

# Freshwater Chlorophyceae from Jalgaon District, North Maharashtra *I-Unicellular Volvocales*

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## ABSTRACT

The present paper deals with the description of 26 taxa of unicellular Volvocales collected from Jalgaon district, North Maharashtra. As far as the authors are aware, except *Chlamydomonas ehrenbergii*, *C. reinhardi* and *C. microspiraera*, the remaining taxa are collected for the first time from Maharashtra. *Sphaerollopsis ovalis* is new to Indian Volvocales and *Chlamydomonas vacuolata* var. *maharashtrensis* is new to science.

## **Effect of SLF on soil parameters**

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### **ABSTRACT**

In the present study, the SLFs extracted from green seaweed *Ulva lactuca*, brown seaweed *Sargassum ilicifolium*, and red seaweed *Gracilaria corticata* were employed to determine their effect on nine different soil parameters viz., soil pH, soil specific conductivity, soil water, bulk density, particle density, soil porosity, water holding capacity, soil minerals, (K,Ca,Mg,Na) and soil organic matter in red, black and sandy soils. All the three SLFs induced an increase in the specific conductivity, water holding capacity, soil water, soil minerals, and soil organic matter in all the three soil types thereby suggesting their positive role as a soil conditioner

## ***Azolla pinnata*, as an antistress agent in broiler chicken production**

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### ABSTRACT

*Azolla pinnata* was cultivated in ponds and yield was assessed both during summer and winter seasons. Sodium selenite (Se) at 1g/m<sup>2</sup> and chromium hexachloride (Cr) at 4g/m<sup>2</sup> was added to ponds to enrich *Azolla*. The Se and Cr were increased in *Azolla* by 6.6 and 33 times respectively compared to control.

Day old broiler chicks (108 Nos.) were divided into four groups and stress was induced in three groups (T2 to T4) by adding corticosterone at 15 mg/kg diet from 21 to 35 days of age. Two groups T3 and T4 received unenriched and enriched *Azolla* (2g/kg diet) while T1 and T2 groups were fed standard diet. Blood samples were collected from chickens at 20, 36 and 42 days of age. The blood glucose and total cholesterol levels did not vary between groups before and after application of stress.

At the end of stress period, the total antioxidant activity (as measured by FRAP value) in *Azolla* fed groups (T3 and T4) was comparable to control (T1) while the T2 group had significantly ( $P < 0.01$ ) lower value. At the end of 42 day, T4 had the highest antioxidant activity compared to T2.

The body weight and feed conversion ratio at the end of 6<sup>th</sup> week in groups T3 and T4 were significantly ( $p < 0.05$ ) better compared to T2. It is concluded that *Azolla* can be included in the diet with or without enrichment of Se and Cr to alleviate stress in broiler chickens.

## **Impact of magnetism on the growth and pigment production of two species of *Spirulina* (*Spirulina platensis* and *Spirulina platensis* var *lonar*) - A preliminary study**

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### **ABSTRACT**

Two species of micro algae (*S.platensis* and *S.platensis* var *lonar*) were grown on magnetized water medium and static low frequency weak magnetic field for a period of 20 days. The growth of the algae was monitored by means of direct microscopic count (DMC) optical density (OD<sub>560</sub>) and dry mass. In the South Pole magnetized water medium the growth of both the micro algae was better, whereas in the North Pole inhibitory growth response was noticed. C-phycoyanin, the accessory pigment was also influenced by the magnetism. From the observation it could be concluded that the North Pole decelerate the growth and the pigment production where as the South Pole has promoting effect.

# **A study on production, optimization and characterization of cryptophycin from *Nostoc* sp. and its evaluation as antifungal agent**

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## **ABSTRACT**

Cryptophycin is a promising drug against a wide variety of tumors including solid and multiple drug resistant tumors. The cyanobacterium *Nostoc sp* was screened for the production of Cryptophycin. Optimization and characterization of Cryptophycin was done and the antifungal activity of Cryptophycin was evaluated. Cryptophycin production was found to be maximum on day 10 at pH 7 in the presence of nitrogen source in BG 11 medium. The results of UV, IR, HPLC and NMR analysis confirmed the presence of Cryptophycin in the extracted sample. Cryptophycin inhibited the growth of test organisms *Aspergillus niger* and *Penicillium sp*. *Aspergillus niger* was found to be more sensitive to cryptophycin than *Penicillium sp*.

