TABULAR STATEMENTS

T A B L E - I

PHYSICOCHEMICAL CONDITIONS USING CHLORELLA VULGARIS:

Tests	DETENTION PERIODS IN DAYS							
	Control		Rawsewage		Rawsewage + Chlorella			
	0	2	4	6	0	2	4	6
A. PHYSICAL								
Water temperature (c^0)	28.5	28.0	28.0	28.5	28.5	28.0	28.5	28.5
Colour x	Pink	Pink	Pink	Pink	Pink	Green	Green	Green
pH	7.7	7.9	7.9	7.9	7.8	8.2	9.1	10.2
B. CHEMICAL (9mg/l)								
Phenol alkalinity	30	35	45	50	30	4 55	130	190
Am-N	27.1	25.0	24.7	24.6	27.1	12.3	4.7	2.8
NO_2-N	.405	.19	.14	1.45	0.405	.33	.25	.35
NO_3-N	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
PO_4	9.0	8.85	8.75	5.25	9.0	3.3	1.75	1.4
BOD 5 at 20^0C ##	133	58	35	28	133	33	10	8
COD ##	275	116	48	34	275	72	18	12

x Pink colour due to discharge of dyes from a nearby textile mill factory.

Centrifuged Supernatant

T A B L E - II

PHYSICO CHEMICAL CONDITIONS USING EUGLENA GRACILIS

Tests	DETENTION PERIODS IN DAYS							
	Control				Rawsewage + Euglena			
	0	2	4	6	0	2	4	6
A. Physical water temperature	28.0	28.0	28.1	28.5	28.0	28.1	28.1	28.0
Colour	Brown	Brown	Brown	Brown	Brown	P. Green	Green	Green
pH	7.4	7.6	7.8	8.0	7.4	8.0	8.6	9.3
B. Chemical (mg/l)								
Phenol alkalinity	25	34	40	44	25	38	60	72
Am.N	26.0	23.4	24.5	22.8	26.0	9.8	6.2	2.0
NO_2-N	TRACE	Nil	Nil	Nil	Trace	0.04	0.08	0.10
NO_3-N	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
PO_4	18.4	18.0	15.9	12.0	18.4	6.4	5.6	4.4
BOD_5 at 20^oC =////=	161	122	99	81	161	66	22	19
COD =////=	257	200	148	126	257	86	45	30

=/// Centrifuged supernatant

TABLE - III

Physico-chemical and bio-chemical conditions using *Microcystis aeruginoea*:

	DETENTION PERIODS IN DAYS							
	Control		Rawsewage		Rawsewage+Microcystis			
	0	2	4	6	0	2	4	6
A. PHYSICAL								
Water temperature (C^{o})	28.5	29.0	29.0	29.0	28.5	29.0	29.0	29.0
Colour	Br.	Br	Br	Br.	Br.	Br.-G	Br.G	Br.-G
pH	7.7	7.8	8.3	8.8	7.8	8.5	9.5	9.75
B. CHEMICAL(mg/l)								
Am-N	30.0	24.4	20.0	18.8	28.8	10.8	9.7	9.3
PO_4	8.9	7.7	7.0	4.6	8.9	2.4	1.92	1.56
COD	328	200	150	140	312	92	80	50
C. BIOCHEMICAL (mg/l)								
1. Carbohydrates								
a. Free sugar	34.6	26.8	18.6	9.6	34.6	19.7	11.3	4.8
b. Total sugar	89.9	63.8	49.3	28.3	96.3	56.3	43.8	16.6
2. Protein	6.0	5.0	3.8	2.7	5.9	4.3	2.9	1.0
3. Amino-nitrogen	4.5	4.2	3.1	2.2	4.4	3.4	2.2	0.8
4. Volatile acids	46.8	34.8	22.8	13.2	44.4	32.4	13.2	6.0

T A B L E - IV

BIOLOGICAL CONDITIONS USING MICROCYSTIS AERUGINOSA:

	DETENTION PERIODS IN DAYS							
	Control		Rawsewage		Rawsewage + Microcystis.			
	0	2	4	6	0	2	4	6
Algal biomass (dry weight) mg/l Microcystis	-	-	-	-	-	200	210	224
1. Dark-brown filaments (iron-bacteria)	-	r	-	r	-	c	r	-
2. Organic debris*	-	r	r	-	r	r	r	r
3. Colourless filaments	-	c	-	-	-	-	-	-
4. Foot-ball like protozian	-	r	-	r	-	c	r	r
Ciliophors(free swimming)								
5. Paramoecium caudatum.	-	c	c	-	-	c	-	-
6. Spathedium	-	-	-	-	r	r	r	-
7. Aspidisca costata	-	-	-	r	-	ccc	ccc	c
Ciliophora (stalked)								
8. Vorticella globosa	-	-	r	-	r	-	-	-
9. Vorticella Spp(dead)	-	c	c	c	-	c	-	-
10.Rotifer-(Lucane spp)	-	-	-	-	r	-	-	r

* Organic debris is not seen separately at the bottom of the culture flask but is seen enmished with the algal forms when seen under a microscope.

