

FIRST RECORD OF THE INTRODUCED FOULING TUBEWORM *FICOPOMATUS ENIGMATICUS* (FAUVEL, 1923) IN THE EASTERN ADRIATIC SEA, CROATIA

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Abstract

Alien species *Ficopomatus enigmaticus* was recorded on two locations along the eastern Adriatic coast, Krka River Estuary and Neretva River Delta. It is probably introduced as ship fouling.

Keywords: *Adriatic Sea, Brackish Water, Species Introduction, Polychaeta*

Introduction

Ficopomatus enigmaticus (Fauvel, 1923), previously known as *Mercierella enigmatica*, is a sedentary suspension-feeding polychaete belonging to the family Serpulidae. These polychaete worms build and live in upright white calcareous tubes that have distinctive collar-like rings at irregular intervals. It reproduces successfully at temperatures around 18°C [1, 2]. It is a cryptic species that probably invaded the Mediterranean Sea as ship fouling during the First World War [3]. The first record in Europe was in the Channel de Caen in northern France in 1921. In the Adriatic Sea, *F. enigmaticus* was recorded for the first time in the Venice Lagoon, the Northern Adriatic [4]. Today, it builds huge aggregate "reefs" in the Po River Delta [2].

F. enigmaticus was recently recorded at two new locations along the eastern coast of the Adriatic Sea, Krka River Estuary and Neretva River Delta (Fig. 1). The investigations of both records were performed by scuba divers. The first location, Krka River, is situated in the karst region and its estuary, with a total length of 22 km, was formed during the Holocene transgression. In the lower part of the estuary, the Port of Šibenik is located. It is a typical example of a stratified estuary which bottom gradually deepens from 2 m to 42 m.



Fig. 1. Locations of the *F. enigmaticus* appearance

Around the shores of the lower part of the Krka River Estuary *F. enigmaticus* occurs as single tubes or as large dense fouling aggregations mostly on artificial substrates like cement (seawalls) and iron construction (Fig. 2). It exists at depths up to 3 m, but the largest settlements are up to 0.5 m. Hull encrustations are up to 25 cm thick reaching the water surface during the low tide. We have found larger fouling aggregations only at three sites. Also, it makes fouling in community with *Mytilus galloprovincialis*. The intertwined tubes are often coated with bryozoans. Additionally, along the coast we have observed dead fragments of fouling aggregations with domination of *F. enigmaticus* tubes. Probably, that fouling aggregate collapses due to excess weight or mortality during the winter due to the exposure to low temperatures for long periods, low

salinity and flow intensity.



Fig. 2. Photo of *F. enigmaticus* from the Krka River Estuary (July, 2009.)

The second location, Neretva River Delta, covers about 20 000 ha of which 12 000 ha are in Croatia. It is constituted of numerous channels. The Port of Ploče is situated near the river mouth, and it is one of the main Croatian ports. In this area, *F. enigmaticus* occurs in two delta's channels as single specimens or in small aggregates regularly in communities with *Balanus* sp. It mostly occurs at depths of 0.7 m. The fishes from the genus *Syngnathus* were observed as main predators on fouling tubeworm in this area.

Conclusion

The fact that populations of *F. enigmaticus* appear near the ports suggests that the probable mechanism of introduction was ship fouling. Also, appropriate environmental factors on these locations enable growth of the species.

References

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