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Uncovering Freshwater Algal Diversity of KADA: A Taxonomic Perspective

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Abstract : *Algae are an ecologically significant and diverse group of photosynthetic organisms that play a fundamental role in aquatic ecosystems by contributing to primary production, oxygen generation, nutrient cycling, and food-web dynamics. The present study focuses on the exploration and taxonomic identification of algal diversity in the Kada region of Beed District, Maharashtra. The investigation was undertaken to document algal taxa occurring in different freshwater habitats, including ponds, streams, rivers, reservoirs, and other aquatic environments. Algal samples were collected from selected sites during field surveys and examined using standard collection, preservation, microscopic observation, and taxonomic identification methods. Identification was carried out primarily on the basis of morphological and microscopic characteristics. The study revealed considerable algal diversity belonging to different taxonomic group's viz. Cyanophyta, Chlorophyta, Bacillariophyta and Euglenophyta. The occurrence and distribution of algae were found to vary with habitat conditions and environmental characteristics. The present investigation provides baseline information on the algal flora of the Kada region and contributes to the understanding of freshwater algal diversity in Beed District. The findings may also serve as a foundation for future studies on algal ecology, taxonomy, water-quality assessment, biodiversity conservation, and sustainable management of freshwater resources.*

Key Words: Diversity, Taxonomy, Taxonomic Identification, Kada

I. INTRODUCTION

Algae constitute an important and highly diverse group of predominantly photosynthetic organisms occurring in a wide range of aquatic and semi-aquatic environments. They are found in freshwater ponds, lakes, rivers, streams, reservoirs, wetlands, temporary water bodies, and moist terrestrial habitats. Because of their ability to perform photosynthesis, algae are among the major primary producers in aquatic ecosystems and contribute substantially to the production of organic matter and oxygen. They also provide food and habitat for numerous aquatic organisms and participate actively in nutrient cycling and energy flow.

Freshwater ecosystems support a remarkable variety of algal forms ranging from microscopic unicellular organisms to macroscopic forms. These organisms exhibit considerable variation in their morphology, cellular organization, pigmentation, reproductive strategies, and ecological requirements. Such diversity makes algae an important subject for taxonomic and ecological investigations. Taxonomic studies of algae are essential for documenting biodiversity and understanding the distribution and ecological significance of different taxa. Morphological characters such as cell shape, colony organization, filament structure, branching pattern, chloroplast characteristics, reproductive structures, frustule morphology in diatoms, and other diagnostic features are frequently used in algal identification. Freshwater algae also have considerable ecological and environmental importance. Changes in algal communities can reflect

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variations in water quality, nutrient availability, light penetration, pH, temperature, and other physicochemical conditions.

The Kada region of Beed District contains a variety of aquatic habitats, including rivers, streams, ponds, lakes, reservoirs, and temporary water bodies. These habitats experience variations in water availability, substrate, nutrient status, seasonal conditions, and human influence, which may support diverse algal communities. Despite the ecological importance of these habitats, systematic investigations of their algal flora are relatively limited. The present study, therefore, was undertaken with the objective of exploring, documenting, and taxonomically identifying algal diversity from selected freshwater habitats of the region. The collected material was studied using microscopic techniques, and identification was carried out using relevant morphological characteristics and standard taxonomic literature.

II. MATERIALS AND METHODS

1. Collection of Algal Samples

Algal samples were collected manually using appropriate sampling methods depending on their growth form and habitat. Floating and planktonic algae were collected using clean sample bottles, while attached and filamentous forms were collected using forceps, spatulas, brushes etc. Epilithic algae growing on stones and other submerged surfaces were carefully removed, whereas epiphytic forms associated with aquatic plants were collected along with a small portion of the substrate.

2. Preservation of Samples

Collected specimens were preserved with 4% formalin for subsequent laboratory examination. Fresh samples were initially examined whenever possible to record their natural colour, habit, colony structure, and other characters that may change after preservation. Representative specimens were preserved in suitable labelled containers using standard preservation procedures for freshwater algal specimens.

3. Laboratory Examination

The collected algal samples were brought to the laboratory for detailed morphological and microscopic examination. Temporary mounts were prepared using clean glass slides and coverslips. The specimens were observed under a compound light microscope at suitable magnifications.

III. RESULTS

1) Pediastrum simplex Meyen

Philipose, 1967, p 113, f 36

Colonies circular to oval, 4 to 32 celled. Inner side of marginal cells nearly straight, outer side produced into a gradually tapering process, sides concave. Inner cell polygonal. Cells in contact with adjacent ones and usually without inter cellular spaces. When present, intercellular spaces very small and few in number. Cell wall smooth or punctate to granulate. Cells 12.5 µ broad, 22.5 µ long.

2) Tetraedron caudatum (Corda) Hansgirg

Philipose, 1967, p 150, f 64 (b)

Cells small, flat, five sided with four of the sides concave and the fifth in the form of notch of varying depth. Angles rounded and produced into a small straight spine. Cells 15 µ in diameter, spine 2.5 µ long.

3) Oocystis. irregularis (Petkof) Printz

Philipose, 1967, p 184, f 95

Cells irregularly ellipsoid to round and usually crowded towards one side. Cell wall thin and without apical thickenings. Chloroplast single, parietal, covering the cell completely and without a pyrenoid. Cells 17.5 µ broad, 25 µ long.