## **Biocontrol efficiency of *Pithophora* sp. against human and plant pathogens**

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### **ABSTRACT**

The freshwater green alga *Pithophora* was selected for the determination of antimicrobial activity against *Staphylococcus aureus* and *Xanthomonas malvacearum*. The crude extract of the alga was prepared by using six different organic solvents. Methanol and chloroform extract of *Pithophora* was found to exhibit antimicrobial activity on *Staphylococcus aureus*. Methanol and hexane extract of the alga was found to be effective against *Xanthomonas malvacearum*. The efficiency of the crude extracts was comparable with the standard antibiotic discs. The solvent system Cyclohexane: Methanol: Diethylether (5:1:4) was found to be efficient for the separation of the algal components. The crude extract of the alga exhibited high antimicrobial activity against the test organisms than the TLC separated fractions. The IR and NMR analysis of the TLC separated prominent fractions revealed the presence of alkynes and aromatic alcohols.

## Effect of ethyl methane sulphonate on growth and pigments of *Spirulina platensis*

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### ABSTRACT

Alkylating agents are the chemicals that transfer alkyl groups to biologically important macromolecules under physiological condition. Study was conducted to find out the toxicity and effective concentration of ethyl methane sulphonate (EMS) for mutagenesis and mutational effect on pigmentation of *Spirulina platensis*. Cultures were treated with different concentration of EMS i.e. 0.0001 % to 0.1% for 1hr, 2 hr and 4 hr duration. Such study may lead to the production of new variants suitable for the mass production of this alga for production of pigments and other fine chemicals, human or animal consumption and various other practical purposes. The growth of cultures was followed through optical density, cell count and pigment i.e. Chlorophyll-a, carotenoids and phycobiliproteins estimation. Cultures of *S. platensis* showed decreased growth and pigment contents in all concentration and duration of EMS treatment. Time taken to revive and recover growth after EMS exposure increased with exposure time and concentration. High doses of EMS and longer duration showed the adverse effect on growth and pigment content. Ethyl methane sulphonate was found to be an effective alkylating mutagen; Four-hour duration exposure of EMS in 0.01% & 0.1% concentration exerted a lethal effect on the cultures of *S.platensis*.

## **Effect of chloro-alkali industrial effluent on two filamentous cyanobacteria : A laboratory bioassay**

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### **ABSTRACT**

Two filamentous cyanobacteria, *Anabaena iyengarii* and *Anabaena* sp. isolated from paddy field soils near the vicinity of chloro-alkali plant situated at Ganjam N.A.C.area, in Orissa were grown in varying concentrations of industrial effluent in defined culture media under laboratory condition to study the effect of the effluent on growth, chlorophyll a, nitrogen content and photosynthetic rate of the isolates. *Anabaena iyengarii* exhibited good growth in chloro-alkali industrial effluent and contained appreciable amount of chlorophyll a, nitrogen with higher photosynthetic rate. The results are discussed on a comparative basis to show the response of the two cyanobacterial isolates to different concentrations of the industrial effluents.

## Some fresh water diatoms from Ahmednagar region, (M.S.) India

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### ABSTRACT

Fifty eight taxa of fresh water diatoms were collected from different water bodies in and around Ahmednagar region. These taxa belong to seventeen genera viz. *Cyclotella*, *Fragillaria*, *Synedra*, *Mastogloia*, *Gyrosigma*, *Calonies*, *Neidium*, *Diploneis*, *Stauroneis*, *Navicula*, *Pinnularia*, *Amphora*, *Cymbella*, *Gomphonema*, *Rhopalodia*, *Nitzschia*, *Surirella*.etc. All these taxa are being reported for the first time from the given area.

