CHEMICAL STUDIES

V CHEMICAL STUDIES -

During the present investigations six major chemical parameters, namely dissolved Oxygen, free carbondioxide , hardness of water, pH, phosphate and nitrate, from the surface waters of Motitalav, were studied.

The water samples for chemical analysis were drawn at two fixed stations and most of the analysis was carried out in the field.

i) Dissolved Oxygen :

Winkler's unmodified method as given by Welch (1948) was used to estimate the dissolved O_2 from the surface waters. The titration method was found much suitable for on the spot studies. According to carritt and Carpenter (1966) this method is less complicated and much more accurate than many other methods (about $\pm$ 0.02 mg/lit).

During the present investigations the water samples were drawn from the surface layers. The monthly average values of the dissolved oxygen are expressed in ppm and shown in the Fig no.6 .The weekly readings are given in the table no. 6 for reference. It can be seen from the table that at station 1 and 2 the maximum values recorded are 12 ppm and 13 ppm respectively on the same day i.e,20.12.81. but the lowest values recorded were 5.2 ppm at stn.1 on 25-9-82 and 4.8 ppm at stn.2 on 27.9.81.

The graph of average values shows similar fluctuations of the values at both the stations with minor difference. At

Table No.6: Weekly readings of dissolved Oxygen in PPM for September 1981 - April 1982.

Date	Station No.1. Readings	Station No.2. Readings
13.9.81	7.2	7.2
20.9.81	7.8	7.0
27.9.81	7.6	4.8
4.10.81	8.4	8.0
11.10.81	5.4	4.8
18.10.81	10.0	9.4
25.10.81	11.2	4.8
15.11.81	7.6	8.4
22.11.81	7.2	7.2
29.11.81	8.7	8.4
6.12.81	7.9	9.4
13.12.81	8.0	8.8
20.12.81	12.0	13.0
3.1.82	9.2	9.3
10.1.82	8.8	10.5
17.1.82	9.0	8.8
24.1.82	8.0	9.1
31.1.82	8.5	8.7

Date	Station No.1. Readings	Station No.2. Readings
14.2.82	7.8	7.7
21.2.82	7.0	5.8
28.2.82	8.0	8.0
7.3.82	6.3	6.4
14.3.82	7.6	6.6
21.3.82	8.0	7.2
28.3.82	6.7	6.7
4.4.82	6.3	6.2
11.4.82	6.0	6.0
18.4.82	5.2	5.6
25.4.82	6.2	5.6

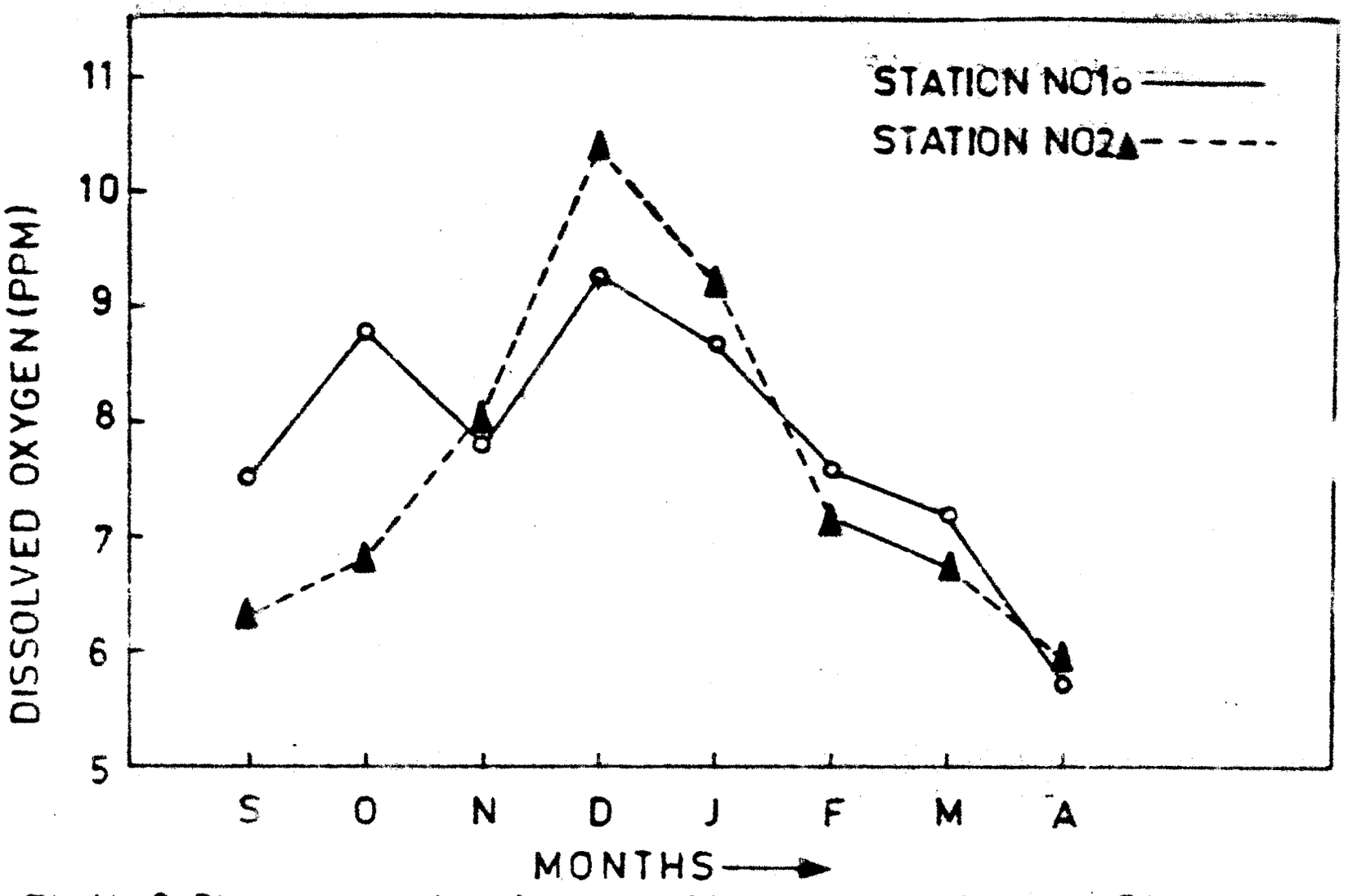

Fig No 6. The graph showing monthly average values of Dissolved oxygen in PPM for the period of Septmber 1981-April 1982

stn.1. and stn 2. during the month of December, maximum average values are recorded. Where as the lowest values are recorded during April '82. In general, the uniform pattern at both the stations was shown during the investigations.

ii) Free Carbon dioxide -

Free carbon dioxide was estimated from the surface waters of Motitalav by using phenolpthaline method as given by Welch (1948). The table no.7 clearly shows that on many occasions the value at one or the other stn.was zero.Specially during the months of January and February at stn.no 2 no free Carbon dioxide was recorded in the surface waters. The highest values for this gas were estimated to be 18 ppm and 17 ppm at stns.1 and 2 respectively on 18.4.82.

The average monthly values show the general tendency of almost parallel fluctuations recording initial higher values in September then gradual drop till the lowest values for both the stns in February and again highest values up to 12 ppm in the month of April'82.

iii) Hardness -

The hardness of water at both the stations show almost uniform corelation in fluctuations for its monthly average values as can be seen from the fig no.8. the lowest average values were observed for both the stns. in September'81 and the highest average values were recorded in the month of December'81.

The table no 8, giving the weekly readings of hardness of water in ppm and shows the same uniform pattern. The

Table No.7: Weekly readings of Free Carbon dioxide in PPM for September 1981 - April, 1982.

