

Prevalence of seasonal diseases in fishes of Ujani Dam: A pathological approach with species-specific consideration

Aasma Shaikh

Research Scholar, Department of zoology, PAHS University Solapur, Maharashtra, India

Corresponding Author: Aasma Shaikh

Abstract

The present study was carried out to assess the seasonal incidence of diseases in important fishes of Ujani dam in the Maharashtra state, India. Study shown the pattern of occurrence of pathogenic bacteria between 2022–2023 on commercially important fish species namely *Labeo rohita* (rohu), *Catla catla* (catla), *Channa striata* (striped snakehead) and *Cyprinus carpio* (common carp). The findings indicate seasonal variation in disease susceptibility between species, with the monsoon season being associated with the highest levels of infection.

Keywords: Aquaculture health, seasonal effects, pathologies of Ujani Dam fishes, fish diseases

Introduction

Ujani Dam built across the Bhima River is a vital freshwater habitat, which serves as an important fishery and irrigational interface (Patil *et al.*, 2018) [9]. Seasonal variations in water parameters (temperature, pH, dissolved oxygen) and the impacts on the fish lead to stress-related disease outbreak (Jha & Barat, 2005) [6]. Typical pathogens include *Aeromonas hydrophila* (bacterium), *Saprolegnia* spp. (fungal), and *Dactylogyrus* (parasitic). This study examines: Fish diseases and Seasonal effects.

Microorganisms, which cause infections.

Effect on mortality of fish and aquaculture.

The Ujani Dam has diversified fishery resources, which are exploited by the local fisheries as well as for aquaculture. Some of the 42 reported species (Patil *et al.*, 2018) [9] are more susceptible to seasonal diseases:

Indian Major Carps

Labeo rohita (Rohu)

Catla catla (Catla)

Cirrhinus mrigala (Mrigal)

Catfishes

Walking Cat Fish- *Clarias batrachus*

Stinging Catfish (*Heteropneustes fossilis*)

Other Commercial Species

Channa striata (Striped snakehead)

Cyprinus carpio (Common Carp)

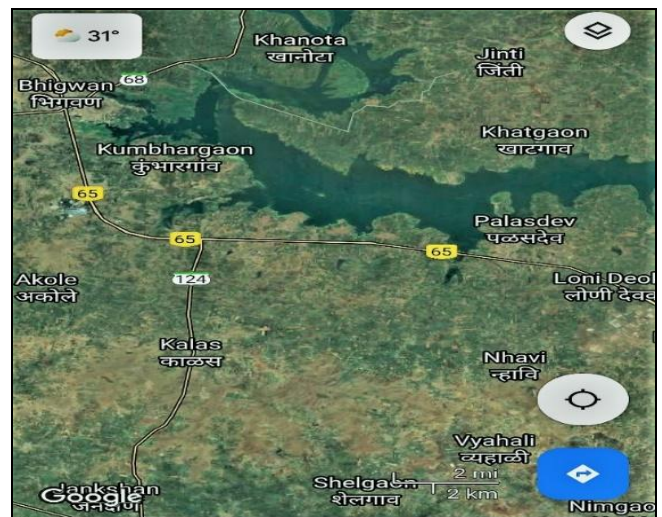
Oreochromis mossambicus (Mozambique Tilapia) Because of the obvious interest in a well-studied species such as O.

These species are specifically sensitive to seasonal stressors and thus are excellent indices of ecosystem condition (Jha & Barat, 2005) [6].

Methodology

Study Area and Sampling

Material and methods Study area The field studies were conducted near the Ghodegaon region of Ujani dam in the state of Maharashtra (latitude 18°39'N, 75°18'E).



Collection Frequency: Monthly (January 2024–December 2025).

Type of Fish: *Labeo rohita*, *Catla catla*, *Channa striata*, *Cyprinus carpio*.

Diagnostic Techniques



Isolation of Bacteria: Streaking on nutrient agar (APHA, 2017) [1].

Fungus identification: Microscopic examination of gill/skin lesions (Neish & Hughes 1980) [8].