## Effect of environmental factors on growth and biochemical composition of *Chaetoceros curvisetus* for use in mariculture

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### ABSTRACT

*Chaetoceros curvisetus*, a marine diatom isolated from Gopalpur Sea was cultured in a chemically defined medium at different temperatures (20, 25 and 30°C), different concentrations of  $\text{NaNO}_3$  (0.3, 0.75, 1.5, 3.0 and 6.0 mM) and different concentrations of  $\text{Na}_2\text{HPO}_4$  (0.5, 1, 5 and 20  $\text{mg PO}_4 \text{l}^{-1}$ ). Maximum biomass in terms of cellular density was observed at 20°C. The specific growth rate and generation time of the organism decreased with increased in temperature. The organism showed maximum growth responses at 5  $\text{mg PO}_4 \text{l}^{-1}$  and 3 mM  $\text{NaNO}_3$ . The specific growth rate and generation time obtained are 0.028 and 34.2 hrs, at 5  $\text{mg PO}_4 \text{l}^{-1}$  and 0.024 and 42.5 hrs at 3 mM  $\text{NaNO}_3$  concentration respectively. The biochemical composition of the organism also changed with response to varied nitrate and phosphate concentrations. The results are discussed with respect to the differential response of *Chaetoceros curvisetus* to different environmental factors.

## Diversity of Algal communities in Umiew River, Meghalaya

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### ABSTRACT

The present paper deals with the diversity of algae in Umiew River, an important river in Meghalaya in relation to physico-chemical characters. The physico-chemical parameters of the two selected stations of the river (running source and dammed reservoir) showed marked variations in width, depth, transparency, current velocity, dissolved oxygen and in nutrient contents like nitrate, phosphorus, calcium and magnesium. Totally, 117 species were recorded from station-1 whereas only 46 species were recorded from station 2. Species diversity value was higher in station-1 than station-2 with 0.51 and 0.37 respectively. Bacillariophyceae showed the highest species diversity in both the stations. Relative abundance of different classes in station-1 was 48% (Chlorophyceae), 24% (Bacillariophyceae), 21% (Cyanophyceae) and 7% (Euglenophyceae), whereas in station-2, 49% were (Bacillariophyceae), 31% (Chlorophyceae), 19% (Cyanophyceae) and 1% (Euglenophyceae). *Navicula* with 13 and 7 species from Bacillariophyceae and *Scenedesmus* with 11 and 4 species from Chlorophyceae had been observed as the most dominant genera in station 1 and 2 respectively. 15 species of Desmids were recorded from station-1 whereas only two species were recorded from station-2. High diversity in station-1 compared to station-2 could be attributed mainly to its changes in physical characteristics of the river as well as chemical characteristics due to lime quarrying.

# Phytoplankton abundance and Physico-chemical parameters of Mangrul Dam, Dist - Jalgaon, Maharashtra

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## ABSTRACT

Phytoplankton abundance and physico-chemical parameters of Mangrul dam (21° 19' 45" North latitude and 72° 2' 15" East longitude) Tal.- Raver, Dist.- Jalgaon, Maharashtra was investigated between November 2007 and October 2008. Two sampling stations were selected on either side of a small hill in a dam. The highest phytoplankton density was observed in June at SI station and in March at SII station while the minimum phytoplanktons were observed in October at both the stations. Phytoplankton assemblages were dominated by diatoms followed by blue-greens, green algae, euglenoids and dinoflagellates. The dominant genera were *Pinnularia*, *Navicula*, *Cymbella*, *Gomphonema*, *Fragilaria*, *Chroococcus*, *Merismopedia*, *Oscillatoria*, *Nostoc*, *Anabaena*, *Phormidium*, *Scenedesmus*, *Ankistrodesmus*, *Kirchneriella*, *Cosmarium*, *Chlorella*, *Tetraedron*, *Spirogyra*, *Euglena*, *Phacus* and *Peridinium*.

