



Sree Narayana Mangalam College, Maliankara

(Affiliated to Mahatma Gandhi University, Kottayam)

Department of Botany

MoU WITH

**Kerala University of Fisheries and Ocean Studies
(KUFOS)**



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STUDENT AND FACULTY EXCHANGE PROGRAMME

About KUFOS: The Kerala University of Fisheries and Ocean Studies (KUFOS) was established by Government of Kerala on 20th November 2010 devoted to studies in fisheries and ocean sciences. It acts as a centre of excellence for human resource development in fisheries and ocean studies and the nodal agency to establish relationship with institutions and universities functioning at national and international level. The University offers several courses like B.F.Sc. B.Tech, M.F.Sc, MBA, M.Sc, LLM, M.Tech, Diploma, PG Diploma etc. including Ph.D and PDF programmes in various areas of fisheries and ocean studies. These courses are offered in the University under the following faculty: Faculty of Fisheries Science, Faculty of Ocean Science and Technology, Faculty of Fisheries Management and Faculty of Fisheries Engineering. The outreach activities of KUFOS include student training, student internship, student and faculty exchange programmes and graduate/postgraduate research programmes.

Objective: To analyse the phytoplankton samples from KUFOS at algal research laboratory under DST-FIST Research Department of Botany, S.N.M College, Maliankara as part of student and faculty exchange programme.

Description: As part of project work, a team of students from KUFOS has submitted phytoplankton samples to the expert faculties of Department of Botany, S.N.M College, Maliankara for analysis. The analysis was carried out at algal research laboratory (accredited by Kerala State Pollution Control Board) under DST-FIST Research Department of Botany, S.N.M College, Maliankara as part of student and faculty exchange programme between S.N.M College, Maliankara and KUFOS.

Outcome: As part of the continuous academic collaboration with KUFOS, the DST-FIST Research Department of Botany, S.N.M College, Maliankara analysed the phytoplankton samples from KUFOS. After analysis, a detailed report of the phytoplankton samples was sent to the concerned authority at KUFOS via email and hard copy of the analysis report in official letterhead was handed over to the students from KUFOS.



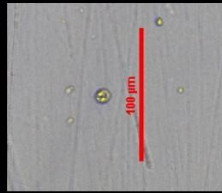
Fundamental analyses had been made for the phytoplankton samples specified below

Bacillariophyceae		Diniphyceae		Chlorophyceae		Cyanophyceae	
1	<i>Amphora holsatica</i>	44	<i>Ceratium furca</i>	51	<i>Chlorella vulgaris</i>	56	<i>Merismopedia sp</i>
2	<i>Bacteriastrum sp</i>	45	<i>Ceratium horridum</i>	52	<i>Closterium kuetzingii, var: laeve</i>		
3	<i>Bacteriastrum delicatulum</i>	46	<i>Ceratium lineatum</i>	53	<i>Coelastrum scabrum</i>		
4	<i>Bacteriastrum furcatum</i>	47	<i>Ceratium sp.</i>	54	<i>Desmodesmus communis</i>		
5	<i>Bacteriastrum hyalinum</i>	48	<i>Ceratium tripos</i>	55	<i>Cosmarium contractum</i>		
6	<i>Chaetoceros affinis</i>	49	<i>Dinophysis caudata</i>				
7	<i>Chaetoceros compressus</i>	50	<i>Gonyaulax spinifera</i>				
8	<i>Chaetoceros curvisetus</i>						
9	<i>chaetoceros danicus</i>						
10	<i>Chaetoceros decipiens</i>						
11	<i>Chaetoceros diversus</i>						
12	<i>Chaetoceros sp</i>						
13	<i>Cheatoceros teres</i>						
14	<i>Coscinodiscus centralis</i>						
15	<i>Coscinodiscus marginatus</i>						
16	<i>Cyclotella striata</i>						
17	<i>Gomphonema sps.</i>						
18	<i>Helicotheca sp.</i>						
19	<i>Helminthosidella sp.</i>						
20	<i>Licmophora juergensii</i>						
21	<i>Melosira variance</i>						
22	<i>Navicula distance</i>						
23	<i>Navicula sp</i>						

