

SHORT COMMUNICATION

First sighting of the Red Sea originated stonefish (*Synanceia verrucosa*) from Turkey

Murat Bilecenoğlu*

Department of Biology, Faculty of Arts and Sciences, Adnan Menderes University,
09010, Aydın, TURKEY

*Corresponding author: mbilecenoglu@yahoo.com

Abstract

A single specimen of stonefish (*Synanceia verrucosa* Bloch and Schneider, 1801) was recently captured off Yumurtalık (Iskenderun Bay), representing its first occurrence on the coast of Turkey and second record in the entire Mediterranean Sea. This species is famous with its highly toxic stings and possess a potential risk for human health, if it finds the opportunity to establish a successfully breeding population in the region.

Key words: *Synanceia verrucosa*, Synanceiidae, alien species, Mediterranean Sea, Turkey

Introduction

The number of alien species in the Mediterranean has currently reached to the psychological threshold of 1000 species (Zenetos *et al.* 2010), advancing the rank of this semi-enclosed sea as one of the most invaded ecosystems on Earth. Despite of the widespread “native good, alien bad” philosophy (Goodenough 2010), ecological and sociological impacts of alien species have proven to share both sides of this approach (see Cinar *et al.* 2011). This paper deals with a newly introduced venomous fish species on the northeastern Levantine coast of Turkey, which doubtless takes part in the negative wing among alien biota.

Species diagnosis

On 18 November 2011, a single specimen of stonefish (*Synanceia verrucosa* Bloch and Schneider, 1801) was captured along the Yumurtalık coast (Adana, Iskenderun Bay) by an artisanal fisherman, presumably using a bottom long-line. The photograph of the captured specimen appeared in a national newspaper (Sözcü newspaper, #1629, 11 December 2011, back page), where the journalist emphasized just on its unexpected huge size of a fish claimed to be a scorpionfish species, weighing 5 kg (Figure 1). Although the fish was not

preserved by the locals, original photographs of the specimen has recently been available to the author, that is sufficient enough to carry out a precise identification.



Figure 1. Dorsal view of *Synanceia verrucosa* Bloch and Schneider, 1801, captured from Iskenderun Bay (Sözcü, 11 December 2011, Photograph: Haşmet Bahadır).

The stonefish specimen appears to have a standard length (SL) of ca. 30 – 35 cm (Figure 1), a very close size to its maximum reported length (Poss and Rao 1984). Weight of the fish (5 kg, as stated in the newspaper) is merely an exaggeration, considering the fact that the largest *S. verrucosa* specimen reported to date (37.2 cm, captured from northern Red Sea) was 2.4 kg (Randall 1995). Similarly, the estuarine stonefish [*S. horrida* (Linnaeus, 1766)], a congeneric species sharing a similar morphology with *S. verrucosa*, can only attain to slightly over 2 kg weight at 30 cm SL (Fewings and Squire 1999).

The genus *Synanceia* Bloch and Schneider includes five valid species (Froese and Pauly 2011): *S.alula* Eschmeyer and Rama-Rao, 1973; *S.horrída* (Linnaeus, 1766); *S.nana* Eschmeyer and Rama-Rao, 1973; *S.platyrrhyncha* Bleeker, 1874 and *S.verrucosa* Bloch and Schneider, 1801. The stonefish, *S.verrucosa*, can easily be distinguished from its congeners by the pectoral fin counts (18–19, but generally 18; see Figure 1), which are clearly lower for *S.alula* (11), *S.horrída* (15 – 17, generally 16), *S.nana* (14 – 16, generally 14) and *S.plathyrrhyncha* (17) (for full description of *S. verrucosa*, see Eschmeyer and Rama-Rao 1973).

Habitat and distribution

Synanceia verrucosa is a typical shallow-water species, which inhabits depths of up to 20 m (Heemstra and Heemstra 2004). It is usually seen in coral rubble pools on reef flats, under rocks and ledges, also penetrating to lagoons (Poss 1999). The species frequently uses the large pectoral fins as scoops for digging out hiding places in the mud or sand (Williamson *et al.* 1996). Moreover, its excellent camouflage is enhanced by a coat of filamentous green and brown algae, hydroids and other organisms (Heemstra and Heemstra 2004) (Figure 2).

The species has widespread distribution at the tropical Indo-West Pacific region, from eastern African shores and Red Sea to Australia and north to Japan (Eschmeyer and Rama-Rao 1973; Poss and Rama-Rao 1984; Poss 1999). Its first occurrence in the Mediterranean Sea was based on a single specimen (ca. 30 cm total length) captured on 18 April 2010, from a depth of 3 m off Palmakhim coasts, Israel (Edelist *et al.* 2011). The present record from Yumurtalık (Iskenderun Bay) does not essentially indicate an established population, but reveals the rapid range expansion of this sluggish species that seems to cover a distance of ca. 320 nautical miles (from Palmakhim to Yumurtalık) just within 19 months (Figure 3). Available data point out the species to be a Lessepsian migrant that have penetrated to the Mediterranean via Suez Canal, but not an aquarium escapee or individuals grown up from pelagic larvae as stated by Edelist *et al.* (2011).

