

OBSERVATIONS

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SHIVAJI UNIVERSITY, KOLHAPUR.

Observations

The inoculated soil samples from different localities showed growth of cyanobacteria after 15 - 20 days. Initially the growth was bit slower but after 25 - 30 days the cultures showed rapid growth. Some forms especially those belonging to order Nostocales appeared at beginning while the Oscillatoriales, Stigonematales and Chroococcales showed slower growth and appeared at later phase of the culture. After three to four months most of the organisms had appeared in culture and it was possible to observe them for the identification with the help of standard literature. The cultures were maintained for about 1 year to monitor the growth of slow growing forms. As the forms were appearing in the cultures they were identified up to species level studying their morphology as well as cultural characters.

Before inoculation the pH and EC of all soil samples collected from various localities was observed using Systronic digital pH and conductivity bridge. The results are shown in Table No. 1.

Table No. : 1 pH and EC of soil samples collected from study area

Sr. No.	Locality	pH	EC $\mu\text{Moh cm}^{-1}$
1	Bamnoli	7.5	53.53
2	Yewateshwar	7.3	83.75
3	Kas	7.2	25.55
4	Petri	7.1	24.81
5	Ambeghar	7.5	20.90
6	Shirsinge	7.5	42.42
7	Falani	7.2	50.08
8	Pateghar	7.1	23.25
9	Thoseghar	7.3	42.08
10	Parali	7.2	33.05

Locality wise enumeration of organisms during the observations has been given below.

Table No. : 2 Locality wise list of cyanobacterial species encountered in soil samples

Sr. No.	Locality	Name of the organism
1.	Bamnoli	<p>Order Chroococcales</p> <p>Family: Chroococcaceae</p> <p><i>Microcystis aeruginosa</i> Kutz</p> <p><i>Chroococcus minutus</i> (Kutz.)Nag.</p> <p><i>Gloeocapsa rupestris</i> Kutz.</p> <p><i>Gloeocapsa atrata</i> (Turp.) Kutz.</p> <p><i>Aphanocapsa pulchra</i>(Kutz.) Rabenh</p> <p><i>Aphanothece saxicola</i> Nag.</p> <p><i>Aphanothece microscopia</i> Nag.</p> <p><i>Synechococcus aeruginosus</i> Nag.</p> <p>Family: Entophysalidaceae</p> <p><i>Chlorogloea fritschii</i> Mitra.</p> <p>Order Nostocales</p> <p>Family: Oscillatoriaceae</p> <p><i>Arthrispira platensis</i> (Nordst.) Gomont</p> <p><i>Spirulina subsalsa</i> Oerst. Ex Gomont</p> <p><i>Oscillatoria sancta</i> (Kutz.) Gomont</p> <p><i>Oscillatoria subbrevis</i> Schmidle</p> <p><i>Oscillatoria princeps</i> Vaucher ex Gomont</p> <p><i>Trichodesmium lacustre</i> Klebahn</p> <p><i>Phormidium stagnina</i> Rao, C. B.</p> <p><i>Lyngbya majuscule</i> Harvey ex Gomont</p> <p>Family: Nostocaceae</p> <p><i>Cylindrospermum majus</i> Kutzing ex Born. Et Flah</p> <p><i>Cylindrospermum muscicola</i> Kutzing ex Born. Et Flah</p> <p><i>Nostoc rivulare</i> Kutzing ex Born. et Flah.</p> <p><i>Nostoc commune</i> Vaucher ex Born. et Flah.</p>

		<p><i>Anabaena doliolum</i> Bhrdwaja <i>Anabaena vaginicola</i> Fritsch et Rich <i>Anabaena torulosa</i> (Carm.) Lagerh. ex Born. et Flah. Family: Scytonemataceae <i>Scytonema cincinnatum</i> Thuret ex Born. et Flah <i>Scytonema simplex</i> Bhardwaja Family: Rivulariaceae <i>Gloeotrichia indica</i> Schmidle <i>Gloeotrichia intermedia</i> (Lemm.) Geitler Order Stigonematales Family: Stigonemataceae <i>Westiellopsis prolifica</i> Janet</p>
2.	Yewateshwar	<p>Order Chroococcales Family: Chroococcaceae <i>Chroococcus pallidus</i> Nag. <i>Gloeocapsa rupestris</i> Kutz. <i>Aphanocapsa pulchra</i>(Kutz.) Rabenh <i>Aphanothece saxicola</i> Nag. <i>Aphanothece pallida</i> (Kutz.)Rbenh. <i>Aphanothece microscopia</i> Nag. Family: Entophysalidaceae <i>Chlorogloea fritschii</i> Mitra. Order Nostocales Family: Oscillatoriaceae <i>Oscillatoria subbrevis</i> Schmidle <i>Oscillatoria curviceps</i> Ag.ex. Gomont <i>Oscillatoria okeni</i> Ag. ex Gomont <i>Trichodesmium lacustre</i> Klebahn Family: Nostocaceae <i>Nostoc commune</i> Vaucher ex Born. et Flah. <i>Nostoc parmelioides</i> Kutz.ex Born. et Flah. <i>Anabaena spiroides</i> Klebahn <i>Anabaena fertilissima</i> Rao, C. B. <i>Anabaena doliolum</i> Bharadwaja</p>

		<p><i>Anabaena torulosa</i> (Carm.) Lagerh. Ex Born. et Flah.</p> <p>Family: Scytonemataceae</p> <p><i>Plectonema radiosum</i> (Schiederm.) Gomont.</p> <p><i>Tolypothrix fragilis</i> (Gardner) Geitler</p> <p>Order Stigonematales</p> <p>Family: Stigonemataceae</p> <p><i>Stigonema ocellatum</i> (Dillw.) Thuret ex Born et Flah.</p>
3.	Kas	<p>Order Chroococcales</p> <p>Family: Chroococcaceae</p> <p><i>Chroococcus minutus</i> (Kutz.)Nag.</p> <p><i>Gloeocapsa atrata</i> (Turp.) Kutz.</p> <p><i>Aphanothece microscopica</i>Nag.</p> <p><i>Synechococcus aeruginosus</i> Nag.</p> <p>Order Nostocales</p> <p>Family: Oscillatoriaceae</p> <p><i>Arthrispira platensis</i> (Nordst.) Gomont</p> <p><i>Spirulina subsalsa</i> Oerst. Ex Gomont</p> <p><i>Oscillatoria sancta</i> (Kutz.) Gomont</p> <p><i>Oscillatoria obscura</i> Bruhl et Biswas</p> <p><i>Oscillatoria okeni</i> Ag. ex Gomont</p> <p><i>Phormidium corenum</i> (AG.) Gomont</p> <p><i>Lyngbya majuscula</i> Harvey ex Gomont</p> <p><i>Microcoleus vaginatus</i> (Vaucher) Gomont</p> <p>Family: Nostocaceae</p> <p><i>Nostoc rivulare</i> Kutzing ex Born. et Flah.</p> <p><i>Nostoc muscorum</i> Ag. ex Born.et Flah.</p> <p><i>Nostoc commune</i> Vaucher ex Born. et Flah.</p> <p><i>Nostoc parmelioides</i> Kutz.ex Born. et Flah.</p> <p><i>Anabaena spiroides</i> Klebahn</p> <p><i>Anabaena oryzae</i> Fritsch</p> <p><i>Anabaena fertilissima</i> Rao, C. B.</p> <p><i>Anabaena doliolum</i> Bharadwaja</p> <p><i>Anabaena torulosa</i> (Carm.) Lagerh. Ex Born. et Flah.</p>

		<p>Family: Scytonemataceae <i>Scytonema amplum</i> West et west</p> <p>Family: Rivulariaceae <i>Calotrix membranacea</i> Schmidle <i>Gloeotrichia indica</i> Schmidle <i>Gloeotrichia intermedia</i> (Lemm.) Geitler</p> <p>Order Stigonematales</p> <p>Family: Stigonemataceae <i>Stigonema ocellatum</i> (Dillw.) Thuret ex Born et Flah.</p>
4.	Petri	<p>Order Chroococcales</p> <p>Family: Chroococcaceae <i>Chroococcus minutus</i> (Kutz.) Nag. <i>Merismopedia glauca</i> (Ehrneb.) Nag. <i>Aphanothece naegeli</i> Wartm. <i>Aphanothece microscopica</i> Nag.</p> <p>Order Nostocales</p> <p>Family: Oscillatoriaceae <i>Spirulina subsalsa</i> Oerst. Ex Gomont <i>Oscillatoria sancta</i> (Kutz.) Gomont <i>Oscillatoria subbrevis</i> Schmidle <i>Oscillatoria formosa</i> Bory ex Gomont <i>Phormidium corenum</i> (AG.) Gomont <i>Lyngbya majuscule</i> Harvey ex Gomont</p> <p>Family: Nostocaceae <i>Cylindrospermum majus</i> Kutzing ex Born. Et Flah <i>Cylindrospermum muscicola</i> Kutzing ex Born. Et Flah <i>Nostoc muscorum</i> Ag. ex Born. et Flah. <i>Nostoc microscopicum</i> Carm. ex Born. et Flah <i>Anabaena aphanizomenoides</i> Forti. <i>Anabaena torulosa</i> (Carm.) Lagerh. Ex Born. et Flah.</p> <p>Family: Scytonemataceae <i>Plectonema radiosum</i> (Schiederm.) Gomont. <i>Plectonema notatum</i> Schmidle <i>Scytonema cincinnatum</i> Thuret ex Born. et Flah</p>

