International Journal of Academic Research and Development
ISSN: 2455-4197
Impact Factor: RJIF 5.22
www.academicsjournal.com
Volume 3; Issue 1; January 2018; Page No. 76-78

The reason of ailments in ornamental fishes in Thoothukudi and Tirunelveli district at Tamil Nadu state

Nazerath Nisha, K Ganesh, Dr. B Geetha
PG and Research and Department of Zoology, VO Chidambaram College, Tuticorin, Tamil Nadu, India

Abstract
The study was conduted from March to May in the year 2017 and coverd Tuticorin and Tirunelveli district fish farms. In the present study gold fish, koicarp, guppy, oscar, flowerhorn, mollies, cichlids were screened for the pathological infections. From the result clearly showed, No specific species and location specific diseases were identified. Since all varieties of fishes both infected and uninfected are distributed at different stages of marketing to all parts of Tamil Nadu and leading to spread of infectious diseases.

Keywords: ornamental fish, diseases

1. Introduction
Ornamental fishes are usually kept in glass aquarium and hence popularly known as "Aquarium fishes". Ornamental fishes are attractive colorful fishes having various characteristics which are kept as pets in confined space of an aquarium or a garden pool for fun and fancy. Aquarium once only found in houses of higher income groups, are at present very common in all houses, shops and offices. Hence fishes of different kinds are needed both in national and international level and thus ornamental fish trade has emerged as a resource with considerable economic potential in recent years. These living jewels not only attract with their bright colours but also with their peculiar characteristics like graceful movements, body morphology, mode of taking food etc. China is the pioneer in adopting aquarium keeping as a hobby. Public aquarium is also set up in many countries. The world first public aquarium was established in England in 1853 and now about 500 public aquaria exist throughout the world.

The commercial potential of ornamental fishes has generated business on a global scale. Ornamental fishes now a day constitute an important commercial component of aquaculture, providing aesthetic requirements and also for the upkeep of the environment. The ever increasing demand for aquarium fishes gradually paved way for global trade of ornamental fishes. The world trade of ornamental fish is valued at about US $ 9.5 billion [2]. The annual turnover in terms of quantity is about 350 million numbers of ornamental fishes in 140 countries including Brazil, Singapore, Thailand, Hong Kong and several South East Asian Countries which contribute 65% of fishes marketed in the world trade. The annual growth rate of world trade of ornamental fishes is 1%. The largest market for ornamental fishes is the USA and 80% of total imports by USA are from Asian countries. Among the Asian countries the major players in the ornamental fish export trade are Singapore (33.4% of total Asian exports) followed by Malaysia (15.3%), Indonesia (10.8%), Japan (10.10%), China (6.9%), Thailand (6.0%), the Philippines (5.5%), Sri Lanka (5.2%), China (2.4%) and India (2.0%). India is thus now amongst the top ten ornamental fish exporters in Asia [8].

2. Materials and Methods
The present study occurrence of various diseases in ornamental fishes of Tamil Nadu was conducted in the selected regions of Thoothukdi and Tirunelveli district for period of 3 months (March 2017 to May 2017). During the study period, 5 farms were visited and samples were taken for the identification of various pathogens. Reagent Phosphate buffered formalin, Trypticase soy agar (TSA), *Pseudomonas* Agar, Mayers - Bennet Hematoxylin and Eosin – Phloxine : A total of five ornamental fish units were visited for study and fish in apparently healthy and moribund conditions and water samples were collected randomly. For histopathological studies infected or apparently healthy ornamental fishes were dissected and the organs namely kidney, skin, gill, liver, intestine were taken out and fixed in 10% neutral buffered formalin and brought to laboratory. Organ tissues of kidney, skin, liver, gill, intestine preserved in 10% neutral buffered formalin were processed, paraffin imbedded sections of the tissues were cut in microtome and stained by hematoxylin and eosin and viewed through microscope. For microbiological studies, the infected organs and other parts are collected, inoculated on brain heart infusion agar plates and broth tubes. After 24 hrs. of incubation, all the colonies with distinct cell morphology were picked up from BHI agar plates and were further streaked onto fresh BHI agar plates for purification of the isolates. A single purified colony was picked and was stained with gram stain. The culture was maintained in agar plates for further identification through sugar fermentation and biochemical tests. The necessary biochemical tests were done to characterize different organisms [9].

