Scholars Academic Journal of Biosciences
Abbreviated Key Title: Sch Acad J Biosci
ISSN 2347-9515 (Print) | ISSN 2321-6883 (Online)
Journal homepage: https://saspublishers.com
NLM ID:101629416

OPEN ACCESS

Botany

Seasonal Abundance of Micro Algae in Mangrove Habitats of Vashista Godavari Estuary from Darbharevu to Biyyaputippa, West Godavari District, AP, India

K. Ambica[1*], G.M. Narasimha Rao[2]

[1]Z.P.H. School, Gummalakshmipuram, Andhra Pradesh- 535523
[2]Formerly Associated with Department of Botany, Andhra University, Visakhapatnam-530003

DOI: https://doi.org/10.36347/sajb.2025.v13i12.007 | **Received:** 28.10.2025 | **Accepted:** 20.12.2025 | **Published:** 22.12.2025

***Corresponding author:** K. Ambica
Z.P.H. School, Gummalakshmipuram, Andhra Pradesh- 535523

Abstract | **Original Research Article**

The present communication deals with composition and seasonal abundance of micro algae in the mangrove habitats of Vashista Godavari estuary near Darbharevu to Biyyaputippa, West Godavari district, Andhra Pradesh. Monthly water samples were collected for a period of one year from January 2024 to December 2024. A total of 57 micro algal species were identified, out of these, 26 species belong to Bacillariophyceae, 14 species belong to Chlorophyceae, 10 species belong to Cyanophyceae, 5 forms related to Euglenophyceae and remaining two species related to Dinophyceae. Abundance of micro algae varied seasonally with a maximum number of cells per liter (5340) was observed in the month of April and minimum number of cells per liter (964) was observed in the month of August. Another growth peak for the abundance (2934 cells/lit.) of micro algae was reported in the month of November

Keywords: Micro algae, Composition and seasonal abundance, Mangrove habitats, Vasishta Godavari estuary, AP.

INTRODUCTION

Estuarine systems provide nutrients to the aquatic organisms which inhabiting in concerned regions. Phytoplankton are the primary producers of the food chain which the energy is transferred from lower levels to higher organisms (Ananthan *et. al.*,2004, Tiwari and Chauhan, 2006). Microalgae play a vital role for promoting the high level of secondary production (Saifullah *et. al.*,2014). Micro algal communities present in estuarine and mangrove habitats was studied by several authors in different parts of our country (Subramanyam, 1946; Mani, 1992; Gouda and Panigrahy, 1996; Sawant and Madhu Pratap, 1996; Mohamed *et. al.*,2009; Raj Kumar *et al.*, 2009; Narasimha Rao and Murty 2010; Madhava Rao *et al.*, 2015; Narasimha Rao,2024 and Prasanna Lakshmi *et al.*, 2024). Horizontal distribution of micro algae at Vasista Godavari estuary was studied by Narasimha Rao, (2025). Narasimha Rao and Lohitasyudu (2024) studied the Mangrove and associated flora of Vashista Godavari estuary from Darbharevu to Biyyaputippa. In this present exploration work a study was undertaken to examine the seasonal distribution of micro algae along with composition of micro algal communities in mangrove habitats of Vashista Godavari estuary from Darbharevu to Biyyaputippa.

MATERIALS AND METHODS

Godavari river known as Dakshina Ganga and is one of the largest rivers in Andhra Pradesh and it empties $240x10^5$ cusecs of water each year into the Bay of Bengal. Godavari river divided into two branches namely Gowthami and Vashista, Vashista branch of Godavari River flows towards southwest and again divided into two branches such as, Vainateyam and Vashista. The branch Vainateyam merges with Bay of Bengal at Odalarevu near Gogannamatam. The west side of the Vashista branch meets Bay of Bengal at Biyyaputippa village. Mangrove vegetation was reported from Darbharevu to Biyyaputippa village (Narasimha Rao and Lohitasyudu,2024). In this present study, water samples were collected randomly from the estuary region in between Darbharevu (longitudes and latitudes are 16.39^0 N 81. 69^0) and Biyyaputippa (16.33^0 N 81.70^0E) for a period of one year, from January 2024 to December 2024. For seasonal abundance of phytoplankton, each month three to four water samples which consisting two-liter bottles collected for this investigation. These