		<p><i>Scytonema simplex</i> Bhardwaja</p> <p>Order Stigonematales</p> <p>Family: Stigonemataceae</p> <p><i>Westiellopsis prolifica</i> Janet</p>
5.	Ambeghar	<p>Order Chroococcales</p> <p>Family: Chroococcaceae</p> <p><i>Chroococcus pallidus</i> Nag.</p> <p><i>Merismopedia glauca</i> (Ehrneb.) Nag.</p> <p><i>Gloeocapsa rupestris</i> Kutz.</p> <p><i>Aphanocapsa roeseana</i> de Bary</p> <p><i>Aphanocapsa pulchra</i>(Kutz.) Rabenh</p> <p>Order Nostocales</p> <p>Family: Oscillatoriaceae</p> <p><i>Oscillatoria amoena</i> (Kutz.) Gomont</p> <p><i>Oscillatoria formosa</i> Bory ex Gomont</p> <p><i>Oscillatoria curviceps</i> Ag.ex. Gomont</p> <p><i>Phormidium stagnina</i> Rao, C. B.</p> <p><i>Lyngbya spiralis</i> Geitler</p> <p><i>Lyngbya majuscula</i> Harvey ex Gomont</p> <p><i>Microcoleus vaginatus</i> (Vaucher) Gomont</p> <p>Family: Nostocaceae</p> <p><i>Nostoc punctiforme</i> (Kutz.)Hariat</p> <p><i>Nostoc muscorum</i> Ag. ex Born.et Flah.</p> <p><i>Anabaena spiroides</i> Klebahn</p> <p><i>Anabaena oryzae</i> Fritsch</p> <p><i>Anabaena aphanizomenoides</i> Forti</p> <p>Family: Scytonemataceae</p> <p><i>Plectonema notatum</i> Schmidle</p> <p><i>Scytonema cincinnatum</i> Thuret ex Born. et Flah</p> <p><i>Scytonema simplex</i> Bhardwaja</p> <p>Family: Rivulariaceae</p> <p><i>Calotrix fusca</i> (Kutz.) Bornet et Flah.</p> <p><i>Calotrix membranacea</i> Schmidle</p> <p><i>Calothrix braunii</i> (A.Br.) Bornet et Flah.</p>

		<p>Order Stigonematales</p> <p>Family: Stigonemataceae</p> <p><i>Stigonema ocellatum</i> (Dillw.) Thuret ex Born et Flah.</p>
6.	Shirsinge	<p>Order Chroococcales</p> <p>Family: Chroococcaceae</p> <p><i>Gloeocapsa gelatinosa</i> Kutz.</p> <p><i>Gloeocapsa polydermatica</i> Kutz.</p> <p><i>Aphanothece saxicola</i> Nag.</p> <p><i>Aphanothece pallida</i> (Kutz.)Rbenh.</p> <p><i>Aphanothece naegeli</i> Wartm.</p> <p>Order Nostocales</p> <p>Family: Oscillatoriaceae</p> <p><i>Oscillatoria subbrevis</i> Schmidle</p> <p><i>Oscillatoria annae</i> van Goor</p> <p><i>Oscillatoria curviceps</i> Ag.ex. Gomont</p> <p><i>Phormidium stagnina</i> Rao, C. B.</p> <p><i>Lyngbya spiralis</i> Geitler</p> <p>Family: Nostocaceae</p> <p><i>Cylindrospermum majus</i> Kutzing ex Born. Et Flah</p> <p><i>Cylindrospermum muscicola</i> Kutzing ex Born. Et Flah</p> <p><i>Nostoc punctiforme</i> (Kutz.)Hariot</p> <p><i>Nostoc calcicola</i> Brebisson ex Born. et Flah.</p> <p><i>Nostoc parmelioides</i> Kutz.ex Born. et Flah.</p> <p><i>Anabaena fertilissima</i> Rao, C. B.</p> <p><i>Anabaena aphanizomenoides</i> Forti</p> <p>Family: Scytonemataceae</p> <p><i>Scytonema javanicum</i> (Kutz.) Bornet et Born. Et Flah.</p> <p>Family: Rivulariaceae</p> <p><i>Calotrix membranacea</i> Schmidle</p> <p>Order Stigonematales</p> <p>Family: Stigonemataceae</p> <p><i>Westiellopsis prolifica</i> Janet</p>

7.	Falani	<p>Order Chroococcales</p> <p>Family: Chroococcaceae</p> <p><i>Chroococcus pallidus</i> Nag.</p> <p><i>Merismopedia glauca</i> (Ehrneb.) Nag.</p> <p><i>Gloeocapsa gelatinosa</i> Kutz.</p> <p><i>Aphanocapsa pulchra</i>(Kutz.) Rabenh</p> <p><i>Aphanothece naegeli</i> Wartm.</p> <p>Order Nostocales</p> <p>Family: Oscillatoriaceae</p> <p><i>Oscillatoria annae</i> van Goor</p> <p><i>Oscillatoria obscura</i> Bruhl et Biswas</p> <p><i>Oscillatoria amoena</i> (Kutz.) Gomont</p> <p><i>Phormidium stagnina</i> Rao, C. B.</p> <p><i>Lyngbya spiralis</i> Geitler</p> <p>Family: Nostocaceae</p> <p><i>Nostoc calcicola</i> Brebisson ex Born. et Flah.</p> <p><i>Nostoc commune</i> Vaucher ex Born. et Flah.</p> <p><i>Nostoc parmelioides</i> Kutz. ex Born. et Flah.</p> <p><i>Anabaena doliolum</i> Bhrdwaja</p> <p><i>Anabaena vaginicola</i> Fritsch et Rich</p> <p><i>Anabaena torulosa</i> (Carm.) Lagerh. Ex Born. et Flah.</p> <p>Family: Scytonemataceae</p> <p><i>Plectonema radiosum</i> (Schiederm.) Gomont.</p> <p><i>Scytonema javanicum</i> (Kutz.) Bornet et Born. Et Flah.</p> <p>Family: Rivulariaceae</p> <p><i>Gloeotrichia intermedia</i> (Lemm.) Geitler</p> <p>Order Stigonematales</p> <p>Family: Stigonemataceae</p> <p><i>Westiellopsis prolifica</i> Janet</p>
8.	Pateghar	<p>Order Chroococcales</p> <p>Family: Chroococcaceae</p> <p><i>Chroococcus pallidus</i> Nag.</p> <p><i>Merismopedia glauca</i> (Ehrneb.) Nag.</p> <p><i>Gloeocapsa polydermatica</i> Kutz.</p>

		<p><i>Gloethece membracea</i> (Rbehn.) Bornet. <i>Aphanocapsa roeseana</i> de Bary <i>Synechococcus aeruginosus</i> Nag. Family: Entophysalidaceae <i>Chlorogloea fritschii</i> Mitra. Order Nostocales Family: Oscillatoriaceae <i>Trichodesmium lacustre</i> Klebahn <i>Oscillatoria subbrevis</i> Schmidle <i>Oscillatoria amoena</i> (Kutz.) Gomont <i>Oscillatoria formosa</i> Bory ex Gomont <i>Phormidium corenum</i> (AG.) Gomont <i>Lyngbya spiralis</i> Geitler Family: Nostocaceae <i>Cylindrospermum muscicola</i> Kutzing ex Born. Et Flah <i>Nostoc punctiforme</i> (Kutz.) Hariot <i>Nostoc calcicola</i> Brebisson ex Born. et Flah. <i>Nostoc commune</i> Vaucher ex Born. et Flah. <i>Anabaena oryzae</i> Fritsch <i>Anabaena aphanizomenoides</i> Forti <i>Aluosira fertilissima</i> Ghose. Family: Scytonemataceae <i>Plectonema notatum</i> Schmidle <i>Scytonema javanicum</i> (Kutz.) Bornet et Born. Et Flah. <i>Scytonema amplum</i> West et West Family: Rivulariaceae <i>Calotrix braunii</i> (A. Br.) Bornet et Flah. <i>Gloeotrichia indica</i> Schmidle</p>
9.	Thoseghar	<p>Order Chroococcales Family: Chroococcaceae <i>Chroococcus pallidus</i> Nag. <i>Merismopedia glauca</i> (Ehrnb.) Nag. <i>Gloeocapsa gelatinosa</i> Kutz. <i>Gloethece membracea</i> (Rbehn.) Bornet.</p>

		<p><i>Aphanocapsa roeseana</i> de Bary <i>Aphanocapsa biformis</i> A. Br. <i>Synechococcus aeruginosus</i> Nag. Family: Entophysalidaceae <i>Chlorogloea fritschii</i> Mitra. Order Nostocales Family: Oscillatoriaceae <i>Oscillatoria annae</i> van Goor <i>Oscillatoria subbrevis</i> Schmidle <i>Oscillatoria formosa</i> Bory ex Gomont <i>Phormidium stagnina</i> Rao, C. B. <i>Microcoleus vaginatus</i> (Vaucher) Gomont <i>Lyngbya spiralis</i> Geitler Family: Nostocaceae <i>Cylindrospermum majus</i> Kutzing ex Born. Et Flah <i>Nostoc commune</i> Vaucher ex Born. et Flah. <i>Anabaena oryzae</i> Fritsch <i>Anabaena doliolum</i> Bhrdwaja <i>Anabaena vaginicola</i> Fritsch et Rich <i>Anabaena torulosa</i> (Carm.) Lagerh. Ex Born. et Flah. <i>Aluosira fertilissima</i> Ghose. Family: Scytonemataceae <i>Plectonema radiosum</i> (Schiederm.) Gomont. <i>Scytonema javanicum</i> (Kutz.) Bornet et Born. et Flah. <i>Scytonema amplum</i> West et West Family: Rivulariaceae <i>Calotrix fusca</i> (Kutz.) Bornet et Flah. <i>Calotrix membranacea</i> Schmidle Order Stigonematales Family: Stigonemataceae <i>Stigonema ocellatum</i> (Dillw.) Thuret ex Born et Flah.</p>
10.	Parali	<p>Order Chroococcales Family: Chroococcaceae <i>Merismopedia glauca</i> (Ehrneb.) Nag.</p>

