

## Population dynamics and fecundity of *Sunamphitoe pelagica* (H. Milne Edwards, 1830) (Crustacea: Amphipoda) associated to *Sargassum* sp. beds in anthropogenic impacted bay

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### Abstract

The coastal environment is often impacted by anthropogenic actions like marine pollution, which has been affecting biogenic substrates and thus its associated fauna. Some brown macroalgae, like *Sargassum* spp., can accumulate heavy metals on its tissues, which can directly affect the fitness of herbivorous amphipods that feed upon these algae, which therefore are considered efficient indicators of environmental quality. This study presents the population dynamics and fecundity rates variations of *Sunamphitoe pelagica*, a *Sargassum*-associated herbivorous amphipod, collected in an impacted bay on southeastern Brazil. *Sargassum* sp. samples were taken in winter and summer at four sampling sites in Flamengo Bay, Ubatuba municipality – SP, at different distances from Saco da Ribeira's marina, considered an important pollution spot in the area.

### Key words:

Macrophytes, Ampithoidae, seasonal variation.

### Introduction

- The amphipods high abundances in association to *Sargassum* sp. habitats stand out, as they benefit from shelter and food sources offered by the algae;

- Amphipod abundance may be influenced by the temporal variation of the macroalgae biomass and by the accumulation of metals on its tissues.

- Amphipod exposure to heavy metals, such as copper and zinc, may result in alterations on morphological, reproductive and physiological parameters, such as decrease on growth and fecundity rates; and malformation of its secondary sexual features, resulting in a decrease of reproductive success and population fitness;

- *S. pelagica* is one of the main herbivorous species found in association with *Sargassum* beds, thus is potentially affected by contamination impacts on these habitats.

### Results and Discussion

- We found that *Sargassum* sp. biomass was higher in summer, whereas the epibiont biomass was higher in winter. The densities of *S. pelagica* was higher in summer, in agreement with the results from Leite & Turra (2003) (ANOVA: *Sargassum*:  $p < 0.01$ ; Epibionts:  $p < 0.001$ ; Density of *S. pelagica*:  $p < 0.001$ ).

- For all collecting sites, the number of juveniles was higher in the summer, indicating the occurrence of reproductive peaks during the warmer months, period in which were also found higher numbers of ovigerous females;

- The size of females varied among sampling sites: females at Lamberto beach were significantly bigger than the ones at Ribeira beach (ANOVA:  $p < 0.05$ ), but the fecundity parameters did not present significant differences among sites;

- The minimum and maximum numbers of eggs produced by *S. pelagica* females were, respectively, two and 15, a very reduced fecundity when compared with other Ampithoidae species and other studies in the same region (Jacobucci & Leite, 2006). Therefore, the impact generated by Saco da Ribeira's marina may be affecting the Flamengo Bay as a whole.

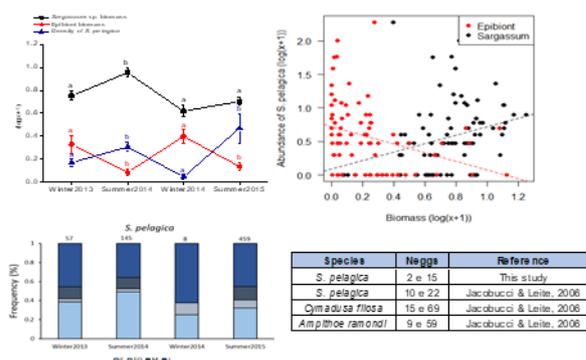


Image 1: a.) Variation of *Sargassum* sp. and epibiont biomass, and density of *S. pelagica*. b.) Relationship between the *Sargassum* sp. and epibionts biomass and the abundance of *S. pelagica*. c.) Relative frequency by sex class. d.) Number of eggs of *S. pelagica* and other species of Ampithoidae.

### Conclusions

- The *Sargassum* sp. and epibionts biomass can influence *S. pelagica* abundance, but in this study others factors may be involved.

- The population was mainly represented by juveniles, indicating the importance of macroalgae not only as feeding resources, but also as reproductive sites;

- Decreased fecundity of *S. pelagica* at all sampling sites indicate that Flamengo Bay may be as a whole affected by anthropogenic impacts;

- Results reinforce the need of further studies on how a contaminated diet may affect the population dynamics and reproductive parameters of herbivorous amphipods.

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LEITE, F.P.P. & GÜTH, A.Z. 2003. Variações morfológicas dos estágios pós-marsúpias de *Sunamphitoe pelagica* Milne-Edwards (Crustacea, Amphipoda, Gammaridea, Ampithoidae) da fauna de *Sargassum cymosum* C. Agardh. Revista Brasileira de Zoologia, 20 (1): 66-73.