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Research Article

**FRESHWATER PLANKTON CULTURE USING DIFFERENT
ORGANIC AND INORGANIC FERTILIZER**¹SASIKALA P, ²INDHU B, ³PUGAZHENDY K, ⁴SATTANATHAN G¹Department of Zoology, Annamalai University, Tamilnadu, India²Department of Zoology, Kandaswami Kandar's College, P. Velur, Tamilnadu, India.³Department of Zoology, University of Madras Guindy Campus, Chennai, Tamilnadu, India⁴Centre for Animal Studies, PG & Research Department of Zoology, Government College for Women (Autonomous), Kumbakonam, Tamilnadu, India**Abstract:**

In the present study, it has been observed plankton cultured by the particular different manures of cow manure, sheep and goat manure, poultry manure, and inorganic fertilizer like urea, and control enhanced the plankton (both of phytoplankton and zooplankton). The plankton cultured in the above manures and observed a higher rate of in which manure of cultured plankton. This study only in the higher rate of poultry manure and cow manure nutrition. This present study only in the rich rate of poultry and cow manure nutrition all the above manures present in the higher number of phytoplankton species of Cycloteela, Scenedesmus, Synedra, Spirulina, Fragilaria, and zooplankton species number of Brachnous, Daphnia, Cyclops. So the best suitable medium for poultry and cow manure in fish culture and production to more feed for to these above-said mediums. So the best suitable medium for poultry and cow manure for plankton culture.

Keywords: *Phytoplankton, Zooplankton, Poultry manure, Goat manure, Cow manure***Correspondence Author:****Sasikala. P,**

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INTRODUCTION:

Many species display local adaptation that allows for the efficient use of groups, these adaptation result in two or more specialized morph types with distinct difference in body morphology cranial-facial morphology, feeding behavior or niche use that are recognizable across many independent populations. In freshwater fish, tropic polymorphisms are exceptionally common; they have been described for 97 species comprising 52 genera and families [1]. Differentiation along this benthic axis is generally continuous but sometimes results in populations that feed almost exclusively on one prey or another [2]. Diatoms constitute a fundamental link between primary autotrophic and secondary (heterotrophic) production and form a vital component of aquatic ecosystem [3]. Aquatic ecosystem monitoring has been carried out in India based on either chemical or biological analysis [4]. The industrial development and rapid urbanization has led to development of polluted zones discharging potentially toxic compounds in the environment [5]. The most common cause of water pollution in developing countries is domestic and industrial waste that is directly released into streams or ponds without treatment [6]. The colors in oceanic and estuarine systems are indicators of phytoplankton communities related to pollution and have been extensively studied by multispectral remote sensings such as for averting and sea wife [7]. There are relatively few comparable freshwater studies [8]. There are a number of defined freshwater media that are useful for growing a wide variety of plankton [8-9]. The plankton has been an interesting group for investigation because of their very primitive nature and a worldwide distribution, which is due to their capability to exist under most varied environmental conditions. Shallow, Clear-water lakes ponds are a major feature of high latitude landscapes and an important class of freshwater ecosystems. Despite the limited abundance of water column resources that can be easily grazed, zooplankton biomass and abundance in ponds are often substance and higher than in deeper lakes with similarly low chlorophyll a levels [11]. Several parental sources of carbon must be considered for shallow water ecosystems in addition to phytoplankton one of the most striking features of high latitude lakes and ponds is the well- developed benthic community of microbial mats [12]. The small size and shallow depth of the ponds connect them closely to benthic processes.

Phytoplankton communities are sensitive to changes in their environment and therefore. Phytoplankton total biomass and many phytoplankton species are used as indicators of water quality. Aquatic

ecosystems that run through agricultural areas have high probability of being contaminated by runoff and ground water is reached by a variety of chemicals [13]. Heavy metals enter into aquatic habitats by a number of routes and cause hazardous effect on their morphology and physiology [14]. Phytoplankton communities give mere nutrient to changes in water quality than mere nutrient concentration or chlorophyll a concentration standard for chemical laboratory analysis. This method requires an inverted microscope equipped with high-quality optics in order to obtain reliable results. Although a uniform methodology for phytoplankton counting based on the method was suggested by Olrik *et al.* 1998. For freshwater, the recommended method is not fully followed or evolved. Studied higher water temperature advanced the bloom timing of most functional plankton groups in both fresh water systems. In contrast to timing responses of bloom magnitudes and were more variable among taxes and systems increased the magnitude of the spring peaks of most phytoplankton and of total phytoplankton biomass.