# Antibacterial and antifungal activity of Cyanobacteria

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## ABSTRACT

Antimicrobial activity of some member of cyanobacteria from paddy-fields in the Telangana region of Andhra Pradesh was studied. Soil samples were collected from paddy fields of 10 districts and certain members of cyanobacteria were isolated and identified. Supernatants, methanolic extracts from biomass of 101 strains of cyanobacteria were isolated and screened against four strains of bacteria (*Staphylococcus aureus*, *Staphylococcus epidermidis*, *Staphylococcus haemolyticus* and *Escherichia coli*) and 4 strains of fungi (*Candida albicans*, *Candida guilliermondii*, *Aspergillus niger* and *Aspergillus fumigatus*). Methanolic extracts and culture supernatants of 16 strains of cyanobacteria exhibited significant microbial activity. According to the results it is concluded that two members of cyanobacteria, *Stigonema ocellatum* and *Lingbya birgei* have shown more potential for producing antimicrobial activity (antibacterial and antifungal) when compared to the other strains under investigation.

## Diversity of blue green algae in paddy fields of the Western Maharashtra

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### ABSTRACT

79 species of Cyanophyceae have been identified from the paddy fields of the Western Maharashtra of which 30 and 49 species belong to non heterocystous and heterocystous category, respectively. The morphological types observed are unicellular, colonial, trichomatous, filamentous simple, false branched, truly branched and parenchymatous. The family Nostocaceae is represented by maximum number of genera and species. The genera *Scytonema* and *Oscillatoria* were represented by maximum number of species.

## **Fresh water diatoms from Eastern Nepal - I**

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### **ABSTRACT**

The paper enumerates 36 taxa representing 9 genera of diatoms found growing on 31 different freshwater habitats in the Terai, Mountain and Himalaya regions of Eastern Nepal. Twenty taxa are reported for the first time from Nepal.

## **Fresh water algae from Chandra Lake of District Lahaul and Spiti, Himachal Pradesh, India**

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### **ABSTRACT**

The present paper reports 19 fresh water taxa grouped under 14 genera from Chandra Lake of District Lahaul and Spiti, Himachal Pradesh. Out of these 19 taxa, 7 taxa belong to the Class Chlorophyceae, 1 taxon belongs to Class Cyanophyceae and 11 taxa belong to Class Bacillariophyceae. In the present work following genera have been described (The numbers of taxa of each genus is given in parenthesis). *Chroococcus* Naeg (1), *Gloeocystis* Kuetz. (1), *Stigeoclonium* Kuetz. (1), *Oedogonium* Link (1), *Schizomeris* Kuetz. (1), *Zygnema* Ag. (1), *Cosmarium* Corda ex Ralf. (2), *Fragilaria* Lyngb. (2), *Cocconies* Ehr. (1), *Calonies* Cleve (2), *Navicula* Bory (2), *Gomphonema* Ag. (1), *Amphora* Ehr. (1), *Cymbella* Ag. (2). Since all these forms are being reported for the first time from the Chandra Lake of district Lahaul and Spiti in the Himachal Pradesh, they constitute new records for the area.

# Freshwater Green Algal Flora from Parsem (Pernem) Goa, India

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## ABSTRACT

96 species of 42 genera representing 18 families of 10 orders of Chlorophyta were collected from Parsem, Pernem taluka of Goa. Collections were made from habitats like paddy fields, temple pond, temporarily formed puddles and streams. The genera recorded exclusively in Mahadev temple pond were *Chlorogonium*, *Coleochaetae*, *Chlamydomonas*, *Volvulina*, *Eudorina*, *Chaetophora*, *Pandorina*, *Pediastrum*, *Hormidium*, *Gloeocystis*, *Apiocystis*, *Phacotus*, *Chlorosarcinopsis* and *Desmidium*. The genera found exclusively in paddy fields are *Uronema*, *Sirogonium*, *Hyalotheca*, *Arthrodesmus*, *Characium*, *Zygnema*, *Chlorella* and *Oocystis*. *Draparnaldiopsis* and *Spirotaenia* were found in stream. The present work is aimed at the documentation of freshwater algae of Goa.