

STUDY OF FRESH WATER ALGA (*SCENEDESMUS*) FROM GUDHA DAM OF HINDOLI TEHSIL BUNDI (RAJASTHAN), INDIA

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ABSTRACT

The current work has been conducted on freshwater alga specially on *Scenedesmus* genus belonging to order Chlorococcales under the Chlorophyceae from Gudha Dam, Hindoli Tehsil, Bundi. Algal samples were taken from selected site G1-G2 during various seasons (Pre-monsoon, Monsoon and Post-monsoon) from 2022-2024. Total 18 species and varieties of this genus have been listed from studied dam.

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INTRODUCTION

Hindoli is a tehsil in Bundi district of Rajasthan state in north west India at 25.57N latitudes and 75.49E longitudes. Gudha dam is located in Gudha village which is situated 16 km towards west from district head quarter Bundi. Gudha dam is the major source of water system for Hindoli Tehsil. This dam is the largest earthen dam in Hadauti. The filling capacity of the dam is 34.50 feet. There are 30 gates of the dam. All 30 gates of the dam will be monitored by Bundi control room. Gudha dam is constructed on Mej river that is an important source of irrigation as well as for water distribution for human consumption. It is famous place for ecotourism in monsoon season. Different algal species grow vastly in this dam but in the current work, only green algal genus (*Scenedesmus*) were studied. Algae are photosynthetic entity living in oceans and freshwater lakes and rivers and dames. They effectively capture atmospheric CO₂ and produce about 50% of all oxygen on Earth. All the microscopic phytoplanktons are capable to convert solar energy to chemical energy via photosynthesis. *Scenedesmus* is commonly found in freshwater bodies of India. *Scenedesmus* is microscopic unicellular to multi-cellular alga.

MATERIAL AND METHOD

Algal sampling was taken out from the two selected sampling site (GD-1 & GD-2) in various seasons i.e. Pre-monsoon (February-May), Monsoon (June-September) and Post-monsoon (October-January). Samples were collected by phytoplanktonic net and dropper. These algal samples were stored in marked bottles to preserve the algal forms in 4% formaldehyde. Microscopic image captured with the help of high resolution trinocular microscope and digital camera and identified by standard monographs.

RESULT AND DISCUSSION

A total of 18 species of *Scenedesmus* have been recorded and the taxonomic enumeration of each species is given as follows:

1. ***Scenedesmus arcuatus*:** Colony eight celled, cells curved and with minor intercellular space. Cells oblong-ovoid and arranged in two series of eight cells. Cells 1.4μ broad and 3μ long.

Collection site: GD-1 during Monsoon.