3. Results
Ornamental fishes are cultured in round and rectangular cement tanks, earthen ponds and in glass tanks. Breeding is

carried out in glass tanks and cement tanks and the juveniles are reared in earthen and cement nursery tanks upto marketable size. The young ones are fed with farm made feeds, commercial pellet feeds and live foods like daphnia, moina and blood worms collected from wild. The sale of ornamental fishes is through retail and whole sale, outlets. The size of ornamental fish units varies from small farms (less than 0.2ha) to large farms (more than 0.2 ha). These regions are favored by water quality and marketing facility, hence these areas were selected for the present study. Establishment of ornamental fish farms are also encouraged by Central and State government bodies like Marine Product Export Development Authority (MPEDA), State Fisheries Department and Fisheries College and the farming are taken up as backyard and large scale farming. The ornamental fish industry is affected with problems of disease caused by parasitic, bacterial, viral and fungal origin.

The diseased fishes from the infected farms were collected for the study. The collection spot includes the wholesale ornamental fish units, the retail units, small fish farms and the large ornamental fish farms. The study includes identification of parasites, bacteria, viral and fungal pathogens, analysis of water quality parameters and calculation of revenue loss due to diseases. Treatments of infected fishes were carried out with low cost, eco-friendly herbals of single and mixture of combinations. Gold fish, koicarp, guppy, oscar, flowerhorn, mollies, cichlids were screened for the pathological infections. Bacterial diseases Haemorrhagic septicemia, Myxobacterial infection / Fin rot and Tail rot and d. Streptococcal infection were identified in the farms surveyed. The percentage incidence of various diseases are dropsy (32.14%), Myxobacterial infection (21.43%), bacterial ulcer (21.42%), The incidence of various groups of parasites recorded during the present study are 1. protozoan parasite, 2. crustacean parasite, 3. monogenean trematodes and 4. endoparasitic metazoan (Plate-1). The percentage of incidence of various parasites are, protozoans 45%, crustaceans 34% monogenean 13% and endoparasitic metazoan 8%.

Among the crustacean parasites *Lernaea* (72%) and *Argulus* (28%) were found to be dominant in the farms. The only viral infection observed was Koicarp Sleeping Sickness. The viral infection was found in three farms surveyed.