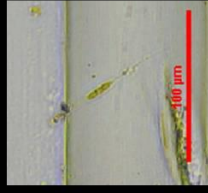
24	<i>Nitzschia closterium</i>
25	<i>Nitzschia obtuse</i>
26	<i>Nitzschia palea</i>
27	<i>Nitzschia sp.</i>
28	<i>Odontella mobiliensis</i>
29	<i>Pinnularia sp</i>
30	<i>Pinnularia viridis</i>
31	<i>Pleurosigma aestuarii</i>
32	<i>Pleurosigma sp.</i>
33	<i>Podosira sp</i>
34	<i>Protoperidinium oceanicum</i>
35	<i>Protoperidium sps.</i>
36	<i>Pyrophacus horelogium</i>
37	<i>Rhizosolenia setigera</i>
38	<i>Rhizosolenia sima</i>
39	<i>Synedra pulchella</i>
40	<i>Synedra sp.</i>
41	<i>Thalassionema sp.</i>
42	<i>Thalassionema frauenfeldii</i>
43	<i>Thalassiosira pseudonana</i>



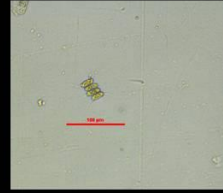
CHLOROPHYCEAE



Clorella vulgaris



Closterium laeve

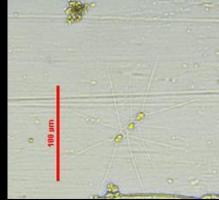


Desmodemus communis

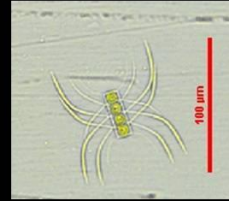
BACILLARIOPHYCEAE



Bacteriatrum delicatulum

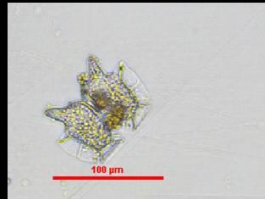


Cheatoceros teres



Cheatoceros diversus

DINOPHYCEAE



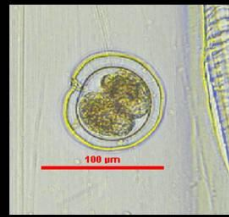
Dinophysis caudata



Ceratium horridum



Ceratium tripos



Pyrophacus horologium



List of Phytoplanktons

	PHYTO 15	No. of Cells per Litre
	Bacillariophyceae	
1	<i>Bacteriastrium furcatum</i>	50
2	<i>Chaetoceros affinis</i>	260
3	<i>Pinnularia viridis</i>	10
4	<i>Chaetoceros diversus</i>	230
5	<i>Thalassiosira pseudonana</i>	40
	Chlorophyceae	
6	<i>Chlorella vulgaris</i>	20
	Dinophyceae	
7	<i>Pyrophacus horologium</i>	30

VPB 4		
1	<i>Cheatoceros curvisetus</i>	3510
2	<i>Cheatoceros affinis</i>	1000
3	<i>Cheatoceros sp.</i>	350
4	<i>Thalassionema sp.</i>	20
5	<i>Bacteriastrium delicatulum</i>	70
6	<i>Rhizosolenia sima</i>	30
7	<i>Bacteriastrium furcatum</i>	20
8	<i>Pleurosigma aestuarii</i>	40
9	<i>Coscinodiscus centralis</i>	10
10	<i>Thalassiosira pseudonana</i>	20
11	<i>Odontella mobiliensis</i>	10
	Dinophyceae	
12	<i>Pyrophacus horologium</i>	10

MA 1		
	Bacillariophyceae	
1	<i>Thalassiosira pseudonana</i>	10
	Chlorophyceae	
2	<i>Chlorella vulgaris</i>	120



	VPB 5	No. of Cells per Litre
	Bacillariophyceae	
1	<i>Bacteriastrum delicatulum</i>	770
2	<i>Bacteriastrum furcatum</i>	190
3	<i>Chaetoceros sp</i>	210
4	<i>Chaetoceros curvisetus</i>	780
5	<i>Coscinodiscus centralis</i>	20
6	<i>Thalassiosira pseudonana</i>	30
	Dinophyceae	
7	<i>Ceratium lineatum</i>	10

