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## RESEARCH ARTICLE

### CERTAINGENERA OF FAMILY DESMIDIACEAE AT MEHEKARI WATER RESERVOIR

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#### ABSTRACT

The *Desmidiaceae* is a family of green algae, commonly referred to as desmids. Desmids are characterized by their unique cell structure, which often appears symmetrical due to the presence of a median constriction. They are predominantly freshwater algae and are found in various aquatic habitats worldwide. Several genera within the family *Desmidiaceae* are notable for their diversity and ecological importance. Desmids have a single cell that is typically divided into two symmetrical halves, each containing a nucleus and chloroplasts. The two halves are joined by a narrow band known as an isthmus. They play a crucial role in freshwater ecosystems as primary producers, contributing to the food web by converting sunlight into organic matter through photosynthesis. They also serve as indicators of water quality, with certain species being sensitive to pollution and environmental changes.

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## INTRODUCTION

Mehekari Lake is constructed on the Seena River in Ashti tehsil of Beed district of Maharashtra. The study was carried out to explore the genera belonging to *Desmidiaceae* of the water reservoir. Earlier the author has reported the presence of *cyanophyceae* from the water reservoir. The cells of *Desmidiaceae* are highly varied in shape and can be spherical, cylindrical, or ribbon-like. They often have intricate cell wall ornamentation, giving them a distinctive appearance under the microscope. These algae reproduce both sexually and asexually. Asexual reproduction occurs through cell division, where the parent cell divides into two daughter cells, each inheriting one half of the parent cell's structure. Sexual reproduction involves the fusion of specialized reproductive cells called gametes.

## MATERIALS AND METHODS

Samples of algae were taken from the water reservoir. The months of November to March of 2021 and 2022 and saw the creation of the collections. The collected samples were gathered and kept in 4% formalin to facilitate additional taxonomic research. Floras and monographs, among other pieces of available material, were used to aid in the identification process.

[Jadhavar and Papdiwal (2012, 2016, 2022), Jadhavar (2023), Prasad and Misra (1992), Rai. and Misra (2008)].

## RESULTS AND DISCUSSION

Order: Zygnematales

Family: Desmidiaceae

Genus: *Closterium* Nitzsch

*Closterium acerosum* (Schrank) Ehr. var. *elongatum* Breb.

Prasad and Misra, 1992, p 98, pl 16, f 20.

Cells are much longer, inner margin more or less straight, outer margin moderately curved, cell apices tapering with rounded to subacute ends; cell wall with fine striations; chloroplast ridged, containing pyrenoids in median series. Long cell 750 µm, lat. cell 40.5 µm, lat. apex 1.5 µm.

Genus: *Penium* Brebisson

*Penium spinospermum* Josh.

Prasad and Misra, 1992, p 95, pl 15, f 10.

Cells 2.5 times longer than broad, uncontracted, very slightly attenuated towards rounded apices; cell wall smooth; each

chloroplast with three ridges and one pyrenoid. Long. cell 25.5  $\mu\text{m}$ , lat. cell 10.5  $\mu\text{m}$ .

**Genus: *Pleurotaenium*** Naegeli

***Pleurotaenium ehrenbergii*** (Breb.) de Bary

Prasad and Misra, 1992, p 124, pl 18, f 10

Cells fairly large, longer than broad, sub-cylindrical, slightly constricted at the base; semicells cylindrical, gently attenuated from base towards apex; basal inflation small with one undulation; apex with a ring of tubercles; cell wall minutely punctate. Long. cell 410  $\mu\text{m}$ , lat. cell 25  $\mu\text{m}$ , lat. apex 15  $\mu\text{m}$ .

**Genus: *Micrasterias*** C.A. Agardh

***Micrasterias pinnatifida*** (Kuetz.) Ralfs.

Prasad and Misra, 1992, p 143, pl 20, f 4.

Cells small, slightly broader than long, deeply constricted, sinus linear but slightly open outwards; semicells 3 lobed, interlobular incision deep and broadly rounded, lateral lobes horizontal, semifusiform with minutely bifid, apices exhibiting acuminate ends, polar lobe with basal portion subrectangular and apical portion with extremities like lateral lobes but relatively shorter in length; cell wall minutely punctate. Long cell 45  $\mu\text{m}$ , lat cell 55  $\mu\text{m}$ , lat isthmus 12.5  $\mu\text{m}$ .

