

## Short communication

## First record of *Vanderhorstia mertensi* Klausewitz, 1974 (Pisces, Gobiidae) in the Mediterranean Sea

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### Abstract

A dense population of the slender shrimpgoby, *Vanderhorstia mertensi* Klausewitz, 1974, was observed in Fethiye Bay (Turkey), in association with burrows constructed by the alpheid shrimps, *Alpheus glaber* and *A.rapacida*. This is the first record of the species in the Mediterranean Sea, and the fifth alien goby in the region.

**Key words:** *Vanderhorstia mertensi*, Gobiidae, alien species, Mediterranean Sea

Gobiidae is the most species rich family among marine fishes, represented by possibly more than 2000 species. Nearly 130 goby species of about 13 Indo-Pacific genera are known by their mutualistic relationships with the Alpheid shrimps, living together in the same burrow (Wirtz 2005). Current knowledge on goby – alpheid association is mostly based on in situ observations carried out at the Pacific, Indian oceans, Red Sea, West Indies and the tropical western Atlantic, but behavioral studies in aquaria are also available (Karplus et al. 1972; Syms and Jones 2004; Thompson 2004; Wirtz 2005). In the Mediterranean, few gobies are known to be associated with other invertebrates: *Chromogobius zebratus* (Kolombatovic, 1891), *Millerigobius macrocephalus* (Kolombatovic, 1891) and *Zebrus zebrus* (Risso, 1827) with sea urchins, and *Gobius bucchichi* Steindachner, 1870 with the *Anemonia viridis* (Forsskål, 1775), however, these interactions are not regarded as true symbiosis (Patzner 1999).

More than 60 gobies inhabit the Mediterranean, four of which have entered via the Suez Canal, i.e. *Coryogalops ochetica* (Norman, 1927), *Oxyurichthys petersi* (Klunzinger,

1871), *Papillogobius melanobranchus* (Fowler, 1934) and *Silhouettea aegyptia* (Chabanaud, 1933) (Golani et al, 2006; Kovačić and Golani, 2007). During a marine biodiversity assessment project carried out at Fethiye Bay (Turkey) between 19 June – 12 July 2008 and 06 – 26 September 2008, numerous individuals of the slender shrimpgoby, *Vanderhorstia mertensi* Klausewitz, 1974, were observed. Natural distribution range of this species includes the Red Sea (Dor 1984), Oman (Randall 1995), Philippines, Taiwan, Papua New Guinea (Froese and Pauly 2008), Japan (Shibukawa and Suzuki 2004) and Australia (Yearsley et al. 2006). We report the presence of this species for the first time in the Mediterranean Sea, and also the first documented case of an alpheid – goby association in the sea.

On 18 September 2008, a single specimen of *V. mertensi* (21 mm SL, 26 mm TL) was collected (Figure 1) from Kizilada (36°39'59"N, 29°02'06"E), during a scuba dive made at a depth of 23 m. The site is characterized by muddy sand, with moderately dense *Halophila stipulacea* (Forsskål) beds in the vicinity. The specimen were preserved in 4% formalin, and



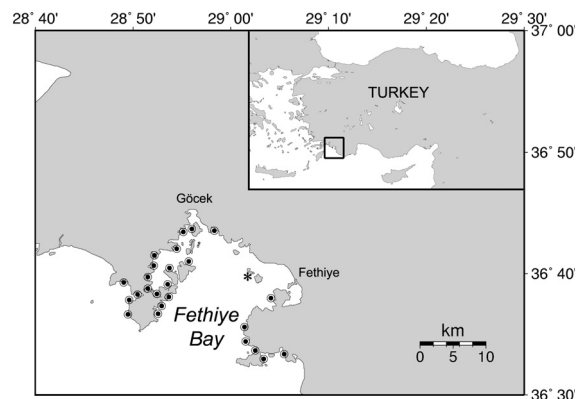
**Figure 1.** *Vanderhorstia mertensi* Klausewitz, 1974, captured from Fethiye Bay (21 mm SL). Scalebar = 5 mm (Photo by M.B.Yokes).

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length and 8.6% of SL; caudal peduncle depth 23.2% of head length and 6.2% of SL; longest dorsal finray 14.8% of SL; pectoral finrays extend as far as to second ray of D2, longest pectoral finray 26.2% of SL; pelvic fins reaching to anus, longest pelvic finray 17.6% of SL; longest caudal finray 28.6% of SL. Color (in life): Dark stripe on the maxilla, numerous yellow/orange spots on head and the dorsal part of the body, a dark spot on the opercle, a vertical dark stripe (not extending down the belly) below the 4th ray of first dorsal fin, three large dark spots below the second dorsal fin and one dark spot on the caudal peduncle, all fins with distinct yellow spots (except for the pelvic fins). Color (preserved): Body pale, with four lateral spots. A faint dark stripe on the maxilla. All fins are colorless.

Of a total of 243 (daytime) scuba dives made along the coast of Fethiye Bay, the slender shrimpgoby was observed on 78 dives at 26 different localities (Figure 2). The shallowest burrows occupied by the shrimpgoby were at 2 m, the deepest was at 52 m. This finding differs from the depth distribution (2-10 m) indicated by Froese and Pauly (2008). The population of *V. mertensi* was most dense over sandy/muddy bottoms (up to 7 individuals/m<sup>2</sup>), and decreased to ca. 0.1 individual/m<sup>2</sup> in the vicinity of *Zostera spp.*, *Posidonia oceanica* (Delile) and *Cymodocea nodosa* (Ucria) meadows (Figure 3). The alpheids collected from the burrows inhabited by *V. mertensi* were identified as *Alpheus glaber* (Olivi, 1792) and *A. rapacida* De Man, 1908. A single Lessepsian penaeid prawn, *Metapenaeopsis aegyptia* Galil and Golani, 1990, was also captured from a burrow at 20 m, but does not signify an association with the shrimpgoby.



