

# AMPHIPODS ASSEMBLAGE WITH THE GREEN ALGA *CHAETOMORPHA AEREA* (CHLOROPHYCEAE) IN PULICAT ESTUARY, TAMILNADU, INDIA

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## Abstract

Macroalgae are primary producers and they play a significant role in the benthic food web of marine ecosystem. They serve as feeding and breeding grounds for invertebrates. In the present study, an attempt was made to find out the amphipods associates with the green alga *Chaetomorpha aerea*, at two sampling sites in Pulicat estuary during the post monsoon seasons from January 2013 to March 2013. The green alga *C.aerea* associated amphipods were *Eriopisa chilkensis*, *Parorchestia morini*, *Ampelisca scabripes* and *Grandidierella gravipes* species were recorded. The present study constitutes the first baseline approach to the amphipods diversity with the green alga *C. aerea* at the Pulicat estuary Tamil Nadu, India.

**Keywords:** *Chaetomorpha aerea*, Amphipods and Pulicat Estuary

## 1.0.Introduction

Macro algal beds are one of the most productive habitats in the marine environment and frequently support high densities of mobile invertebrates including small crustaceans, gastropods, copepods and polychaetes (Edgar, 1986 and 2001) Macro algae support sessile epifauna such as bryozoans, ascidians, hydroids and sponges with some taxa rarely found growing on other substrata (Fletcher and Day, 1983)

The order Amphipoda comprises a group of small to medium sized Peracarid crustaceans that are widely distributed in marine, brackish and terrestrial environments world over. They constitute an important element of the aquatic energy cycle by converting plant and animal proteins into suitable food for larger animals. Many aquatic environments and habitats are yet to be explored especially the deep ocean basins, estuary and macroalgal beds. The body of a Gammaridean usually flattened from side to side is composed of a clearly defined head, a thorax of seven freely articulated segments lacking of carapace and an abdomen of six segments. (Asari 1983: lyla *et al.*,1998).

Peracaridans are more specialized than decapods morphologically through reduction or loss of carapace. The first and second antennae are usually well developed. The size of the amphipods ranges from less than

1mm to 250 mm. the amphipods are good chewers and either eat algae debris or detritus or swallow mud containing food particles (Lyla *et al.*,1998). Amphipod feeding habits are diverse; they can be herbivores, detritivores, carnivores, or omnivores. Most subterranean species are supposedly omnivorous, and even when predatory, they indirectly depend on organic debris derived from surface environments. Amphipods can be important in the diets of fish, and frequently serve as intermediate hosts of their parasites. They often play a critical role in aquatic food webs, acting as conduits of nutrients and energy to higher trophic levels (Vainola, *et al.*, 2008)

## 2.0. Materials and Methods

### 2.1. Study area and sample collection

Pulicat estuary, is the second largest brackish water body in India and is located between 13°26' and 13°43' N latitude and 80°03' and 80°18' E longitudes, with an average water spread area of about 461 sq. km on the Coromandel coast. The sampling sites were within the Pulicat estuary, sampling site I- 13°26'02.11'N 80°19'17.78"E and Sampling site II -13°25'41 N 80°18'54.86"E.

### 2.2. Collection and identification

The green alga *Chaetomorpha aerea* was collected from the Pulicat estuary ( Quadrate, 25 X 25 cm<sup>2</sup>; each 10 replicates). The alga associated with amphipod groups were sorted and preserved in 4 % formalin for species identification (Sharma and Ganapati 1972). Amphipods were identified by using the monographs and field manuals (Lyla *et al.*,1998; Peethambaram, 1980). Voucher specimens have been deposited in the School of Biodiversity and Environmental Monitoring, Department of Advanced Zoology and Biotechnology, Loyola College, Chennai-34.

### 3.0. Results and Discussion

The coastal and marine environs have some of the richest biodiversity areas which include extensive areas of complex and specialized habitats such as enclosed seas and tidal systems, estuaries, salt marshes, coral reefs, sea grass beds, and mangroves. Estuaries are unique coastal ecosystems acting as repository for a plethora of organisms. The green alga *C.aerea* associated amphipods were *Eriopisa chilensis*, *Parorchestia morini*, *Ampelisca scabripes* and *Grandidierella gravipes* species were recorded at Pulicat estuary during the study period.