		<p><i>Gloeocapsa gelatinosa</i> Kutz.</p> <p><i>Gloethece membracea</i> (Rbhn.) Bornet.</p> <p><i>Aphanocapsa biformis</i> A. Br.</p> <p><i>Aphanocapsa saxicola</i> Nag.</p> <p>Family: Entophysalidaceae</p> <p><i>Chlorogloea fritschii</i> Mitra.</p> <p>Order Nostocales</p> <p>Family: Oscillatoriaceae</p> <p><i>Trichodesmium lacustre</i> Klebahn</p> <p><i>Oscillatoria annae</i> van Goor</p> <p><i>Oscillatoria subbrevis</i> Schmidle</p> <p><i>Oscillatoria curviceps</i> Ag.ex. Gomont</p> <p><i>Oscillatoria amoena</i> (Kutz.) Gomont</p> <p><i>Lyngbya spiralis</i> Geitler</p> <p><i>Microcoleus vaginatus</i> (Vaucher) Gomont</p> <p>Family: Nostocaceae</p> <p><i>Nostoc punctiforme</i> (Kutz.) Hariot</p> <p><i>Nostoc parmelioides</i> Kutz.ex Born. et Flah.</p> <p><i>Anabaena oryzae</i> Fritsch</p> <p><i>Anabaena aphanizomenoides</i> Forti.</p> <p><i>Aluosira fertilissima</i> Ghose.</p> <p>Family: Scytonemataceae</p> <p><i>Plectonema notatum</i> Schmidle</p> <p><i>Scytonema cincinnatum</i> Thuret ex Born. et Flah</p> <p><i>Scytonema simplex</i> Bhardwaja</p> <p>Family: Rivulariaceae</p> <p><i>Calotrix braunii</i> (A. Br.) Bornet et Flah.</p> <p>Order Stigonematales</p> <p>Family: Stigonemataceae</p> <p><i>Stigonema ocellatum</i> (Dillw.) Thuret ex Born et Flah.</p>
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Purification-

The cultures required frequent transfers in order to maintain them for longer period. All the soil samples showed some common forms (see Table No. 6) while some cyanobacterial forms were very specific to certain soils only. In order to study the biochemical characters the pure cultures of some of the forms were raised. Initially the correct identification was done based on morphological and cultural characteristics. Then the selected species were given frequent transfers in order to isolate them. Once these forms occurred growing in isolation they were raised in pure forms, to capture them in their log phase for their biochemical analysis. Plate Nos. II, III and IV show the culture vessels for individual pure culture. The photomicrographs on Plates V reveal the characteristic features of some individual isolates in pure culture.

Following strains of cyanobacteria were raised in pure cultures.

List of forms grown in pure cultures is as follows:

- Chlorogloea fritschii* Mitra.
- Oscillatoria obscura* Bruhl et Biswas
- Oscillatoria curviceps* Ag.ex. Gomont
- Oscillatoria princeps* Vaucher ex Gomont
- Spirulina subsalsa* Oerst. ex Gomont
- Nostoc muscorum* Ag. ex Born.et Flah.
- Nostoc commune* Vaucher ex Born. et Flah.
- Nostoc microscopicum* Carm. ex Born. et Flah
- Anabaena spiroides* Klebahn
- Anabaena fertilissima* Rao, C. B.
- Anabaena doliolum* Bharadwaja
- Anabaena torulosa* (Carm.) Lagerh. Ex Born. et Flah.
- Tolypothrix fragilis* (Gardner) Geitler

PLATE NO. I

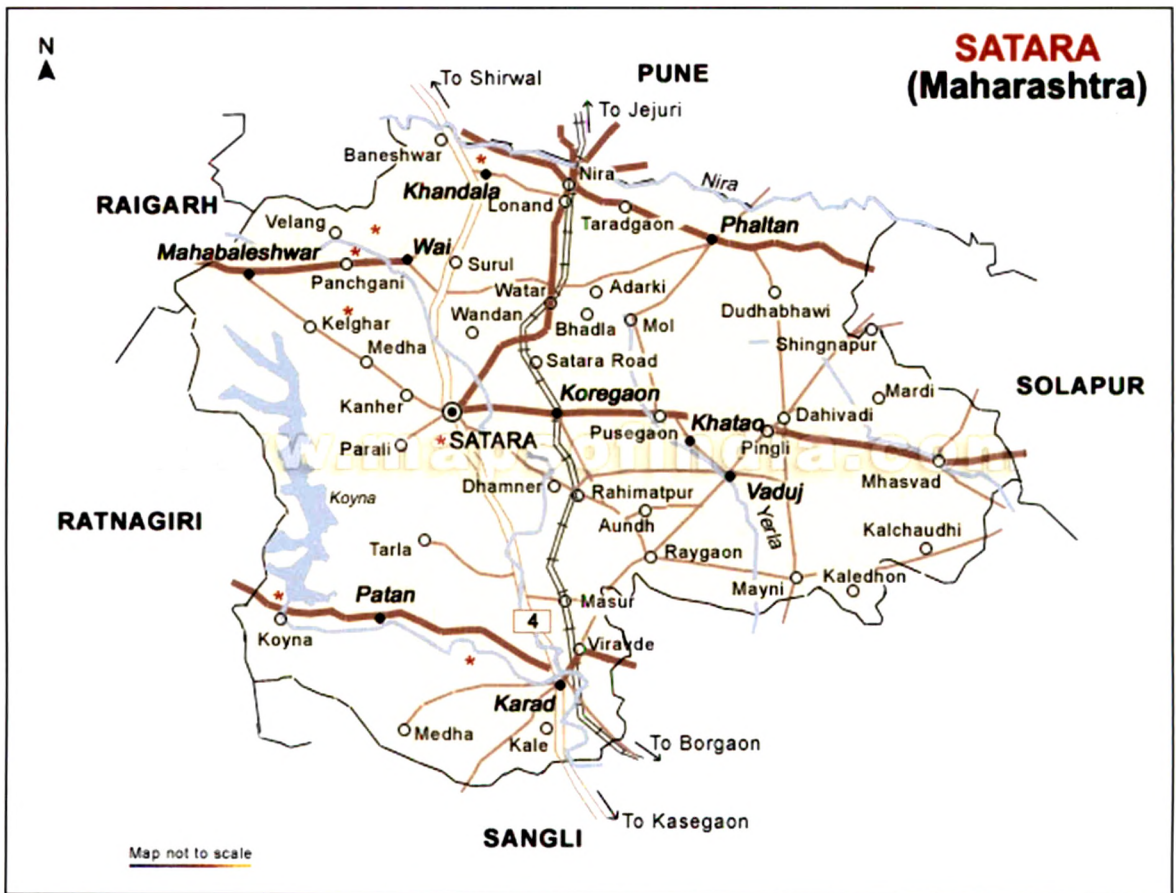


PLATE NO. II



Nostoc microscopicum

Anabaena fertilissima



Oscillatoria curviceps

Anabaena doliolum

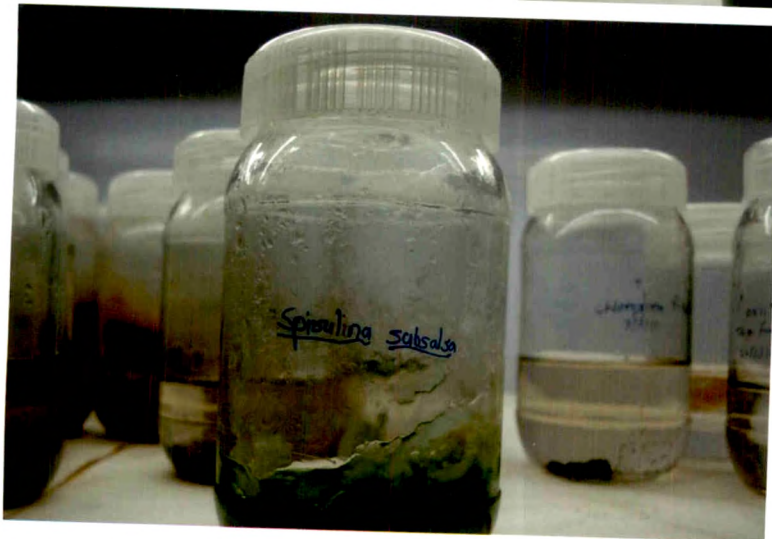


PLATE NO. III

Anabaena simplex



Oscillatoria princeps



Spirulina subsalsa

Nostoc muscorum

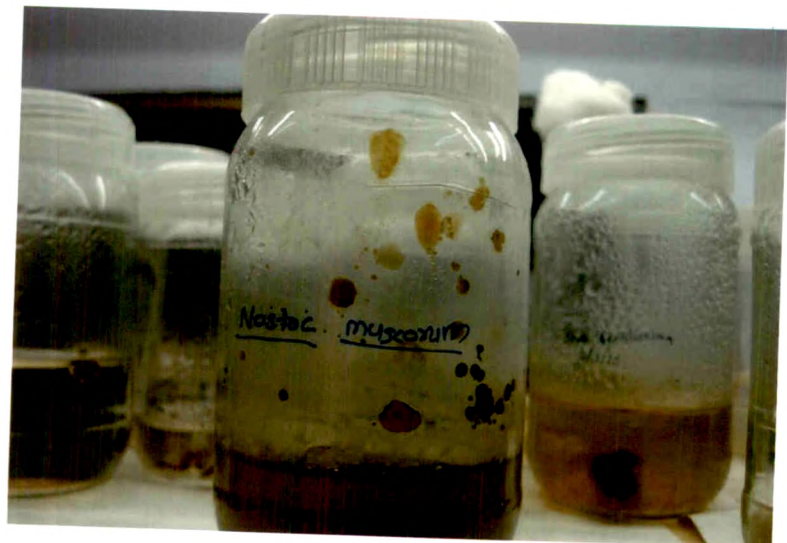
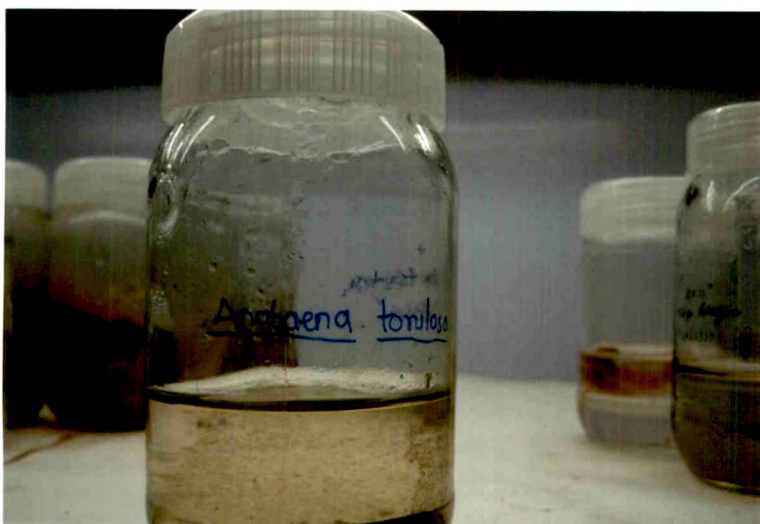
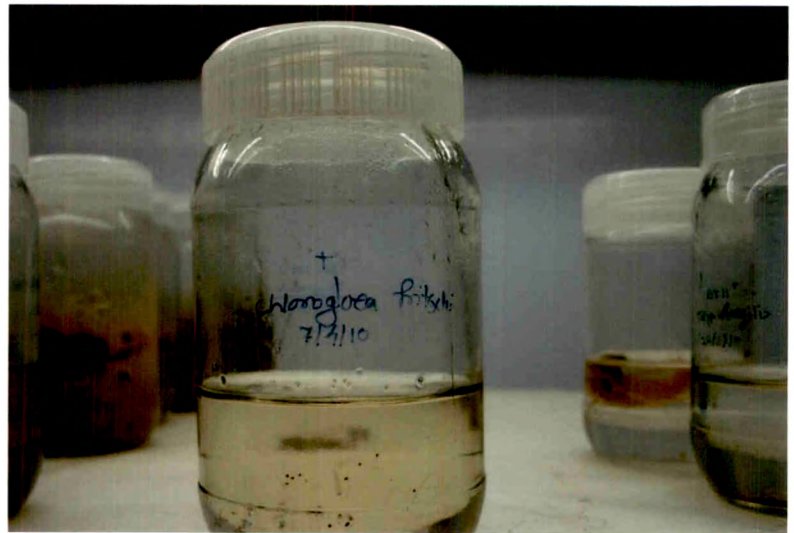