Date	Station No.1. Readings	Station No.2. Readings
13.9.81	4.0	12.0
20.9.81	5.0	5.0
27.9.81	7.5	8.0
4.10.81	10.0	4.0
11.10.81	5.0	2.5
18.10.81	3.0	00
25.10.81	4.3	00
15.11.81	3.0	00
22.11.81	6.0	5.0
29.11.81	4.0	3.0
6.12.81	00	00
13.12.81	7.0	3.5
20.12.81	1.0	00
3.1.82	4.0	00
10.1.82	3.0	00
17.1.82	3.0	00
24.1.82	3.0	00
31.1.82	6.0	00

Date	Station No.1. Readings	Station No.2. Readings
14.2.82	2.0	00
21.2.82	00	00
28.2.82	00	00
7.3.82	00	00
14.3.82	4.0	3.0
21.3.82	2.0	5.0
28.3.82	5.0	6.0
4.4.82	8.0	6.0
11.4.82	10.0	7.0
18.4.82	18.0	17.0
25.4.82	11.0	15.0

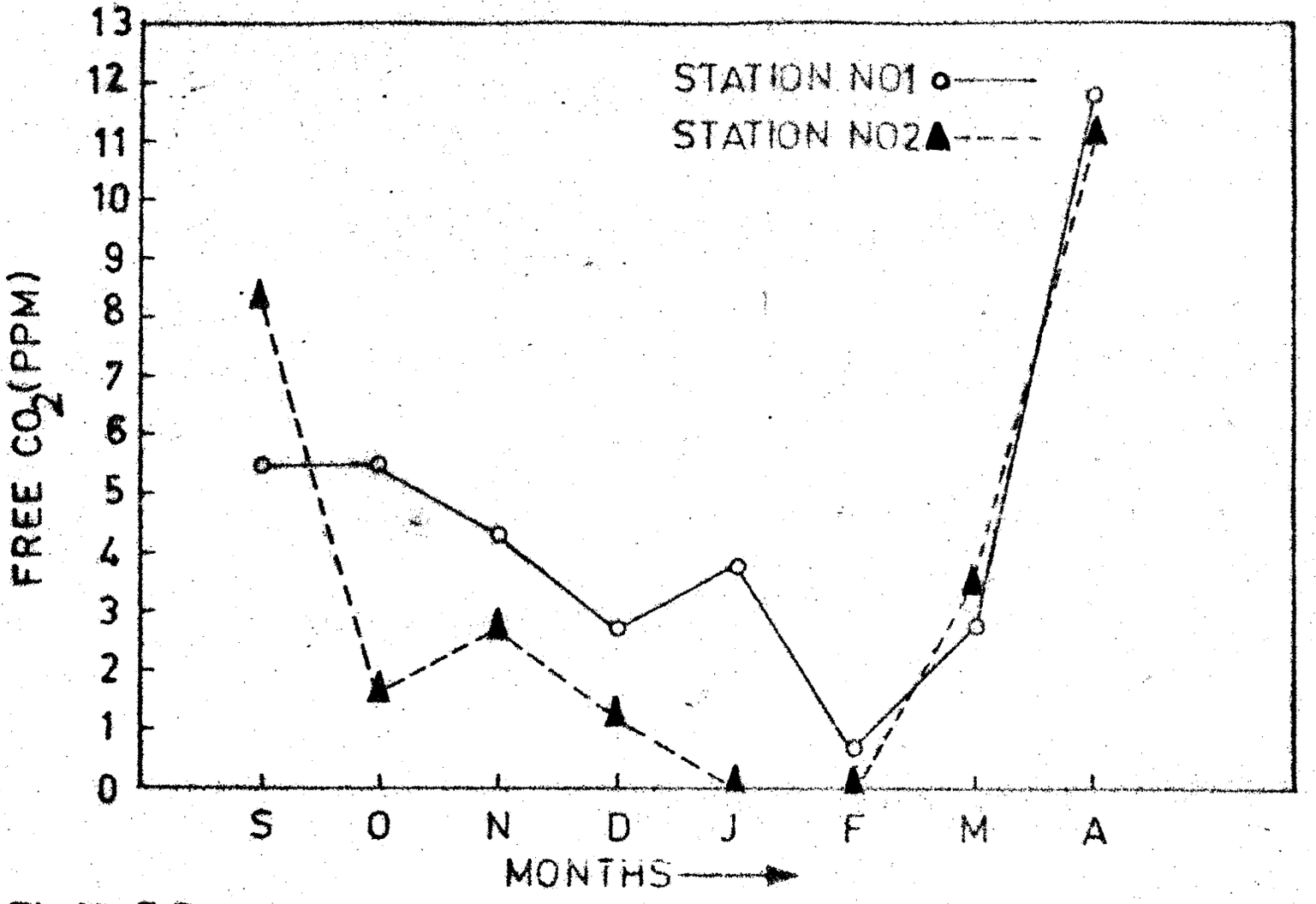

Fig No.7 The graph showing monthly average values of free CO_2 in PPM for the period of September 1981 April 1982.

Table No.8 : Weekly readings of Hardness of water in PPM for September 1981 - April 1982.

Date	Station No.1. Readings	Station No.2. Readings
13.9.81	12.00	24.00
20.9.81	12.00	35.00
27.9.81	31.00	38.00
4.10.81	26.00	38.00
11.10.81	34.00	30.00
18.10.81	55.00	54.00
25.10.81	55.00	55.00
15.11.81	33.00	34.00
22.11.81	36.00	43.00
29.11.81	27.00	31.5
6.12.81	37.00	33.00
13.12.81	31.00	30.00
20.12.81	110.00	113.00
3.1.82	42.5	44.00
10.1.82	47.0	51.00
17.1.82	43.0	44.00
24.1.82	41.0	46.00
31.1.82	42.5	45.00

Date	Station No.1. Readings	Station No.2. Readings
14.2.82	41.00	44.5
21.2.82	42.00	38.5
28.2.82	41.00	38.0
7.3.82	50.00	55.00
14.3.82	50.00	48.00
21.3.82	48.00	45.00
28.3.82	43.00	43.00
4.4.82	30.00	45.00
11.4.82	30.00	36.00
18.4.82	38.00	36.00
25.4.82	28.00	31.00

