

BACTERIAL AND CRUSTACEAN DISEASES REPORTED FROM FISHES CULTURED IN PONDS OF BEGNAS, POKHARA, NEPAL

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ABSTRACT

Present study surveyed fish diseases in ponds of Begnas area in Pokhara Valley, Nepal. The fishes were collected with the help of the local fishermen and were examined under compound microscope in the laboratory of Pokhara Fisheries Research Centre, Begnas. Two fish diseases, Tail rot and Arugulosis were reported of which later was dominant.

Key words: Begnas, fish pathogen, host, parasite and bacteria.

INTRODUCTION

It is generally accepted that, all outbreak of a communicable disease is the result of interaction between the host, the pathogen and the environment (Hedrick, 1998). This is particularly true in regard to fishes, which are cold blooded and utilize oxygen dissolved in water.

One of the major problem of fish farming is the prevalence of fish diseases. Several bacterial, protozoan, parasitic, crustacean and fungal diseases are prevalent in Nepal. Some fish diseases were studied in the past by some workers, fish specialists and zoologists. Among the bacterial diseases, are Tail and Fin Rot, Columniariis, and gill disease (Nepal *et al.*, 2002; Jha and Bhujel, 2012). The common fungal diseases are Saprolegniasis, Epizootic Ulcerative Syndrome (Jha and Bhujel 2012), and Hepatoma disease (Nepal *et al.*, 2002). Trichodiniasis, Costiasis, Ichthyophthiriasis, Myxosomiasis, Apiosomiasis, and Epistylis are the major protozoan diseases identified in Nepal (Jha and Bhujel, 2012). Ectoparasitic diseases

caused by *Dactylogyrus sp.*, *Gyrodactylus sp.*, *Bothriocephalus sp.*, *Procamallanus sp.*, *ZyLANema sp.*, *Piscicola sp.*, and *Cariophyllaeus sp.* have been reported from Nepal (Jha and Bhujel; 2012). Among the crustacean diseases, those caused by *Argulus sp.* and *Lernea sp.* are present (Jha and Bhujel, 2012). In addition to specific diseases, other unknown problems such as sporadic fish kill and falling of scales have been observed by fish farmers in Nepal (Jha and Bhujel, 2012). It is expected that the present study will help to provide additional information about the fish diseases in ponds.

MATERIALS AND METHODS

Study area

Pokhara Valley is a place of natural paradise in western Nepal with many fascinating water bodies such as lakes, rivers, streams, ponds, creeks and falls, which provide suitable habitat for fresh water fishes. It is also popularly known as " Water Resources Valley of Nepal". Begnas is located about 10 Km east of Pokhara city at 25° 07' and 28° 10' N latitude, 83° 50' and 84° 50'

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E longitude and lies 800 masl (Tripathi, 1984-85) (Figure 1).



Figure 1. Location map of study area.

Sampling

Fish sampling was done with the help of local fishermen using fishing trap and cast net. It was carried out from April to July, 2017 in ponds of ward numbers 27, 29, 30, 31 of Pokhara Metropolitan City and ponds of Fisheries Research Centre, Pokhara and visited for three times every month. Altogether 57 fish specimens (fingerlings and brood fishes) were collected and brought to the laboratory of Pokhara Fisheries

Research Center, Begnas.

Laboratory work and identification

In the laboratory, gills, scales, fins, tail and the internal organs of fishes were examined. The outer surface of tail, fins, scales and small portion of gills were taken out with the help of scapula. On the slide they were teared and observed under compound microscope (10x10). For internal organs, their small parts were taken out and observed. The body surface of the specimens was also observed if there were any organisms. The ectoparasites were observed and viewed under microscope (4x10) along with their movement. Photographs were also taken using camera. The parasites were identified following Noga (2010) and bacteria following Bailey, Scott and Weisfeld (1998). Fishes were identified following Shrestha (1981) and Jayram (1999).