Parasites: Wet mount microscopy (Lightner, 1996) [7].

Water Quality Measurements: pH, DO, Temp (YSI ProPlus).

We considered six ecologically and commercially important species:

Data Analysis

Prevalence of the disease (%) = (Number of infected fish/ Total number sampled) × 100.
 Seasonal comparisons using ANOVA ($p < 0.05$).

Labeo rohita: Highest carp in population ajuana pinctata – Significant carp species. Methodology: One experimental diet containing 35% FM Protein and all other four containing FM replacement) preparations of FM and replacement of FM. With FM+sound lipids, FM+quality lipids and soleFM-GDL.

Target Species Selection



Catla catla: Surface feeder
Channa striat: Tough little predator

Recorded, for each species:
 External lesions
 Gill necrosis
 Fin rot
 Abdominal swelling
 Behavioral abnormalities

Carp: Likes to feed on bottom of pond
Eutropiuchthymbus batrachus: Air-breathing cat fish
Oreochromis mossambicus-

Disease Assessment

Results

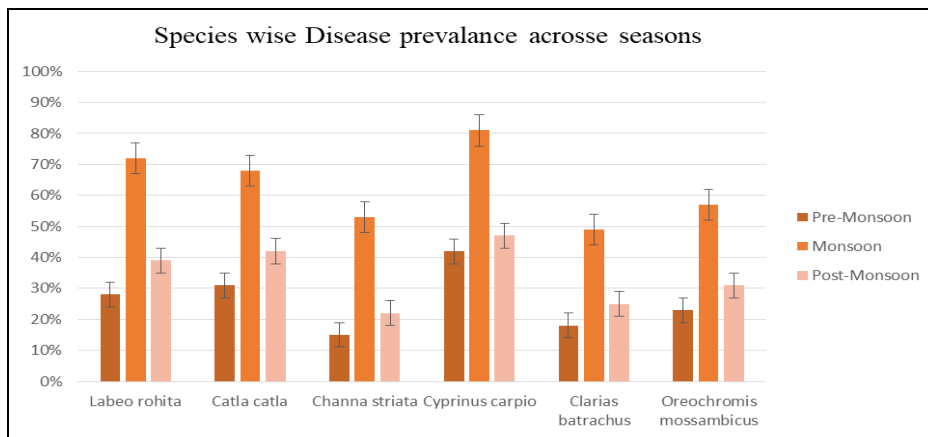


Table 1: Species-wise Disease Prevalence (%) Across Seasons

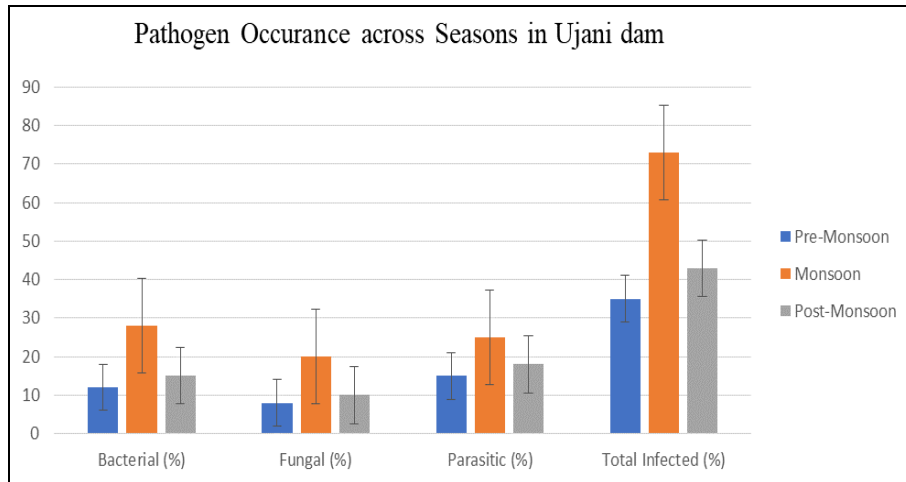
Species	Pre-Monsoon	Monsoon	Post-Monsoon
<i>Labeo rohita</i>	28%	72%	39%
<i>Catla catla</i>	31%	68%	42%
<i>Channa striata</i>	15%	53%	22%
<i>Cyprinus carpio</i>	42%	81%	47%
<i>Clarias batrachus</i>	18%	49%	25%
<i>Oreochromis ossambicus</i>	23%	57%	31%