PLATE NO.IV



Tolypothrix fragilis

Chlorogloea fritschii



Anabaena fertilissima

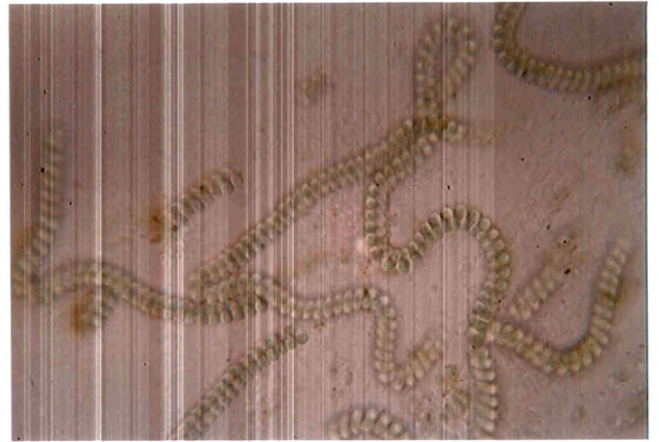
Oscillatoria obscura



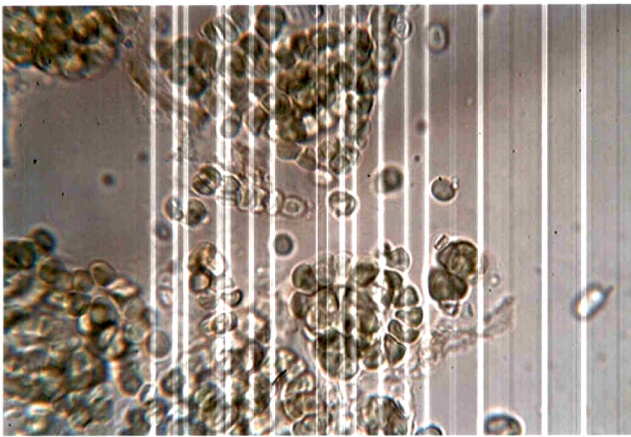
PLATE NO V : Isolates under the Microscope



Nostoc commune



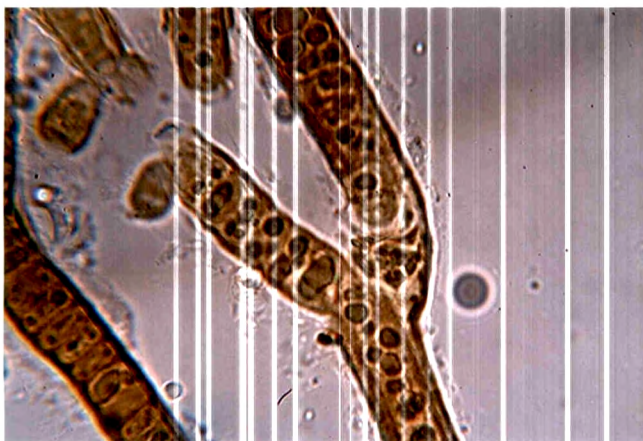
Spirulina subsalsa



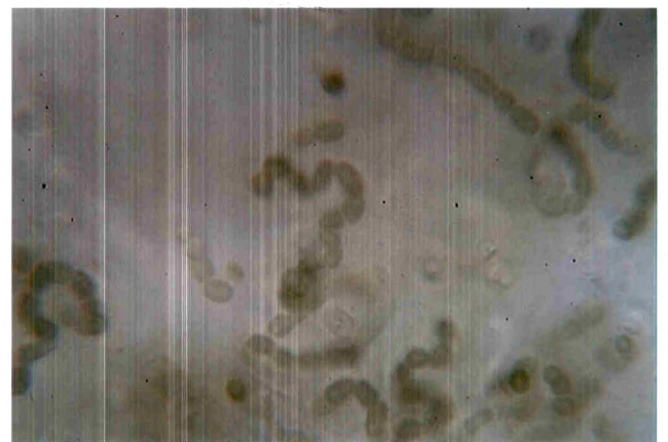
Chlorogloea fritschii



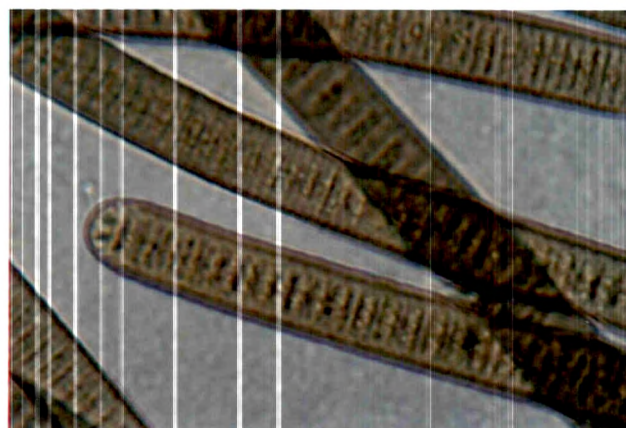
Anabaena fertilissima



Tolypothrix fragilis



Anabaena spiroides



Oscillatoria nriencens

Biochemical characterization:

Algal cultures growing in pure forms were used for their biochemical characterization. Initially the cultures were captured in their log phase to obtain maximum cell count and then subjected to their chemical analysis. Three biochemical characters viz., chlorophyll a, carotenoid and carbohydrates in the form of glucose were estimated for each of the isolate. Table No. 3 shows the results for individual isolates for the three parameters.

Table No. : 3 Estimation of chl a, carotenoids and carbohydrates

Sr. No.	Name of isolate	Chlorophyll a $\mu\text{g ml}^{-1}$	Carotenoids $\mu\text{g ml}^{-1}$	Carbohydrates $\mu\text{g ml}^{-1}$
1	<i>Chlorogloea fritschii</i>	92.6	2.728	18
2	<i>Oscillatoria obscura</i>	550.9	1.448	10.5
3	<i>Oscillatoria curviceps</i>	2123.6	2.008	11
4	<i>Oscillatoria princeps</i>	200.8	1.008	10.7
5	<i>Spirulina subsalsa</i>	160.3	1.64	78
6	<i>Nostoc muscorum</i>	101.4	1.68	52
7	<i>Nostoc commune</i>	72.0	1.04	89
8	<i>Nostoc microscopicum</i>	50.8	2.2	79
9	<i>Anabaena spiroides</i>	36.4	53.4	46
10	<i>Anabaena fertilissima</i>	50.5	2.616	22
11	<i>Anabaena doliolum</i>	102.9	72.8	26
12	<i>Anabaena torulosa</i>	48.8	84.0	48
13	<i>Tolypothrix fragilis</i>	438.6	3.896	80

The extracts prepared for chlorophyll and carotenoid estimation were scanned for total wavelengths ranging between 350 nm to 700 nm. (See the scan graphs for individual isolate). All the isolates showed distinct absorption maxima in both blue and red range. The extract for chlorophyll estimation showed the first peak at the range between 414 nm to 433 nm except *Nostoc commune* which showed the absorption maxima at 383nm, similarly the extract prepared for carotenoid also showed surprisingly absorption maxima at 382 nm. In the red region for the both the extracts absorption maxima were observe around 662 nm to 664 nm.

