D-17: The pathogenicity of a freshwater *Vibrio sp* on an ornamental fish, *Pterophyllum scalarae* (Angel fish)

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An investigation carried out on disease outbreaks of freshwater ornamental fish culture in Sri Lanka, during the period January 1993 to February 1994 revealed that a vibriosis - like disease was involved in 23% of the cases. *Pterophyllum scalarae* (Angle fish) which is a popular ornamental fish was shown in be susceptible. Therefore the present study was planned to investigate the pathogenicity of the freshwater *Vibrio* sp. isolated from above mentioned outbreaks on Angle fish using immersion and oral routes under laboratory conditions.

Four nutrient broth (Oxoid) cultures were prepared from the *Vibrio* isolate with optical densities 0.031, 0.165, 0.212 and 0.321 at 600 nm (CECIL, CE 594 UV/VIS spectrophotometer). These cultures were centrifuged (3500 rpm), supernatant was decanted, bacterial cells were re-suspended in 0.85% saline and the required volume was prepared. Bacterial counts were obtained by the pour plate method. Acclimatised Angle fish was immersed in each concentration of *Vibrio* suspension (2.1×10^5 to 1.8×10^8 CFU/ml) separately for 45 min (immersion route) and then were transferred to freshwater. 10 g of formulated feed and 10 ml of each bacterial suspension was mixed separately and this feed was given to another set of fish thrice a day for 3 days separately (oral route). Fish were observed for their behaviour, external and internal lesions and for mortality in order to find out how different bacterial concentrations affect the course of manifestation of the disease through immersion and oral routes.

The first sign of vibriosis (immersion route) was abnormal swimming. The fish became sluggish, slowly swam to the surface and remained there for a time. At a later stage they lost their appetite and spent more time at the surface floating inactively keeping pectoral fins and eyes upward while opening the mouth. At a high concentration of bacteria (1.8×10^8 CFU/ml) fish stopped feeding and died within a short period of time after a brief display of other symptoms. Predominant external lesions included haemorrhages at the base of dorsal fin, around mouth and operculum which spread all over the body at high bacterial concentrations. Cumulative mortalities at 120 h were 45% and 82% for the bacterial concentration of 2.1×10^5 and 1.8×10^8 CFU/ml respectively.

The behaviourial changes observed for oral route was similar to those of immersion route, except fish did not seem to lose their appetite. The only lesion observed was haemorrhages at the base of the dorsal fin. There was no mortality at low concentrations and the cumulative mortality recorded for bacterial cell concentration of 1.8×10^8 CFU/ml was 43% at 192 h for this method.

The results show that the *Vibrio* sp. tested is a serious pathogen to Angel fish at the tested bacterial cell concentrations, which could transmit the infection through the body surface (immersion route) much more effectively than through the alimentary canal (oral route). There was a clear correlation between the viable

bacterial cell concentration and the mortality of the fish recorded for the immersion challenge. Majority of fish developed haemorrhages at the base of the dorsal fin and the fish that survived the infection too had this symptom. This is suggestive to the fact that it might be possible to avert the infection if a suitable treatment commences once the first sign (haemorrhages at the base of the dorsal fin) is observed.