The freshwater medium named combo that supports the excellent growth of both plankton and zooplankton. Their results suggested that combo is an effective artificial defined culture medium capable of supporting robust growth and reproduction of both freshwater phytoplankton and zooplankton. Studied it was a performance the evaluate the plankton communities and the effect of fish ponds on their standing crop wind species composition. The fish culture had obviously influenced the intraplankton dynamics. The small rotifers and nauplius larvae of copepods were the most dominant in spite of the large form in the main feeder. Its contents were much higher in comparison with Mn and Ni levels. Much plankton grows in brackish water (oscillation anabaena etc). Such waters are unpalatable for drinking and contain less salts than sea water but more than freshwater. Many freshwater organisms which can float easily in water one place to other are called plankton animals plankton are called zooplankton where as plant plankton are called phytoplankton. Plankton floating in open water is called plankton. Water pollution is usually caused by various human sources, typically (point and non-point) industrial facilities and agrochemicals especially in aquatic ecosystem, has grown up to be a serious environmental problem nowadays [15].

Thousands of plank tonic algae are known. They are mainly the members of bacillariophyceae and phyrophyta under favorable nutritional conditions some plankton algae increase enormously in number

and from water blooms classified the plankton on the basis of their size. Organisms more than 2000 or more diameter, megaplankton. Organisms 2000-2000 in diameter, mesoplankton. Organisms 2-20 in diameter, nannoplankton. Organisms 2-200 in diameter, microplankton. Organisms less than 2 in diameters, nannoplankton. Wherever the phytoplankton is present, they are found generally in very large number. An estimation of their number can be gathered by the statement of the present that some phytoplankton may occur in quantities as high a 4000000 per liter but this number can be quickly reduced because they form a regular food of aquatic animals. Some algae phytoplanktons are species of *fragilaria*, *synedra*, *nizochra*, *cytotella*, *actinomyces*, *frustule*, *pinnularia*, *euglena*, *phacus*, *scenedesmus*, *chlorella*, *microcystis*, *Anabaena*, *gloeotricha*, etc.

MATERIALS AND METHODS:

Collection of sample and sampling period:

The water sample was collected fortnightly around 9.00 to 11 am from selected sites of liver and pond 4.02.2013 to 9.02.2013 winter season.

Plankton sampling and analysis:

Plankton samples plankton net [200 to 300 mesh bolting silk and the sample culture. the analysis involved by collecting of 1ml sub culture sample from each the sample to the organic fertilizers like cow manure, sheep and goat manure, poultry manure, and inorganic fertilizer like urea, and control.

Physico-chemical parameters:

The sample was taken from the selected pond and river various types of physico-chemical such as temperature, and PH, DO₂, etc. Water temperature was measured at each station [sites] using a mercury thermometer water PH paper. The sample was taken from two different sites of pond and river was measured and analyzed by using relevant equipment in the laboratory.

Collection of sample:

The study was conducted by frequently surveying in winter 2013 more than 50 phytoplankton and zooplankton samples of fresh water plankton were collected with the help of phytoplankton and zooplankton net mesh size 200-300 μ meter from the very river of front and back between the bridge, pond of Kandaswami Kandar's College, Vellur of Namakkal districts. Different methods of collection were used for different plankton ice Flora was collected with help of pipette, hands from the

collection, sites. All the collected sample of plankton cultured in used manures of cow manure, sheep and goat manure, poultry manure, urea, and control. The analysis was carried out at Department of Zoology, Kandaswami kandar's college, Velur.

Identification:

One drop from each sample was taken with help of small pipette put on the slide and cover slip, under the microscope and the diagrams were drawn with the help of camera digital technique.