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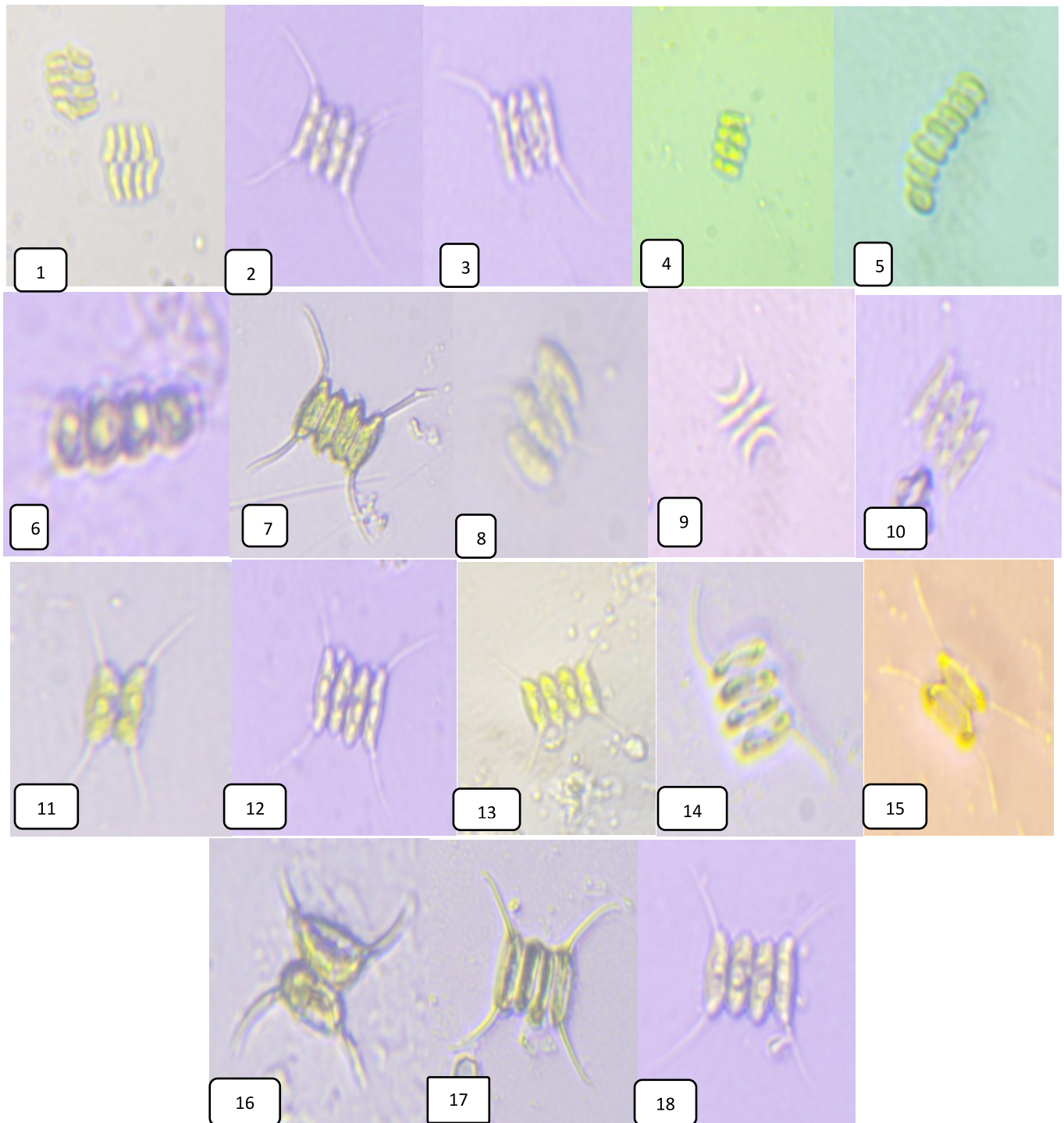


Plate 1: *Scenedesmus* Meyen identified from Gudha Dam Hindoli, Bundi (Rajasthan).

Figure: 1: *Scenedesmus arcuatus*; 2. *Scenedesmus armatus* (Chodat); 3. *Scenedesmus armatus* var. *bicaudatus* (Chodat); 4. *Scenedesmus bijugatus*; 5. *Scenedesmus bijugatus* var. *flexusus*; 6. *Scenedesmus bijugatus* var. *parvus* (G.M. Smith); 7. *Scenedesmus carinatus* (Lemm.) Chodat; 8. *Scenedesmus caudate-aculeotus*; 9. *Scenedesmus dimorphus*; 10. *Scenedesmus obliquus* (Chodat); 11. *Scenedesmus opoliensis* P. Richter; 12. *Scenedesmus opoliensis* var. *mononensis*; 13. *Scenedesmus quadricauda* (Turpin); 14. *Scenedesmus quadricauda* var. *bicaudatus*; 15. *Scenedesmus quadricauda* var. *longispina*; 16. *Scenedesmus quadricauda* var. *quadripina* (Chodat); 17. *Scenedesmus quadricauda* var.; *westi* 18. *Scenedesmus tropicus* Crow.