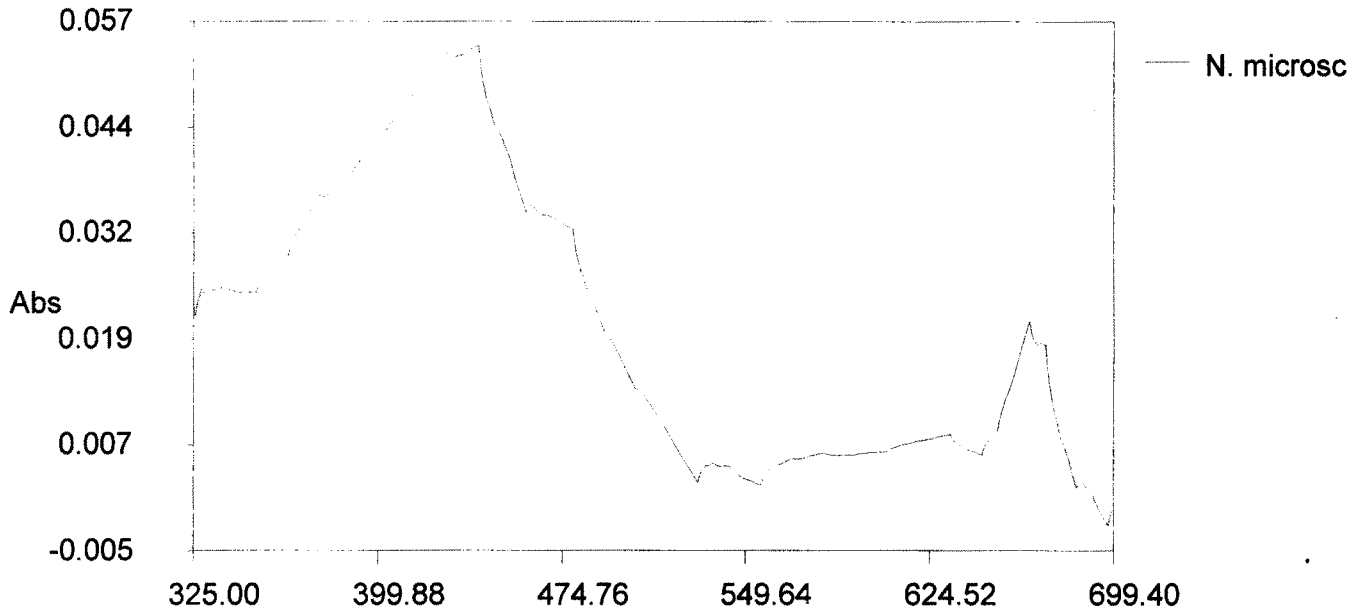
SYSTRONICS
UV-VIS Spectrophotometer: 119

Date : 26/08/10

Time : 12:53:29

Name of the Company/Laboratory:

Mode of Operation: Scan Mode



Base Graph : N. microsc

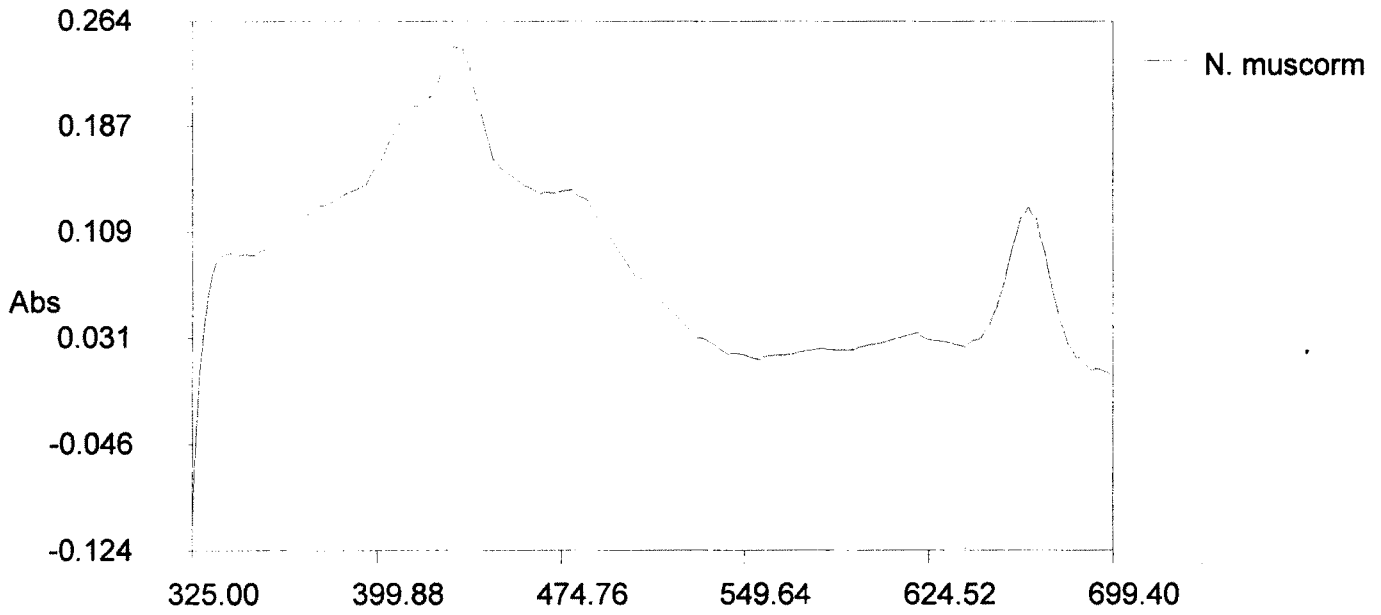
SYSTRONICS
UV-VIS Spectrophotometer: 119

Date : 26/08/10

Time : 12:51:36

Name of the Company/Laboratory:

Mode of Operation: Scan Mode



Base Graph : N. muscorm

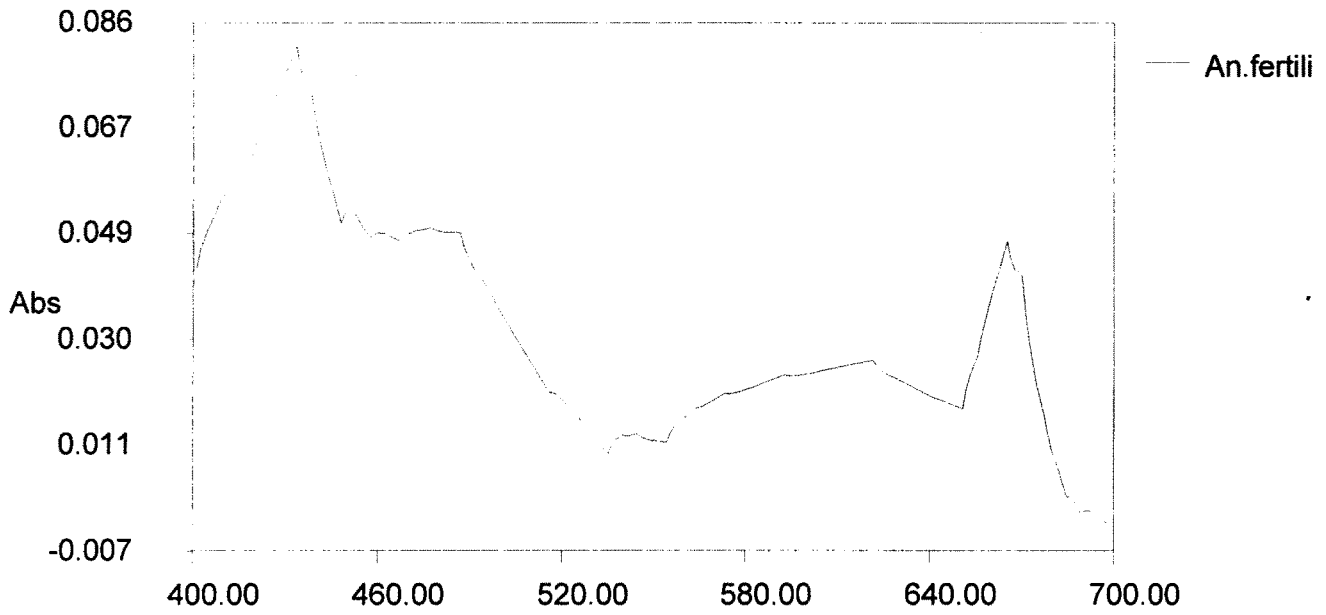
SYSTRONICS
UV-VIS Spectrophotometer: 119

Date : 26/08/10

Time : 12:48:41

Name of the Company/Laboratory:

Mode of Operation: Scan Mode



Base Graph : An.fertili

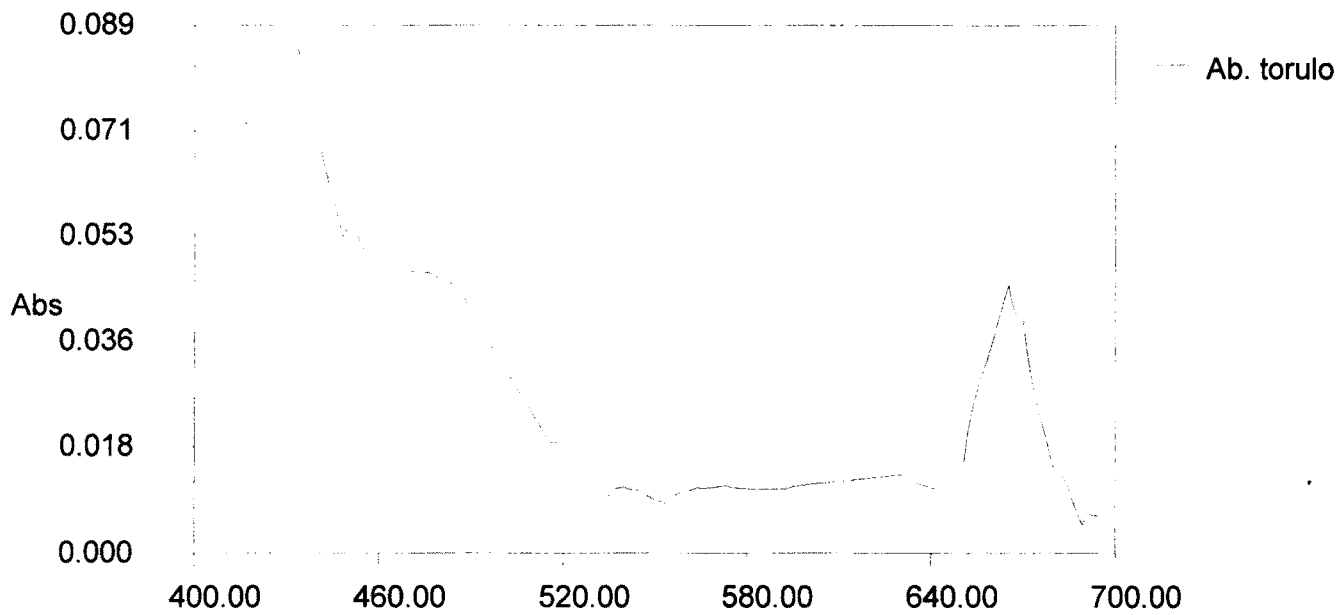
SYSTRONICS
UV-VIS Spectrophotometer: 119

Date : 26/08/10

Time : 12:44:48

Name of the Company/Laboratory:

Mode of Operation: Scan Mode



Base Graph : Ab. torulo

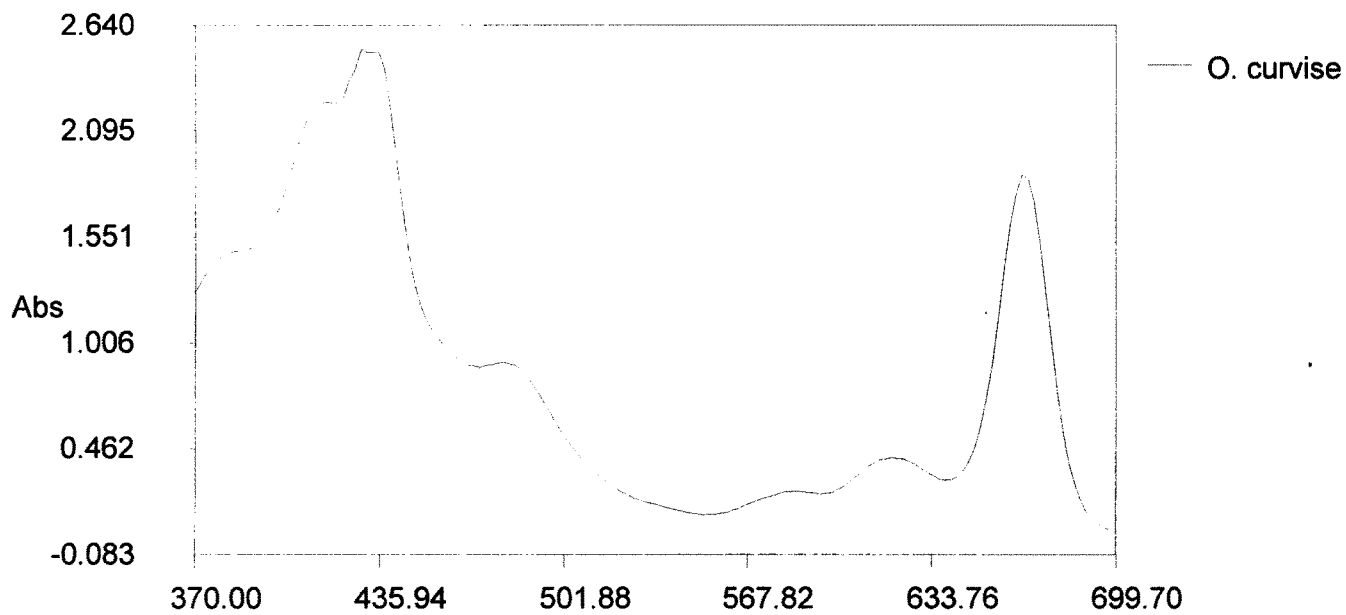
SYSTRONICS
UV-VIS Spectrophotometer: 119

Date : 26/08/10

Time : 12:55:48

Name of the Company/Laboratory:

Mode of Operation: Scan Mode



Base Graph : O. curvise

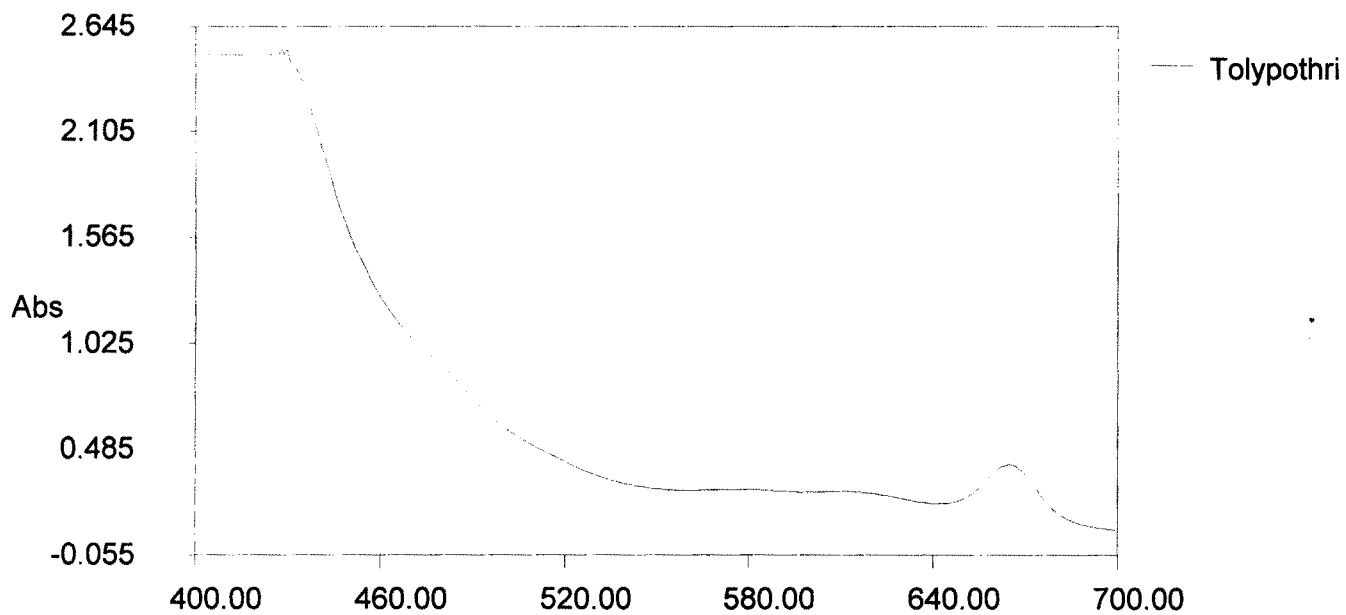
SYSTRONICS
UV-VIS Spectrophotometer: 119

Date : 26/08/10

Time : 12:59:48

Name of the Company/Laboratory:

Mode of Operation: Scan Mode



Base Graph : Tolypothri

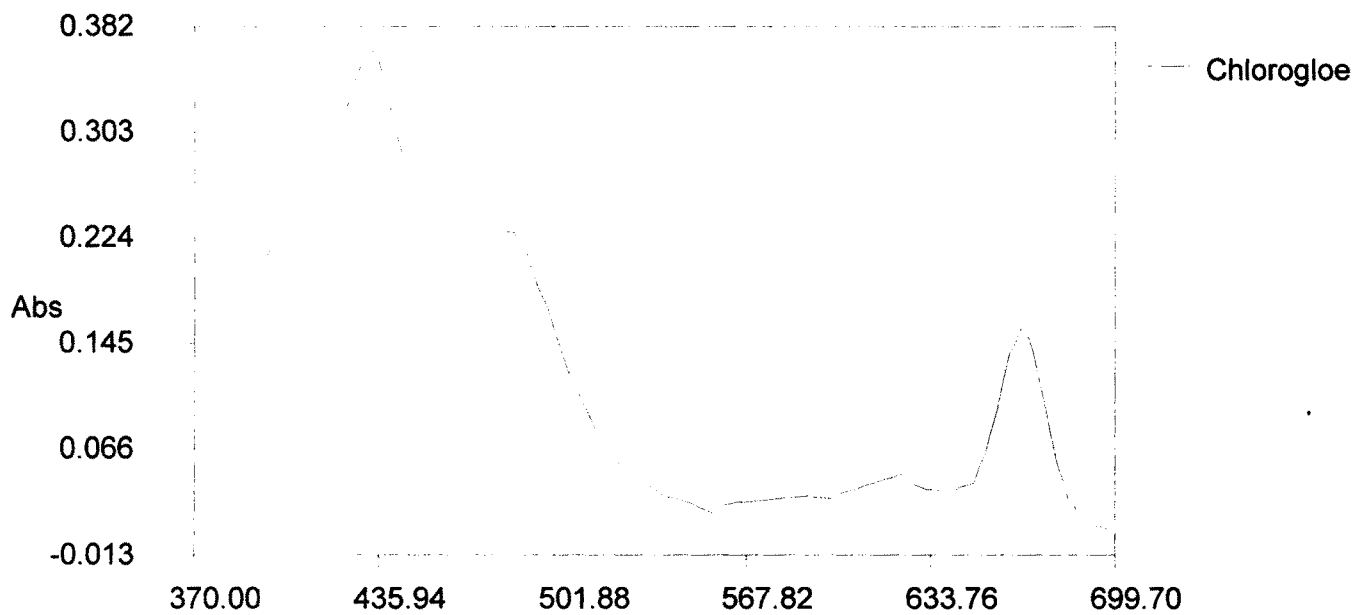
SYSTRONICS
UV-VIS Spectrophotometer: 119

Date : 26/08/10

Time : 13:00:46

Name of the Company/Laboratory:

Mode of Operation: Scan Mode



Base Graph : Chlorogloe

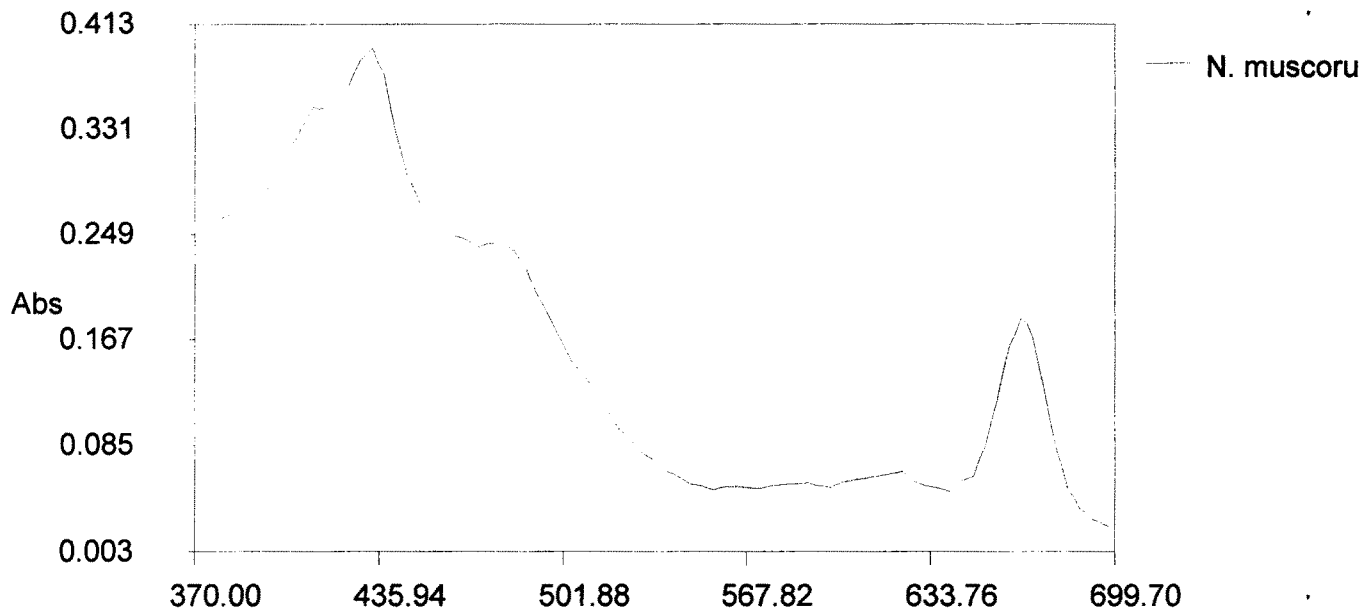
SYSTRONICS
UV-VIS Spectrophotometer: 119

