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Paddy field algal diversity of Sindewahi taluka, district Chandrapur (M.S.) India.

[1*]Wadhave, NS and [2]Pandao, SP

[1]Assistant Professor and Head Department of Botany, N.S.Science and Arts College, Bhadrawati, Dist. Chandrapur, MS (India)
[2]Assistant Professor, Head Department of Botany, Arts, Commerce and Science College, Tukum, Chandrapur, MS (India)
Email: nswadhawe@gmail.com

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ABSTRACT
The total area of Sindewahi is 792.06 sq.km and rainfall of sindewahi taluka is 1414 mm. Algal sample was collected from site of Sindewahi taluka are Kihhi, Navargaon, Sindewahi, Palasgaon, and Pawanpur. From the present studies 73 algal taxa could be identified, these taxa belongs to 40 Cynophyta, 20 to Chlorophyta, 5 to Euglenophyta and 8 to Bacillariophyta.

Keywords: Paddy field, Soil, Cynophyta Chlorophyta, Bacillariophyta.

INTRODUCTION

Paddy is cultivated in an area over 80 million acres in India. It is the staple food of Indian particularly south Indian people. Yield of the paddy crop is mainly depending on the soil. Soil comprised of living and non-living parts. The non-living part composed of inorganic material and organic matter. The living part has microfauna and microflora. The microflora comprised of algae, fungi, bacteria and viruses. Many fungi and bacteria are best decomposer.

Yield trends from long terms continues cropping experiments conducted in the Philipines, India, Indonesia, Thailand and Bangladesh indicate that, even with the best available cultivars and scientific management, rice yeld, has declined over time since the early 1980's [1,2,3].

Farm monitoring data from the Philipines showed that average wet season rice yields where 4.2 tons / hector in central Luzon and 47 tons/ hector in Laguna in the early 1980's. since then, it's have gradually decline to such an extent that they were 0.5 tons/hector lower in 1990 in both dolmens. In Ludhiyana, Panjab, India, where an intensive rice wheat double- crop system is being practice, average rice yield attained by 1980 was 4.0 tons/hector and has remain relatively constant, there after[2] . Such declining or stagnant yields have raised concerns about the long term sustainability of intensive rice production system.

Most of the world's rice production is in Asia where, for Centuries, farmers have practice a cultural system that insure modest but stable yields, yet maintained a degree of nitrogen fertility in the soil. Additions of nitrogen through BNF balance the losses of nitrogen through crop harvest and other mechanisms, creating a dynamic equilibrium [4]. This equilibrium was disturb by the need to increase rice production and high yielding rice verities (HYVs) which can use additional Nitrogen in comparison with tradition verities, the HYVs needs larger amounts of nitrogen from soil.

The role played by the micro-organisms is of paramount importance as they bring about chemical and physical changes In the soil nature by various reactions. The first soil algae into an auxenic culture from a soil collection. The chemical, physical and physiological changes brought about by various microbial activites, which effect on the structure and fertility of soil [5]. Nostoc and Anabaena were the commonest nitrogen fixing algae in Swedish soils and had the greatest pH tolerance. The present investigation was, therefore, undertaken for further studies on different relating to paddy and paddy field algae of Sindewahi taluka[6]

METHODOLOGY

Experiments were conducted on five places of Sindewahi Taluka. The soil samples and algal sample collected from various soil of Sindewahi taluka the selected site were Kinhi, Navargaon, Sindewahi, Palasgaon Pawanpur. Algal samples were collected with the help spatula, scalpel and forceps in rainy season. From the soil samples, 1 gm. Of soil was used for each culturing For the culturing five different culture media were employed.

The culturing vessels with culture media were sterilized in an autoclave at 2 lbs. pressure for 20 minutes prior of inoculation. From the culturing, a sub-cultures were prepared and from the sub-culturing, a few cells were drawn into a fine pipette, washed in sterilized water and transfer to media and give a unialgal cultures for the identification of algae.

