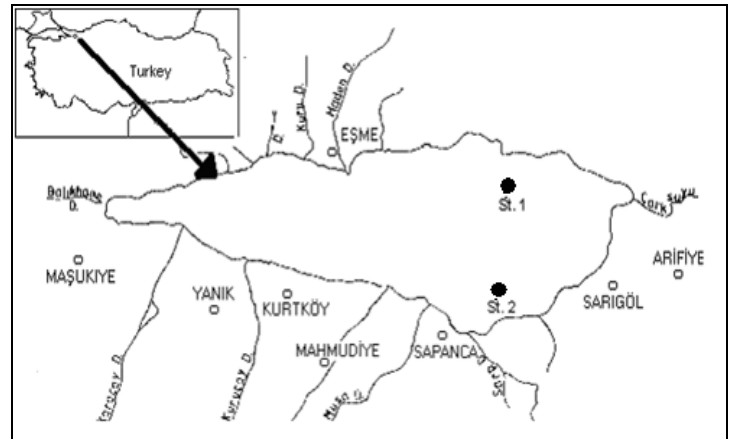


Figure 1. Study area and stations

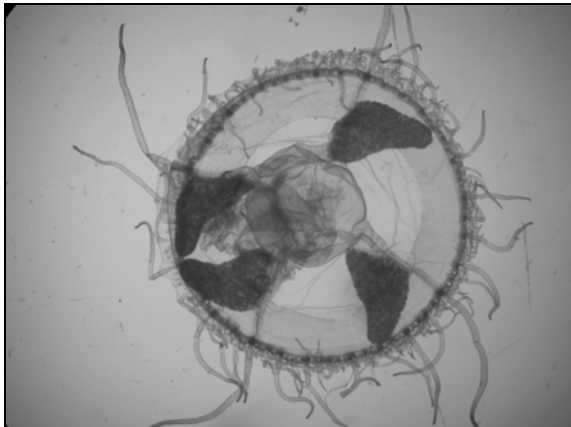
## Results and Discussion

Although *C. sowerbyi* has been observed in the lake for more than two decades, the measurements of individuals were done first time in the present study. The medusae were observed in the plankton of the lake between early August and late September. Samples were taken from two stations in the eastern part of the lake. Maximum depths of the stations were 20 m and 2 m at the first and second station, respectively. The mean temperature was 24.3 °C (± 1.5), pH was 9.1 and dissolved oxygen was recorded as 7.4 mg L<sup>-1</sup>. The mean water transparency was measured as 5.6 m.

*C. sowerbyi* was dispersed in most parts of the lake, but could not be observed in the western part which is shallow and occupied by dense macrophyte population. The minimum and maximum umbrella diameter was 4 mm and 11.6 mm; number of tentacles ranges between 200 and 480 (Figure 2). The number of gonads present was 4 per medusa.

The growth and reproductive activity of *C. sowerbyi* generally take place in summer months in temperate regions and medusae are found in open water as a common feature (Boothroyd et al., 2002). The occurrence of *C. sowerbyi* in Sapanca Lake is consistent with these findings. Originating from China, the medusae have a worldwide distribution, although it is impossible to find out how this happened and the way of introduction to the new localities (Fritz et al., 2009). Probably not the medusae but the tiny polyps could be transported by several ways, especially by ornamental, exotic aquatic plants, by aquatic

animals or by bird's feet (Didžiulis, 2006). The way of introduction of this species to Sapanca Lake is also unknown. However, it is possible that human activities caused its presence in the lake. In the last decades, some exotic fish species like *Carassius gibelio* (Bloch, 1782), *Lepomis gibbosus* (Linnaeus, 1758), even a couple of piranha, which did not form a population luckily, have been found in the lake.



**Figure 2.** *Craspedacusta sowerbyi* in the Sapanca Lake

Although, more species of genus *Craspedacusta* were described, only *C. sowerbyi* has a worldwide distribution. Possible reasons could be the several types of vegetative reproduction, successful long term survival and also the ability of producing a resting body in adverse conditions (Fritz et al., 2007). These features may facilitate its invasions in new localities and also enable to form a new population in different kind of water bodies, making this species a successful invader.

*C. sowerbyi* feeds mainly on zooplankton. Smith and Alexander (2008) claimed that the medusae could affect the zooplankton community and if there is a medusae-bloom, community structure can be altered, causing a significant change in food web of aquatic systems. Also, individuals may consume excess oxygen and so decreases the quality of environment fish live in and the drinkable water. For these reasons, a detailed study on *C. sowerbyi* population in Sapanca Lake must be conducted.

## Conclusion

In conclusion, *C. sowerbyi* was first record in Sapanca Lake in this study. It was seen in this fresh water lake between early August and late

September, 2009 when the temperature increases. The lake water is used as a source of drinking water by the city and district of Adapazarı, and as a recreational area. For these reasons, a detailed study on *C. sowerbyi* population in Sapanca Lake must be conducted.

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