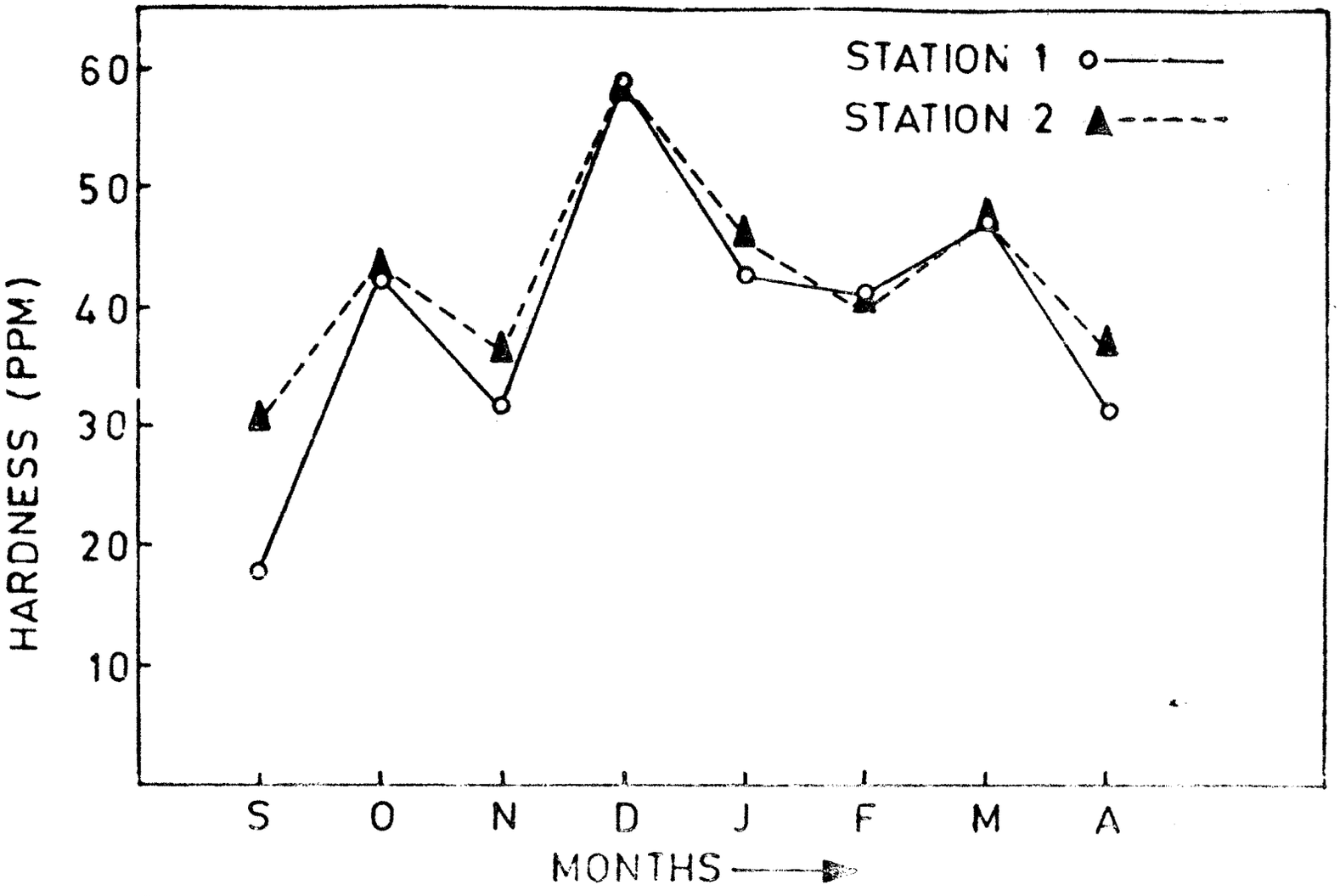

Fig No 8 The graph showing monthly average values of Hardness in ppm for the period of September 1981-April 1982.

maximum and minimum hardness values were recorded at both the stations on same days. Therefore it is seen that on 13-9-81 the lowest values of 12 ppm and 24 ppm were recorded at stn 1 and stn 2 respectively. The higher values were as high as 110 ppm and 113 ppm respectively for the stations 1 and 2.. Almost throughout the time during the period of investigations the monthly average values at stn 2 were higher than those at stn.1.

iv) pH (Hydrogen ion concentration)

The pH of water was studied by using an universal indicator kit in the field. The fig 8. show the clear picture of the pH fluctuations during the period of investigations.

The average monthly readings fluctuated from 6.3 at stn.1 in the month of October to 8.2 at stn. 2 in November '81.

The weekly readings at stn. 1 and stn. 2. show that the pH values had considerable fluctuation throughout the period of investigation which can not be noticed by studying the average values. At stn 1 the weekly values ranged from 4 on 11-10-81 to .8.5 on 25.11.81. where as at stn. 2 the lowest value of 5.0 was recorded on 4.10.81 where as the highest value of 9 was recorded at this station serveral times like on 25.10.81, 6.12.81, 18 and 25.9.82, etc. But on an average the pH values were more than 7 for longer duration during the investigations.

v) Phosphate

Posphate is one of the important nutrients essential for the productivity of phyto-plankton and macrophytes in

Table No.8a Weekly readings of pH values for September 1981 - April 1982.

Date	Station No.1. Readings	Station No.2. Readings
13.9.81	7.5.	6.0
20.9.81	7.0	7.0
27.9.81	6.5	7.0
4.10.81	5.0	5.0
11.10.81	4.0	5.5
15.10.81	7.5	8.5
25.10.81	8.5	9.0
15.11.81	7.5	8.5
22.11.81	7.5	7.5
29.11.81	7.5	8.5
6.12.81	8.5	9.0
13.12.81	6.0	5.5
20.12.81	6.0	6.0
3.1.82	6.0	5.5
10.1.82	7.0	7.0
17.1.82	7.0	7.0
24.1.82	6.0	7.0
31.1.82	6.5	7.0

Date	Station No.1. Readings	Station No.2. Readings
14.2.82	7.0	7.0
21.2.82	7.0	7.0
28.2.82	7.0	7.5
7.3.82	6.5	7.0
14.3.82	7.5	7.5
21.3.82	8.0	7.5
28.3.82	7.5	7.5
4.4.82	7.5	8.0
11.4.82	7.5	8.0
18.4.82	7.5	9.0
25.4.82	7.5	9.0

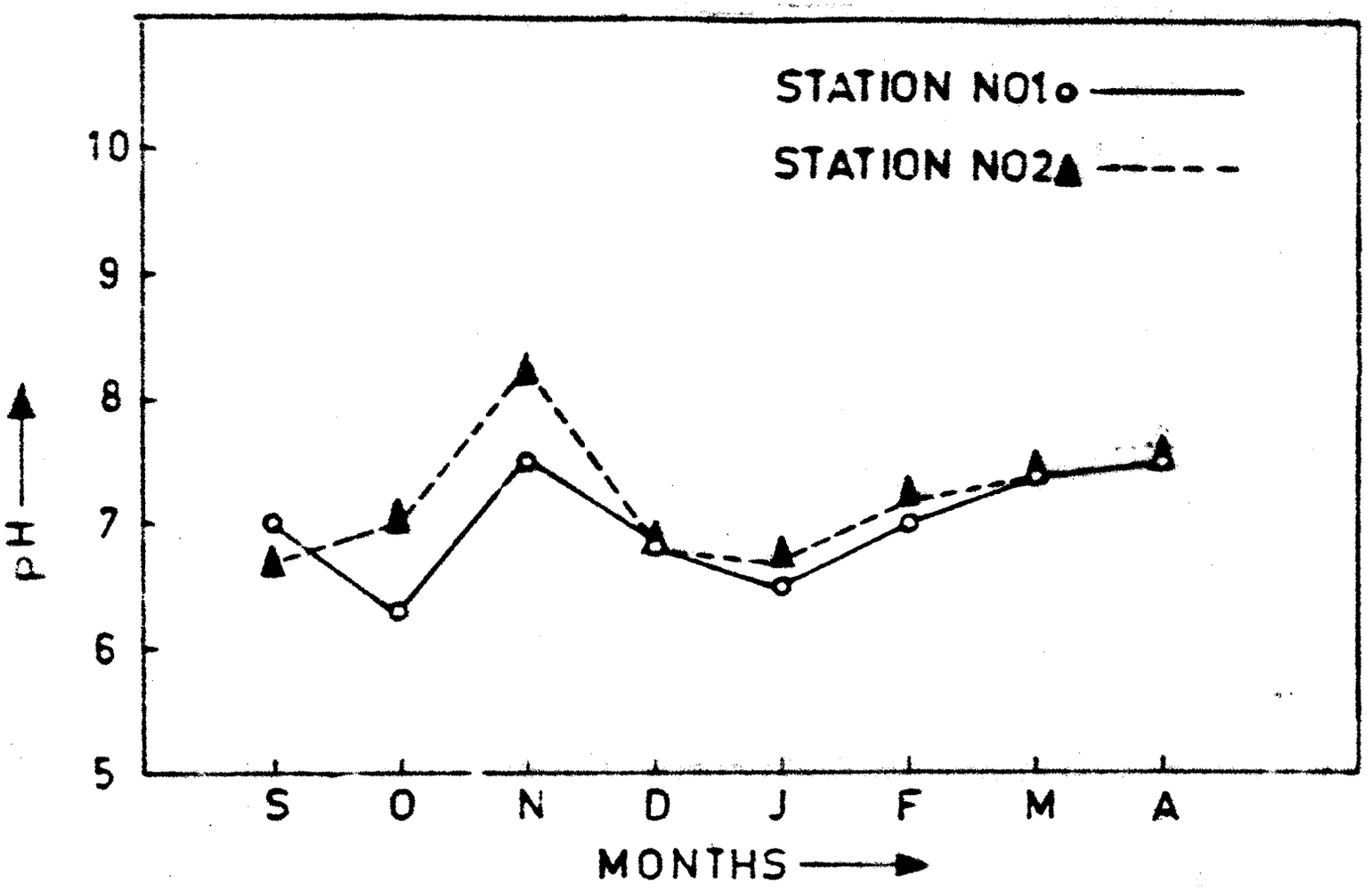

Fig No 8a The graph showing monthly average values of pH for the period of September 1981-April 1982

Table No.9: Weekly readings of Phosphate in mg/lit for September 1981 - April 1982.