ccc = Common
r = less common
rr = rare
rrr = stray form

TABLE - V

BIOLOGICAL CHANGES USING CHLORELLA VULGARIS

Description	DETENTION PERIODS IN DAYS							
	Controll		Rawsewage		Rawsewage +Algae			
1. Dark to light brown filaments (Leptothrix ochraces).	-	r	cc	cc	-	r	c	CC
2. Organic debris intermixed with algae,	-	-	-	-	-	r	c	cc
3. Flocculent brown precipitate seperately seen at the bottom or suspended.	-	r	r	cc	-	-	-	-
4. Ciliophra (free swimming) Spathidium spathula	-	-	-	-	-	-	rr	rr
Paramecium caudatum	-	r	c	rr	-	r	rr	rr
Aspidisca costata	-	-	-	-	-	-	r	r
Chilodenella st	-	c	c	c	-	-	-	-
Amphileptus st.	-	-	c	c	-	-	-	-
5. Ciliophora (stalked): Vorticella spp.	-	c	c	rr	-	c	c	rrr
Lionatus fasciola	-	-	-	-	-	c	r	rr
6. Rotifera								
Lecane sp.	-	-	-	-	-	-	r	c
7. Algae								
Chlorella vulgaris	-	-	-	-	-	c	ccc	ccc

c = common cc= more common ccc = most common r= less common rr=rare
rrr = stray form

T A B L E - VI

Bacteriological examination (Sanitary Aspect) in high-rate aerobic oxidation pond using Chlorella vulgaris:

Detention period in days	Control	Rawsewage	High-rate	Algae treated
	Coliforms (MPN/100 ml) at 37°C	Total count per ml at room temp. (28-30°C)	Coliforms (MPN/100 ml) at 37°C	Total count per ml. at room temp. (28-30°C)
0	9.18×10^7	17.6×10^9	16.09×10^7	18.85×10^7
2	18.09×10^9	59.2×10^9	12.00×10^9	34.6×10^9
4	79.00×10^5	6.62×10^6	79.00×10^3	4.2×10^5
6.	16.00×10^4	48.0×10^5	60.00×10^2	27.10^4

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T A B L E - VII

Distribution of a few important attributes among the 200 dominant bacteria isolated from the alga, chlorella vulgaris treated high rate aerobic oxidation pond on different detention periods. Fifty isolates were studied for each detention period. Results expressed in percentage of positive isolates.

TESTS	Detention period in days			
	0	2	4	6
	Rawsewage + Chlorella vulgaris			
Rods	100	100	100	100
Colour: whitish	80	38	70	100
yellowish	20	62	10	Nil
Red	nil	nil	20	Nil
Gram negative	96	94	94	96
Flagella:Polar	26	56	32	60
Peritrichous	74	44	68	40
Citrate utilisers	38	38	60	80
Starch hydrolysers	60	66	48	44
Jelatin hydrolysers	44	76	76	86
Tributyrin hydrolysers	25	50	10	10
Catalase activity	100	100	100	100
Reserve Materials:				
glyeogen	100	100	100	100
Lipid inclusions	100	100	100	100
Volutin	100	100	100	100

T A B L E - VIII

Important biochemical characteristics of the dominant bacteria in high rate aerobic oxidation pond using Chlorella-vulgaris. 200 isolates studied, fifty on each day. Results expressed as percentage of positive isolates.

Characteristics	Detention period in days			
	0	2	4	6
Acid from glucose	40	66	40	50
Acid and gas from glucose	46	20	56	44
No reaction in glucose	14	14	4	6
Nitrate reduced	74	68	72	54
H_2S formed	26	38	34	8
Hugh and Leifson's medium: glucose				
Oxidative	40	60	60	50
Fermentative	46	26	36	44
Neutral	10	14	4	-
Alkaline	4	-	-	6

TABLE - IX

Dominant Bacteria in High-rate aerobic oxidation pond with Chlorella vulgaris isolated on different detention periods. 200 isolates studied, fifty on each day. Results expressed as percentage of positive isolates.

Detention period in days	0	2	4	6
Organisms: Genera	Percentage positive			
Achromobacter	4	-	18	36
Aerobacter	10	4	16	-
Aeromonas	10	16	4	4
Bacillus	8	18	6	-
Alcaligenes	10	-	4	-
Brevibacterium	8	-	2	-
Comamonas	4	14	-	6
Coryn-bacterium	-	-	4	4
E.Coli	20	-	-	-
Flavobacterium	8	16	4	-
Microbacterium	-	6	-	-
Psendomonas	8	20	6	6
Proteus	6	-	16	40
Serratia	-	-	20	-
Santhomonas	-	6	-	-
Zooglea	4	-	-	4

T A B L E-X

Dominant bacteria isolated from Assimilating and endogenous phases of a High-rate Aerobic -oxidation pond. 200 isolates studied, fifty on each day.

Results expressed as percentage of positive isolates.

Metabolic Phase	Assimilating		Endogenous	
Detention periods in (days)	0	2	4	6
Organisms: Genera	Percentage positive			
Achromobacter	4	-	18	36
Aero bacter	10	-	16	-
Aeromonas	10	16	-	-
Bacillus	8	18	-	-
Commamonas	4	14	-	-
Flavo bacterium	8	16	-	-
Proteus	6	-	16	40
Pseudomonas	8	20	-	-
Serratia	-	-	20	-