	MA 6	
	Bacillariophyceae	
1	<i>Licmophora juergensii</i>	10
2	<i>Rhizosolenia imbricate</i>	30
3	<i>Podosira sp</i>	10
4	<i>Nitzschia closterium</i>	10
5	Cyanophyceae	
6	<i>Merismopedia sp</i>	600
	Dinophyceae	
7	<i>Ceratium furca</i>	30
8	<i>Pyrophacus horologium</i>	10
9	<i>Dinophysis caudata</i>	20



Sl no	Phyto 7 18/02/2020	
	Dinophyceae	

1	<i>Ceratium fusus</i>	10
2	<i>Pyrophacus horologium</i>	10
	Bacillariophyceae	
3	<i>Thalassiosira pseudonana</i>	70
4	<i>Cheatocecos diversus</i>	100
5	<i>Cheatocecos curvisetus</i>	70
6	<i>Odontella mobiliensis</i>	10
7	<i>Rhizosolenia hebetata</i>	10
	Chlorophyceae	
8	<i>Coelastrum scabrum</i>	10

	PHYTO 13	
	Chlorophyceae	
1	<i>Chlorella vulgaris</i>	90
	Bacillariophyceae	
2	<i>Bacteriastrum hyalinum</i>	200
3	<i>Chaetoceros sp.</i>	210
4	<i>Coscinodiscus granii</i>	30
5	<i>Helminthosidella</i>	20
6	<i>Chaetoceros affinis</i>	20
7	<i>Synedra sp</i>	20
	Dinophyceae	
8	<i>Pyrophacus horologium</i>	80
9	<i>Protoperidinium oceanicum</i>	30



	MA 3	
	Bacillariophyceae	
1	<i>Thalassiosira pseudonana</i>	10

2	<i>Chaetoceros decipiens</i>	10
3	<i>Coscinodiscus centralis</i>	10

	Phyto 14 morning	
	Bacillariophyceae	
1	<i>Bacteriastrum sp</i>	50
2	<i>Chaetoceros compressus</i>	110
3	<i>Chaetoceros diversus</i>	20
4	<i>Nitzschia sp.</i>	30
	Dinophyceae	
5	<i>Pyrophacus horologium</i>	30

	MA 2	
	Bacillariophyceae	
1	<i>Chaetoceros decipiens</i>	20
2	<i>Pleurosigma normanii</i>	10
	MA 5	
	Bacillariophyceae	
1	<i>Chaetoceros decipiens</i>	50
2	<i>Rhizosolenia hebetata</i>	10
3	<i>Coscinodiscus centralis</i>	10
	Dinophyceae	
4	<i>Ceratium furca</i>	50
5	<i>Pyrophacus horologium</i>	10



	Phyto 12	
1	<i>Chaetoceros diversus</i>	30
2	<i>Bacteriastrum delicatulum</i>	10
3	<i>Chaetoceros compressus</i>	20
4	<i>Chaetoceros decipiens</i>	70
5	<i>chaetoceros danicus</i>	50
6	<i>Nitzschia sp.</i>	10
7	<i>Bacteriastrum furcatum</i>	10
	Dinophyceae	
8	<i>Pyrophacus horologium</i>	100
9	<i>Protoperidinium oceanicum</i>	10
10	<i>Dinophysis caudata</i>	10
	Phyto 11	
	Chlorophyceae	
1	<i>Chlorella vulgaris</i>	1330
	Bacillariophyceae	
2	<i>Thalassiosira pseudonana</i>	40
3	<i>Nitzschia sp.</i>	880
4	<i>Synedra sp.</i>	10
5	<i>Thalasionema sp.</i>	10
6	<i>Chaetoceros sp.</i>	10
7	<i>Nitzschia closterium</i>	10
8	<i>Pleurosigma sp.</i>	20
	Dinophyceae	
9	<i>Protoperidinium oceanicum</i>	10
	VPB-1 20/02/2020	
	Bacillariophyceae	
1	<i>Amphora holsatica</i>	30
2	<i>Chatoceros curvisetus</i>	10
3	<i>Thalassiosira pseudonana</i>	60