Date	Station No.1. Readings	Station No.2. Readings
13.9.81	0.5	1.0
20.9.81	0.04	0.3
27.9.81	1.0	1.1
4.10.81	0.4	0.6
11.10.81	1.4	1.4
18.10.81	0.8	0.9
25.10.81	0.2	0.2
15.11.81	0.2	0.3
22.11.81	0.4	0.5
29.11.81	0.18	0.4
6.12.81	1.0	1.0
13.12.81	1.2	1.2
20.12.81	0.6	0.4
3.1.82	0.08	0.08
10.1.82	0.6	0.2
17.1.82	0.04	0.04
24.1 .82	0.06	0.06
31.1.82	0.5	0.5

Date	Station No.1. Readings	Station No.2. Readings
14.2.82	0.1	0.1
21.2.82	0.06	0.06
28.2.82	0.4	0.4
7.3.82	0.6	1.0
14.3.82	0.4	0.4
21.3.82	0.1	0.1
28.3.82	0.1	0.1
4.4.82	0.1	0.1
11.4.82	0.2	0.2
18.4.82	0.1	0.1
25.4.82	0.1	0.1

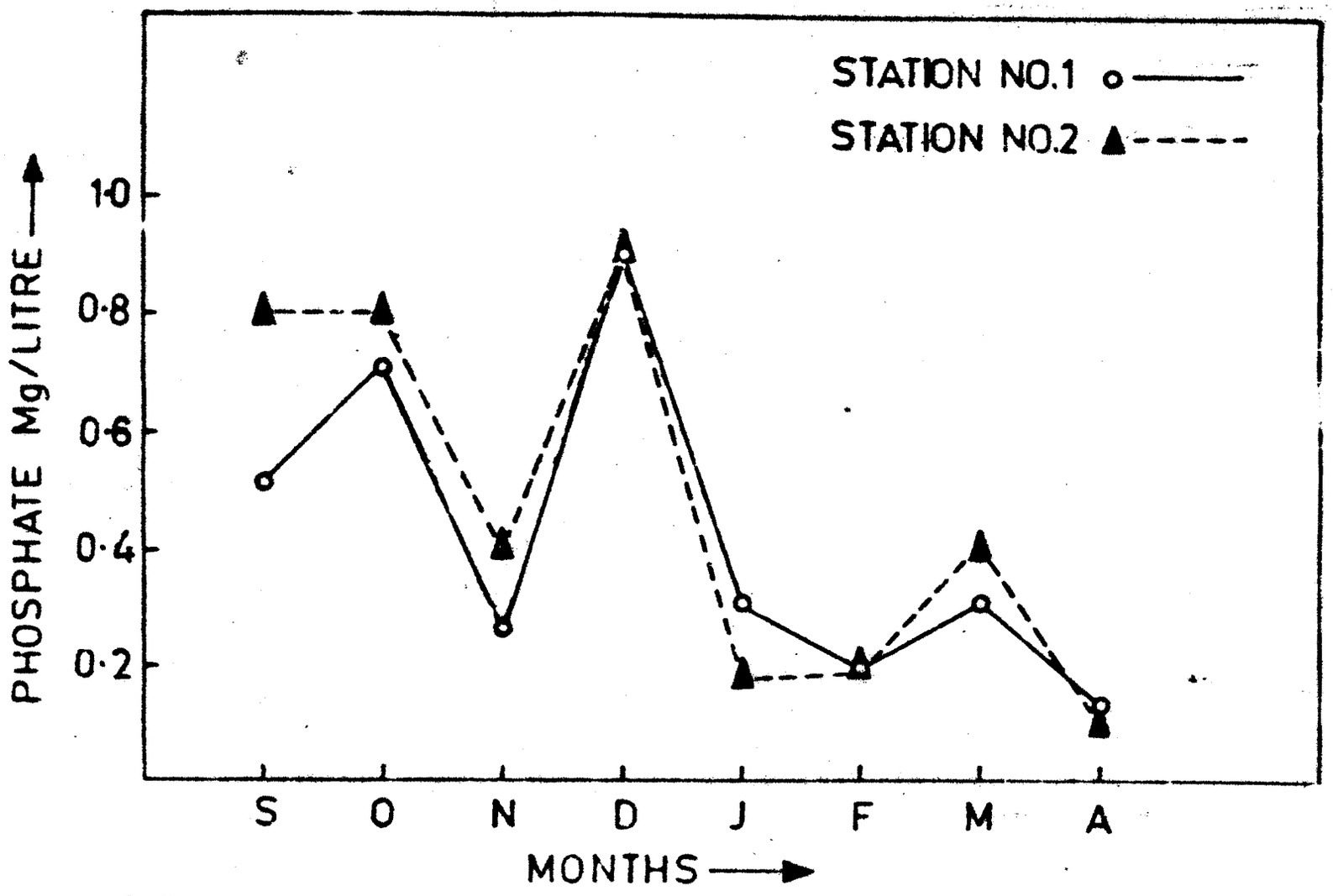

Fig No 9. The graph showig monthly average values of phosphate in mg/litre for the period of September 1981-April 1982.

aquatic ecosystem.

The fig 9 shows monthly average values of phosphate from the surface waters of Motitalav at Stations 1 and 2. The readings are expressed in mg/lit. In the graph there is a general correlation in the average values at both the stations. The values range between .1 mg/lit in April '82 and .9 mg /lit in December'81.

The table 9 shows the weekly readings of phosphate at both the stations during the period of study .The highest value recorded during the period was 1.4 mig/lit.on 11.10.81 at both the stations. The lowest phosphate value of .04 mg/lit was also recorded on one day i.e. 17.1.82.at both the stations. The difference in the both the values appears to be 1.36 mg/ lit.

vi) Nitrate -

Weekly values of Nitrate have been expressed in the table no.10. Where much irregular pattern can be seen.

Though the maximum value during the study period i.e. 1.25 mg/lit of nitrate was observed at both the stations on 10.1.82. The fig 10. shows that the monthly average values were more in the months of March and April.

On some Occassions the nitrate values were zero as shown in the table. Therefore it was evident that the nitrate content in the tank water was not constant and significant.

Table No.10: Weekly readings of Nitrate in mg/lit for September 1981 -April 1982.

Date	Station No.1. Readings	Station No.2. Readings
13.9.81	0.7	0.65
20.9.81	0.25	0.25
27.9.81	0.15	0.35
4.10.81	0.5	0.5
11.10.81	0.5	0.35
18.10.81	0.25	0.25
25.10.81	0.25	0.35
15.11.81	0.3	0.25
22.11.81	0.25	0.4
29.11.81	00	00
6.12.81	0.3	0.4
13.12.81	00	00
20.12.81	0.5	0.5
3.1.82	0.5	0.5
10.1.82	1.25	1.25
17.1.82	0.5	0.35
24.1.82	0.4	0.4
31.1.82	0.08	0.1

Date	Station No.1. Readings	Station No.2. Readings
14.2.82	00	00
21.2.82	00	00
28.2.82	0.2	0.2
7.3.82	0.5	1.0
14.3.82	0.9	0.9
21.3.82	0.75	1.0
28.3.82	1.0	1.0
4.4.82	1.0	1.0
11.4.82	1.0	1.0
18.4.82	1.0	1.0
25.4.82	1.0	1.0