OBSERVATION AND DISCUSSION

Results of algal studies showed that, from the 5 place of Sindewahi tahsil, 73 algal taxa could be identified from the studies, Table 1, these taxa belonged. 40 to Cyanophyta, 20 to Chlorphyta, 05 to Euglenophyta, and 08 to Bacillariophyta.

The **Cyanophyta** genera were *Microcystis protocystis, Microcystis robusta, Chroococcus limneticus, Chroococcus schizodermaticus, Chroococcus Spelaeus, Aphanocapsa biformis, Aphanothece naegeli, Spirulina Subtilissima Oscillatoria Amonea, Oscillatoria salina, Oscillatoria sancta, Phormidium feveolarum, Phormidium jelnkelianum, Phormidium uncinatum, Lyngbya alloreigi Lyngbya aerugneocorrulea, Lyngbya corticicola, Lyngbya rivunarianum, Hydrocoleus subincrustaceus, Cylinderospermum indicum, Cylindrospermum musicola, Nostoc calcicola Nostoc Commune, Nostoc linckia, Nostoc microscopium, Nostoc paludasum, Anabaena laxa, Anabaena bharadwajae, Anabaena variabilis, Alluosira fertilissima, Aluosira laxa, Scytonematopsis woronichinii, Scytonema fremyii, Tolypothrix bouteillei, Microchaete calothrichoides, Calothrix brevissima var.moniliforme, Calothrix epiphytica, Gloeotrichia indica, Haplosiphon intricatus, Stiogonema hormoides.*

The **Chlorophyta** genera were *Chalamydommonas globosa, Cartaria klebsii, Chlorococcum humicolum, Chlorella Vulgaris Oocystis eleptica, Oocystis Lacustris, Ankistrodesumus falcatus, Scenedesmus bijugatus, Scenedesmus dimorphus, Ulothrix Oscillarina, Protococcus viridis, Chaetophora pisiformis, Oedogonium globosum, Spirogyara Chakiense, Spirogyra inflate, Spirogyra irregularis, Spirogyra submaximal, Pithophora varia, Closterium acerosum, Closterium acutum.*

The **Euglenophyta** genera were *Euglena maharastrensis, Euglena multiformis, Phacus acuminatus, Phacus torgus, Trachelomonas obllonga.*

The **Bacillariophyta** genera were *synedra affinis, Achnanthes delicatula, Achnanthes microcephala, Navicula major, Navicula lanceolata, Pinnularia microstauron, Cymbella austriace, Nitzschia dissipata.*

Table No.1 Soil Sample Collection Site

Navagraon	Soil Sample B
Sindewahi	Soil Sample C
Palasgaon	Soil Sample D
Pawanpur	Soil Sample E

Table No. II showing the list of, Cyanophycean, Chlorophycean, Euglenophycean, and Bacillariophycean Algae present in the paddy field of Sindewahi Taluka

Sr. No.	Name of Algae	Place of Occurrence				
		Kinhi Site 1	Navargaon Site 2	Sindewahi Site 3	Palasgaon Site 4	Pawanpur Site 5
	CYANOPHYTA					
1	*Microcystis protocystis*	+	-	+	+	-
2	*Microcystis robusta*	+	-	-	+	+
3	*Chroococcus limneticus*	-	+	+	+	+
4	*Chroococcus schizodermaticus*	+	-	-	-	+
5	*Chroococcus Spelaeus*	+	+	+	+	+
6	*Aphanocapsa biformis*	+	-	-	+	+
7	*Aphanothece naegeli*	+	-	+	-	+
8	*Spirulina Subtilissima*	-	+	-	+	-
9	*Oscillatoria Amonea*	+	-	+	+	-
10	*Oscillatoria salina*	-	+	-	+	-
11	*Oscillatoria sancta*	+	-	+	+	-
12	*Phormidium feveolarum*	+	-	-	+	+
13	*Phormidium jelnkelianum*	-	+	+	+	+
14	*Phormidium uncinatum*	+	-	-	-	+
15	*Lyngbya alloreigi*	+	+	+	+	+
16	*Lyngbya aerugneocorrulea*	+	-	-	+	+
17	*Lyngbya corticicola*	+	-	+	-	+
18	*Lyngbya rivunarianum*	-	+	-	+	-
19	*Hydrocoleus subincrustaceus*	+	-	+	+	-
20	*Cylinderospermum indicum*	+	-	-	+	+
21	*Cylindrospermum musicola*	-	+	+	+	+
22	*Nostoc calcicola*	+	-	-	-	+
23	*Nostoc Commune*	+	+	+	+	+
24	*Nostoc linckia*	+	-	-	+	+
25	*Nostoc microscopium*	+	-	+	-	+