4) Scenedesmus indicus Philipose

Philipose, 1967, p 258, f 167

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Colony 4 celled. Cells curved with capped ends and swollen middle and arranged in a sub-alternating series with the outer ends of internal cells in a contact with the middle of the nearest terminal cell, the inner ends remaining free. Internal cells also in contact with each other at the median region. Cells 5 µ broad, 12.5 µ long.

5) Spirogyra rivularis (Hassal) Rabenhorst

Prasad and Misra, 1992, p 88, pl 14, f 4,6

Vegetativecells 42.5 µ broad, 125 µ long, end walls plane; each cell with three chloroplasts making 2-2.5 turns; conjugation scalariform by tubes formed by both gametangial cells; fertile cells cylindrical, zygospores ellipsoid 45 µ broad, 75 µ long; median spore wall smooth and yellowish brown.

6) Fragillaria intermedia Grun.

Sarode and Kamat, 1984, p 27, pl 1, f 21

Frustules united together to form long bands, linear, rectangular in girdle view; valves 80 µ long, 7.5 µ broad, linear with parallel margins; ends gradually tapering and rounded; axial area narrow, linear; striae 10-12 in 10 µ, coarse and distinct, absent on one side in the middle.

7) Stauroneis anceps Ehr. var. hyalina Brun. et Perag.

Sarode and Kamat, 1984, p 90, pl 10, f 213

Valves 55 µ long, 10 µ broad, subelliptical lanceolate with produced, feebly capitate ends; raphe thin and straight, central pores distinct and terminal fissures very slightly curved; axial area very narrow; central area large, narrowly rectangular and reaching the margins; striae 30 in 10 µ, radial and very finely punctate.

8) Pinnularia dolosa Gandhi

Sarode and Kamat, 1984, p 141, pl 16, f 367

Valves 85 µ long, 15 µ broad, linear, tumid in middle with slightly swollen broadly rounded ends; raphe formed in the hyaline zone, central pores closely set and unilaterally bent, terminal fissures curved; axial area wide, with fine irregularly disposed punctae; central area slightly unilaterally dilated; striae 9-11 in 10 µ, thick slightly radial in the middle and convergent at the ends.

9) Chroococcus turgidus (Kuetz)Nag.

Desikachary, 1959, p 101, pl 26, f 6

Cells spherical or ellipsoidal single, or in groups of mostly 2-4, very seldom many, blue-green, olive green or yellowish, without sheath 30 µ, with sheath 20 µ diam; sheath colourless, not distinctly lamellated.

10) Merismopedia elegans A.Br.

Prescott, 1951, p 459, pl 101, f 1

Colony irregularly quadrangular, composed of 16 or more compactly arranged, ovate cells, with the row of cells, becoming distorted in older and longer colonies; cells 5 µ in diameter, 7.5 µ long; contents bright blue green.

11) Oscillatoria proboscidea Gomont

Prasad and Srivastava, 1992, p 69, pl 8, f 9

Trichomes single, dark blue green; not constricted at cross walls, 6-12 µ in diameter, cells¼ times as long as broad, 2.5 µ long; cell contents light blue green, homogenous, without gas vacuoles, granules distributed irregularly throughout but usually towards septa; end cells almost truncate, capitate with thick convex outer membrane; cell wall thick and smooth.

12) Phacus curvicauda Swirenko

Prescott, 1951, p 399, pl 88, f 21

Cells broadly ovoid to suborbicular in outline, slightly spiral in the posterior part which is extended into caudus; anterior end broadly rounded; periplast longitudinally finely striated; paramylon bodies 2 large discs; chloroplast numerous ovoid bodies; cells 25 µ in diameter, 30 µ long.

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IV. DISCUSSION

The present study recorded 12 algal taxa from freshwater habitats of the Kada region, Beed district, belonging to Chlorophyta, Bacillariophyta, Cyanobacteria and Euglenophyta. Green algae represented by Pediastrum simplex, Tetraedron caudatum, Oocystis irregularis, Scenedesmus indicus and Spirogyra rivularis. Three diatoms viz. Fragilaria intermedia, Stauroneis anceps var. hyalina and Pinnularia dolosa showed distinct valve and striae characteristics. Cyanobacteria such as Chroococcus turgidus, Merismopedia elegans and Oscillatoria proboscidea were also recorded, along with the euglenoid Phacus curvicauda. The identification was based mainly on morphological characters and comparison with standard taxonomic literature. Overall, the findings demonstrate considerable algal diversity in the comparatively less-explored Kada region and emphasize the need for further seasonal and ecological studies.

REFERENCES

1. Desikachary, T.V. (1959) Cyanophyta. Indian Council of Agricultural Research, New Delhi.
2. Philipose, M.T. (1967) Chlorococcales, Indian Council of Agricultural Research, New Delhi.
3. Prasad, B.N. and P.K. Misra (1992) Fresh water algal flora of Andman and Nicobar Islands, Vol. II, Bishen Singh Mahendra Pal Singh, Dehra Dun
4. Prasad, B.N. and M.N. Srivastava (1992) Fresh water Algal flora of Andman and Nicobar Islands, Vol-I, Bishen Singh Mahendra Pal Singh, Dehra Dun.
5. Prescott GW. (1951) Algae of the Western Great Lakes Area, Cranbrook Institute of Science, Michigan.