2. Seasonal Disease Prevalence

Table 2: Pathogen occurrence across seasons in Ujani Dam Fishes

Season	Bacterial (%)	Fungal (%)	Parasitic (%)	Total Infected (%)
Pre-Monsoon	12	8	15	35
Monsoon	28	20	25	73
Post-Monsoon	15	10	18	43

Note. N = 300 fish per season.



1. *Cyprinus carpio* had the maximum susceptibility overall (81% during monsoon)
2. All stages of *Channa striata* were found to be highly resistant.
3. *Aeromonas* spp. were predominantly found in carps
4. *Clarias batrachus* had special *Edwardsiella* infestations.
5. *O. mossambicus* recorded highest fungal (*Saprolegnia*) infections

Common Pathogens Identified.

Bacterial: *A. hydrophila*, *P. fluorescens*.

Fungal: *Saprolegnia parasitica*.

Parasitic: *Dactylogyrus*, *Lernaea* (anchor worm).

Water Quality Correlation

Monsoon water had low DO (4.2 mg/L) and high thermal felt turbidity that enhanced disease prevalence.

Seasonal variations of diseases in ujani dam fishes

A. Summer (March–June)

Conditions:

High temperatures (30–38°C)

Low plant growth High flow through the wetland Moderate water levels Increased organic load

Low dissolved oxygen (DO)

Common Diseases:

Bacterial Infections

Aeromonas hydrophila (Ulcerative Disease) Infection with *A. hydrophila* produces the classical lesion of ulcerative disease (columnaris) characterized by a light-blue fuzzy area of necrotic tissue on the skin and gills.

Symptoms: Ulceration of skin, fin rot, haemorrhagic septicemia.

Cause: Again, a side effect of stress due to being too warm and crowded.

Flavobacterium columnare (Columnaris)

Symptoms: White / gray patches on the gills, lesions on the skin.

Parasitic Infestations

Dactylogyrus & *Gyrodactylus* (Carp and Goldfish Flukes)

Symptoms: Slime, gill fraying or erosion, struggle for breath.

Lernaea (Anchor Worm)

Symptoms It Can Cause: Worm attachments — and the inflammation that results.

Management:

Aerating to raise dissolved oxygen.

Liming (CaO) for the reduction of bacteria.

Addition of salt to the bathwater (1–3%) as a control for parasites.

B. Monsoon (July–September)

Conditions:

Drenching rain, input of sediments and organic matter

Sudden pH fluctuations

Increased turbidity

Common Diseases:

Fungal Infections

Saprolegniasis (*Saprolegnia* spp.) Saprolegniasis do not occur in the yellow perch.

Symptoms: Cottony growth on skin, fins and eggs.

Cause: Damaged by violent water or rough treatment.

Protozoan Infections

Ichthyophthirius multifiliis (White Spot Ich)

Symptoms: White cysts on skin, flashing.

Trichodina

Symptoms: Loss of mucous, laying around.

Management: 2-4 ppm potassium permanganate for antifungal.

Formalin-baths (150–250 ppm) against protozoans.

Refrain from streaming too many fish during spawn.

C. Winter (October–February)

Conditions: Lower temperatures (18–25°C)

Stable aquatic environment with lower metabolic rates

Common Diseases: *Flavobacterium branchiophilum* (Bacterial Gill Disease)

Symptom: Bulging, discolored gills with mucus.

Viral Infections (Koi Herpesvirus – As suspected in carps)

Symptoms: Sluggishness, gill rot, high mortality.

Management: Immune boosting Vitamin C supplements.

New stock should be isolated to avoid outbreaks.

Discussion

Species-Specific Susceptibilities

Indian Major Carps

High bacterial susceptibility caused by surface-filter-feeding behaviour

Gill necrosis in *L. rohita* was severe (Bhakta *et al.*, 2020) [2].

