



Diversity of Soil Algae in the Methi Field of Aurangabad (M.s.).

KEYWORDS

Algal diversity, soil and methi field.

MILIND J. JADHAV

Department of Botany, Sir sayyed College, Roshan Gate, Aurangabad – 431001 (M.S.) INDIA

BALASAHEB S. NIMBHORE

Department of Botany, Sir sayyed College, Roshan Gate, Aurangabad – 431001 (M.S.) INDIA

ABSTRACT Algae constitute an important group of soil microflora. They play a crucial role in fertility of soil. Present research work deals with the study of algal diversity of methi (*Trigonella foenum-graecum* L.) field of Aurangabad tehsil area. Algal samples which are grown on moist soil surface of wheat field were collected at regular intervals from October 2013 to December 2013. Bold's basal medium was also used to culture algae from soil of methi field. Algal samples were observed thoroughly under research microscope and identified with the help of standard literature on algae. A total of 41 species under 21 genera belonged to Chlorophyceae, Xanthophyceae, Bacillariophyceae and Cyanophyceae were identified and recorded. Cyanophycean algae were found dominant followed by Chlorophyceae, Bacillariophyceae and Xanthophyceae. Algal form Aphanothece, Myxosarcina, Oscillatoria, Phormidium, Microcoleus, Plectonema, Scytonema, Gloeocystis, Chlorella, Chlorococcum, Nitzschia and Pinnularia were found dominant. Physicochemical analysis of methi field soil was performed by selecting certain physicochemical parameters such as pH, electrical Conductivity, organic carbon, available nitrogen, available phosphorus, and available potassium to understand fertility status of soil. The soil of methi field is moderate alkaline with moderate electrical conductivity. Carbon, nitrogen and phosphorus is found in low amount whereas potassium is high.

INTRODUCTION

Algae are one of the important components of soil microflora. Soil algae, generally occur on or in soil and grow in abundance and found in diverse form. Soil, algal flora have great ecological importance as it protect soil from wind erosion and also act as an absorptive organ for water. Soil algae play a significant role in soil fertility. Cyanophyceae algae especially heterocystous algal forms fixes atmospheric nitrogen and enhances fertility of soil. Almost all species of soil algae helps in retention of soil moisture and provides germination grounds for seeds of flowering plants. Soil algae have attracted the attention of phycologists for past few decades (meeting 1981, Bongale 1985, Prasad 2005, Auti and Pingle 2007, Jadhav 2010). Algal flora of paddey, banana, wheat and sugarcane fields has been well documented (Bongale and Bharati 1980, Santra 1983, Chaporkar and Gangawane 1984, Kolte and Goyal 1985, Kottawar and Pachpande 1986, Nayak et. al. 2001, Patil and Chaugule 2004, Prasad 2005, Auti and Pingle 2006). Methi (*Trigonella foenum-graecum* L.) is one of the important leaf vegetable crops of India. It is also cultivated on large scale in Marthwada region of Maharashtra. Review of literature reveals that very rare attention has been paid towards algal diversity of methi field. Therefore, it has been decided to work systematically on algal diversity of methi field soil.

MATERIALS AND METHODS

A Methi field from Aurangabad tehsil area has been selected for the collection of algal and soil samples. Algal samples which are grown on moist soil surface of methi field were collected at regular intervals from October 2013 to December 2013. Algal samples were collected in sterilized collection bottles. Collected algal samples were brought to the laboratory, for observation and identification. The sun dried soil samples collected from same methi field were examined for their algal components by petriplate culture method. 1 gm of pulverized soil poured and spread uniformly into the petriplates containing agarized Bold's basal medium (Bold 1942). Liquid nutrient medium was poured

into the plates at the time of keeping those for incubation and frequently supplemented with the same. The petriplates were incubated under the tubelights having 1000 to 1500 lux capacity in the algal culture chamber. Petriplates were checked for the growth of algal colonies. After sufficient growth, algal colonies were picked up for identification.

Algal samples were observed under research microscope and identified with the help of standard literature on algae. In order to know the fertility status of selected methi field, analysis of soil was performed for certain selected physicochemical parameters such as pH, electrical conductivity, organic carbon, available nitrogen, available phosphorus and available potassium (Trivedi et. al. 1998).

RESULTS AND DISCUSSION

A total of 41 species under 21 genera of algae belonged to Chlorophyceae, Xanthophyceae, Bacillariophyceae and Cyanophyceae were identified and recorded from collected well cultured algal samples of methi field of Aurangabad tehsil area. Of these, 6 species under 5 genera belonged to Chlorophyceae, 1 species under 1 genus belonged to Xanthophyceae, 3 species under 2 genera belonged to Bacillariophyceae and 31 species under 13 genera belonged to Cyanophyceae (Table 1). In methi field during present investigation Cyanophycean algae were found dominant. Bongale and Bharati (1980), Kottawar and Pachpande (1986), Auti and Pingle (2006) and Jadhav (2010) reported dominance of Cyanophycean algae from soils of different crop fields. Chaporkar and Gangawane (1984) recorded species of Phormidium, Nostoc, Anabaena, Scytonema and Fischerella from sorghum, wheat, sugarcane and cotton fields of Marthwada region of Maharashtra. During present research work Aphanothece, Myxosarcina, Oscillatoria, Phormidium, Microcoleus, Plectonema and Scytonema were dominant. Similar kind of observations were by Prasad (2005) and Jadhav (2010).