**Genus: *Euastrum*** Ehrenberg

***Euastrum coralloides*** Josh. var. ***trigibberum*** Lagerh.

Prasad and Misra, 1992, p134, pl 19, f 4

Cells small with deep constriction; semicells three lobed, polar lobe short and broad with deep median incision, apical angles furnished with short spines, lateral lobe bilobulate, each lobule truncate, emarginate with a small spine in the furrow; each semicell with 5 tumours, two small and lateral in position, one rather large just above the sinus and one on each side of apical notch in polar lobe. Long. cell 37.5  $\mu\text{m}$ , lat. cell 25  $\mu\text{m}$ , lat. isthmus 5  $\mu\text{m}$ .

**Genus: *Cosmarium*** Corda ex Ralfs

***Cosmarium granatum*** Breb.

Prasad and Misra, 1992, p 160, pl 21, f 20

Cells small, slightly longer than broad, sub-rhomboid to elliptic, deeply constricted, sinus linear with a dilated extremity; semicells truncate, pyramidal, basal angles rounded, apical angles obtuse, sides straight or slightly convex, apex narrowly truncate with faintly retuse margin, cell wall finely punctate; chloroplast axile with single pyrenoid. Long. cell 25  $\mu\text{m}$ , lat. cell 17.5  $\mu\text{m}$ , lat. isthmus 5  $\mu\text{m}$ .

**Genus: *Arthrodesmus*** Ehrenberg

***Arthrodesmus curvatus*** Turner f. **major** Turner

Prasad and Misra, 1992, p 191, pl 25, f 1

Cell of medium size, almost as long as broad, deeply constricted, sinus narrow with slightly dilated extremity and open outwards; semicells transversely oblong-elliptic with straight or faintly retuse apices, lateral angles acute with long and converging spines showing slightly recurved tips; cell wall smooth; chloroplast axile with one pyrenoid. Long. cell 45  $\mu\text{m}$ , lat. cell with spine 92.5  $\mu\text{m}$ , lat. cell without spine 40  $\mu\text{m}$ , lat. isthmus 12.5  $\mu\text{m}$ .

**Genus: *Staurastrum*** Meyen

***Staurastrum granulosum*** (Ehrenb.) Ralfs

Prasad and Misra, 1992, p 197, pl 25, f 22

Cells small, almost as long as broad, deeply constricted, sinus open with subacute apex; semicells more or less obsemicircular with convex apex, lateral angle scarcely rounded and furnished with acute spines; top view triangular with slightly retuse median portion; cell wall granulate, granules minute, arranged in concentric series near the lateral angles and scattered in middle portion. Long cell 27.5  $\mu\text{m}$ , lat. cell with spine 32.5  $\mu\text{m}$ , lat isthmus 10  $\mu\text{m}$

**Genus: *Xanthidium*** Ehrenberg

***Xanthidium sexmamillatum*** W and G.S. West

Rath and Adhikari, 2005, p 57, pl 8, f 25, pl 17, f 131

Cells fairly big, little longer than broad, deeply constricted, sinus broadly open, semicells transversely elliptic, lateral margin with 3 mamillae on each side, one apical, one subapical and one median. Six strong spines on the apices of these six mamillae on each semicell, apical and subapical spines curved upwards, the median being horizontal, forth mamillae distinctly marked with a short spine on both the lower side of the semicell, apex mostly straight, vertical view nearly rhomboidal, sides thickened slightly more yellowish, three asymmetrically disposed spines at each pole, cell wall punctate, pyrenoids two in each semicell.

**Genus: *Desmidium*** C.A. Agardh

***Desmidium swartzii*** (Ag.) Ag. ex Ralfs

Rai and Misra, 2008, p 54, pl 1, f 1 & 4

Cells 15  $\mu$  long, 25  $\mu$  broad, narrowly rectangular, moderately constricted, sinus linear but widely open out, united into spirally twisted filaments; isthmus 20  $\mu$  wide; semicells narrowly oblong, lateral margins obliquely truncate with upper angle protruded towards the apex, apex slightly straight without depression; cell wall smooth; chloroplast axile.

## CONCLUSION

The species diversity and systematic explanation of the *Desmidiaceae* family observed in Mehekari Water Reservoir are provided in this article. This concludes the ten species of Desmids from the reservoir.

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