Potential impacts

Stonefishes (the genus *Synanceia*) were reported to be the most dangerous fishes of the world, which possess a very sophisticated venom apparatus and potentially lethal toxin (Vine 1994; Randall 1995; Poss 1999). Their venom apparatus consists of spiny rays at dorsal (12 to 14), anal (3) and pelvic (1+1) fins (Poss and Rama-Rao 1984; Lee *et al.* 2004). The large sized venom glands are covered by warty skin and partially enclosed by lateral grooves of the spines. Upon contact, the warty skin is compressed, squeezing the venom gland and injecting the venom into the victim's organ (Heemstra and Heemstra 2004).



Figure 2. An extremely well-camouflaged stone fish (*Synanceia verrucosa*) observed at Safaga, Red Sea (Photograph: Tahsin Ceylan).

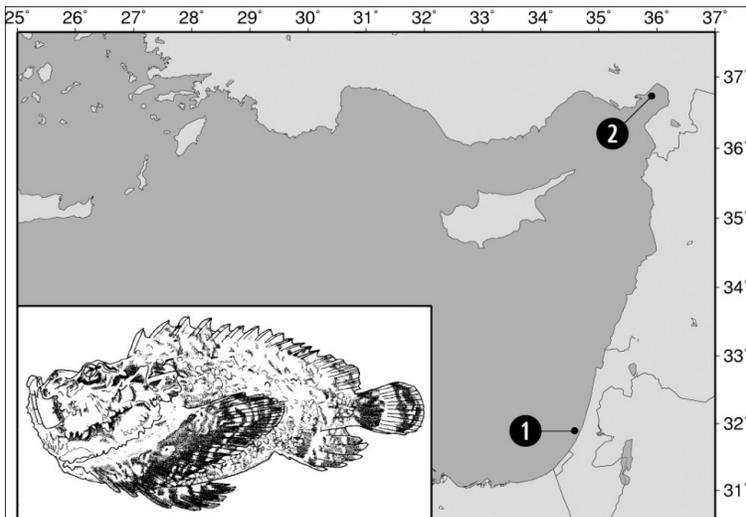


Figure 3. Records of *Synanceia verrucosa* from the Mediterranean Sea. 1) Palmakhim (Edelist *et al.* 2011), 2) Yumurtalık (present study).

The venom obtained from *Synanceia* spp. contains heat-labile (denaturates over 50°C) and antigenic protein toxins with molecular weights up to 158000, which exhibits myotoxic, neurotoxic, vascular-leakage and myocardial effects in experimental animals (Williamson *et al.* 1996). Wounds from the spines are excruciatingly painful, soon becoming intolerable and can last for days (Randall

1995; Heemstra and Heemstra 2004). Deaths attributed to stonefishes are relatively rare. Among five documented deaths, only two occurred in Seychelles and Mozambique (Smith 1957) seem to be valid, while the rest were not caused primarily by envenomation (Fenner 1998). Stonefish injuries are common at Singapore shoreline, where 8 envenomations were treated successfully between October 2001 to January 2003 with an average hospital stay of 3.9 days (ranging 0.5 to 9 days) (Lee *et al.* 2004). In a recent study, a case of severe systemic envenomation with debatable cardiac arrest was reported from the New Caledonia, supporting the life-threatening potential of stonefish injuries (Maillaud *et al.* 2009).

Only a few toxic alien species occur in the Mediterranean Sea, which pose severe risks to human health. Of these, painful stings of the nomadic jellyfish (*Rhopilema nomadica*) and the toxic flesh of silverstripe blaasop (*Lagocephalus sceleratus*) have been responsible for several cases of injuries and poisonings at the eastern Mediterranean coasts (Bilecenoglu 2010; Ozturk and Isinibilir 2010; Cinar *et al.*, 2011). Despite of governmental actions taken (i.e. fishery ban of *Lagocephalus* spp. by Turkish Ministry of Food, Agriculture and Livestock), bathers, fishermen and locals still seem to remain unwary, increasing the level of risks. As for the case of stonefish introduction, precautionary approach should be taken swiftly, together with synchronous research for determining the population status of the species.

Acknowledgements

Special thanks to Gökhan Karakaş and Tahsin Ceylan for providing stonefish photographs, and Prof. Dr. Melih Ertan Çınar for valuable comments on a draft of this paper.

Kızıldeniz kökenli taşbalığının (*Synanceia verrucosa*) Türkiye’den ilk gözlemi

Özet

Yumurtalık açıklarında (İskenderun Körfezi) yakalanan bir adet taşbalığı (*Synanceia verrucosa* Bloch and Schneider, 1801) bireyi, Türkiye’den ilk, tüm Akdeniz’den ise ikinci defa rapor edilmektedir. Dikenlerinde taşıdıkları kuvvetli zehir ile bilinen taşbalıkları, bölgede başarılı popülasyonlar oluşturması durumunda insan sağlığı açısından potansiyel tehlike arz etmektedir.