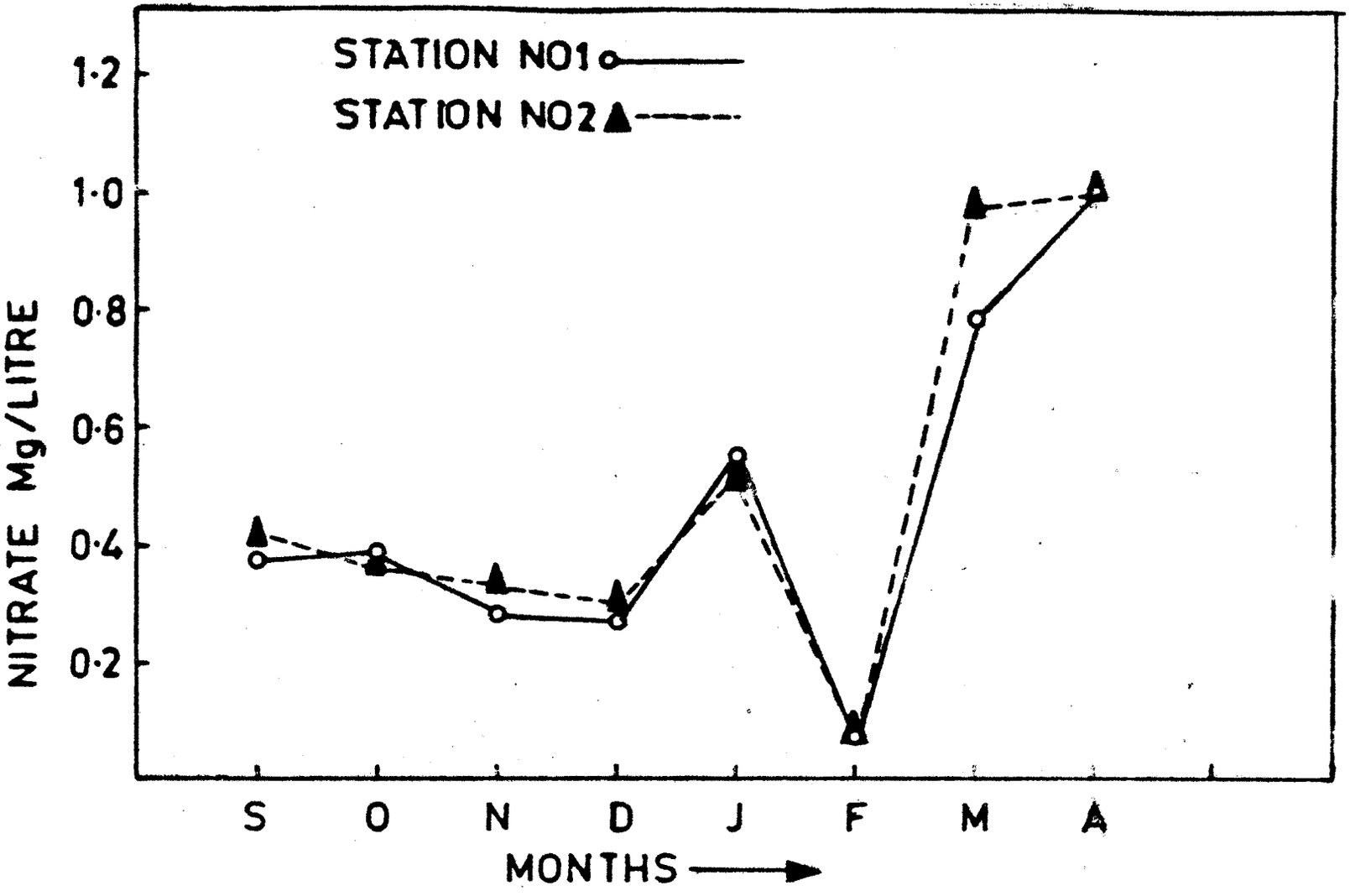

Fig No 10. The graph Showing monthly average values of Nitrate in mg/litre for the period of September 1981-April 1982.

BIOLOGICAL STUDIES

VI

BIOLOGICAL STUDIES

In the studies of the biota of the tank, the floral and faunal samples were collected from mainly the marginal areas throughout the period of investigations. Though the plankton samples were initially drawn from different locations, due to its almost uniform distribution, later the plankton samples were collected from Stn.1 and Stn.2 only (Map.). The plankton samples could not be collected during the months of May-July 1982, due to the drying of the tank by the local Municipality for tank cleaning purpose as a measure for weed control.

1) Flora and Fauna -

The flora and fauna of the tank showed much less number of types of organisms though it has a considerable water spread area (12.5 ha.) The macro vegetation in the tank was represented by only three dominant species where as the phytoplankton consisted of following types: Bacillariophyceae-20, Chlorophyeeae-14, Cyanophyceae-10 and Desmidioaceae-7, In total the phytoplankton samples represented about 51 types of organisms.

In Zooplankton samples about 24 types of forms were common and they were found throughout the period of investigations with minor seasonal fluctuations. In the samples 10 types of Rotifer, 9 types of Copepod and 5 types of Cladoceran organisms were identified. The macro fauna of the tank was made up of 11 species. The composition of the fauna was Crustaceans-2, Molluscs-2, Fishes-4, Amphibian-1 and Reptiles-2.

The list of organisms found in the Motitalav is given below :-

Phytoplankton

Diatoms (Bacillariophyceae)

1. Diatom vulgare
2. Cymbella affinis
3. Tabellaria SP.
4. Teracyclus lacustris
5. Epithemia Zebra
6. Diatomella balfouriana
7. Frustulia SP.
8. Pinnularia Nobilis
9. Navicula SP.
10. Fragilaria CaPucina
11. Synedraulina SP.
12. Achnanthes SP.
13. Brebissonia boekii
14. Amphora ovails
15. Mesosira SP.
16. Melosoria granulata
17. Fragilaria crotonensis
18. Synedra affinis
19. Gomphonema Paravulum
20. Stauronesis anceps

Chlorophyceae (Green Algae)

1. Spirogyra
2. Nephrocytium quadriseta
3. Characium Hookeri

Chlorophyceae (Green Alage)(Contd....

4. Chlorosarcina minor
5. Pediastrum Simplex
6. Pediastrum duplex
7. Hyponodinium SP.
8. Spinoclosterium Curvatum
9. Treubaria regulare
10. Hydrodicyton Reticulatum
11. Spondylosium moniliforme
12. Desmidiom sphaericum
13. Sphaerocystis Schroeteri
14. Pithophora oedogonia

Cynophyceae (Blue - green Algae)

1. Microcystis aeruginosa
2. Pediastrum boryanum
3. Coelosphaerium dibium
4. Spirulina Piatensis
5. Anabaenopsis circularis
6. Merismopedia Punctata
7. Pleurocepsa SP.
8. Micrasterias SP.
9. Anabaena SP.
10. Nostoc linckia

Desmids (Desmidiaceae)

1. Desmid staurastrum
2. Staurastrum leptocladium
3. Coelastrum microporum
4. Staurastrum chaetoceras
5. Cosmarium monomazum
6. Cosmarium granatum
7. Sphaero zosoma aubertianum

Macrophytes

1. Paspalidium SP.
2. Marsilea Uncinata
3. Hydrilla vertecllata

Zooplankton (Rotifers)

1. Branchious falcatus
2. Branchionus rubens
3. Branchionus calyciflorus
4. Keratella taurocephala
5. Trichocera cylindrica
6. Paracolurella aemula
7. Asplanchna Pilinia
8. Asplanchna Filinia
9. Notholcaocum minota
10. Filinia terminalis
11. Trichocerca longiseta
12. Cephalodella megalocephalo
13. Cochlearis SP.
14. Branchionus caudatus

Zooplankton (Contd...

15. Kellicottia SP

16. Branchionus forficula

17. Filinia branchiata

18. Lophocharis salpina

19. Euchlanis SP.

Copepods

1. Diaptomus napulius II (Developmental Stage)

2. Diaptomus napulius IV (Developmental Stage)

3. Neodiaptomus diaphorus

4. Cletocamptus albvquerquensis

5. Rhinediaptomus indicus

6. Spicodiaptomus chelospinus

7. Cyclopoid SP.

8. Cyclops bicuspidatus thomasi

9. Ergasilus chautaughaensis

Cladocera

1. Chidorus SP.

2. Daphnia pulex

3. Diaphanosoma brachyurum

4. Ceriodaphnia Parthenogenetic

5. Simocephalus SP.

Macro-Organisms

Crustacean

1. Macrobrachium SP. (Fresh Water Prawn)

2. Paratelphusa SP. (crab)

Molluscs

1. Pila SP.
2. Melonia tuberculata
3. Fishes

1. Puntius ticto
2. Rasbora dbniconius
3. Labeo fibriatus
4. Cirrhina reba

Amphibians

1. Rana tigerina

Reptiles

1. Cerbenus hynchops
2. Geomyda SP. (Turtle)

The following forms were found predominant in the phyto and Zooplankton samples for the entire period of research.