	ANJ-4 20/02/2020	
	Chlorophyceae	

1	<i>Chlorella vulgaris</i>	40
2	<i>Closterium kuetzingii, var: laeve</i>	10
	Bacillariophyceae	
3	<i>Nitzschia palea</i>	10
4	<i>Thalassiosira pseudonana</i>	20
5	<i>Chaetoceros sp.</i>	10
6	<i>Amphora holsatica</i>	10
7	<i>Rhizosolenia setigera</i>	10

	V A3 18/02/2020	
	Dinophyceae	
1	<i>Dinophysis caudata</i>	30
	Bacillariophyceae	
2	<i>Thalassiosira pseudonana</i>	60
	Chlorophyceae	
3	<i>Chlorella vulgaris</i>	30



VA-2	18-02-20
Chlorophyceae	

1	<i>Chlorella vulgaris</i>	40
	Bacillariophyceae	
2	<i>Chaetoceros</i> sps.	10
3	<i>Thalassiosira pseudonana</i>	10
	Dinophyceae	
4	<i>Dinophysis caudata</i>	20
	VA-4	18-02-20
	Bacillariophyceae	
1	<i>Thalassiosira pseudonana</i>	100
2	<i>Bacteriastrum furcatum</i>	10
	Dinophyceae	
3	<i>Ceratium furca</i>	10
	Chlorophyceae	
4	<i>Chlorella</i> <i>Vulgaris</i>	30

	ANJ-1	20-02-20
	Bacillariophyceae	
1	<i>Pinnularia</i> sp	10
2	<i>Navicula distance</i>	20
3	<i>Thalassiosira pseudonana</i>	20
4	<i>Nitzschia closterium</i>	20

	VPB-2	
	Chlorophyceae	
1	<i>Desmodesmus communis</i>	10
	Bacillariophyceae	
2	<i>Pleurosigma aestuarii</i>	20
3	<i>Thalassiosira pseudonana</i>	10



	ANJ-3	
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	Chlorophyceae	
1	<i>Chlorella vulgaris</i>	130
2	<i>Cosmarium contractum</i>	20
	Bacillariophyceae	
3	<i>Thalassiosira pseudonana</i>	10
4	<i>Chaetoceros diversus</i>	10
5	<i>Synedra pulchella</i>	10
	Dinophyceae	
6	<i>Gonyaulax spinifera</i>	10
Sl no		
	ANJ-2 20/02/2020	
Dinophyceae		
1	<i>Gonyaulax spinifera</i>	80
2	<i>Protoperdinium sps.</i>	10
Bacillariophyceae		
3	<i>Synedra pulchella</i>	10
4	<i>Helminthosidella</i>	20
5	<i>Chaetoceros sp.</i>	30
6	<i>Ceratium horridum</i>	10
7	<i>Nitzschia obtuse</i>	10
8	<i>Podosira sp</i>	10
Chlorophyceae		
9	<i>Chlorella vulgaris</i>	60



Sl no		
	VAI 18/02/2020	
Bacillariophyceae		
1	<i>Cyclotella striata</i>	10
2	<i>Thalassiosira pseudonana</i>	20
3	<i>Melosira variance</i>	10
4	<i>Gomphonema sps.</i>	10
Chlorophyceae		
5	<i>Chlorella vulgaris</i>	40

Sl	VA 5 18/02/2020	
Bacillariophyceae		
1	<i>Cheatoceros decipiens</i>	30
2	<i>Thalassiosira pseudonana</i>	50
3	<i>Cheatoceros teres</i>	20
4	<i>Cheatoceros curvisetus</i>	70
5	<i>Rhizosolenia imbricata</i>	20
6	<i>Cheatoceros sps.</i>	40
7	<i>Rhizosolenia hebetata</i>	10
8	<i>Helicotheca sp.</i>	30
Dinophyceae		
9	<i>Bacteriastrum delicatulum</i>	30
10	<i>Pyrophacus horologium</i>	20
11	<i>Dinophysis caudata</i>	40
12	<i>Protoperidinium oceanicum</i>	10



