

# Benthic macrofauna on the coast line rocky substrates of the southern Caspian Sea

Ghasemi Amir Faraz<sup>1</sup>, Mehrshad Taheri<sup>2</sup>, Maryam Yazdani Foshtomi<sup>2</sup> and Armin Jam<sup>2</sup>

<sup>1</sup> Department of Marine Biology, Faculty of Marine Science and Oceanography, Khorramshahr University of Marine Science and Technology, P.O. Box 64199-669, Khorramshahr, Khuzestan, Iran  
E-mail: [faraz\\_ghasemi@yahoo.com](mailto:faraz_ghasemi@yahoo.com)

<sup>2</sup> Iranian National Institute for Oceanography, 9, Etemadzadeh Avenue, West Fatemi Street, Tehran, Iran

Rocky substrates support a variety of habitats and heterogeneity which provide a wide range of resources underpinning rich diversity of biota. Within the Caspian Sea, rocky substrates and their biocenose as a patch structures were rarely investigated. In our study, in order to determine the community structure of the benthic macrofauna in the rocky substrates of the southern Caspian, two time samplings (with scraping a surface of 400cm<sup>2</sup> in five replicates) were conducted in summer (August) and winter (March) of 2012. In total, 4,473 specimens of the six species were identified. Total abundances were recorded 1,910 and 20,455 ind.m<sup>-2</sup> in summer and winter respectively. Among the species, *Balanus improvises* and *Mytilaster lineatus* were the dominant, with relative abundance of 98.69 and 94.45% in summer and winter respectively. Another stable species, *Palaemon elegans* was observed in summer and winter with relative abundance of 1.3 and 0.17 % respectively. *Alitta succinea* (4.2%), *Rhithropanopeus harrisii* (0.81%) and *Gmelina pusilla* (0.36%) were observed only in winter. Except *G. pusilla*, the others are NIS. Origins of *P. elegans* and *M. lineatus* are Atlantic-Mediterranean, while others are from American coasts of Atlantic (Grigorovich *et al*, 2002). *A. succinea* have been intentionally introduced as a food reserve for commercially exploited fish (Ghasemi *et al*, 2013). *P. elegans* and *M. lineatus* have been released accidentally. *R. harrisii* and *B. improvises* unintentionally introduced by shipping activity via ballast water or hull fouling of ships (Grigorovich *et al*, 2002).

It seems that wave hydrodynamic force is one important in determining the abundances and dynamics of communities. As during the field samplings we observed the empty samples in stormy days. In this case species severely attached on the bottom such as *B. improvises* and *M. lineatus* could establish in area with strong currents on all rigid substrates very well (Karpinsky *et al*, 2005). Beside demersal predators are not able to separate them from the substrate actively. The mobile species such as *P. elegans*, *R. harrisii* and *A. succinea*, due to high ability to swimming, could rapidly colonize the rocky beds after storm events and their restoration lasted shorter than *G. pusilla*. Moreover, the environmental variables related to seasonal changes such as temperature, salinity and day length, due to their effects on the reproduction activity of macrofauna and their predators, affected directly on the abundances and dynamics of communities (Taheri and Foshtomi, 2010).

Many invasions appear to have relatively negligible ecological consequences, whereas others cause dramatic disruptions to biodiversity and food webs. The NIS collected in the present study may co-exist with native species and even force out them. For instance two endemic Caspian bivalves, *Dreissena elata* and *D. caspica* having been replaced completely by *Mytilaster* (Karpinsky *et al*, 2005). In other hand, some others may inhabit on the vacant ecological niches and play a key role as a significant food resource (Zenkevitch, 1963). So, further studies are required to monitor their impacts and interactions on the native fauna of the Caspian Sea.

## References

Ghasemi A.F. Taheri M. Jam A. 2013. Does the introduced polychaete *Alitta succinea* establish in the Caspian Sea? Helgoland Mar. Res. DOI: 10.1007/s10152-013-0356-1.

Grigorovich I.A. MacIsaac H.J. Shadrin N.V. Mills E.L. 2002. Patterns and mechanisms of aquatic invertebrate introductions in the Ponto-Caspian region. Can. J. Fish. Aquat. Sci. 59: 1189–1208.

Karpinsky M.G. Shiganova T.A. Katunin D.N. 2005. Introduced species. In: Kostianoy AG, Kosarev AN (eds) The Handbook of Environmental Chemistry: The Caspian Sea Environment. Vol. 5 Springer, Berlin, pp 175–190.

Taheri M. Foshtomi M. 2010. Community structure and biodiversity of shallow water macrobenthic fauna at Noor coast, South Caspian Sea, Iran. J Mar Biol Assoc UK 90(5):1–7.

Zenkevitch L.A. 1963. Biology of the USSR Seas. AN SSSR. Moscow. 956p.