RESULTS

In the present study, it has been observed that plankton culture by the particular different manures of sheep and Goat manure, cow manure, poultry manure, and urea, enhanced the plankton [both of phytoplankton and zooplankton]. The plankton cultured in the above manures and observed a higher rate of in which manure cultured plankton. Predation by fish determines the abundance of herbivorous zooplankton, which in turn regulates the level of phytoplankton. A recent study revealed that changes in the abundance of planktivorous fish do affect both the phytoplankton and zooplankton. Plankton feeds a nutrition value of different types of manures. These different types of manures enhanced the plankton counts although in treated planktons observed in nature view the growth promoting the effect of different types of medium.

In order conduct experiment on infraction between animals and food organisms, it is necessary to develop a medium that adequately supports the growth of both plankton and zooplankton without the need to alter the medium to accommodate either the plankton or the animals. We devised a freshwater medium, named COMBO that supports excellent growth of both phytoplankton and zooplankton. Two types of plankton, *Ankistrodesmus falcatus*, and *Stephanodiscus hantzschii*, were reared in COMBO and their growth rates were not significantly different from those of plankton grown in a reference medium. One of this plankton, *A. falcatus*, was then fed to a cladoceran, *Daphnia pulex*, which was also cultured in COMBO and resulting fecundities of *D. pulex* was affected by medication in nitrogen or phosphorus concentration to evaluate whether the new medium will be useful in nutritional research. Our results suggest that COMBO is an effective artificial, defined culture medium capable of supporting robust growth and reproduction of both freshwater phytoplankton and zooplankton

Table 1. Physico Chemical parameters of control and experimental culture water samples

Experiment	Control	Sheep & Goat	Cow manure	Poultry manure	Urea
pH	8	7	8	8	8
Temperature	29	30	29	28	29
DO ₂	1.4	1.4	1.4	2.8	1.4

Table 2. Plankton abundance in control and experimental culture

Experiment	Phytoplankton's [x 10/ml]	Zooplankton [x 10/ml]
Control	28	-
Sheep & Goat	123	2
Cow manure	268	3
Poultry	326	5
Urea	162	6

Table 3 : Number of Species in the Experiment

Experiment	<i>Scenedesmus</i>	<i>Synedra</i>	<i>Pediastrum</i>	<i>Cyclotella</i>	<i>Fragilaria</i>
Control	1	0	0	10	0
E1	0	7	0	0	0
E2	4	3	2	95	3
E3	99	35	4	88	10

Table 4 . Number of Species in the Experiment

Experiment	<i>Nablicula</i>	<i>Spirulina</i>	<i>Tapellaria</i>	<i>Desmidium</i>
Control	8	4	5	0
E1	5	60	0	6
E2	9	50	0	24
E3	0	20	60	6
E4	10	5	25	5

Table 5: Number of Species in the Experiment

Experiment	<i>Oscillatoria</i>	<i>Selenastrum</i>	<i>Microspora</i>	<i>Gloeotrichia</i>	<i>Pandorina</i>
Control	0	0	0	0	0
E1	1	0	9	8	4
E2	1	10	0	0	0
E3	0	3	0	0	0
E4	0	3	0	0	0

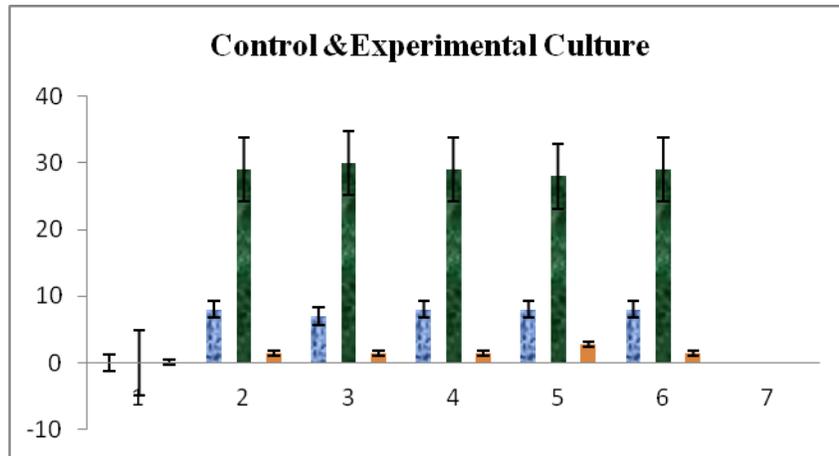


Fig 1. Physico Chemical parameters of control and experimental Culture water samples

