

THE FIRST SUBSTANTIATED RECORD AND NORTHWARD EXPANSION OF THE MERTENS' PRAWN-GOBY, *Vanderhorstia mertensi* (OSTEICHTHYES: GOBIIDAE) IN THE AEGEAN SEA

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Abstract:

The occurrence of the alien goby *Vanderhorstia mertensi*, off Akbük Cove, Anatolian coasts of Aegean Sea, is here well proven for the first time. On 12 August 2014, a single specimen was observed by visual census. This finding substantiate that its presence and also distribution is expanding northwards, along the Anatolian coasts of the Aegean Sea.

Keywords: *Vanderhorstia mertensi*, Aegean Sea, Alien species, Anatolian coasts

Introduction

A crucial factor heavily influencing the changes of Mediterranean biodiversity is the continuous introduction and rapid establishment of exotic newcomers of Erythraean origin (Zenetos et al., 2012). Alien biota in the Aegean Sea include 775 alien species of which 105 are exotic fish species consisting of more than 65 species of Indo-Pacific origin (Zenetos et al., 2012). Bilecenoğlu et al. (2014) stated 512 fish species belonging to 150 families along the Turkish coasts, where 55 non-indigenous fish species are reported (Ergüden et al., 2013).

Gobiidae is one of the largest fish family among marine fishes, found mainly in shallow waters in diverse habitats, including approximately 1900 species in all tropical and temperate regions (Golani et al., 2006). It is also the richest family in the Mediterranean more than 60 species, four of which are Lessepsian immigrant (Bilecenoğlu et al., 2008; Goren, 2014).

The Erythraean slender shrimpgoby, *Vanderhorstia mertensi* Klausewitz, 1974, has been first

recorded from the Fethiye Bay, Turkey (Bilecenoğlu et al., 2008) and afterwards it was reported chronologically: in 2008 at Iskenderun Bay (Yokeş et al., 2009), in 2009 at Antalya Bay (Gökoğlu et al., 2011), in 2010 at Gökova Bay (Çınar et al., 2011) and in 2012 from the Haifa Bay (Goren et al., 2013) (Figure 1.).

Materials and Methods

On 12 August 2014, While SCUBA dive performed in order to determine marine biota in the Akbuk Cove, SE Aegean Sea, Turkey (Figure 1.) (37°23'N - 27°25'E), some of the authors (A.T, Ü.A and F.Y) observed a single specimen of *Vanderhorstia mertensi* (Figure 2.) in shallow waters (approx. 6 m), on sand and muddy bottom and its photo was taken using Canon EOS550d Digital Camera with Ikelite Underwater Housing. The identification of the species was based on the description provided by Larson and Murdy (2001) and Bilecenoğlu et al. (2008) using high quality photos.