	VA 6 18/02/2020	
1	Bacillariophyceae	
2	<i>Thalassiosira pseudonana</i>	80
3	<i>Cheatoceros curvisetus</i>	90
4	<i>Helicotheca sp.</i>	40
5	<i>Cheatoceros sp.</i>	70
6	<i>Rhizosolenia imbricata</i>	10
7	<i>Ceratium sp.</i>	10
8	<i>Nitzschia sp.</i>	10
9	<i>Protoperdinium oceanicum</i>	50
10	<i>Coscinodiscus marginatus</i>	10
11	<i>Bacteriastrum delicatulum</i>	20
12	<i>Coscinodiscus centralis</i>	10
	Dinophyceae	
13	<i>Dinophysis caudata</i>	30
14	<i>Navicula sp</i>	10
	Chlorophyceae	
15	<i>Cholrella vulgaris</i>	40



Sl no	VPB 3 20/02/2020	
	Bacillariophyceae	
1	<i>Cheatoceros curvisetus</i>	3800
2	<i>Pleurosigma aestuarii</i>	110
3	<i>Bacteriastrum delicatulum</i>	100
4	<i>Thalassionema frauenfeldii</i>	30
5	<i>Helminthopsisidella sp.</i>	10
6	<i>Ceratium horridum</i>	20
7	<i>Cyclotella striata</i>	10
8	<i>Odontella mobiliensis</i>	20
9	<i>Bacteriastrum furcatum</i>	60
10	<i>Cheatoceros affinis</i>	70
	Dinophyceae	
11	<i>Protoperidinium oceanicum</i>	30
Sl no	Phyto 9 18/02/2020	
	Bacillariophyceae	
1	<i>Cheatoceros curvisetus</i>	20
2	<i>Rhizosolenia imbricata</i>	30
3	<i>Rhizosolenia hebetata</i>	10
	Dinophyceae	
4	<i>Ceratium tripos</i>	40
5	<i>Ceratium horridum</i>	10
	Chlorophyceae	
6	<i>Chlorella vulgaris</i>	90



Sl no	Phyto MA 4 - 20/02/2020	
	Chlorophyceae	
1	<i>Chlorella vulgaris</i>	140
	Bacillariophyceae	
2	<i>Pinnularia viridis</i>	10
3	<i>Chaetoceros diversus</i>	40
4	<i>Thalassiosira pseudonana</i>	30
	Dinophyceae	
5	<i>Dinophysis caudata</i>	10
6	<i>Ceratium lineatum</i>	10
7	<i>Ceratium horridum</i>	10
8	<i>Protoperidinium oceanicum</i>	30

Sl no	Phyto 10 18/02/2020	
	Chlorophyceae	
1	<i>Chlorella vulgaris</i>	90
	Bacillariophyceae	
2	<i>Pleurosigma aestuarii</i>	10
4	<i>Rhizosolenia imbricata</i>	10
5	<i>Cheatoceros sps.</i>	10
6	<i>Coscinodiscus granii</i>	10
	<i>Rhizosolenia hebetata</i>	10
	Dinophyceae	
7	<i>Ceratium lineatum</i>	10



Sl no	Phyto 8 18/02/2020	
	Bacillariophyceae	
1	<i>Thalassiosira pseudonana</i>	10
2	<i>Chaetoceros</i> sps.	20
3	<i>Odontella mobiliensis</i>	10
4	<i>Cheatoceros diversus</i>	10
5	<i>Cheatoceros curvisetus</i>	10
	Chlorophyceae	
6	<i>Chlorella vulgaris</i>	130
	Dinophyceae	
7	<i>Ceratium fusus</i>	20
8	<i>Ceratium tripos</i>	10
9	<i>Protopteridinium oceanicum</i>	10

	STN 14 18.02.20	
	Bacillariophyceae	
1	<i>Thalassiosira pseudonana</i>	70
2	<i>Chaetoceros affinis</i>	40
3	<i>Chaetoceros diversus</i>	40
	Dinophyceae	
4	<i>Ceratium tripos</i>	10
5	<i>Pyrophacus horologium</i>	10

