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On the occurrence of *Bursatella leachii* de Blainville, 1817 in Izmir Bay, Turkey

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Abstract

One of the well- established alien species in the eastern Mediterranean basin is Bursatella leachii, also known as a lessepsian immigrant. The present paper provides a contribution to Bursatella leachii's distribution in the Bay of Izmir, Turkish Aegean Sea.

Keywords: *Bursatella leachii;* Lessepsian immigrant; Alien species; Opisthobranchia; Turkey; Aegean

Introduction

Recent reviews of alien biota in the Mediterranean have revealed 196 molluscan species having been introduced into the Mediterranean (ZENETOS *et al.,* 2003; 2005). Most of them have been introduced into the Eastern Mediterranean (GOFAS & ZENETOS, 2003). Among these, *Bursatella leachii* an opisthobranch gastropod, is well established (ZENETOS *et al.,* 2003; 2005). There are a few records related to molluscan fauna in Izmir Bay, even fewer on alien species in the area (YOKES & RUDMAN, 2004; ÖZTÜRK & POUTIERS, 2005; ÇINAR *et al.,* 2006; ÇINAR *et al.,* 2007).

Izmir Bay harbour is one of the most important commercial ports in Turkey with intense maritime traffic. In addition, the bay is affected by domestic and industrial effluent. Both aforementioned factors make the broader harbour area quite appropriate for the introduction of alien species.

Although *Bursatella leachii,* known as the ragged sea hare, is established in Turkish waters (TURAL, 2004; ÇINAR *et al.,* 2005), to date it has not been included in the list of aliens from the Izmir Bay. Therefore, observation of *Bursatella leachii* from the Izmir-Inciralti coastline is reported in the present study.

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Materials and Methods

Nine individuals of *Bursatella leachii* were collected from the Izmir-Inciralti coastline. After examination and photographing of the species, the specimens were released into the sea. Although sea visibility in this part of Izmir bay is very poor, the observation and collection of the specimens were very easy since they were around red macroalga *Gracilaria verrucosa* at a depth range of 20-50 cm. Two of the collected specimens were preserved in 70% ethyl alcohol. The specimens were deposited in the museum of Faculty of Fisheries at Ege University in Izmir. Voucher number is ESFM-GAS/2008-01

Result and Discussion

The species has a brownish mantle and in some areas of the mantle blue spots (ocelli) were observed. The number of blue spots was between 5 and 8. Characteristic thorny structures (papi llae) on the mantle helped us to identify this species easily. The bottom of the animals was whitish, with brownish spots. The specimens had very short tails (0.5 ± 0.2 cm). The distance between mouth and head was 0.4 ± 0.2 cm. The size of the animal is 9.2 ± 0.21 cm (Figs 1-2). When they were disturbed, blue-purple defensive fluid was also observed, as in other sea hares.

Bursatella leachii is distributed and reported in the temperate waters of the Indo-Pacific and Atlantic Oceans and also from Mediterranean Sea (ZENETOS *et al.,* 2003; DASKOS & ZENETOS, 2007). Although *Bursatella leachii* a lessepsian immigrant, is one of the well-known sea hares in the Mediterranean Sea, there is weak information in the literature related to its distribution in the Turkish Aegean Sea. The distribution of this species along Greek coastlines is reported from Northern Greece: Chios island, Lesvos (BARASH & DANIN, 1986) the Thermaikos Gulf and Chalkidiki (KOUTSOUBAS, 1992), and from the Greek South Aegean Sea: Crete and the Saronikos Gulf (DASKOS & ZENETOS, 2007). So far, this species has been recorded by TURAL (2004) in Datca-Turkey and SWENNEN (1961) in the Turkish Aegean Sea. This species has also been observed from Gumuldur coastline. The geographical coordinates of the sampling site are 38° 04' 01.55" and 26° 59' 45.42" (Ulas DURAL, Mehmet ANTMEN, pers.commun.).

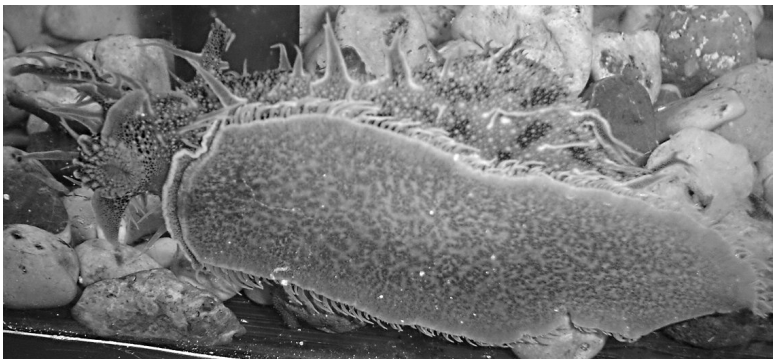


Fig. 1: Ventral view of *Bursatella leachii.*

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Fig. 2: Dorsal view of *Bursatella leachii.*

Izmir is the third biggest and one of the most important commercial and industrial cities in Turkey. In addition, Izmir Bay provides a major contribution to the economic development of not only Izmir, but also to the Aegean region of Turkey. On the other hand, due to the many factories producing food, dyes, chemicals, textiles and metals , as well as domestic waste water, up to 2000 the bay has been exposed to heavy pollution (KUCUKSEZGIN *et al.,* 2006; ÇINAR *et al.,* 2008). In 2000 the Izmir municipality developed a project called 'The Grand Canal Project' to prevent the flow of pollution into the bay. Current studies on pollution in the bay report that the primary pollution factors are now nutrients and/or organic matter rather than heavy metals (KUCUKSEZGIN *et al,* 2006; ÇINAR *et al.,* 2008).

Based on field observation of *Bursatella leachii,* the distance between specimens along the Izmir-Inciralti coastline was very close, about 10-25 cm, in daylight. On the other hand, during the night this distance increased (to about 500 cm) compared to daylight values. This observation might be explained by the bioactive chemicals secreted for interaction with other individials by *Bursatella leachii.* The secretion may be affected by UV-radiation and might be transformed into another bioactive chemicals. To understand this phenomenon, research on the isolation and characterization of bioactive molecules secreted by this species in the existence and absence of UV-radiation is warranted. Moreover, an investigation into stress biomarkers such as enzyme- based antioxidant systems and also lipid peroxidation levels in the tissues of *Bursatella leachii* should be carried out. Monitoring of these parameters might provide valuable information on the cleaning of Izmir bay and also the success of 'The Grand Canal Project'.

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