**Table.1.** Green alga *C. aerea* associated amphipods in the Pulicat estuary

Classification of Amphipods	Description	Distribution	References
Phylum: Arthropoda Class: Crustacea Order: Amphipoda Family: Gammaridae Genus: <i>Eriopisa</i> Species: <i>E. chilensis</i>	Eyes present; 1 <sup>st</sup> peduncular article of 1st antenna smaller than 2 <sup>nd</sup> ; 2 <sup>nd</sup> peduncular article of 1 <sup>st</sup> antenna with long setae, Colour: Dull whitish.	<i>Eriopisa chilensis</i> Chilton (Gammaridae) was first recorded from Chilka Lake by Asari (1983) they are filter feeders feeding on organic-rich detritus. <i>E. chilensis</i> was encountered in varying densities in the epifaunal community in the seaweed, sea grass and mangrove rich regions.	Lyla, <i>et al.</i> , 1998; Peethambaram, 1980

Phylum: Arthropoda Class: Crustacea Order: Amphipoda Family: Talitridae Genus: <i>Parorchestia</i> Species: <i>P. morini</i>	Eyes large almost rectangular, very close to each other and black; propodus of male 2 <sup>nd</sup> gnathopod massive; inner margin of palm with a row of stout spines; outer margin of 5 <sup>th</sup> peraeopod strongly dentate, Colour: Greyish green.	Tropical waters, Estuary	Brackish Lagoons,	Lyla, <i>et al.</i> , 1998; Peethambaram, 1980
Phylum: Arthropoda Class: Crustacea Order: Amphipoda Family: Ampeliscidae Genus: <i>Ampelisca</i> Species: <i>scabripes</i>	Eyes 3 pairs, 1 subcutaneous pair on dorsal apex beyond 1st antenna, 1 pair of corneal lens below laterally and small 3rd pair, placed in between 1st and 2nd; 1st antenna reaches middle of 5th peduncular article of 2nd antenna, Colour : Light yellowish with light violet spots.	Tropical waters, Estuary	Brackish Lagoons and	Lyla, <i>et al.</i> , 1998; Peethambaram, 1980
Phylum: Arthropoda Class: Crustacea Order: Amphipoda Family: Aoridae Genus: <i>Grandidierella</i> Species: <i>gravipes</i>	Eyes medium, black; carpus of male 1st gnathopod with 1 long process at inner distal apex, carpus only slightly larger than propodus; inner margin of propodus mildly convex with 4 to 5 spines. Colour: Pale yellowish.	Tropical waters, Estuary	Brackish Lagoons and	Lyla, <i>et al.</i> , 1998; Peethambaram, 1980

*Eriopisa chilkinsis**Parorchestia morini*

*Ampelisca scabripes**Grandidierella gravipes***Figure 1.** *C.aerea* algae associated amphipods at Pulicat Estuary

Yogamoorthi, (1982) observed the amphipods, harpacticoides, nematodes and ostracods to dominate in the phytal faunal composition in *Gracilaria verrucosa* occurring in Vellar estuary. Selvaranjitham *et al.* (2008) studied the phytal fauna from Vellar estuary. The examination of phytal fauna on the Vellar estuary, revealed the presence of a rich variety of nematodes, harpacticoids and amphipods. The filamentous alga *Chaetomorpha linum* due to its densely growing habit providing more area of substratum, it supported a high number of organisms, compared to other seaweeds. Many species inhabiting marine algae depend on them for food. The most common are polychaetes, amphipods and gastropods. The feeding relationships of these algal fauna also vary. Many are filter feeders, detritus feeders, scavengers or carnivores; algivores ranging from minute crustaceans to large sized gastropods (Selvaranjitham *et al.*, 2008).

Assemblages associated with macrophytes are dominated by peracarid crustaceans having direct development, such as amphipods and isopods (Fenwick, 1984; Tanaka and Leite, 2003). Amphipods can be characterized by their life habits (Barnard and Karaman, 1991), a useful approach to relate their distribution to environmental conditions (Fenwick, 1976; Conradi and Cervera, 1995). Free-living amphipods have good swimming ability and may select distinct substrates in which they hide and forage, whereas tube-building amphipods are more sedentary, selecting substrates where they can find both shelter and food (Fenwick, 1976; Buschmann, 1990; Dixon and Moore, 1997; Barnard and Karaman, 1991 and Tanaka and Leite, 2003). *Eriopisa chilensis* was encountered in varying densities in the epifaunal community in the seaweed, sea grass and mangrove rich regions (Aravind, *et al.*, 2005).

#### 4.0. Conclusion

This is the first study comparing species diversity, composition amphipods assemblages in *C. aerea* at Pulicat estuary. The filamentous alga *C. aerea* due to its densely growing habit providing more area of the substratum, it is supported the amphipods. Four species, *Eriopisa chilensis*, *Parorchestia morini*, *Ampelisca scabripes* and *Grandidierella gravipe* of algae associated amphipods were recorded from the two sampling sites of Pulicat estuary during the study periods. However, knowledge of seasonal fluctuations of algae associated amphipods is necessary for monitoring, for making consistent management decisions, especially in protected areas such as Pulicat estuary, Tamil Nadu, India.

#### Acknowledgements

We extremely thank late Dr. V. Krishna Moorthy, Director, Krishna Moorthy Institute of Algology, Chennai, for the identification of Alga; Dr. José Manuel Guerra García, Professor Departamento de Zoología,



Universidad de Sevilla, Spain, for the identification of Amphipods and Dr.J.V.Ganesh, Ms.Sarala and Ms.Krishna Priya Varier and Ms. Marianesam for their helps during the field visits.

**Conflict of interest:** The authors declare that they have no conflict of interest.

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