Bacellaria - Melosiva granulata, Diatoma sp.

Algae - Nephrocytium quadriseta, Coelastrum microporum, [illegible], Spirogyra sp., microcystis aeruginosa,

Rotifer - Branchionus farlicula

Copepod - Rhinediaptomus indius and Diaptomus napulis V larval stage.

ii) Plankton Studies:

In the quantitative plankton studies the samples were collected at Stn.1 and Stn.2. respectively in the Motitalav . After collection, the samples were centrifuged and the volume of the sample was estimated in a graduated test tube. After calculating the volume of tank water filtered to get the plankton the results were expressed as plankton sample in cc/lit of tank water . The weekly readings of plankton volume for the period of Sept.,1981-April,1982 are given in table No.11 and the monthly average values of volume of plankton at both the stations is shown in fig.no.11.

The plankton volume ranged from o.ol cc/lit to 0.15 cc/lit. and 0.01 cc/lit. to 0.08 cc/lit. at stations 1 and 2 respectively. The plankton volume at Stn.1 was most of the time more than at Stn.2 . The monthly average value of the plankton volume at Stn.1 was 0.04 cc/lit and at stn.2 was 0.03 cc/lit. At Stn.1 the maximum monthly average values were recorded in the month of september (0.09 cc/lit) and in the subsequent months the level droped down till March. In the month of April the plankton volume increased to reach the Second peak, (i.e. 0.06 cc/lit.) At Stn 2 not much fluctuation in the planktons was observed (Fig. 11).Where the maximum monthly average value was recorded to be 0.05 cc/lit.in September 1981.

In the quantitative study, the weekly percentage composition of the phyto and zooplankton was estimated to see its interrelationship. After using the sample for its

Table No.11: Weekly readings of Plankton Sample in CC/lit for September 1981 - April 1982.

Date:	Station No.1 Readings	Station No.2. Readings
13.9.81	00.04	0.06
20.9.81	0.15	0.05
27.9.81	0.08	0.06
4.10.81	0.03	0.02
11.10.81	0.03	0.03
18.10.81	0.04	0.08
25.10.81	0.03	0.01
15.11.81	0.04	0.05
22.1.81	0.04	0.02
29.11.81	0.06	0.03
6.12.81	0.03	0.04
13.12.81	0.03	0.03
30.12.81	0.02	0.02
3.1.82	0.08	0.03
10.1.82	0.02	0.01
17.1.82	0.03	0.03
24.1.82	0.01	0.01
31.1.82	0.025	0.01

Date	Station No.1 Readings	Station No.2 Readings
14.2.82	0.04	0.04
21.2.82	0.03	0.01
28.2.82	0.01	0.02
7.3.82	0.01	0.02
14.3.82	0.02	0.02
21.3.82	0.01	0.02
28.3.82	0.04	0.04
4.4.82	0.01	0.05
11.4.82	0.11	0.03
18.4.82	0.07	0.01
25.4.82	0.04	0.04

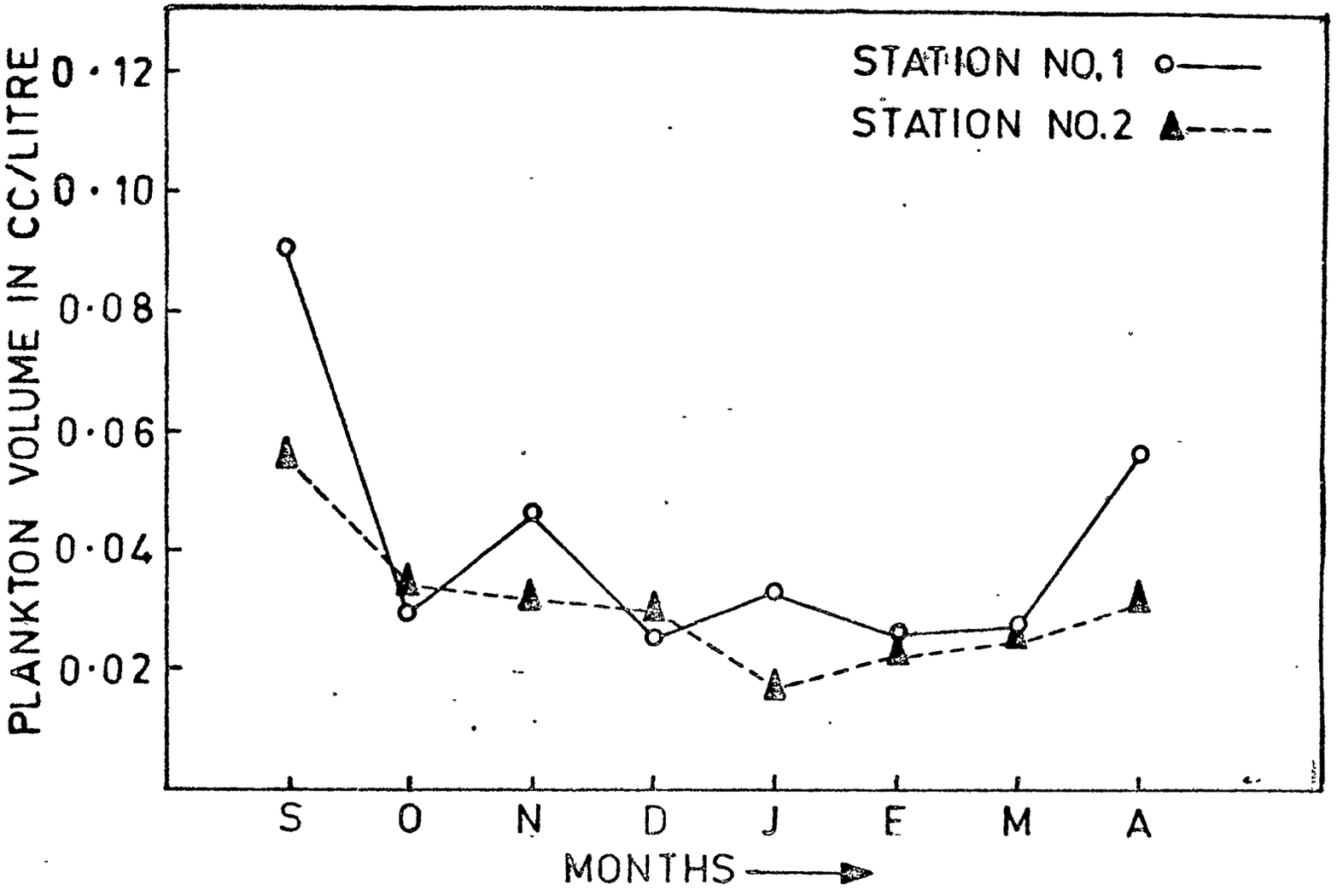

Fig No 11 The graph Showing the monthly average Values of plankton volume in cc / litre for the period of September 1981 – April 1982.

Table No.12:- Weekly readings of percentage composition of phyto and zooplankton from September 1981 - April 1982.

Station No.I:

Date	Phytoplankton	Zooplankton
13.9.81	46.20	52.41
20.9.81	85.00	15.00
27.9.81	--	--
4.10.81	85.77	14.04
11.10.81	--	--
18.10.81	69.08	28.88
25.10.81	--	--
15.11.81	49.8	49.98
22.11.81	--	--
29.11.81	87.26	11.09
6.12.81	46.35	50.73
13.12.81	91.47	8.12
20.12.81	80.10	19.22
3.1.82	66.03	33.60
10.1.82	91.50	8.13
17.1.82	62.33	34.51
24.1.82	98.92	1.11
31.1.82	80.17	15.86
14.2.82	87.68	12.06
21.2.82	90.25	8.47

Station No.I:

Date	Phytoplankton	Zooplankton
28.2.82	75.15	24.66
7.3.82	94.72	5.17
14.3.82	69.18	30.42
21.3.82	58.98	38.51
28.3.82	40.67	58.79
4.4.82	62.35	37.43
11.4.82	49.59	44.98
18.4.82	92.98	6.20
25.4.82	55.44	44.68.