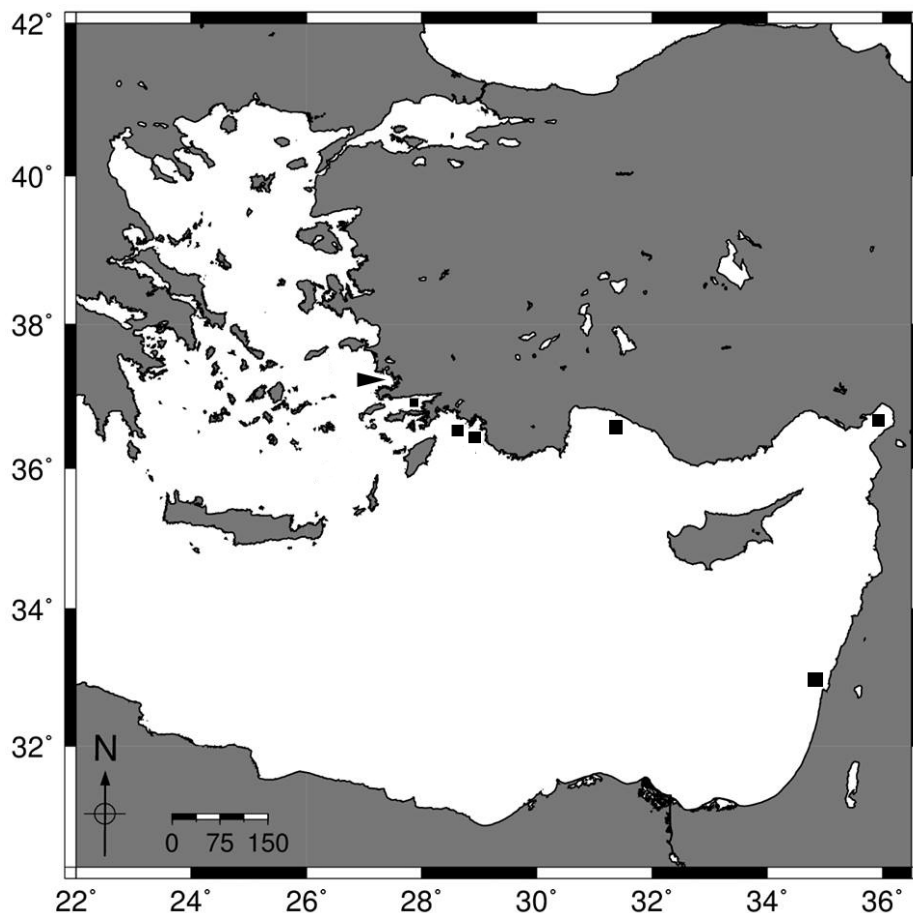


Figure 1. Locations of Mediterranean reported by *Vanderhorstia mertensi* (▲ Present study, ■ previous studies)



Figure 2. A general view of *Vanderhorstia mertensi* in front of its nest (Photo: Ali Türker).

Results and Discussion

Important diagnostic features of specimen were clearly visible and noticeable: Body colour white ventrally with spotless, beige and light grey dorsally; a mid-lateral line of well-distinguished vertical dark stripes (not reaching the belly). Dorsal and ventral zones were separated by dark strips with numerous irregular yellow/orange spots where exist on dorsal part of body and head. One dark spot on both the opercle and caudal peduncle and, three more below the second dorsal fin.

Identification of goby species requires more attention because the most important characters of species are visible generally under stereomicroscope. There are over 120 gobiid fish belonging to 20 genera known to live in association with Alpheid shrimps, there have been only two Erythraean associated gobiids, *Vanderhorstia mertensi* and *Cryptocentrus caeruleopunctatus*, in the Mediterranean (Rothman and Goren, 2015). This feature provides convenience for photographic identification of Red Sea gobies in the Mediterranean. These two species also are differentiated from each other by distinct and characteristic colorations.

The opening of the Suez Canal, which are formed artificially, have contributed to be invaded Medi-

terranean biodiversity by Erythraean fauna and flora (Coll et al., 2010). This phenomenon, called as Lessepsian influx, associated with anthropogenic actions and global warming have proceed the remodeling drastically biota of Mediterranean in the last century (Bianchi and Morri, 2003).

Most of Erythraean fishes that are quite common in the eastern Mediterranean have not yet been observed in the southeastern Aegean, probably due to difficulties in overcoming biotic and/or abiotic factors, such as temperature regime, substrate, currents, structure of the continental shelf, thermal tolerance of the colonizing species, food availability, competition with indigenous species, resistance to local pathogens, and extension of the spawning season (Corsini-Foka and Economidis, 2007; Mavruk and Avsar, 2007). However, cold water temperature has been considered as the most important restrictive factor in invasion/colonization processes of Erythraean fishes. Nevertheless, distributions of coastal littoral species, such as *V. mertensi*, seem to not affected by these unfavourable conditions because shallow sandy and/or muddy habitats that provide suitable conditions for their survival and establishment (Golani et al., 2007; Yapici et al., 2015). Additionally, substantial northward occurrences of the previously-known *V. mertensi* may probably increase due to the fact that rise in seawater tem-

perature of approx. 1–2°C of the Aegean Sea (Pancucci-Papadopoulou et al., 2012; Bianchi et al., 2014). Moreover, its distribution may be wider from the known up to now due to it has no commercial value, a small size and cryptic behavior. Concerning alien fishes, Golani et al. (2011) highlighted the importance of both first records and additional records in new areas, because they indicate that previous occurrences were not just accidental and they provide information about their invasion pathways and zoogeographic range expansion.

Conclusion

The observation of the Erythraean alien goby *Vanderhorstia mertensi* here reported for the first time provably in the Turkish Aegean waters, shows a lightly expansion northern to the Anatolian coasts of Aegean Sea. Therefore, studies of non-indigenous new assemblages should focus more, and their interactions deeply investigated as well.

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