

PRELIMINARY TRIALS ON THE TOXICITY OF "ALGISTAT" TO FISH AND ALGAE

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Preliminary toxicity trials conducted with "Algistat" (an algicide) indicated that a dose of 0.66 ppm. of the compound was highly toxic to fish and 0.8 ppm. was the general lethal level for *Spirogyra* sp. The blue green algae, *Oscillatoria* sp., *Microcystis* sp. and *Anabaena* sp. were adversely affected by dosages higher than 0.5 ppm. *Euglena* sp. was not affected even at 1.0 ppm.

INTRODUCTION

The occurrence of algal blooms in fish ponds is known to be harmful in different ways; fish mortality may be caused by depletion of dissolved oxygen or liberation of toxic substances, incidence of 'gas embolism' (gas disease) caused by excess of oxygen due to increased photosynthetic activity etc. (Philipose, 1966). Excessive growths of filamentous algae like *Spirogyra* may also cause adverse conditions, as they may restrict movement of fishes and fry or fingerlings which get trapped by the algal filaments may die. However, not much advances have been made in India in the control of such algae in waters used for pisciculture. Temporary relief has sometimes been obtained by application of raw cowdung as a liquid spray (Alikunhi, 1956). Copper sulphate is the only chemical that has been used with some success for the control of algae

in certain types of waters (Philipose, Ibid)- "Algistat", a proprietary algicide manufactured by M/S. Bristish Drug Houses Ltd., was referred for studies regarding its suitability or otherwise in the control of noxious algae in fish culture waters.

MATERIALS AND METHODS

"Algistat" has been reported to be a safe and effective compound in controlling algal growths in water-cooling towers and associated ponds. The active constituent of the product is 2:3-dichloro - 1:4 naphthaquinone.

The present experiments were conducted in 3 litre and 10 litre glass jars and 15 litre earthen 'gamlas'. Both tap water and pond water were used. *Cyprinus carpio* (var. *communis*) were used as test fish. The algae tried were *Spirogyra* sp., *Oscillatoria* sp., *Anabaena* sp., *Microcystis*

TABLE I "EFFECT OF 'ALGISTAT' ON *Cyprinus carpio* FRY

Serial No	No. of fish	Conc. in ppm.	Fish		No. of fish died	Lethal time in Hr. & Min.)	
			Length mm (range)	Weight gm (range)		Minimum	Maximum
1	8	Control	27-39	0.3-0.8	nil		
2	8	0.33	28-39	0.3-0.8	1	7-25	
3	8	0.5	26-39	0.2-0.9	4	3-25	6-32
4	8	0.66	30-41	0.3-1.1	8	2-20	1-05

TABLE II EFFECT OF 'ALGISTAT' ON ALGAE

Serial No.	Species	Concentration of Algistat	No. of Trials	Observation after 24 hours
1	<i>Spyrogyra</i> sp.	Control	4	No mortality
2	do	0.33 ppm	3	do
3	do	0.4 ppm	4	do
4	do	0.55 ppm	2	do
5	do	0.6 ppm	4	do
6	do	0.66 ppm	2	do
7	do	0.8 ppm	4	All died
8	do	1.0 ppm	7	do
1	<i>Oscillatoria</i> 60% <i>Anabaena</i> sp. 30% <i>Microcystis</i> sp. 5% <i>Euglena</i> sp. 5%	Control	4	No mortality
2	do	0.5 ppm	4	do
3	do	0.66 ppm	4	All, except <i>Euglena</i> died
4	do	1.0 ppm	4	do

sp., and *Euglena* sp. The fish and algae were acclimatised prior to experiments.

RESULTS

During initial trials, it was observed that the test fish as well as *Spirogyra* sp. died in 1 ppm. concentration of 'Algistat'. Hence, lower concentrations were tried for

subsequent experiments and the results obtained are presented in Tables I and II. From Table I it will be observed that a dose of 0.66 ppm. of the compound was highly toxic to *Cyprinus carpio* fry. Some trials were made using fry of Indian major carps and it was observed that 0.3 ppm. concentration did not have any apparent

adverse effect. 0.5 ppm. was generally the lethal level for Catla and 0.66 ppm. for Rohu and Mrigal.

From Table II it will be seen that up to 0.6 ppm. concentration no ill effect on *Spirogyra* sp. was observed. However, little crumpling of the chloroplast was noticed. The same sort of crumpling was found when *Spirogyra* collected from pond water was kept in tap water. Dosages of 0.8 ppm. and above killed this filamentous algae. The blue green algae, *Oscillatoria*, *Microcystis* and *Anabaena* were adversely affected by dosages higher than 0.5 ppm. *Euglena* sp. was not affected even at 1.0 ppm. concentration.

CONCLUSION

The preliminary trials conducted indicate that generally the application of 'Algistat' for control of algal blooms and filamentous algae may have to be tried in nursery and rearing ponds, before introducing the fish. The possibility of applying the compound at a dose of about 0.6 ppm. on regions of water surface, where algae get concentrated by wind action, as done by Kessler (1960) with copper sulphate spray, may also have to be looked into. As already mentioned the experiments

described above were meant as preliminary trials only and further field observations will be worthwhile.

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