

THE CURRENT STATUS OF THE ALIEN ASCIDIAN *HERDMANIA MOMUS* IN MALTA

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Abstract

The non-indigenous ascidian *Herdmania momus* was first recorded from the southeast coast of Malta at Marsaxlokk in 2013. Surveys at eight sites along the east coast of Malta revealed that it has since spread to another two sites, one of which is located ca 10 km north of Marsaxlokk. The ascidians remain largely restricted to artificial substrata in areas under anthropogenic influence, although a few individuals were observed on natural rock. The size distributions of the three populations reflect the likely propagation of the tunicates from the site of introduction. Four taxa of commensal crustaceans inhabiting Maltese *H. momus* were found, with the highest abundance of ascidicolous crustaceans recorded from the Marsaxlokk population.

Keywords: Alien species, Species introduction, Tunicata, Sicily Channel

Introduction

The solitary ascidian *Herdmania momus* is an Erythraean immigrant that was restricted to the eastern Mediterranean until 2013, when it was recorded from Marsaxlokk Bay on the southeastern coast of Malta [1]. The Marsaxlokk population was restricted to artificial substrata, but this ascidian can also colonise natural rocky bottoms [2], while its planktonic larval stage increases its potential for range expansion along the Maltese coast. The present study was undertaken to assess the current distribution and status of *H. momus* along the eastern coast of Malta.

Material and Methods

Field surveys were carried out at eight sites along the eastern coast of Malta in September–November 2015 (Fig. 1). At each site 2–4 stations with either a concrete or a natural substratum were sampled. At each station, 25 m of coastline were surveyed from 0 m to a depth of 1 m and the abundance of *H. momus* was recorded. Up to 25 individuals were collected at random from each station, narcotized and fixed. Body length of these individuals was measured from the base of the oral siphon to the base of atrial siphon along the mid-ventral line. The specimens were then dissected and the branchial sac was examined for the presence of commensals.

Results and Discussion

Herdmania momus was found at three of the eight sites investigated: in Marsaxlokk Bay (site 1), where the first record of *H. momus* in Maltese waters was originally made, at Birzebbuga (site 2) and in Rinella Bay (site 5), with the highest abundances recorded from artificial substrata at Birzebbuga (Fig. 1). The present data show that *H. momus* tends to establish populations in areas under anthropogenic impact, since all three sites are located in harbours characterised by intense human activities. It has been suggested that non-indigenous ascidians thrive particularly well on artificial surfaces but often fail to establish on natural substrata [3]. The present results show that in Malta *H. momus* remains largely restricted to artificial substrata, but a few individuals were also recorded from natural rocky bottoms indicating that it has the ability to also colonise natural substrata, as reported previously in Israel [2].

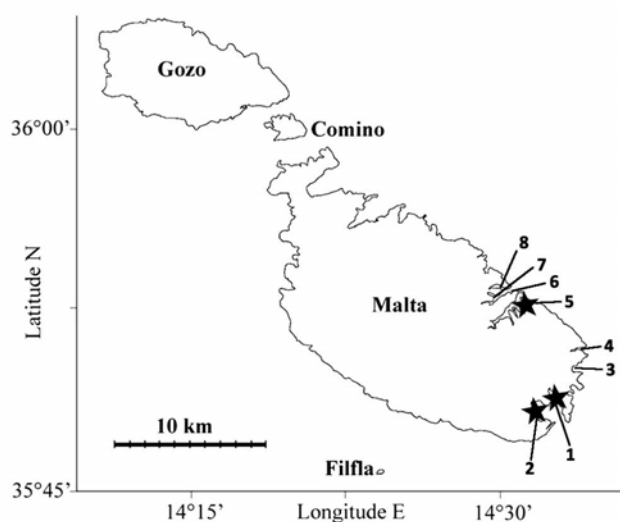
The size structure of the ascidian populations varied between sites. The Marsaxlokk population had the broadest size distribution with body lengths ranging from 18 mm to 129 mm, whereas no individuals larger than 102 mm were recorded from Birzebbuga or Rinella, suggesting that Marsaxlokk was colonized first. This pattern of size distribution likely reflects the propagation of the species from Marsaxlokk Bay to other sites along the coast. From the 145 ascidians dissected and examined for commensals, four different crustacean taxa were recorded: two copepod taxa (not identified further), one amphipod (*Leucothoe* sp.) and one tanaid (*Leptocheilia savignyi*), with copepods accounting for more than 99% of all individuals. Commensal crustaceans were found in around half of the ascidians collected from artificial substrata in Marsaxlokk and Birzebbuga, while no commensals were observed in specimens from Rinella. The abundance of commensals was correlated with the mean size of the ascidian host and the probable 'settlement age', which is the time since the population was first established.

These results suggest that the *H. momus* populations are well established and this species may continue to spread along the coast of Malta, possibly invading communities on natural shores. Continued monitoring of the status of such immigrants is of high importance as interspecific interactions between alien and native biota can lead to niche limitation, displacement or local extinction [4].

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References

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Mean (±SD) abundance per transect

	Artificial substratum	Natural substratum
Site 1 (Marsaxlokk)	42.5 ± 23.3	4.0 ± 5.6
Site 2 (Birzebbuga)	69.0 ± 26.9	12.5 ± 14.8
Site 5 (Rinella)	2	4

Fig. 1. Map of the Maltese Islands showing the location of sites surveyed for *Herdmania momus* (numbered 1–8). The mean abundances of *H. momus* (as individuals per 1 m x 25 m belt transect) from artificial and natural substrata at the three sites where populations were found (black stars) are also shown.