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Parhyale plumicornis (Heller, 1866) - Amphipoda Hyalidae

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A first snapshot of sandy-beach amphipod (Crustacea) assemblage in a Marine Protected Area, Favignana Island (central Mediterranean Sea)

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ABSTRACT

The aim of this study is to compile a preliminary first check-list of Amphipoda species from beaches of Favignana Island (Sicily, Italy), and contribute to the knowledge relating to the distribution of this taxon in the Mediterranean Sea. Five amphipod species, belonging to two families (Talitridae and Hyalidae), have been collected in the island. The supralittoral assemblage appears to contain three main biogeographical categories: Atlanto-Mediterranean species, Mediterranean endemic species and cosmopolitan species.

KEY WORDS

Crustacea; Amphipoda; sandy beaches; Favignana Island; Mediterranean Sea.

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INTRODUCTION

To date no survey regarding the amphipod fauna of the coastal zone of Favignana Island (the largest of the islands Egadi Islands Marine Reserve in Sicily, Italy) has been conducted. This is notwithstanding that Marine Protected Areas (MPA) and marine reserves have been widely advocated as a form of marine conservation for preserving biodiversity (Agardy, 1994; Leslie, 2005).

This study will focus on the sandy beaches of Favignana Island, which are subjected to biotic and abiotic disturbances, and represented by natural and artificial bioturbation, mostly caused by recreational seashore activities. There is a growing interest in assessing factors and processes occurring in sandy beaches of Favignana Island (Bacci et al., 2015),

thus, an evaluation of amphipod assemblage need.

Sandy beaches are supralittoral areas, representing highly dynamic ecosystems that provide habitats for a diversity of fauna (Defeo et al., 2009). Due to the high vulnerability of these habitats, action plans for their conservation should be a priority; choosing a reliable target of organisms as an indicator for making decisions addressed to the preservation of biological diversity can be considered a fundamental task (Deidun et al., 2009; Lo Brutto et al., 2011; 2013; Sarà et al., 2014).

This paper will outline an initial assessment of the supralittoral Amphipoda assemblage, which are present along the sandy coasts of Favignana Island; the aim of the paper is in order to deepen our taxonomic knowledge regarding the composition of these species.

MATERIAL AND METHODS

The study was carried out on Favignana Island, which is located approximately five kilometers off the west coast of Sicily. Samples were collected during July - August 2015 from eight sites (37.93° N 12.27° E; 37.94° N 12.28° E; 37.93° N 12.32° E; 37.93° N 12.34° E; 31.94° N 12.36° E; 37.91° N 12.33° E; 37.91° N 12.32° E; 37.91° N 12.32° E), located in the northern and southern side of Favignana Island. These supralittoral sites, displaying two types of habitat, i.e. banquettes of *Posidonia oceanica* (Linnaeus) Delile, 1813 or sand and algal/seagrass wrack, were sampled by means pitfall-traps: these consisted of plastic cups about 10 cm in diameter and 20 cm in height, positioned in the sand or in the banquettes. The traps were deployed at nightfall, at approximately 7.30 pm, and emptied at dawn in order to intercept individuals moving across the supra-littoral zone.

Identification of the collected specimens was carried out according to the morphological characteristics described by Ruffo ed. (1993), Iacifano & Lo Brutto (2016; 2017) and Lowry & Fanini (2013).

RESULTS

On the whole 171 individuals of amphipods were collected: four of Talitridae, three belonging to the *Orchestia* Leach, 1814 genus, one species of the *Platorchestia* Bousfield, 1982 genus, and one species of Hyalidae, the latter belonging to the *Parhyale* Stebbing, 1897 genus.

This first checklist led us to document the occurrence of Amphipoda on Favignana Island. The supralittoral assemblage appears to contain three main biogeographical categories: Atlanto-Mediterranean species, *Parhyale aquilina* (Costa, 1857) and *Orchestia mediterranea* Costa, 1853, species endemic for the Mediterranean Sea, *O. montagui* Audouin, 1826 and *O. stephensi* Cecchini 1928, and cosmopolitan species, *Platorchestia platensis* (Krøyer, 1845).

In the Mediterranean Sea, talitrid family divided into three ecological categories: driftwood-hoppers: e.g. *Macarorchestia* spp., sand-hopper: e.g. *Talitrus saltator* (Montagu, 1808), beach-hopper: e.g. *Orchestia s.l.* (Lowry & Fanini, 2013).

In this study only the beach-hopper group was captured, though previous surveys collected both sand-hopper and beach-hopper categories in close geographic areas. Jelassi et al. (2015) recorded eight species of sand-hoppers and beach-hopper talitrids along Tunisian coastal lagoons. Prato et al. (1995) reported seven species, belonging to sand-hopper and beach-hopper groups, along the coast of Taranto (Ionian Sea, southern Italy); while Lowry & Fanini (2013) listed four species of sand-hopper and beach-hopper talitrids on the coast of Crete.

The sampling method (pitfall traps) may have selected species having mainly surface activity, i.e. beach-hopper, though Fanini & Lowry (2016) demonstrated that recreational use of the beaches can affect talitrid composition. In fact, sand-hoppers (substrate modifiers) appeared to be more sensitive than beach-hoppers (non-substrate modifiers) to such kind of bioturbation (Fanini & Lowry, 2016).

BRIEF GUIDE FOR BEACH-HOPPER IDENTIFICATION IN FAVIGNANA ISLANDS

Here a dichotomous key to species identification is presented.

- 1) A1 longer than peduncle of A2, U3 inner ramus poorly defined _____ *Parhyale aquilina*
A1 shorter or equal to peduncle of A2, U3 uniramous _____ 2
- 2) A2 peduncle inflated _____ *Platorchestia platensis*
A2 peduncle not inflated _____ 3
- 3) U1 peduncular spine-like seta absent, P5-P7 dactylus with a long seta on anterior margin _____ *Orchestia mediterranea*
U1 peduncular spine-like seta present _____ 4
- 4) P5-P7 dactylus with a long seta on anterior margin _____ *O. stephensi*
P5-P7 dactylus with a short seta on anterior margin _____ *O. montagui*

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