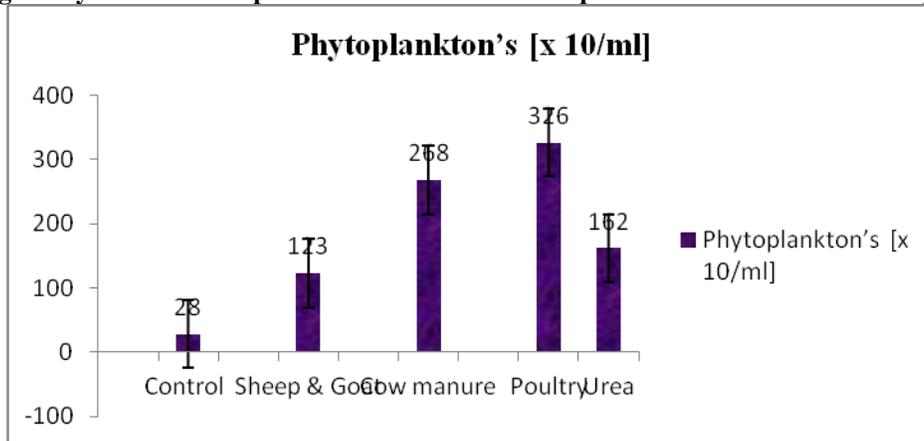


Fig 2. Plankton abundance in control and experimental Culture in phytoplankton

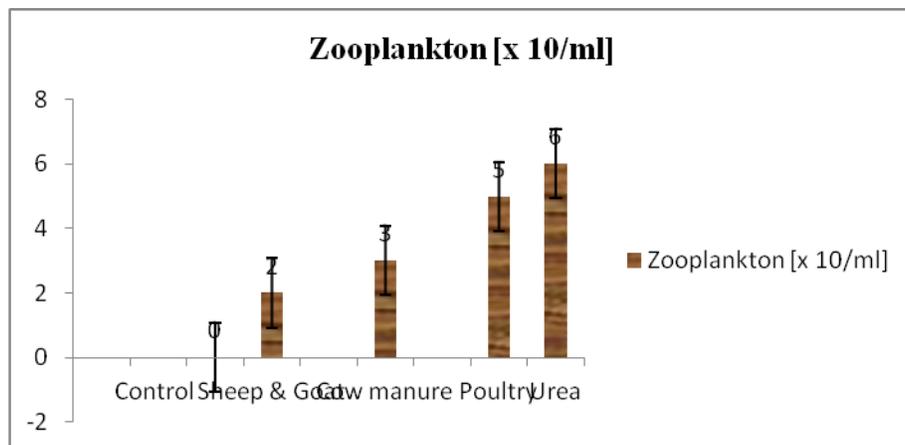


Fig3. Plankton abundance in control and experimental Culture in phytoplankton

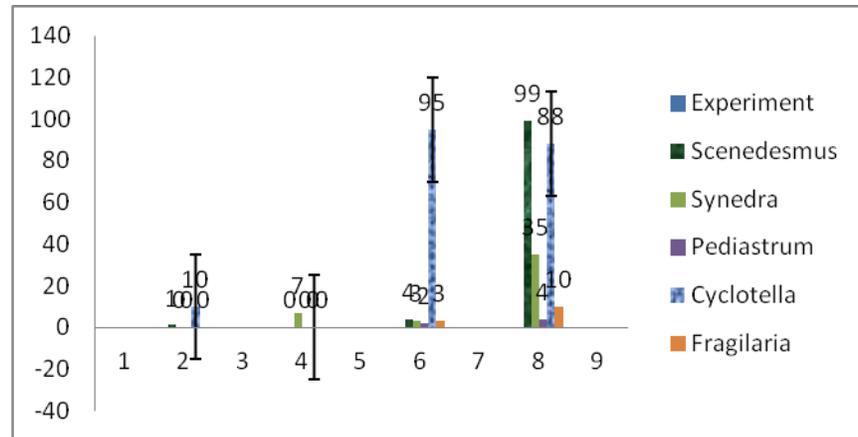


Figure 4. Numbers of Species in the Experiment

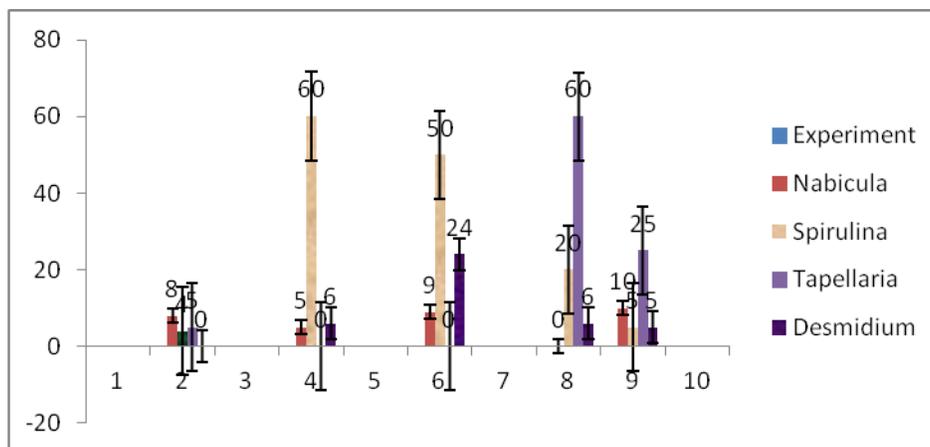


Figure 5. Numbers of Species in the Experiment

DISCUSSION:

Phytoplankton and zooplankton communities in fishpond are subjected to wide variation in environmental condition in addition to the predation. The phytoplankton and zooplankton communities developed in rearing ponds are influenced by and fish predation [16]. Water temperature plays an important role in the activity of aquatic organisms [17]. Numerical density of phytoplankton implies that green algae occupied the first predominant position at fishponds, while diatoms were the dominant species of River Nile water. Diatoms can be lost by sedimentation from the lentic water of the fish farm ponds, where the sedimentation is affected by species composition. These data are consistent with the conclusion of [18]. That chlorophyll always occupied first dominant position, consisting 65% of total phytoplankton crop in escrow fish farm (South Western shore of lake [19] recorded in their experiment with Nil tilapia that the Bacillariophyta dominated in the fishless ponds, while in presence of the Nil tilapia, green algae replaced diatoms in the same time [20]. Current

reported that diatoms contributed about 55.4% while green algae constituted 25% of the total phytoplankton crop at River Nile. The greater production of fish is not only the result of the utilization of food as yet unused components but is also the result of processes leading to