



ENUMERATION OF BACTERIAL COUNT PARTICULARLY COLIFORM IN HOUSE HOLD AQUARIUM, PELLETED FISH FEED AND UNTREATED TAP WATER USED FOR THOSE AQUARIUMS

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ABSTRACT

Pellet fish feed and untreated tap water used for aquarium to maintain fishes were screened to enumerate CFU (Colony Forming Unit) as well as well as coliform. In Feed sample average no 2.8×10^7 /gm and 7.2×10^2 /gm CFU and coliform found respectively. Similarly in water sample average no 3.7×10^{13} /gm and 5.8×10^3 /gm CFU and coliform found respectively. Both CFU and Coliform number in aquarium water increased rapidly up to third week of initiation of fish culture and at the end of fourth and fifth week the number is almost similar. The aquarium water from *Gambusia* (*Gambusia affinis*) culture showed lesser number of both CFU and Coliform (7.2×10^{20} and 3.4×10^5 /ml) compared to other where maximum number observed in water of *Platy* (*Xiphophorus maculatus*) culture (3.5×10^{25} and 3.2×10^7) at the end of fifth week where the initial number at the end of first week were 7.6×10^{15} and 7.0×10^4 / ml for *Gambusia* and 2.1×10^{17} and 9.6×10^5 / ml for *Platy*.

INTRODUCTION

Keeping of ornamental fishes in aquarium in domestic houses are becoming popular like other pets i.e. dog, cat etc. It needs to clean, fed and change of water time to time. The keepers of the aquarium get direct exposure to the fish micro environment. Bacteria are found everywhere on the Earth's surface where water is at least temporarily available. The seeds of fishes, adult fishes, fish feed and tank water harbor different types bacteria belonging to the different genera and particularly family *Enterobacteriaceae* (I. Zmysłowska *et.al.* ,2001 and T. J. Trust, Vida G. Money, 1972). Though a great number of the Coliforms are neutral to human but their presence indicate that microorganisms harmful to human are present. There is a possibility of getting pathogenic bacterial contact during handling of aquariums containing ornamental fishes. These Coliforms are very much important in aquarium culture (H. N. Williams *et.al.*, 1987). Very scanty reports are available regarding the bacteriological study in aquarium fish culture. The study was undertaken in the summer season.

MATERIALS AND METHODS

Study Area

Experiments were carried out in the Disease Diagnosis Laboratory under Directorate of Research, Extension and Farms, West Bengal University of Animal and Fishery Sciences Mohonpur Campus, Nadia. Twenty aquariums were maintained for four species of ornamental fishes viz. Guppy (*Poecilia reticulata*), *Platy* (*Xiphophorus maculatus*), Gold fish (*Carassius auratus*) and *Gambusia* (*Gambusia affinis*) and *Tilapia* (four aquariums for each species). Untreated tap water was used for maintaining of fishes and branded artificial pelleted fish feed was fed to the fishes. During the study no fish disease or no loss were observed, so no treatment bath was made.

Materials

Materials consisted of:

1. Untreated water from tap,
2. Water from aquarium,
3. Branded artificial pelleted fish feed
4. Total Count Agar and Coliform Agar from Hi Media.

Methods

1. Water samples of tap and aquarium were collected directly into sterile glass bottles. Water samples were diluted with physiologic salt solution (0.85% NaCl).
 2. Ten grams of fish feed was sampled and diluted 10-fold with the same NaCl solution, homogenized for 10 min, and subsequently, diluted 10-fold.
 3. All media plates were incubated after inoculation of samples at 34° - 36° C for 24-28 hours and colony was counted through colony counter.
- Quantitative analyses of water and fish feed comprised determination of total number of bacteria and Coliform among them grown on appropriate media. Bacteria number was determined with plate method as described in Bergey's Manual of Determinative Bacteriology, 1994 and - after plate incubation - the results were given as a CFU in 1 ml or 1 gm. All inoculations were made in three parallel repetitions.

RESULTS AND DISCUSSION

Pellet fish feed and untreated tap water used for aquarium to maintain fishes was screened to enumerate CFU as well as coliform. In Feed sample average no 2.8×10^7 /gm and 7.2×10^2 /gm CFU and coliform found respectively. Similarly in water sample average no 3.7×10^{13} /gm and 5.8×10^3 /gm CFU and coliform found respectively (Table-I). These results are similar of the observation of T. J. Trust, Vida G. Money, 1972.

Bacterial count particularly coliform in house hold aquarium

TABLE-I

Items	Total count	Coliform count
Pellet fish feed	2.8X10 ⁷ /gm	7.2X10 ² /gm
Untreated tap water	3.7X10 ¹³ /ml	5.8X10 ³ /ml

Water samples from aquarium of five different fishes were screened for five weeks. The CFU and coliform found from each sample are enumerated at every week end and the results shown in the table-II. It was observed that the both CFU and Coliform number in aquariums increased rapidly up to third week from initial date of experiment and at the end of fourth and fifth week the number was almost similar. Using same water and fish feed, water

from aquarium of *Gambusia* (*Gambusia affinis*) showed lesser number of both CFU and Coliform compared to other where maximum number observed in aquarium water of *Platy* (*Xiphophorus maculatus*). This agrees with the results obtained by Esteve and Gray, 1991 but these obtained results are much higher than the observation of I. Zmysłowska *et.al.* 2001. Presence of these coliforms may cause human health hazards.

TABLE-II

Species	Days	Average total count (CFU)/ml	Average Coliform count/ml
Guppy (<i>Poecilia reticulata</i>)	7 th	7.3X10 ¹⁸	8.8X10 ⁴
	14 th	5.2X10 ²²	9.8X10 ⁵
	21 st	4.8X10 ²⁴	7.3X10 ⁶
	35 th	4.1X10 ²⁴	6.2X10 ⁶
	42 nd	3.0X10 ²⁵	7.6X10 ⁶
Platy (<i>Xiphophorus maculatus</i>)	7 th	2.1X10 ¹⁷	9.6X10 ⁵
	14 th	1.2X10 ²²	2.1X10 ⁶
	21 st	7.5X10 ²⁴	7.0X10 ⁶
	35 th	2.3X10 ²⁵	3.4X10 ⁷
	42 nd	3.5X10 ²⁵	3.2X10 ⁷
Gold fish (<i>Carassius auratus</i>)	7 th	5.0X10 ¹⁶	5.4X10 ⁴
	14 th	9.8X10 ²¹	9.1X10 ⁴
	21 st	2.5X10 ²³	7.1X10 ⁵
	35 th	1.1X10 ²⁴	5.2X10 ⁵
	42 nd	7.1X10 ²⁴	8.8X10 ⁵
Gambusia (<i>Gambusia affinis</i>)	7 th	7.6X10 ¹⁵	7.0X10 ⁴
	14 th	2.4X10 ¹⁸	9.1X10 ⁴
	21 st	9.5X10 ¹⁹	3.1X10 ⁵
	35 th	7.5X10 ²⁰	3.5X10 ⁵
	42 nd	7.2X10 ²⁰	3.4X10 ⁵
Tilapia (<i>Oreochromis mossambicus</i>)	7 th	5.2X10 ¹⁷	2.2X10 ⁴
	14 th	9.1X10 ¹⁸	2.9X10 ⁴
	21 st	2.7X10 ²⁰	3.0X10 ⁵
	35 th	3.0X10 ²¹	6.3X10 ⁵
	42 nd	3.4X10 ²¹	6.7X10 ⁵

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