

RESULT AND DISCUSSION

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Present work was carried out keeping in view the following objectives

1. **Culture, cultivation and identification of cyanobacterial forms of paddy field soils.**
2. **Isolation and purification of some cyanobacterial forms.**
3. **Biochemical characterization of forms in axenic cultures.**

In all 50 soil samples were collected from 10 different localities from Western hilly parts of Satara district. The selection of these 10 localities was based on the criteria that these localities have the paddy as the sole crop in “Kharip season.” As the western part of Satara district comprises offshoots of Sahyadri ranges the terrains constitute smaller paddy growing plots. The basic composition of soil is red lateritic and hence the soil within the plots also showed the similar composition. The culturing and isolation experiments showed following composition of cyanobacteria (See the list below) from the soil. The soil cultures raised from different localities showed abundance of cyanobacterial species.

Physical analysis of the soil samples did not reveal much variation in the two parameters viz. pH and electrical conductivity. All the soil samples showed pH range between 7.1 - 7.5, thus showing slightly alkaline nature. The EC however ranged between 20.9 - 83.75 $\mu\text{Moh cm}^{-1}$. As compared to analysis of soils done by the earlier workers from other parts of Indian subcontinent the soil samples under investigation showed short range of pH and lower conductivity. The pH of soils from northern India ranges between acidic to alkaline range while the range of conductivity is lower as compared to that of north Indian paddy field soil.

The overall list of the species isolated from the soils during the study is given below:

I. Order : Chroococcales

Family: Chroococcaceae

Microcystis aeruginosa Kutz

Chroococcus minutus (Kutz.)Nag.

Chroococcus pallidus Nag.

Gloeocapsa gelatinosa Kutz.

Lyngbya majuscula Harvey ex Gomont

Family: Nostocaceae

Cylindrospermum majus Kutzing ex Born. Et Flah

Cylindrospermum muscicola Kutzing ex Born. Et Flah

Nostoc punctiforme (Kutz.) Hariot

Nostoc rivulare Kutzing ex Born. et Flah.

Nostoc calcicola Brebisson ex Born. et Flah.

Nostoc muscorum Ag. ex Born. et Flah.

Nostoc commune Vaucher ex Born. et Flah.

Nostoc microscopicum Carm. ex Born. et Flah

Nostoc parmelioides Kutz. ex Born. et Flah.

Anabaena spiroides Klebahn

Anabaena oryzae Fritsch

Anabaena fertilissima Rao, C. B.

Anabaena vaginicola Fritsch et Rich

Anabaena aphanizomenoides Forti.

Anabaena doliolum Bharadwaja

Anabaena torulosa (Carm.) Lagerh. Ex Born. et Flah.

Aulosira fertilissima Ghose.

Family: Scytonemataceae

Plectonema radiosum (Schiederm.) Gomont.

Plectonema notatum Schmidle

Scytonema cincinnatum Thuret ex Born. et Flah

Scytonema simplex Bhardwaja

Scytonema javanicum (Kutz.) Bornet et Born. Et Flah.

Scytonema amplum West et west

Tolypothrix fragilis (Gardner) Geitler

Family: Rivulariaceae

Calothrix fusca (Kutz.) Bornet et Flah.

Calothrix braunii (A. Br.) Bornet et Flah.

Calothrix membranacea Schmidle

Gloeotrichia indica Schmidle

Gloeotrichia intermedia (Lemm.) Geitler

Table No. : 7 Species distribution of each locality under investigation

Sr. No.	Locality	No. of genera	No. of species
1	Bamnoli	19	29
2	Yewateshwar	14	24
3	Kas	14	20
4	Petri	12	20
5	Ambeghar	16	26
6	Shirsinge	13	21
7	Falani	12	20
8	Pateghar	19	27
9	Thoseghar	17	23
10	Parali	18	25

From the 10 localities screened for cyanobacterial flora of paddy field. Soil from Bamnoli showed maximum species (29) followed by Thoseghar (27), Kas (26), Pateghar (25), Ambeghar (24), Parali (23), Petri (21) and Falani, Yewateshwar, Shirsinge (20) each. The abundance of cyanobacterial isolates in Bamnoli may be because of the higher pH and moderate EC while the soils of Ambeghar also show higher pH but lower EC. The localities Falani, Yewateshwar and Shirsinge showed lower number of species. Of the 10 localities from where the soils were collected for these cultural studies Thoseghar and Kas were located at higher altitude while Pateghar, Parali and Bamnoli are located at the foothills of Sahyadri ranges.

From the above cyanobacterial isolates following 13 forms were isolated in axenic forms by different methods described by earlier workers.

content between 200.8 $\mu\text{g ml}^{-1}$ to 2123.6 $\mu\text{g ml}^{-1}$. The range of *Nostoc* was 50.8 $\mu\text{g ml}^{-1}$ to 101.4 $\mu\text{g ml}^{-1}$; *Anabaena* was 36.4 $\mu\text{g ml}^{-1}$ to 102.9 $\mu\text{g ml}^{-1}$.

Anabaena torulosa showed maximum carotenoid content (84 $\mu\text{g ml}^{-1}$), while *Nostoc commune* had least carotenoid content (1.04 $\mu\text{g ml}^{-1}$). As compared to species of *Nostoc* and *Oscillatoria* the species of *Anabaena* isolated showed maximum variation in their carotenoid content.

The analysis of carbohydrate of 13 species under investigation showed a range between 10.5 to 89 $\mu\text{g ml}^{-1}$ of glucose. *Nostoc commune* showed maximum glucose content (89 $\mu\text{g ml}^{-1}$) while *Oscillatoria obscura* had least glucose content i. e. (10.5 $\mu\text{g ml}^{-1}$).

It was observed that 3 species of *Oscillatoria* had glucose content between 10.5 $\mu\text{g ml}^{-1}$ to 11 $\mu\text{g ml}^{-1}$. Three species of *Nostoc* had a range of 52 $\mu\text{g ml}^{-1}$ to 89 $\mu\text{g ml}^{-1}$ of glucose while four species of *Anabaena* showed a glucose range between 22 $\mu\text{g ml}^{-1}$ to 48 $\mu\text{g ml}^{-1}$.