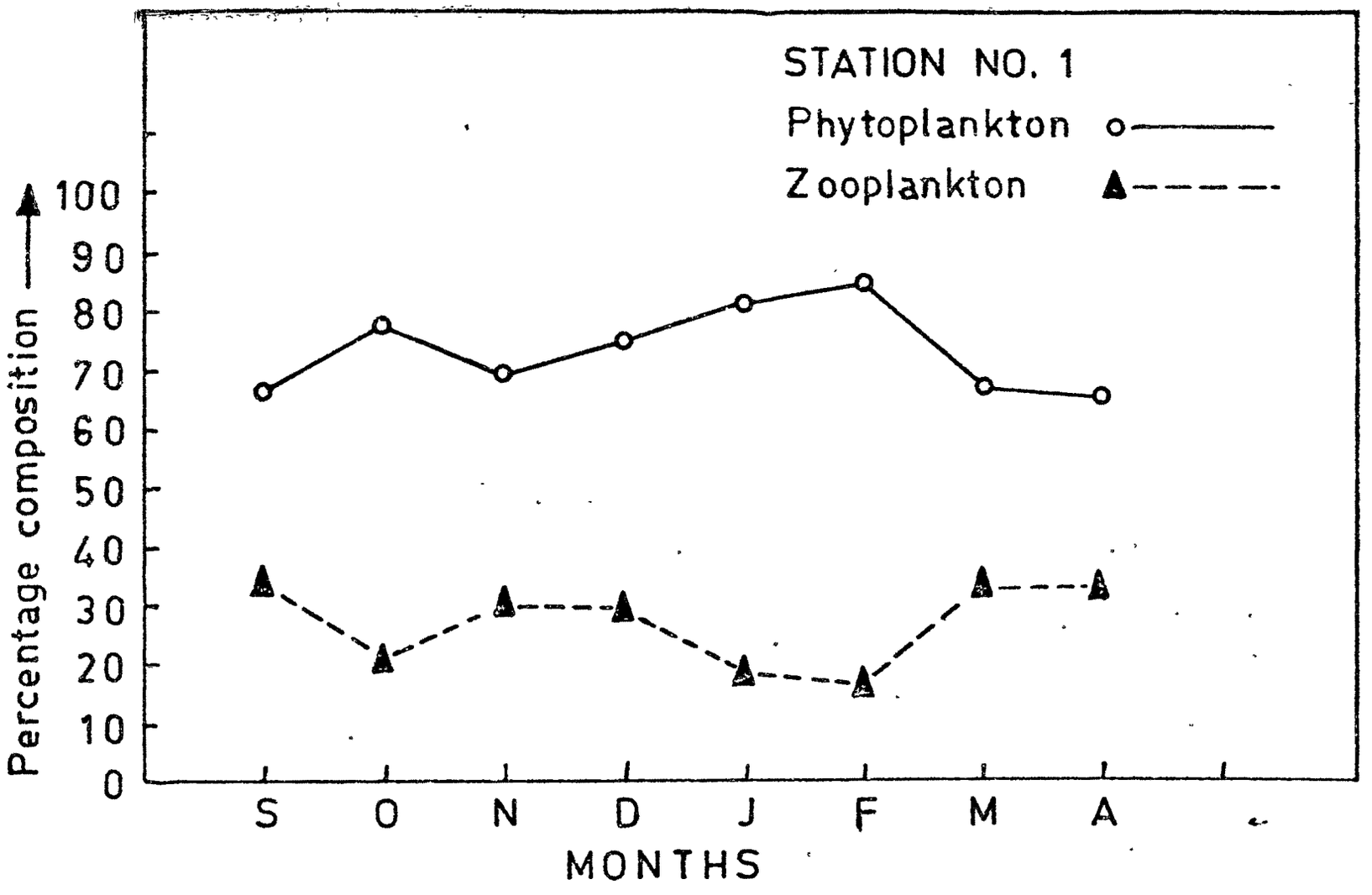

Fig No 12 - The graph showing monthly fluctuations in the percentage composition of phyto and zooplankton from September - 1981 - April 1982.

qualitative analysis, and volume estimation. The weekly samples were studied by using Hensen Stempel pipette and Sedgwick-Rafter counting cell to count the number of phyto and zooplankton organisms in 2 cc. of diluted sample. The number organisms counted was utilized to determined the percentage composition of both plankton groups in the sample.

The table No.12 and No.13 show the weekly fluctuations in the percentage composition of phyto and zooplankton at Stn.1 and Stn.2 respectively.

From the weekly readings it can be seen that on four occassions at Stn.1 and on six occasions at Stn.2 . The Zooplankton dominated phytopkanton organisms. However, in all other readings phytoplankton was dominant as expected.

The weekly percentage of phytoplankton at Stn.1 and Stn.2 ranged from 40.67 % to 98.92 % and 16.84% to 100% respectively. In the weekly Zooplankton samples at both the stations the fluctuation was at Stn.1 .1.11 % to 58.79 % and at Stn.2 from 0 % to 83 %.

The difference in the fluctuations (the maximum and minimum values recorded) in phytoplankton percentage at Stn.1 and Stn.2 were 58.25 and 83.52 respectively. Where as in Zooplankton these values were at Stn.No.1. 57.68 and at Stn.2, 83.

This clearly shows that at Stn.No.2 the fluctuations in the plankton samples were much prominant and varied as compared to the fluctuations at Stn.No.1, which were much uniform.

Table No.13 :- Weekly readings of percentage composition of phyto and zooplankton from September 1981 - April, 1982.

Station No.II.

Date	Phytoplankton	Zooplankton
13.9.1981	90.79	9.08
20.9.81	88.7	11.1
27.9.81	99.8	0.2
4.10.81	97.25	2.70
11.10.81	100.00	0.0
18.10.81	98.97	0.93
25.10.81	--	--
15.11.81	76.11	24.29
22.11.81	--	--
29.11.81	84.24	15.56
6.12.81	22.62	77.29
13.12.81	86.32	12.57
20.12.81	88.5	6.5
3.1.82	16.84	83.00
10.1.82	88.89	11.06
17.1.82	60.62	38.76
24.1.82	90.74	9.12
31.1.82	73.38	24.58
14.2.82	52.60	46.92
21.2.82	38.67	59.88
28.2.82	48.53	51.32

Station No.II.

Date	Phytoplankton	Zooplankton
7.3.82	57.11	42.81
14.3.82	51.93	48.00
21.3.82	55.78	42.82
28.3.82	32.40	64.62
4.4.82	72.29	25.44
11.4.82	52.22	46.91
18.4.82	94.53	5.35
25.4.82	41.82	57.76