2. ***Scenedesmus armatus* (Chodat):** Colony four celled. Cell oblong-ellipsoid with acute spines and organize in a straight series. Terminal cells have a single long spine from each pole. Cells 6.48μ broad 16.7μ long. Colony four celled and about 23.66μ broad.
Collection site: GD-1 & GD-2 during all seasons.
3. ***Scenedesmus armatus* var. *bicaudatus* (Chodat):** Colony four celled having a long spine from one of the poles of the terminal cell only, the spine of the two terminal cell alternating with each other. Cells oblong-ellipsoid with sharp spine and present in a linear series. Cells 3.74μ broad and colonies 14.96μ broad, 11.22μ long Spines 8.8μ long.
Collection site: GD-1 during Pre-monsoon season.
4. ***Scenedesmus bijugatus*:** Colony four celled, cells organized in a single straight series. Cells oblong-ellipsoid with broadly rounded ends. Cells 6.4μ broad 18.55μ long.
Collection site: GD-1 & GD-2 in all seasons.
5. ***Scenedesmus bijugatus* var. *flexusus*:** Colony eight celled with the cells present in an irregular spiral series. Cells 3.14μ broad, 9.25μ long.
Collection site: GD-1 during Pre-monsoon season.
6. ***Scenedesmus bijugatus* var. *parvus* (G.M. Smith):** Four cells colony in which with cells present in a regular sub-alternating manner. Cells are much smaller and oblong-ovoid. Cells 2.6μ broad and 7.48μ long.
Collection site: GD-1 & GD-2 during Post monsoon season.
7. ***Scenedesmus carinatus* (Lemm.) Chodat:** Colony four celled. Cells present in a straight series with one-third of their length in the median region in lateral contact. Cell fusiform to cuboid with beaked ends. Terminal cells have a long-curved spine from each pole. Cells 7.48μ broad and 26.18μ long. Spine of terminal cells 24.18μ long.
Collection site: GD-1 & GD-2 in all seasons.
8. ***Scenedesmus caudate-aculeotus*:** Colony four celled. All cells loosely associated in a straight series. Cells oblong with rounded poles. Terminal cells nearly curved and have a long and curved spine from each pole. Cells 7.48μ long and 3.74μ broad. Spine 3.48μ long.
Collection site: GD-1 during Pre-monsoon.
9. ***Scenedesmus dimorphus*:** Colony four celled, cells found in a straight series. Cells 3.4μ broad 7.48μ long.
Collection site: GD-1 & GD- 2 in Monsoon season and Pre monsoon season.
10. ***Scenedesmus obliquus* (Chodat):** Four celled colony in which cells present in straight series. Cells fusiform with sharp ends. Cells 1.4μ broad and 3μ long.
Collection site: GD-1 during Pre-monsoon season.
11. ***Scenedesmus opoliensis* (P. Richter):** Colony have four cells. Cylindrical cells found in a linear series. Neighbouring cells in touch only along about a third of their length. Terminal cells have a long more or less curved spine on their poles. Cell 7.48μ broad, 26.18μ long and spine 28.7μ long.
Collection site: GD-1 during Pre-monsoon season.
12. ***Scenedesmus opoliensis* var. *mononensis*:** Colony keeps four cells. Inner cells widely fusiform with round end. Terminal cell with attenuate end with long curved spine from each pole. Cell 7.42μ , 25.97μ long. Spine of terminal cells 22.26μ long.
Collection site: GD-1 in Post monsoon and Pre-monsoon season.
13. ***Scenedesmus quadricauda* (Turpin):** Colony four celled. Cells oblong-cylindrical with rounded ends and packed in a linear series. Cells 6.66μ broad, 16.18μ long. Spines 14.18μ long.
Collection site: GD-1 & GD-2 in all season.
14. ***Scenedesmus quadricauda* var. *bicaudatus*:** Colony four celled. Each terminal cell has a long spine at one end that is present on at an angle opposite to other terminal cell. Cells 3.74μ broad, 11.22μ long. Spine 7.48μ long.
Collection site: GD-1 during Pre-monsoon season.
15. ***Scenedesmus quadricauda* var. *longispina*:** Colony two celled. Cells cylindrical and spines long with compared to the length of the cell. Cells 3.74μ and 6.77μ long. Spine 11.22μ long.
Collection site: GD-1 during Pre-monsoon season.
16. ***Scenedesmus quadricauda* var. *quadrispina* (Chodat):** Colony two celled. Cell generally oviform and about twice as long as broad. Terminal cells have a single short curved spine. Cell 8.3μ broad, 18.44μ long. Spines 5.48μ long.

Collection site: GD-1 during Pre-monsoon season.

17. ***Scenedesmus quadricauda* var. *westi***: Colony four celled. Cells 4.74μ broad, 9.77μ long. Spines 11.22μ long.

Collection site: GD-1 during Pre- Monsoon season.

18. ***Scenedesmus tropicus* Crow**: Colony four celled. Cells are biconvex in the middle, alternated towards the ends with inflated poles. Terminal cells have a long, curved spine. Cells -7.48μ broad, spine -24.18μ long. Colony -28.7μ long and 26.18μ broad.

Collection site: GD-1 Pre-monsoon season.

In the current work *Scenedesmus bijugatus* and *Scenedesmus armatus* were commonly found and showing their dominancy over rest of the chlorococcales. *Scenedesmus carinatus* and *Scenedesmus quadricauda* var. *quadrispina* reported in all studied season.

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