samples were immediately fixed with 5% formalin and transported to the laboratory then centrifuged at 3000 rpm for 15 minutes. The Phytoplankton counting was made in duplicate on sedge wick rafter counting chamber. The species of the micro algae was identified by the following keys (Subrahmanyam, 1946; Desikachary,1959; Prescott, 1951).

RESULTS AND DISCUSSION

In this present investigation on composition of micro algae in mangrove habitations of Vashista Godavari estuary near Darbharevu reveals that a total of 57 micro algal species (Table 1) were identified from the collected water samples during the period from January 2024 to December 2024. Out of these 57 micro algal forms, 26 species belong to Bacillariophyceae, 14 species related to Chlorophyceae, 10 species belong to Cyanophyceae, 5 species related to Euglenophyceae and remaining 2 species belong to Dinophyceae (Table 1). Based on the presence and composition of micro algal communities in mangrove habitats of the study site, it is evident that class Bacillariophyceae was more dominant group than remaining algal forms in this mangrove habitations. These observations were agreed with the results of Gouda and Panigrahy (1996); Sawant and Madhu Pratap (1996); Narasimha Rao and Murty, (2010); Madhava Rao *et al.,* (2015); Narasimha Rao (2024); Prasanna Lakshimi *et. al.,* (2024) and Narasimha Rao (2025).

Table 1. Composition of micro algae in mangrove habitats of Vashista Godavari near Darbharevu and Biyyaputippa regions, West Godavari District, AP. India.

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

S. No	Name of the alga	class
40	*Zygnema pectinatum*	Chlorophyceae
41	*Anabaena constricta*	Cyanophyceae
42	*Chroococcus varians*	Cyanophyceae
43	*Gleotheca rupestris*	Cyanophyceae
44	*Lyngbya nigra*	Cyanophyceae
45	*Microcystis elegans*	Cyanophyceae
46	*Nostoc commune*	Cyanophyceae
47	*Oscillatoria cortiana*	Cyanophyceae
48	*Phormodium fragile*	Cyanophyceae
49	*Rivularia curvata*	Cyanophyceae
50	*Spirulina patensis*	Cyanophyceae
51	*Euglena fusca*	Euglenophyceae
52	*Euglena viridis*	Euglenophyceae
53	*Euglena caudate*	Euglenophyceae
54	*Phacus longicauda*	Euglenophyceae
55	*Trachelomonas armata*	Euglenophyceae
56	*Ceratium sp*	Dinophyceae
57	*Diplopsalis sp.*	Dinophyceae

Seasonal changes in the abundance of total micro algae/phytoplankton (cells/lit.) in mangrove habitats of Biyyaputippa to Darbharevu regions of Vashista River estuary was presented in Table 2. In this present investigation, two growth peaks were reported as observed by Narasimha Rao and Murty (2010) on micro algal populations of Godavari estuary. Similar reports were observed by Narasimha Rao (2025) on horizontal distribution of micro algae of Vashista estuary. Prasanna Lakshmi *et. al.,* (2024) reported one growth peak in seasonal phytoplankton abundance of Gosthani estuary. In this present study two growth periods were observed, higher number of micro algal cells per one liter (5340 cels/lit.) was reported in the month of April and lower number of micro algae (964 cells/lit.) was observed in the month of August. Another growth peak (2934 micro algal cells/Lit.) in these estuarine waters was reported in the month of November.