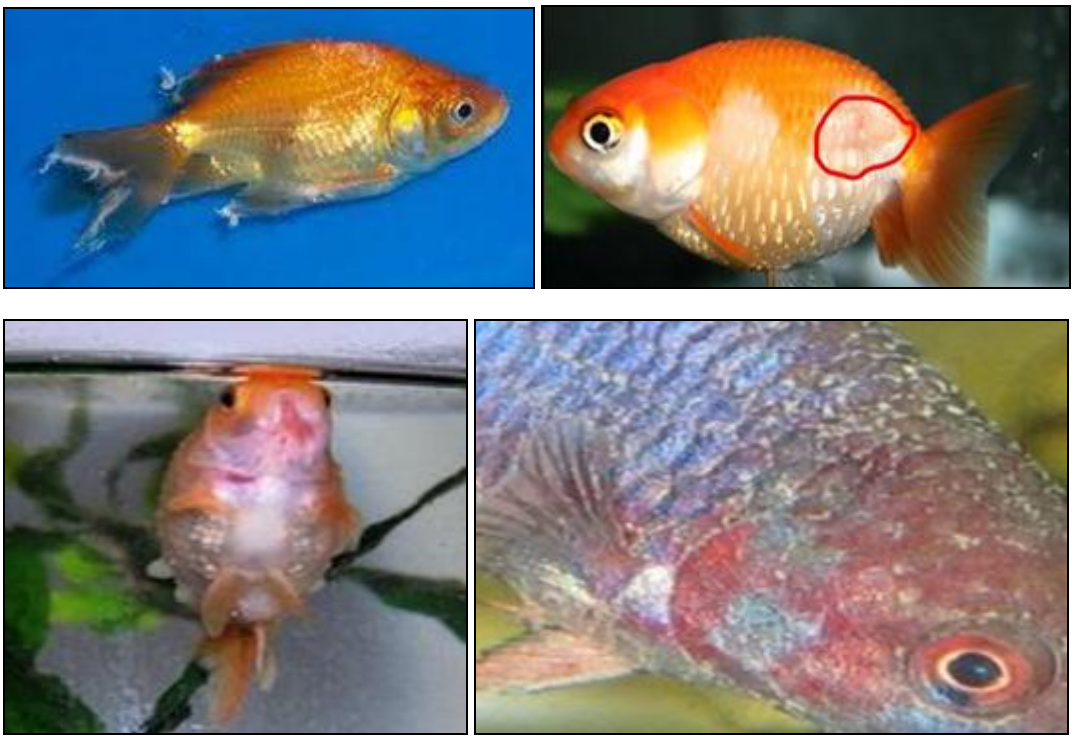

Fig 1

Protozoan parasites were found dominant in 3 farms. Among the seven varieties of fish sampled gold fish was found to be more susceptible 23% followed by Koi (16%) Molly (15%) Cichlids (13%) Guppies 13% Platy (12%) and angel 8%. Crustacean parasites are found to be dominant in 13 (21.66) farms. Among the fishes examined gold fish are more susceptible (22%), followed by cichlids (19%), koi (18%), molly 14% platy (5%) and angel fish 4%.

Prominent gill necrosis by thrombosis of blood vessels in gills. Segmental tissue necrosis due to vascular thrombosis and ischemia were observed. The disease was diagnosed by identification of non-septate branching hyphae with intrahyphal eosionphilic round bodies (aplanosphores) around blood vessel of gills. Gillfilaments infiltered with lymphocytes and eosionphils were observed. The monogenean trematodes includes the *Dactylogyrus* (Gill fluke) and Gyrodactylus (skin fluke). The affected fishes were found sluggish, with poor appetite, with poor respiration and most of the time found lying near the inflow of water. Abundant secretion of mucus on gills, pale colouration of gills and mortality of 80-100% within 5 days of infection were also observed. The clinical symptoms and macroscopic findings were erratic swimming,

darting, scratching and visible cotton like tufts on body fin, mouth and in wound area. Tufts of hyphae were found on the wound or ulcer of infected gold fish, murrel and mollies.

4. Discussion

Five ornamental fish units in Thoothukudi and Tirunelveli district of Tamil Nadu were surveyed for the incidence of diseases for a period of 3 months. During the study, four ornamental fish units were visited every weak and samples were collected for further disease investigation. The study regions were selected based on the intensity of the ornamental fish farms. Thoothukudi and Tirunelveli region, the main hub of ornamental fish farming have whole sale units, retail units, small farm units and large farm units. The whole sale units receive ornamental fishes from the backyard and large farms located in and around Thoothukudi and Tirunelveli. In backyard units fishes are grown in rectangular cement tanks. In large farms fishes are grown in earthen ponds. Thus the whole sale units collect wide variety of fishes from five farms. After collection they are stocked in glass tanks and sold too many retail centers. Diseases of bacterial, viral, fungal and parasitic origin were documented in these regions. No specific species and location specific diseases were identified. Since all varieties of fishes both infected and uninfected are distributed at different stages of marketing to all parts of Tamil Nadu and leading to spread of infectious diseases.