26	*Nostoc paludasum*	-	+	-	+	-
27	*Anabaena laxa*	+	-	+	+	-
28	*Anabaena bharadwajae*	+	-	-	+	+
29	*Anabaena variabilis*	-	+	+	+	+
30	*Alluosira fertilissima*	+	-	-	-	+
31	*Aluosira laxa*	+	+	+	+	+
32	*Scytonematopsis woronichinii*	+	-	-	+	+
33	*Scytonema fremyii*	+	-	+	-	+
34	*Tolypothrix bouteillei*	-	+	-	+	-
35	*Microchaete calothrichoides*	+	+	-	+	-
36	*Calothrix brevissima var.moniliforme*	+	-	-	-	+
37	*Calothrix epiphytica*	+	-	-	+	+
38	*Gloeotrichia indica*	+	+	+	+	+
39	*Haplosiphon intricatus*	+	-	+	+	-
40	*Stiogonema hormoides*	+	-	-	-	+
Sr. No.	**Name of Alga**	**Place of Occurrence**				
		Kinhi	**Navargaon**	**Sindewahi**	**Palasgaon**	**Pawanpur**
	CHLOROPHYTA					
1	*Chalamydommonas globosa*	+	-	+	+	-
2	*Cartaria klebsii*	+	-	-	+	+
3	*Chlorococcum humicolum*	-	+	+	+	+
4	*Chlorella Vulgaris*	+	-	-	-	+
5	*Oocystis eleptica*	+	+	+	+	+
6	*Oocystis Lacustris*	+	-	-	+	+
7	*Ankistrodesumus falcatus*	+	-	+	-	+
8	*Scenedesmus bijugatus*	-	+	-	+	-
9	*Scenedesmus dimorphus*	+	-	+	+	-
10	*Ulothrix Oscillarina*	+	-	-	+	+
11	*Protococcus viridis*	-	+	+	+	+
12	*Chaetophora pisiformis*	+	-	-	-	+
13	*Oedogonium globosum*	+	+	+	+	+
14	*Spirogyara Chakiense*	+	-	-	+	+
15	*Spirogyra inflate*	+	-	-	+	+
16	*Spirogyra irregularis*	+	-	+	-	+
17	*Spirogyra submaximal*	-	+	-	+	-
18	*Pithophora varia*	+	-	+	+	-
19	*Closterium acerosum*	+	-	-	+	+

20	*Closterium acutum*	-	+	-	+	-
Sr. No.	**Name of Alga**	**Place of Occurrence**				
		Kinhi	**Navargaon**	**Sindewahi**	**Palasgaon**	**Pawanpur**
	EUGLENOPHYTA					
1	*Euglena maharastrensis*	+	-	+	+	-
2	*Euglena multiformis*	+	-	-	+	+
3	*Phacus acuminatus*	-	+	+	+	+
4	*Phacus torgus*	+	-	+	-	+
5	*Trachelomonas obllonga*	-	+	-	+	-
Sr. No.	**Name of Algae**	**Place of Occurrence**				
		Kinhi	**Navargaon**	**Sindewahi**	**Palasgaon**	**Pawanpur**
	BACILLARIOPHYTA					
1	*Synedra affinis*	+	+	+	+	+
2	*Achnanthes delicatula*	+	-	-	+	+
3	*Achnanthes microcephala*	+	-	+	-	+
4	*Navicula major*	-	+	-	+	-
5	*Navicula lanceolata*	+	-	+	+	-
6	*Pinnularia microstauron*	+	-	-	+	+
7	*Cymbella austriace*					
8	*Nitzschia dissipata*	+	+	-	+	-