Table 2: Seasonal changes in the abundance of total micro algae in mangrove habitats of Vashista Godavari near Darbharevu and Biyyaputippa regions, West Godavari District, AP. India

Month	Total micro algae (Cells/Lit.)
January 2024	1460
February	2356
March	3674
April	5340
May	4230
June	2376
July	1148
August	964
September	1460
October	2348
November	2934
December 2024	1964

Acknowledgements:

We are thankful to local people of Darbharevu and Biyyaputippa villages of West Godavari district for their support and cooperation in collection of water samples and field studies.

REFERENCES

- Ananthan, G., P. Sampathkumar, P. Soundarapandian and L. Kannan, 2004. Observations on environmental characteristics of ariyankuppam estuary and verampattinam coast of pondicherry. J. Aqua. Biol., 19: 67-72.
- Desikachary, T. V. (1959). Cyanophyata Indian Council of Agricultural Research, New Delhi, p. 686.
- Gouda, R. and R. C. Panigrahy (1996). Ecology of phytoplankton in coastal waters of Gopalpur, east coast of India. Indian J. Mar. Sci. 25:81-84.
- Mani, P. (1992). Natural Phytoplankton communities in Pichavaram Mangroves. Indian J. Marine Sci. 21(4):72-77.
- Madhava Rao D. S, Jyothi Kaparapu and G. M.Narasimha Rao 2015. Micro Algal

- Population in Mangrove Habitats of the Visakhapatnam, East Coast of India. J. Algal
- Biomas Utln. 2015, 6 (2): 5- 10.
- Mohamed, A. A., G. Sithik, K. Thirumaran, R. Arumugan, R. Ragupathi Raja Kannan and P. Anantharaman (2009). Studies of Phytoplankton Diversity from Agnitheertham and Kothandaramar Koil Coastal waters, Southeast Coast of India. Global J. Env. Res. 3(2):118-125.
- Narasimha Rao G. M, Prayaga M. P., Seasonal Abundance of Micro Algae in Pandi Backwaters of Godavari Estuary, Andhra Pradesh, India. Not Sci Biol 2 (3) 2010, 26-29.
- Narasimha Rao G. M. 2024. Preliminary account on the composition of Phytoplankton in Sarada and Varaha estuarine complex, Visakhapatnam district, Andhra Pradesh, India. Indian Journal of Applied research vol. - 14 | Issue - 08 | August - 2024 | DOI: 10.36106/ijar.
- Narasimha Rao G. M. and K. Lohitasyudu,2024. Mangroves and associated flora of Vasishta Godavari estuary from Darbharevu to Biyyaputippa, West Godavari district, AP, India. Haya: Saudi J Life Sci,9(11): 404-407.
- Narasimha Rao G. M.,2025. Horizontal distribution of micro algae in Vasishta Godavari estuary, Andhra Pradesh, India. Sch. Acad.J. Biosci, 2025,13 (4); 475-478.
- Prasanna Lakshmi, K. Reshmi Chetterjee and G.M. Narasimha Rao, 2024. Seasonal Abundance of Phytoplankton Populations in Gosthani River Estuary near Bhimili, Andhra Pradesh, India.2024. Haya Saudi J Life Sci, 9 (9): 365-368.
- Prescott, G. W. (1951). Algae of Western Great Lake areas. pub. Cran brook Institute of Science Bulletin 33:1-496.
- Rajkumar, M., P. Perumal, A.V. Prabu, N.V. Perumal and K.T. Rajeskar, 2009. Phytoplankton diversity in Pichavaram mangrove waters from South-east coast of India. J. Environm. Biol., 30: 489-498.
- Subrahmanyam, K. (1946). The diatoms of the Madras Coast.Proc.Indian Acad. Sci. 24:85-197.
- Sawant, S. and M. Madhupratap (1996). Seasonality and composition of phytoplanktons in the Arabian sea. Curr. Sci. 71:869-873.
- Tiwari, A. and S.V.S. Chauhan, 2006. Seasonal phytoplanktonic diversity of Kithamlake, Agra. J. of Environ. Biol., 27: 35-3