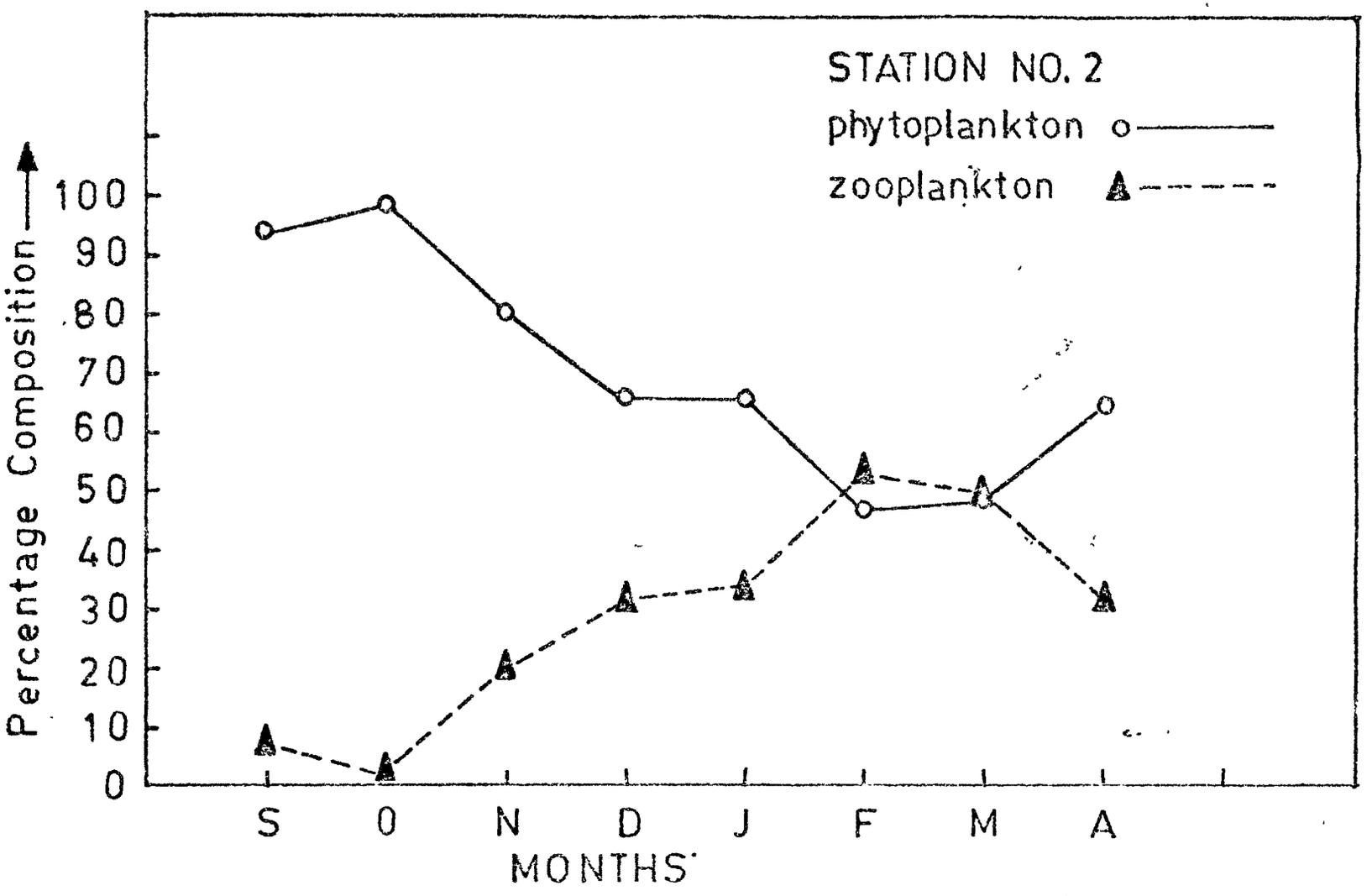

Fig No 13. The graph showing monthly average flutuations in the percentage composition of phyto and zoo plankton from September 1981 - April 1982.

The monthly average values in the percentage compositions of phyto and zooplankton are shown in the fig 12 and fig 13 for Stn.1 and Stn.2 respectively.

At station 1. throughout the period the phytoplankton proportion in the total sample was much more than Zooplankton. The monthly values show (fig.No.12) that proportion of Phytoplankton was between 65-84% where that of Zooplankton was between 16-34 %.

Stn.No.2 shows the monthly percentage of Phytoplankton ranging from 47 % to 99 % and Zooplankton from 1 % to 53 % (Fig.No.13).

Though there are periodic fluctuations at both the stations in plankton composition monthly average values show (fig.No.12 and No.13) that phytoplankton is dominant at both the stations with only exception Stn.2 in February 82 when Zooplankton exceeds phytoplankton.

ii) Fishery potential :--

The information about the fishery activity in 'Motitalav' was made available from the Sawantwadi Municipality records and department of fisheries Govt.of Maharashtra.

Unfortunately the records are not properly mentained and whatever information is there is inadequate and scanty. Since there is no fishery activity in the tank for last some years no fishery statistics could be obtained.

This productive tank is not utilized for fishing purpose apperently for the following reasons as communicated by the local sources: i) As Sawantwadi town is nearer to the western coast (21 Km.) as in any other place in Konkan region the fish eaters prefer only sea-fish and do not like to consume fresh water fish. ii) Due to the long distance of the probable market places for fresh water fish i.e. Kolhapur and Belgaum, the transport, packageing and ice charges make the shipment expensive. iii) The fisherman with the required dragnets and other materials from Kolhapur, Satara do not go to Sawantwadi for fishing iv) The municipality yet does not think of aquaculture in Motitalav as a source of revenue and also less expensive food supply to the poor population of the town. Instead it dries the tank during the summer moth to get rid of algae, the rich source of food for most of the cultivable fishes.

According to the earlier records in the year 1955 the smaller portion of the tank near Sth No.2 (6 acres) was stocked with the spawn of Indian major carps Catla catla , Labeo rohita and Cirrhina mrigala.

The trial fishing was carried out on 14.5.1956 when three catla were caught, their weights ranged between 480 grams to 600 grams and the average length of the fishes was 30 cms. This growth was satisfactory in natural waters.

In the year 1957 the fishes were caught by draining the tank. The record say that the 80 fishes caught weighed from 3.6 to 18 Kg. each. This is certainly remarkable rate of

growth. Most of the fishes were planktoniphayus i.e. Catla catla. A record says that breeding of fishes was observed in Motitalva in 1955, though no authentic information could be gained wheather it was induced breeding or a natural one.

For the two years i.e.1966-67 and 1967-68 fishing was conducted in the Motitalav. In 1966-67 the major carps caught weighed 1513 Kg. The fishing operation in 1967-68 lated for 10 days in which 1681 Kg. of fish was caught. The daily catch ranged from 73 Kg. to 326 Kg. The total catch averaging about 168 Kg./ day.

It is known that in any perennial water body the fishes caught in shorttime would at the most be around 40% of the total fish population in the water-body.

David et al (1969) have reported that the standing Crop of fish in a waterbody is up to 3 to 5 times more than the yield at any given time. According to Turner 1960 , even from the small ponds from Kentncky U.S.A. the yield of harvestable size fish could be only 15 to 48% of the standing Crop. In the T.V.A. reservoir, out of only 120 Kg/ha of standing Crop. only about 30% i.e. 38 Kg/ha is capable of removal.(Miller,1951) Carlander (1955), Jenkins (1958), have given few more examples of the relationship between the standing crop and the actual fish yield.

Therefore considering the fish catch of the years 1966-67 and 1967-68, the average annual fish catch of Motitalav can be estimated to be 1597 Kgs.

Considering the fish catch to be moderate 40 % of the standing crop of fish in the tank the water body should support about 3992 Kg. of fish in the tank.

According to Bhimachar (1975), the perennial and seasonal tanks in the country naturally produce fish to the extent of about 150 Kg./ha and 25 Kg/ha per year, respectively. He mentions that with management techniques the same production could easily reach about 500 Kg/ha and 100 Kg./ha. in the two types of water bodies.

'Motitalav' has perennial water supply and drainage facility to dry the tank if required. Therefore, these suitable facilities along with the improved aquaculture techniques like application of polyculture and fertilization of the water by sewage nutrients, will greatly increase the fish production potential of this shallow and predator free water body.

Therefore the annual fish production in the tank could be increased to about 320 Kg./ha and not 128 Kg./ha, as was caught during the fishery operations in 1966-68.

If the tank is provided with fertilizers or treated sewage by the Sawantwadi Municipality the fish production from the same tank may reach as high as 400-500 Kg./ha./yr. This is not a very ambitions figures considering the experience in other places.

The composite fish culture of chinese and Indian major carps together, in the small ponds in India, has resulted in fish production, as high as 3000-5800 kg/ha. per 6 months and 7000-9000 kg/ha. per year in the water ponds (Jhingran,1976)

The commercial fish culture of common carp,silver carp and tilapia, in kibutz Gan shmuel, Israel, has resulted in a highly productive catch of 10,000 kg./ha per year (Pruginin, 1976), with only the sewage sering as the source of organic manure.