Chlorophycean algae Gloeocystis, Chlorella and Chloro-

cocum were found dominant. *Trebouxia humicola* and *selenastrum westii* also reported from methi field. Prasad (2005) recorded *Chlorella* and *Chlorococcum* while studying algal flora wheat field. One Xanthophyceae alga *Protosiphon botryoides* was found in methi field during present study. Bacillariophycean algae *Nitzschia Palea*, *Pinnularia interrupta*. Var. minor and *Pinnularia sp.* were recorded. Bongale (1985) recorded 47 taxa of diatoms belonging to the genera *Fragilaria*, *Synedra*, *Eunotia*, *Cocconeis*, *Achnanthes*, *Pleurosigma*, *Navicula*, *Pinnularia*, *Stauroneis*, *cymbella*, *Hantzschia*, *Nitzschia* and *Suriella* from cultivated soils of Karnataka.

Physicochemical analysis of soil reveals fertility status of soil. The overall fertility status of selected methi field soil was moderate alkali (pH 8.09), moderate electrical conductivity (0.57 M mhos/cm), low organic carbon (0.390%), low available nitrogen (210.14 kg/hectare), low available phosphorous (18.172 kg/hectare) and High available potassium (310.12 kg/hectare) (Table 2). Moderate alkaline soil favours growth of algae. Optimum electrical conductivity Supports growth of algae. Soil rich in nitrogen, Phosphorous and potassium harbours algal flora. In methi field soil available nitrogen and phosphorous is low but potassium is high.

CONCLUSION

A total of 41 species under 21 genera of algae were recorded from soil of methi field. Cyanophycean algae are found dominant than Chlorophyceae, Bacillariophyceae and Xanthophyceae. Unicellular, colonial and filamentous algae were recorded. Filamentous algae were found abundant in a methi field. Algal flora of methi field is rich and is found in diverse form. Soil is moderate alkaline with moderate electrical Conductivity. carbon, nitrogen and phosphorous is found in low amount whereas Potassium is high.

Table 1 : Algae of Methi field soil.

Chlorophyceae
<i>Gloeocystis gigas</i> , <i>Gloeocystis major</i> , <i>Chlorococcum humicola</i> , <i>Trebouxia humicola</i> , <i>Chlorella vulgaris</i> , <i>Selenastrum westii</i> .
Xanthophyceae
<i>Protosiphon botryoides</i>
Bacillariophyceae
<i>Nitzschia Palea</i> , <i>Pinnularia interrupta</i> var. <i>minor</i> , <i>Pinnularia sp.</i>
Cyanophyceae
<i>Chroococcus turgidus</i> , <i>Gloethece palea</i> , <i>Aphanothece sixicola</i> , <i>Aphanothece nidulans</i> , <i>Synechocystis aqualis</i> , <i>Myxosarcina burmensis</i> , <i>Spirulina laxissima</i> , <i>Spirulina major</i> , <i>Oscillatoria acuta</i> , <i>Oscillatoria acuminata</i> , <i>Oscillatoria animalis</i> , <i>Oscillatoria obscura</i> , <i>Oscillatoria subbrevis</i> , <i>Phormidium abronema</i> , <i>Phormidium ambiguum</i> , <i>Phormidium bohneri</i> , <i>Phormidium jadinianum</i> , <i>Phormidium jenkelianum</i> , <i>Phormidium molle</i> , <i>Phormidium usterii</i> , <i>Lyngbya major</i> , <i>Microcoleus acutusimus</i> , <i>Microcoleus lacustris</i> , <i>Microcoleus Sociatus</i> , <i>Microcoleus subtorulosus</i> , <i>Plectonema gracilimum</i> , <i>Plectonema nostocorum</i> , <i>Plectonema radiosum</i> , <i>Scytonema bohneri</i> , <i>Scytonema schmidii</i> , <i>Stigonema hormoides</i> .

Table 2 :- Physicochemical analysis of methi field soil.

Sr. No.	Parameter	Observation	Fertility status
1	pH	8.09	Moderate alkali
2	Electrical Conductivity (Mili mhos/centimeter)	0.57	Moderate
3	Organic Carbon (%)	0.390	Low
4	Available Nitrogen (Kg/hectare)	210.14	Low
5	Available Phosphorous (Kg/Hectare)	18.172	Low
6	Available Potassium (Kg/hectare)	310.12	High

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