**Figure 2.** Map of the study area. Full dots indicate localities where *Vanderhorstia mertensi* individuals are observed. The capture locality of the single specimen is indicated with an asterisk (see Annex 1 for details).



**Figure 3.** A typical burrow observed within *Cymodocea nodosa* meadows (Photo by M.B.Yokes).

All *V. mertensi* individuals were observed hovering near the entrance of burrows, keeping their position if unthreatened. When the divers tried to approach nearer the burrow, the goby darted inside performing a swift “U-turn”.

The Indo-Pacific fish genus *Vanderhorstia* Smith, 1949, includes 21 species worldwide, several species being described recently. Among all Indo-Pacific shrimp gobies, *Vanderhorstia* is most similar to *Cryptocentrus* Valenciennes, 1837 and *Amblyeleotris* Bleeker, 1874, and can be distinguished by the head papillae pattern (longitudinal in *Vanderhorstia* vs. transverse in the latter two). Comparison with *Vanderhorstia* species known from the Red Sea, *V. delagoae* (Barnard, 1937) and *V. opercularis* Randall, 2007, with *V. mertensi* shows the latter differs in

having more dorsal and anal fin soft rays (15 dorsal / 16 anal vs. 13-14 / 13-14 and 12 / 12, respectively), and a unique color pattern.

We assume that the well established population of *V. mertensi* in Fethiye Bay originates from the Red Sea and entered the Mediterranean via the Suez Canal, but the possibility of a ship-mediated introduction should also be considered.

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**Annex 1.** Records of *Vanderhorstia mertensi* in the Fethiye Bay in 2008.

| Station            | Record coordinates |               | Date of record | Depth range (m) | Number of specimens |
|--------------------|--------------------|---------------|----------------|-----------------|---------------------|
|                    | Latitude, °N       | Longitude, °E |                |                 |                     |
| Kizilkuyruk Burnu  | 36°36'05"          | 28°52'00"     | 20.06.2008     | 8 – 13          | 5 – 10              |
| Lakoz Koyu         | 36°39'22"          | 28°48'38"     | 21.06.2008     | 20 – 22         | 25 – 30             |
| Kapidagi Y. (Dogu) | 36°37'43"          | 28°52'53"     | 21.06.2008     | 40 – 52         | 30 – 40             |
| Kara Burnu         | 36°38'31"          | 28°50'26"     | 22.06.2008     | 18 – 30         | 20 – 25             |
| Gungormez Burnu    | 36°37'14"          | 28°49'41"     | 23.06.2008     | 20 – 31         | 30 – 40             |
| Kurtoglu Burnu     | 36°36'38"          | 28°49'51"     | 24.06.2008     | 26 – 34         | 20 – 25             |
| Merdivenli Koyu    | 36°38'27"          | 28°53'54"     | 25.06.2008     | 16 – 20         | 10 – 15             |
| Domuz Adasi        | 36°40'06"          | 28°53'30"     | 26.06.2008     | 25 – 30         | 15 – 20             |
| Tersane Adasi      | 36°40'10"          | 28°55'49"     | 27.06.2008     | 28 – 33         | 35 – 40             |
| Gobut              | 36°38'55"          | 28°53'46"     | 28.06.2008     | 12 – 18         | 15 – 20             |
| Kleopatra Koyu     | 36°38'34"          | 28°52'36"     | 29.06.2008     | 4 – 16          | 25 – 30             |
| Kleopatra Koyu     | 36°38'49"          | 28°51'16"     | 29.06.2008     | 10 – 18         | 20 – 25             |
| Siralibuk Koyu     | 36°40'43"          | 28°51'43"     | 29.06.2008     | 10 – 24         | 50 – 60             |
| Sarsala Koyu       | 36°39'49"          | 28°51'12"     | 30.06.2008     | 8 – 14          | 30 – 35             |
| Tasyaka Koyu       | 36°41'29"          | 28°52'10"     | 01.07.2008     | 16 – 20         | 60 – 70             |
| Kille              | 36°42'16"          | 28°54'25"     | 02.07.2008     | 24 – 36         | 40 – 50             |
| Gocek              | 36°43'37"          | 28°55'08"     | 04.07.2008     | 2 – 12          | 70 – 80             |
| Gocek Adasi        | 36°43'28"          | 28°56'51"     | 08.07.2008     | 5 – 22          | >100                |
| Doganburnu (Bati)  | 36°42'56"          | 28°59'14"     | 09.07.2008     | 6 – 10          | 25 – 30             |
| Kayakoy (Guney)    | 36°33'07"          | 29°05'35"     | 08.09.2008     | 20 – 26         | 10 – 15             |
| Gemiler Koyu       | 36°33'25"          | 29°02'58"     | 09.09.2008     | 12 – 21         | 30 – 35             |
| Gemiler Koyu       | 36°32'20"          | 29°03'06"     | 10.09.2008     | 11 – 15         | 5 – 10              |
| Fethiye Disliman   | 36°37'24"          | 29°04'41"     | 13.09.2008     | 5 – 8           | 40 – 50             |
| Bozburun (Guney)   | 36°34'03"          | 29°01'55"     | 15.09.2008     | 10 – 13         | 15 – 20             |
| Bozburun           | 36°35'19"          | 29°01'45"     | 16.09.2008     | 12 – 13         | 10 – 15             |
| Kizilada           | 36°39'59"          | 29°02'06"     | 18.09.2008     | 15 – 23         | 15 – 20             |