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A Preliminary Account on Micro and Estuarine Algal Assemblages of Vamsadhara Estuary, Bhavanapadu, Srikakulam District, Ap, India

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Abstract | **Original Research Article**

In this present investigation, composition and distribution of micro and Estuarine algal species in the mangrove habitats of Vamsadhara estuary near Bhavanapadu, Srikakulam district, Andhra Pradesh was studied. Water samples and estuarine algal materials were collected in mangrove habitats of Bhavanapadu during the month of January 2025. A total of 49 micro algae and 5 species of estuarine algae were identified in this study. Out of these 49 micro algal forms 22 species belong to Bacillariophyceae, 14 species belong to Chlorophyceae, 8 species of Cyanophyceae, 4 forms related to Euglenophyceae and remaining one species related to Dinophyceae.

Keywords: Micro algae, Estuarine algae, Mangrove and estuarine habitats, Vamsadhara estuary, Bhavanapadu, Srikakulam district, AP, East Coast of India.

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INTRODUCTION

Estuaries are highly productive ecosystems which provide nutrients to the aquatic organisms. Phytoplankton are the primary producers which the energy transferred from lower levels to higher levels of organisms (Ananthan *et al.,* 2004, Tiwari and Chauhan, 2006). Micro algae play an important role for promoting the secondary production (Saifullah *et al.,* 2014). Micro algae and estuarine algal communities present in estuarine and mangrove habitats was studied by several authors in different parts of India (Subramanyam, 1946; Narasimha Rao and Umamaheswara Rao,1991; Mani, 1992; Narasimha Rao,1995; Narasimha Rao and Vekanna,1996; Gouda and Panigrahy, 1996; Sawant and Madhu Pratap, 1996; Mohamed *et al.,* 2009; Raj Kumar *et al.,*2009; Narasimha Rao and Murty 2010A; Narasimha Rao, 2012; Madhava Rao *et al*.,2015; Narasimha Rao,2016; Narasimha Rao,2024; Prasanna Lakshmi *et al.,*2024; Narasimha Rao, 2025; Ambica and Narasimha Rao.2025). Narasimha Rao and Murty (2010B) studied the mangrove populations of Vamsadhara estuary near Bhavanapadu. The present work was undertaken to examine the distribution of micro algae and estuarine algal assemblages in mangrove habitats of Vamsadhara estuary, Bhavanapadu, Srikakulam district, Andhra Pradesh, East Coast of India.

MATERIALS AND METHODS

River Vamsadhara is the 4th largest river in Andhra Pradesh, originated from the Eastern Ghats of India in Odisha state. This river bifurcated into major and minor branches, major branch merges into Bay of Bengal at Kalingapatnam and minor branch merges with Bay of Bengal at Bhavanapadu. Tiny mangrove ecosystem exists from Bhavanapadu to Meghavaram which is 10 to 12 kms. distance from the mouth region and width of the forest is only 10 to 15 meters, most of the forest comprises of halophytic vegetation while on either side of the creek true mangrove plants are existing. In this present study, macro algal collections and water samples were made randomly from the Vamsadhara estuarine region near Bhavanapadu (longitudes and latitudes are 18^0 32' 73" N 84^0 19' 80" E) during January 2025. Water samples were collected for the preliminary studies on the composition of micro algae in Vamsadhara estuary. Two-liter water samples were collected randomly in five regions of the estuary and these samples were immediately fixed with 4% formalin to avoid decay of the micro algae in water samples. These samples were brought to the laboratory and centrifuged at 2000 rpm for 10 minutes. Micro algae counting was made in duplicate on sedge wick rafter cell. Species of the micro algae was identified by the following keys (Subrahmanyam, 1946; Desikachary,1959; Prescott, 1951). Estuarine algal samples were collected from the pneumatophores and

prop roots of mangrove plants. These estuarine algal materials were fixed with 5% formalin and brought to the laboratory and identified by the herbarium specimens deposited in the department of Botany, Andhra University, Visakhapatnam.

RESULTS AND DISCUSSION

In this present study on composition of micro algae and estuarine algae in mangrove habitats of Vamsadhara estuary near Bhavanapadu reveals that a total of 49 micro algal species were identified (Table 1) from the collected water samples during January 2025. Out of these 49 micro algae, 22 species belong to Bacillariophyceae, 14 species related to Chlorophyceae, 8 species belong to Cyanophyceae, 4 species related to Euglenophyceae and remaining one species belong to Dinophyceae (Table 1). In this present investigation on the micro algal composition in the mangrove habitats of Vamsadhara estuary, it is evident that Bacillariophyceae class was more dominant group than other Chlorophyceae, Cyanophyceae and Euglenophyceae classes. Minimum number of Euglenophyceae species (four), Dinophyceae species (one) was observed in this study. Findings of the present study were supported the results of earlier investigations on micro algae in mangrove and estuarine habitats (Gouda and Panigrahy ,1996; Sawant and Madhu Pratap, 1996; Narasimha Rao and Murty, 2010A; Madhava Rao *et al.,*2015; Narasimha Rao, 2024; Prasanna Lakshimi *et al.,*2024; Narasimha Rao, 2025; Ambica and Narasimha Rao,2025).