greater productivity of the water body. These processes should be reflected by changes in the phytoplankton and zooplankton as basic food component of most fishes. Now day's farmers are using an assortment of pesticide and insecticide monocrotophos in their grassland of cultivation devious the insect pest. Residual of this pesticide alters in to the ecosystem and trouble the healthy environment and aquatic forms. Aquatic farm contains fish and other organism [21]. But the fish is mostly affected by pesticide residuals the actual number of pesticide related illnesses is unknown [22]. This reduced grazing pressure on bacteria, in addition to favorable growing conditions may contribute to the high bacterial biomass in northern ponds. The measured 10-100 times higher clearance rates for phytoplankton suggest that the low phytoplankton biomass in the

water bodies studied was at least partly a result of herbivorous grazing. [22].

CONCLUSION:

Freshwater plankton has numerous environmental functions and is based upon the recycling of nutrients. Plankton in fresh waters has numerous environmental functions and are based upon the recycling of nutrients. And the other hand some species have increased enormous making different manures. This present study only in the rich rate of poultry and cow manure nutrition all the above manures present in the higher number of phytoplankton species of *Cycloteela*, *Scenedesmus*, *Synedra*, *Spirulina*, *Fragilaria*, and zooplankton species number of *Brachnous*, *Daphnia*, *Cyclops*. So the best suitable medium for poultry and cow manure in fish culture and production to more feed for to these above-said mediums. So the best suitable medium for poultry and cow manure for plankton culture.

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