Table III Results of Soil Analysis of Sindewahi Taluka

Parameters	**Soil A**	**Soil B**	**Soil C**	**Soil D**	**Soil E**
Colour	**Blackish brown**	**Blackish brown**	**Black**	**Blackish brown**	**Black**
pH	**7.8**	**7.4**	**7.5**	**7.7**	**7.7**
EC mS/cm	**0.7**	**0.3**	**0.3**	**0.5**	**0.4**
Nitrogen(Kg/h)	**127**	**130**	**114**	**133**	**114**
Phosphorus(Kg/h)	**12.6**	**11.2**	**11.1**	**10.1**	**10.8**
Potassium (Kg/h)	**272**	**268**	**270**	**290**	**270**

DISCUSSION AND CONCLUSION

The algal flora of a particular region or crop fields depends on the climate, of the region, environment of the field and nature of cultivation. The interaction between the algal flora and the crop plant in a crop field. Paddy have much important effects by the algal flora of the paddy field.

Paddy shows a variable environment for the growth of different types of algae at different seasons, hence, collection of algae and cultures of algae of different seasons were made to finalise the list of algae present in the paddy fields of Sindewahi Taluka. Five different culture medias were used to avoid elimination of an alga from the list due to culture condition.

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flora of the paddy field. Paddy shows a variable environment for the growth of different types of algae at different seasons. Hence, collection of algae and cultures of algae of different seasons were made to finalize the list of algae present in the paddy fields of Sindewahi taluka. Five different culture medium were used to avoid elimination of an alga from the list to culture condition.

In the present investigation site 1 has 31 cynophycean algae, site no. 4 has 30 algae, site no. 5 has 28 agale, site no 3 has 19 algae, and site 2 has 15 cynophycean algae. Site no.1 shows dominant Cynophycean algae whereas site no. 2 shows less no. of algae. The soil sample analysis shows more pH at site no.1 hence more cynophycean algae occur.

Site no.4 shows more Chlorophycean algae whereas site no.2 shows less chlorophycean algae. Site 4 shows more Euglenophyta and site no. 2 shows less Euglenophyta. Site no.1 shows more bacillariophyte whereas site no. 3 shows less bacillariphyte. While studying of fertilizer on the subterranean algal flora of paddy fields, she obtained as many as 30 species of Myxophyceae in the cultures. Later, Shtina (1966)[7] studed the algal flora or 24 soil samples of algae, out of which 81 belong to Myxophyceae. The present observation of algae of Sindewahi paddy field also stand with the result obtained by her. while working extensully on the paddy fields of Uttar Pradesh, observed preponderance of the Mixophyceae algae over the others. He obtained a total of 74 species, both in culture and from natural collections. Majority of algae reported by him were found in present investigating also.

Soil analysis of the respective fields were made to correlate the presence of an alga in a particular type of soil, Table II. The soil analysis showed a pH range from 7.4 to 7.8. the pH was alkaline so Cynophycean algae are more dominant in the present investigation.

In all 73 taxa from paddy fields from Sindewahi Taluka were isolated and identified with the help of Nidham and Nidham Literature and T. Deshikachari, of these 40 to Cyanophyta, 20 to Chlorophyta, 5 to Euglenophyta and 8 to Bacillariophyta

Conflicts of interest: The authors stated that no conflicts of interest.

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