Table 1: Composition of micro algal species in Vamsadhara estuary, Bhavanapadu, Srikakulam district, AP, India

S. No	Name of the alga	Family
1	*Asterionella japonica*	Bacillariophyceae
2	*Amphiprora paludosa*	Bacillariophyceae
3	*Amphiprora gigantean*	Bacillariophyceae
4	*Coscinodiscus sublineatus*	Bacillariophyceae
5	*Cocconeis pediculus*	Bacillariophyceae
6	*Cyclotella meneghiniana*	Bacillariophyceae
7	*Cymbella austriaca*	Bacillariophyceae
8	*Fragilaria intermedia*	Bacillariophyceae
9	*Leptocylindrus minimus*	Bacillariophyceae
10	*Melosira moliniformis*	Bacillariophyceae
11	*Navicula major*	Bacillariophyceae
12	*Navicula bacilloides*	Bacillariophyceae
13	*Nitzschia paradoxical*	Bacillariophyceae
14	*Pinnularia viridis*	Bacillariophyceae
15	*Pleurosigma balticum*	Bacillariophyceae
16	*Rhizosolenia stolterfothii*	Bacillariophyceae
17	*Skeletonema costatum*	Bacillariophyceae
18	*Synedra rumpens*	Bacillariophyceae
19	*Thalassiosira decipienns*	Bacillariophyceae
20	*Thalassiothrix frauenfeldii*	Bacillariophyceae
21	*Raphoneis amphiceros*	Bacillariophyceae
22	*Synedra affinis*	Bacillariophyceae
23	*Ankistrodsmus convolutes*	Chlorophyceae
24	*Chalmydomonas globosa*	Chlorophyceae
25	*Chlorella vulgaris*	Chlorophyceae
26	*Closterium ehrenbergii*	Chlorophyceae
27	*Chaetophora elegans*	Chlorophyceae
28	*Eudorina pectnalis*	Chlorophyceae
29	*Hydrodictyon reticulam*	Chlorophyceae
30	*Pediastrum simplex*	Chlorophyceae
31	*Scenedesmus dimophus*	Chlorophyceae
32	*Scenedesmus obliquns*	Chlorophyceae
33	*Scenedesmus quadricauda*	Chlorophyceae
34	*Spirogyra communis*	Chlorophyceae
35	*Zygnema sterile*	Chlorophyceae
36	*Zygnema pectinatum*	Chlorophyceae
37	*Anabaena constricta*	Cyanophyceae
38	*Chroococcus varians*	Cyanophyceae
39	*Gleotheca rupestris*	Cyanophyceae
40	*Lyngbya nigra*	Cyanophyceae

S. No	Name of the alga	Family
41	*Nostoc commune*	Cyanophyceae
42	*Oscillatoria cortiana*	Cyanophyceae
43	*Phormodium fragile*	Cyanophyceae
44	*Rivularia curvata*	Cyanophyceae
45	*Euglena fusca*	Euglenophyceae
46	*Euglena viridis*	Euglenophyceae
47	*Phacus longicauda*	Euglenophyceae
48	*Trachelomonas armata*	Euglenophyceae
49	*Ceratium sp.*	Dinophyceae

Table 2 shows the presence of estuarine algae in different regions from mouth of the Vamsadhara estuary to upward region of the estuary i.e. Meghavaram. A total of 5 estuarine algae were reported, out of these, two species such as *Catenella impudica* and *Bostrychia tenella* were observed near mouth of the estuary while *Chara baltica* and *Ulva lactuca* were reported two kms away from the mouth. The remaining Rhodophyceae member *Caloglossa leprieurii* was observed near Meghavaram region of the estuary. Presence of estuarine algae in mangrove habitats was reported and studied by Narasimha Rao (1995); Narasimha Rao and Venkanna (1996); Narasimha Rao (2012) and Narasimha Rao (2016) in different estuarine habitats of Andhra Pradesh. In the present investigation, higher salinity levels were observed near the mouth of the estuary while away from the mouth region salinity was decreased, based on the salinity fluctuations estuarine algae adopted to salinity gradients and settled in comfortable zones in the estuary as observed by Narasimha Rao (1995 and 2016).

Table 2: Estuarine algae present in mangrove habitats of Vamsadhara estuary, Bhavanapadu, Srikakulam district, AP, India

S. No	Name of the alga	Class
1	*Chara baltica*	Chlorophyceae
2	*Ulva lactuca*	Chlorophyceae
3	*Bostrychia tenella*	Rhodophyceae
4	*Caloglossa leprieurii*	Rhodophyceae
5	*Catenella impudica*	Rhodophyceae

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