Co-habitation of fishes was another reason for prevalence of all diseases in different regions. In the present study 80% of ornamental fish units showed infections of bacterial, viral, fungal and parasitic origin, since the fishes are maintained in stress condition similar report was made by [3] who noted any stress like shipping, crowding and maintaining fishes in poor water quality might predispose the fish to bacterial infections. Reveals that 80% of the farms are with disease and severe loss to farmer and the study confirms the FAO report stating that high disease incidences are the major constraint in the development of aquaculture sector world wide [7]. Many authors reported incidence of bacterial, parasitic, viral and fungal incidence in ornamental fish farm [1, 10, 6].

The bacterial diseases observed in farms were dropsy, bacterial ulcer disease, haemorrhagic septicemia, fin and tail rot/ myxobacterial infection and streptococcal infection. Incidence of dropsy was 32.14%, bacterial ulcer disease was 21.42% and followed by haemorrhagic septicemia and that was 10.74%. Fin rot/ tail rot / myxobacterial infection 21.42% and Streptococcal infection was 14.28%. The observation was similar to that of [4] who reported a variety of bacterial diseases like haemorrhagic septicemia, infectious dropsy, tropical ulcerative syndrome caused by *Aeromonas hydrophila* which was the major bacterial fish pathogen. In the present study infectious dropsy proved to be the dominant disease followed by bacterial, ulcer disease, haemorrhagic septicemia, myxobacterial infection and streptococcal infections. It included protozoan parasite, crustacean parasite like *Gyrodactylus* and *Dactylogyrus*, endoparasites (Tape worm) and monogenean trematodes and the percentage of incidence were 44.7, 7.89, 34.21 and 13.18 respectively.

Koi carp sleeping sickness disease was observed in two (6.66%) of the total surveyed ornamental fish units. Sleepy disease and they occur when they are transferred from earthen to cement tanks and also reported mass mortality within two weeks. In the present study the low incidence of the disease (5% of the total surveyed farms) may be due to water temperature which is above 25°C which is not conducive for the proliferation of the virus. Moreover these farms are isolated and maintain minimum temperature fluctuations [5].

5. References

1. Adams A, Thompson KD, Morris D, Farias C, Chen SC. Development and use of monoclonal antibody probes for immunochemistry, ELISA and IFAT to detect bacterial and parasitic fish pathogens. Fish shell fish Immunol, 1995; 5:537-547.
2. Golam Ziauddin, Dutta C, Goswami A. Ornamental fish trade and marketing in India. Fishing Chimes. 2007; 27(9):44-46.
3. Inglis V, Robers RJ, Bromage NR eds. Bacterial Diseases of fish, Newyork, NY, Halsted Press, 1993, 25-29.
4. Karunasagar I, Ali A, Otta SK, Karunasagar I. Immunization with bacterial agents: Infections with motile Aeromonas, Dev. Biol. Stand, 1997; 90:135.
5. Miyazaki TY, Kuzuya S, Yasumoto M, Yasuda, Kobayashi T. Histopathological and Ultrastructural features of Koi herpes virus KHV - infected carp Cyprinus carpio and the morphology and morphogenesis of KHV. Dis. Aquat. Org., 2005; 80:1-11.
6. Srivastava GG. Fungal parasites of certain freshwater fishes of India, Aquaculture, 1982; 21:387-392.
7. Subasinghe RP, Bondad MG. Reantaso and SE Mc Gladdery. Aquaculturen development, health and wealth. In: R.P. Subasinghe, P. Burno, M.J. Phillips, C. Hough, S.E. McGaddery, and J.R. Arthur, Eds, Aquaculture in Third Millennium. Technical proceedings of the conference on Aquaculture in the Third Millennium, NACA, Bangkok and FAO, Rome, Italy, 2001, 23-28.
8. Tarlochan Singh, Dey VK. Trends in world ornamental fish trade. In; Sovenoir of ornamental kerala. Department of Fisheries, Govt of Kerala, 2006; 2(7):3-8.
9. Whitman Kimberly. Finfish and Shellfish Bacteriology Manual Techniques and procedures. Blackwell Publishing Company, Iowa State Press, IOWA, 2004, 106.
10. Yanong RPE. Pentastomid infections in fish. University of Florida, IFAS extension referred through http://edis.ifas.ufl.edu, 2006.