Date : 26/08/10

Time : 13:07:25

Name of the Company/Laboratory:

Mode of Operation: Scan Mode



Base Graph : N. muscoru

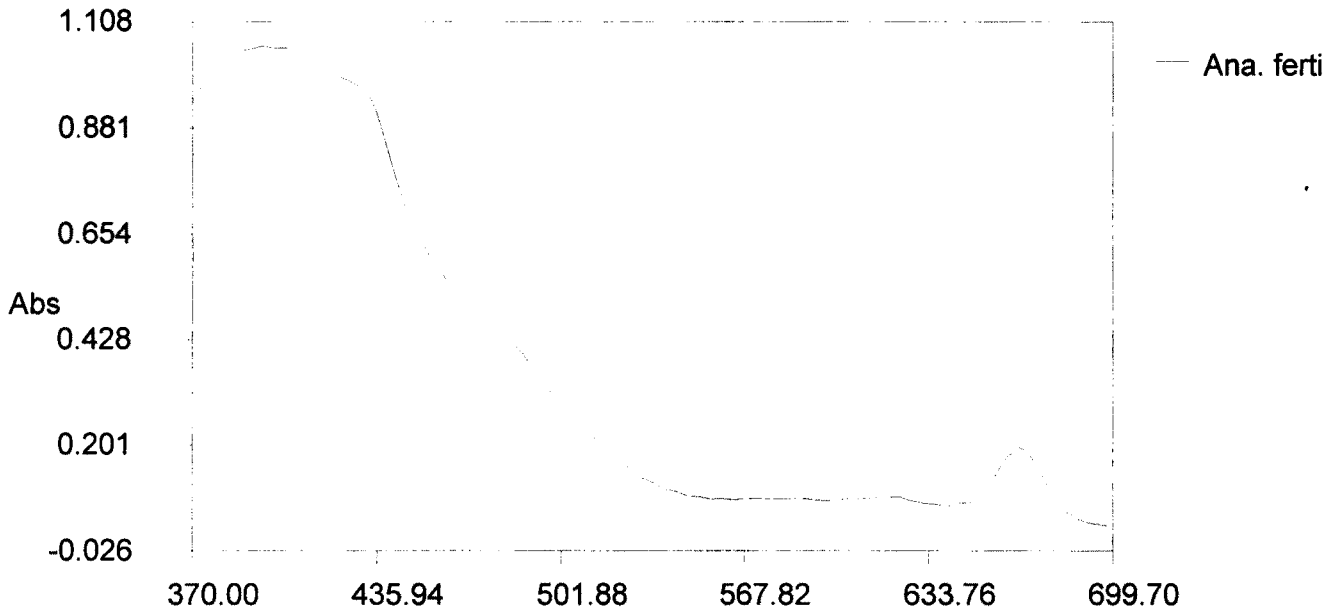
SYSTRONICS
UV-VIS Spectrophotometer: 119

Date : 26/08/10

Time : 13:05:29

Name of the Company/Laboratory:

Mode of Operation: Scan Mode



Base Graph : Ana. ferti

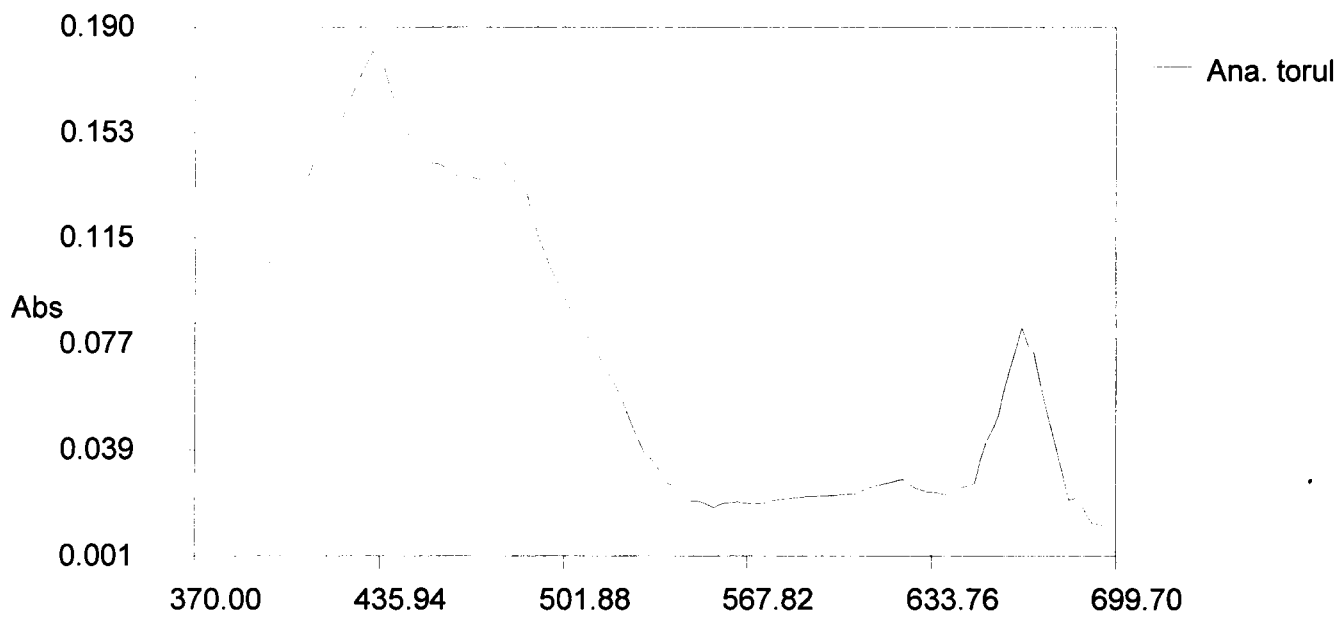
SYSTRONICS
UV-VIS Spectrophotometer: 119

Date : 26/08/10

Time : 13:02:34

Name of the Company/Laboratory:

Mode of Operation: Scan Mode



Base Graph : Ana. torul

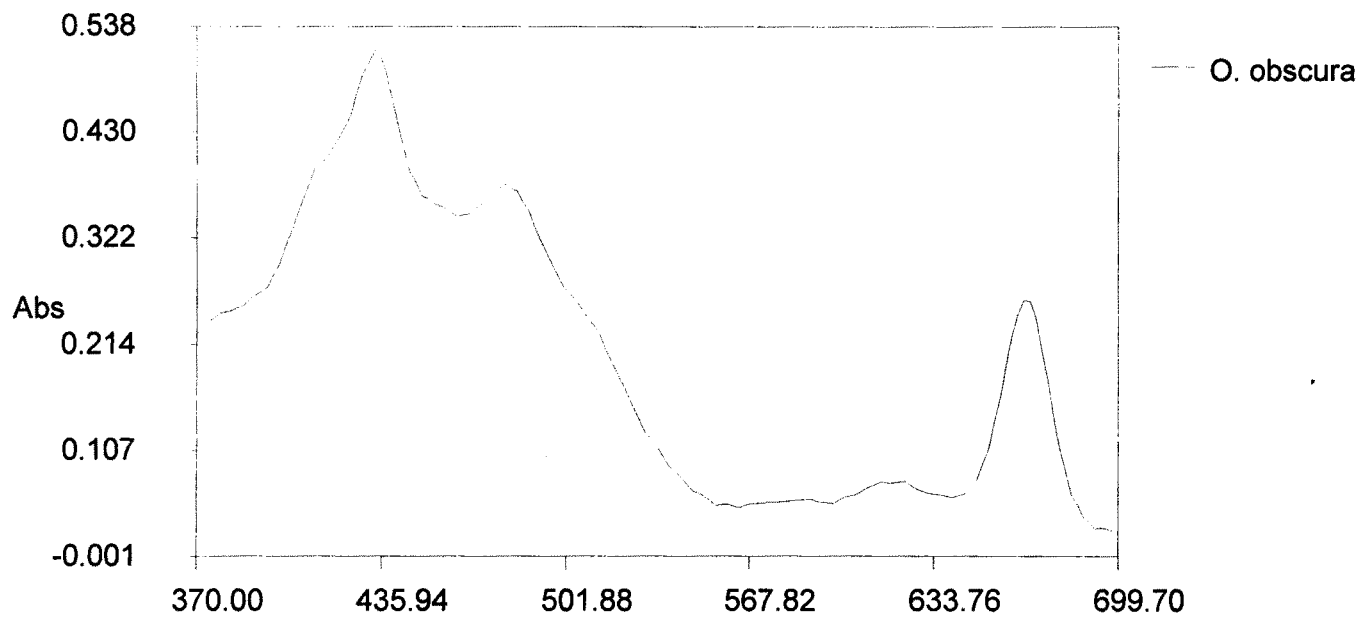
SYSTRONICS
UV-VIS Spectrophotometer: 119

Date : 26/08/10

Time : 13:10:49

Name of the Company/Laboratory:

Mode of Operation: Scan Mode



Base Graph : O. obscura

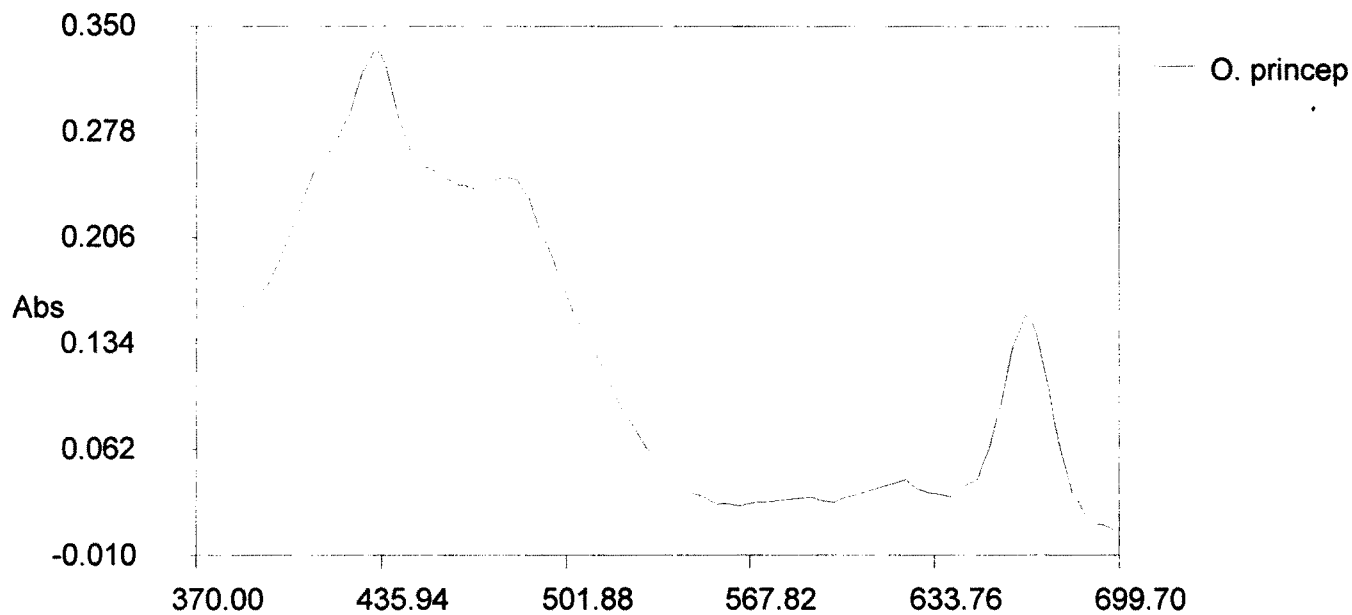
SYSTRONICS
UV-VIS Spectrophotometer: 119

Date : 26/08/10

Time : 13:13:30

Name of the Company/Laboratory:

Mode of Operation: Scan Mode



Base Graph : O. princep

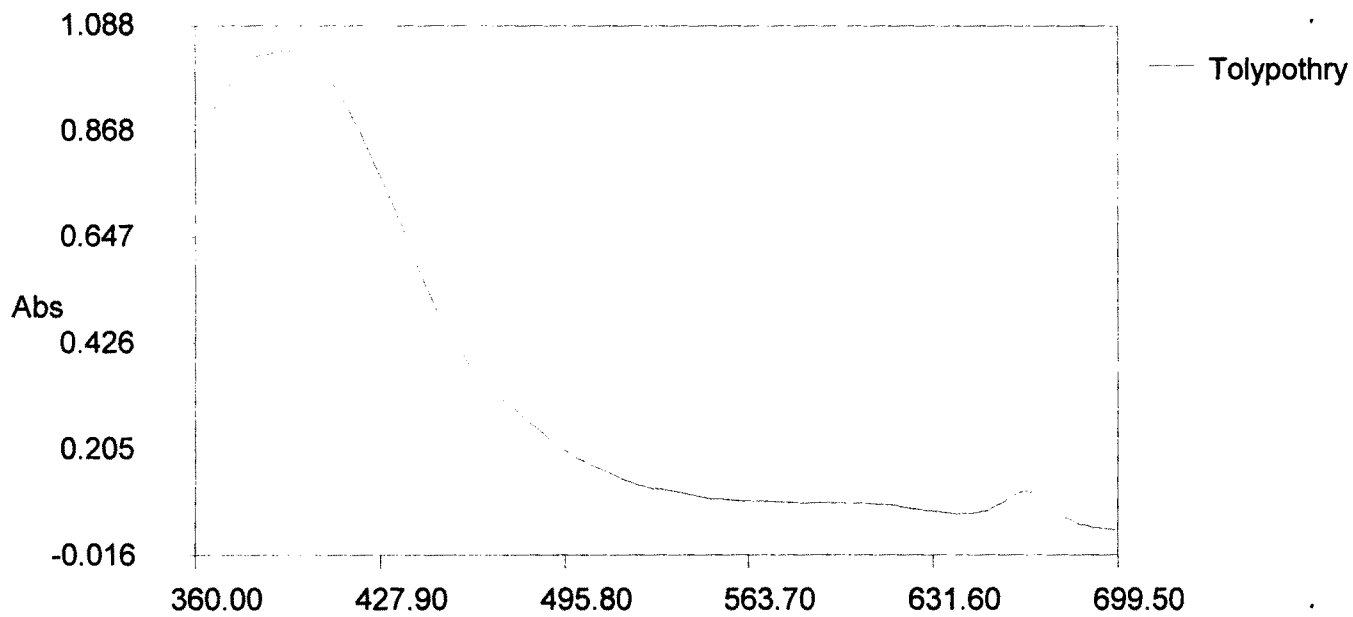
SYSTRONICS
UV-VIS Spectrophotometer: 119

Date : 26/08/10

Time : 13:16:28

Name of the Company/Laboratory:

Mode of Operation: Scan Mode



Base Graph : Tolypothry

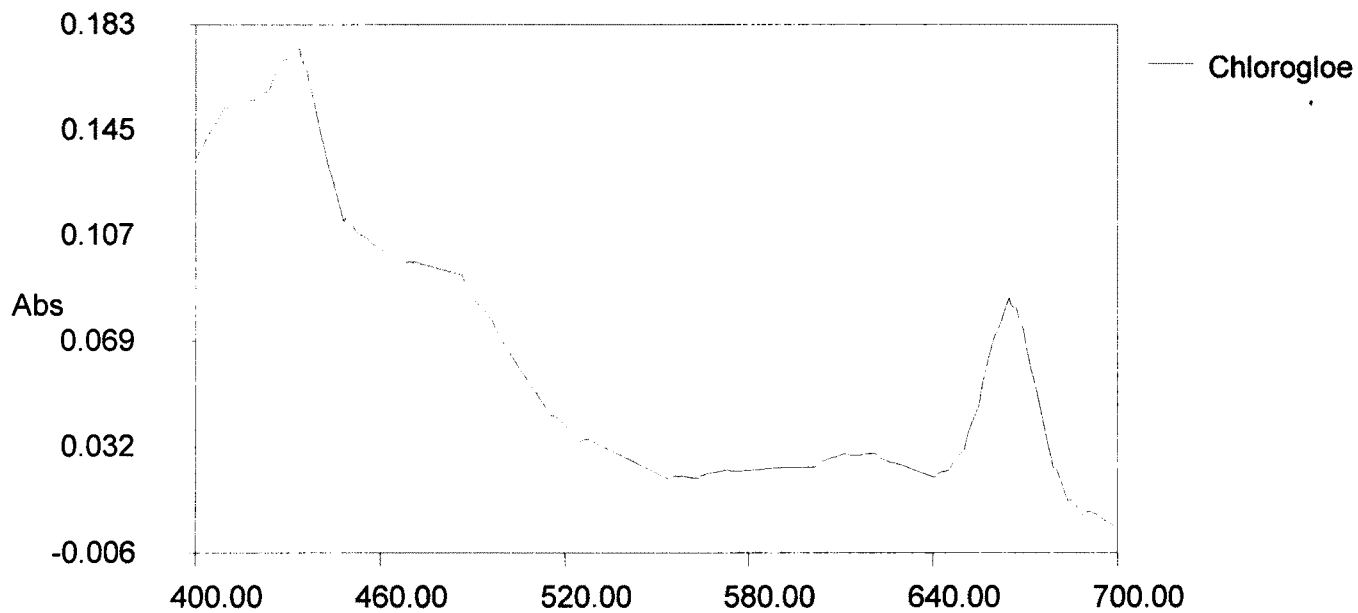
SYSTRONICS
UV-VIS Spectrophotometer: 119

Date : 26/08/10

Time : 13:17:20

Name of the Company/Laboratory:

Mode of Operation: Scan Mode



Base Graph : Chlorogloe

Following table shows absorption maxima for estimation of chlorophyll a. (Extraction was done in 90% acetone)

Table No. : 5 Absorption maxima in for individual isolate in 90 % acetone.

Sr No.	Isolate	Absorbance maxima	
		Blue range	Red range
1.	<i>Chlorogloea fritschii</i> Mitra.	433	664
2.	<i>Spirulina subsalsa</i> Oerst. ex Gomont	431	664
3.	<i>Oscillatoria obscura</i> Bruhl et Biswas	433	664
4.	<i>Oscillatoria curviceps</i> Ag.ex. Gomont	428	664
5.	<i>Oscillatoria princeps</i> Vaucher ex Gomont	433	664
6.	<i>Nostoc muscorum</i> Ag. ex Born.et Flah.	414	664
7.	<i>Nostoc commune</i> Vaucher ex Born. et Flah.	383	662
8.	<i>Nostoc microscopicum</i> Carm. ex Born. et Flah	440	662
9.	<i>Anabaena spiroides</i> Klebahn	432	662
10.	<i>Anabaena fertilissima</i> Rao, C. B.	432	662
11.	<i>Anabaena doliolum</i> Bharadwaja	430	664
12.	<i>Anabaena torulosa</i> (Carm.) Lagerh. Ex Born. et Flah.	432	662
13.	<i>Tolypothrix fragilis</i> (Gardner) Geitler	429	664