RESULTS

Occurrence

The following diseases and parasites were observed on the infected fishes by their microscopic examination and are shown in Table 1.

Table 1. List of fishes, their diseases and causative agents.

| S. N. | Local name | Fish species | Number of specimens | Disease diagnosed | Causative agent |
|-------|--------------|---|---------------------|-------------------|---|
| 1. | Common Carp | <i>Cyprinus carpio</i> (Linnaeus) | 6 | Tail rot | <i>Pseudomonas fluorescens</i> (Migula) |
| 2. | Grass Carp | <i>Ctenopharyngodon idella</i> (Valenciennes) | 5 | Argulosis | <i>Argulus</i> (Williams) |
| 3. | Rohu | <i>Labeo rohita</i> (Hamilton-Buchanan) | 4 | - | - |
| 4. | Naini | <i>Cirrhinus mrigala</i> (Hamilton-Buchanan) | 6 | - | - |
| 5. | Bhakur | <i>Catla catla</i> (Hamilton-Buchanan) | 4 | - | - |
| 6. | Silver Carp | <i>Hypophthalmichthys molitrix</i> (Valenciennes) | 5 | Argulosis | <i>Argulus</i> |
| 7. | Bighead Carp | <i>Aristichthys nobilis</i> (Richardson) | 6 | - | - |

| | | | | | |
|--------------|---------|--|-----------|----------|----------|
| 8. | Sahar | <i>Tor putitora</i> (Hamilton-Buchanan) | 4 | - | - |
| 9. | Tilapia | <i>Oreochromis niloticus</i> (Linnaeus) | 7 | - | - |
| 10. | Gardi | <i>Labeo angra</i> (Hamilton-Buchanan) | 4 | - | - |
| 11. | Magur | <i>Clarias batrachus</i> (Linnaeus) | 6 | - | - |
| Total | - | 11 | 57 | 2 | 2 |

Altogether 11 species of fishes were included in the study which were Common Carp (*Cyprinus carpio*), Grass Carp (*Ctenopharyngodon idella*), Rohu (*Labeo rohita*), Naini (*Cirrhinus mrigala*), Bhakur (*Catla catla*) Silver Carp (*Hypophthalmichthys molitrix*), Bighead Carp (*Aristichthys nobilis*), Sahar (*Tor putitora*), Tilapia (*Oreochromis niloticus*), Gardi (*Labeo angra*) and Magur (*Clarias batrachus*); and two pathogens were observed from three species of fishes (Table 1). The pathogens were *Pseudomonas fluorescens* (bacteria) and *Argulus* (parasite). Fungal, protozoan, mycotic and viral pathogens were not observed. Of the pathogens listed, they were primary pathogens as they potentially caused mortality and deformity in fishes.

Treatment

Fish dipped in 2-3% salt solution for 5-10 minutes was effective against argulosis. Application of Trichlorfon or Dipterex solution in the pond at the rate of 0.25 ppm was also useful. Fish dipped in 500 ppm copper sulphate solution for one minute once a day was effective against bacterial disease.

DISCUSSION

Columnaris disease was reported in *Clarias lazera* and also isolated *Flavobacterium columnare* and *Cytophaga sp* were identified (El Attar *et al.*, 2001). In 2000, encysted metacercariae (EMC) were collected from Nile

Tilapia and after experimental infection, adult flukes were identified as *Prohemistomum vivas*, *Pygidioopsis genata*, *Procerovium varium* and *Haplorchis pumilio* (Mousa *et al.*, 2002).

Similarly, African catfish were examined in Dakahlia Province, Egypt in 2002 for parasites, of which 40% were found to be infected with *Trichodina fultoni*, *Ichthyophthirius multifiliis*, *Ichthoboda sp.* and *Myxobolus dermatobia* (Badran, 2002).

CONCLUSION

Argulosis and Tail rot (dominant) were seen on carp species only, i.e. Tail rot on Common Carp and Argulosis on Silver Carp and Grass Carp. Use of chemicals for controlling the diseases was found effective.

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