References

Bilecenoglu, M. (2010) Alien marine fishes of Turkey—an updated review. In: Fish Invasions of the Mediterranean Sea: Change and Renewal. (eds., D. Golani, B. Appelbaum-Golani), Sofia-Moscow, Pensoft Publishers, pp. 189-217.

- Cinar, M.E., Bilecenoglu, M., Ozturk, B., Katagan, T., Yokes, M.B., Aysel, V., Dagli, E., Acik, Ş., Ozcan, T., Erdogan, H. (2011) An updated review of alien species on the coasts of Turkey. *Mediterranean Marine Science* 12: 257-316.
- Edelist, D., Spanier, E., Golani, D. (2011) Evidence for the occurrence of the Indo-Pacific stonefish, *Synanceia verrucosa* (Actinopterygii: Scorpaeniformes: Synanceiidae), in the Mediterranean Sea. *Acta Ichthyologica et Piscatoria* 41: 129-131.
- Eschmeyer W.N., Rama-Rao, K.V. (1973) Two new stonefishes (Pisces, Scorpaenidae) from the Indo-west Pacific, with a synopsis of the subfamily Synanceiidae. *Proceedings of the California Academy of Sciences* 39: 337-382.
- Fenner, P. (1998) Dangers in the ocean: the traveler and marine envenomation. II. Marine Vertebrates. *Journal of Travel Medicine* 5: 213-216.
- Fewings, D.G., Squire, L.C. (1999) Notes on reproduction in the estuarine stonefish *Synanceia horrida*. *SPC Live Reef Fish Information Bulletin* 5: 31-33.
- Froese, R., Pauly, D. (2011) Synanceiidae. Fishbase – world wide web electronic publication. <http://www.fishbase.org>, version (12/2011).
- Goodenough, A.E. (2010) Are the ecological impacts of alien species misrepresented? A review of the “native good, alien bad” philosophy. *Community Ecology* 11: 13-21.
- Heemstra, P.C., Heemstra, E. (2004) Coastal Fishes of Southern Africa. South African Institute for Aquatic Biodiversity and National Inquiry Service Centre Publications, Grahamstown. 488 pp.
- Lee, J.Y.L., Teoh, L.C., Leo, S.P.M. (2004) Stonefish envenomations of the hand – a local marine hazard: a series of 8 cases and review of the literature. *Annals Academy of Medicine* 33: 515–520.
- Maillaud, C., Sebat, C., Pouradier, F., Paladini, L., Peres, O., Durand, F. (2009) Envenimation par poisson-pierre: une observation d’inefficacité circulatoire en Nouvelle-Calédonie. *Médecine Tropicale* 69: 591-594.
- Ozturk, B., Isinibilir, M. (2010) An alien jellyfish *Rhopilema nomadica* and its impacts to the Eastern Mediterranean part of Turkey. *Black Sea/Mediterranean Environment* 16: 149-156.
- Poss S.G. (1999) Scorpaenidae, scorpionfishes (also, lionfishes, rockfishes, stingfishes, stonefishes and waspfishes. In: FAO Species Identification Guide

for Fishery Purposes. Vol. 4. Bony Fishes, Part 2 (Mugilidae to Carangidae). (eds., K.E. Carpenter, V. Niemi), FAO, Rome, pp. 2291-2352.

Poss, S.G., Rama-Rao, K.V. (1984) Scorpaenidae. In: Species Identification Sheets for Fishery Purposes. (eds., W. Fischer, G. Bianchi), FAO Western Indian Ocean (Fishing Area 51). Vol. 4. FAO, Rome. pag. var.

Randall, J.E. (1995) Coastal Fishes of Oman. University of Hawaii Press, Honolulu, Hawaii, 439 pp.

Smith, J.L.B. (1957) Two rapid fatalities from stonefish stabs. *Copeia* 3: 249.

Vine, P. (1994) Red Sea Safety: Guide to Dangerous Marine Animals. Immel Publishing, 144 pp.

Williamson, J.A., Fenner, P.J., Burnett, J.W., Rifkin, J.F. (1996) Venomous and Poisonous Marine Animals, (eds., J.A. Williamson, P.J. Fenner, J.W. Burnett, J.F. Rifkin), Medical and Biological Handbook 4th edition. University of New South Wales Press, Sydney, 504 pp.

Zenetos, A., Gofas, S., Verlaque, M., Cinar, M.E., Garcia Raso, E., Bianchi, C.N., Morri, C., Azzurro, E., Bilecenoglu, M., Frogli, C., Siokou, I., Violanti, D., Sfriso, A., San Martin, G., Giangrande, A., Katagan, T., Ballesteros, E., Ramos Espla, A., Mastrototaro, F., Ocana, O., Zingone, A., Gambi, M.C., Streftaris, N. (2010) Alien species in the Mediterranean Sea by 2010. A contribution to the application of European Union's Marine Strategy Framework Directive (MSFD). Part I. Spatial distribution. *Mediterranean Marine Science* 11: 381-493.

Received: 15.12.2011

Accepted: 22.12.2011