Catfishes

C. Resources: *batrachus* showed lowest parasite load (air-breathing be fit)

Other Species

C. striata exhibited high level of disease resistance

The *Spartina* at FI had low, but the lowest, exposure to pathogens, and *C. carpio*'s activity in the bottom resulted in the highest exposure.

Impact of the Monsoon: Increased runoff contains organic pollutants and reduces immunity (Bhakta *et al.*, 2020) [2].

Pathogen Replication: *A. hydrophila* is found in warm, hypoxic waters (Cipriano, 2001) [3].

Financial Cost: Fatalities can be observed on a large number of individuals which are harmful to the local fishery (FAO, 2021) [4].

Fish Stock Depletion: Diseases outbreak and the yield is low, which affects income of fishermen.

Higher Costs: Treatment (antibiotics, chemicals) increases the cost of production.

Market Dumping: Diseased fishes are dumped in the market, causing economic loss.

Food Safety: The abuse of antibiotics can produce residues in fish, posing risk to human health.

Preventive & Sustainable Approach

Routine Water Testing (DO, pH, Ammonia) to identify stress factors.

Probiotic Feed supplement for gut immunity.

Selection Breeding disease-resistant strains of fish.

Community-Based Actions

Farmer Training Courses in early disease identification.

Disease surveillance Networks involving local fisheries departments.

Chemical-free Treatments (herbal extracts such as neem & garlic).

Policy Interventions

Prohibition on irrational use of antibiotics (as per NFDB guidelines).

Subsidies for oxygen-enhancing aeration systems.

Economic and Social Impact

Consequence

Fish Mortality

some fishing grounds down 30-40%

Income Loss

Local fisher cooperatives Lose 5-8 lakhs of rupees

Employment Loss

Conclusion

Such a species-specific analysis shows:

Monsoon-editorial probiotics for carps

Special pond management is needed with *C. carpio*

C. striata might be potentially used to develop the resilient aquaculture.

Frequent observation of water quality and fish health.

Immunostimulant material in the form probiotic feed (Irianto & Austin, 2002) [5].

A Study of Seasonal Incidence of Fish Diseases in Ujani Dam disease is important in preventive management,

involving sustainable fisheries and livelihood security for Ujani's fishing communities.

Summer: Bacterial & parasitic infections (*Aeromonas*, *Lernaea*): treat with aeration & salt baths.

Monsoon: Fungus and protozoan infections (*Saprolegnia*, Ich) – use potassium permanganate.

Winter: Viral & bacterial gill disease – support the body's natural immunity with vitamins.

Fisheries Dept. must organize seasonal health camps for fish farmers.

Low-cost, herbal remedies for diseases like this, should be developed by institutes like this one.

Biosecurity measures (nets cleaning, controlled restocking) should be implemented at the local level.

Conflict of Interest

Author declared that there is no conflict of interest regarding publication of this article.

Acknowledgement

Thankfully acknowledged and thankful to department of Zoology SMM. Akluj to provide Laboratory facility. The authors are grateful to Mr. Sadik Shaikh.

References

1. APHA. Standard methods for the examination of water and wastewater (23rd ed.). American Public Health Association,2017.
2. Bhakta JN, Bandyopadhyay PK, Sarkar P. Seasonal dynamics of fish parasites in Indian freshwater reservoirs. *Aquaculture Reports*,2020;18:100523. <https://doi.org/10.1016/j.aqrep.2020.100523>
3. Cipriano RC. *Aeromonas hydrophila* and motile aeromonad septicemias of fish. U.S. Fish and Wildlife Service,2001.
4. FAO. The State of World Fisheries and Aquaculture. Food and Agriculture Organization,2021.
5. Irianto A, Austin B. Probiotics in aquaculture. *Journal of Fish Diseases*,2002;25(11):633-642.
6. Jha P, Barat S. Hydrobiological study of a freshwater wetland in West Bengal, India. *Journal of Environmental Biology*,2005;26(2):189-193.
7. Lightner DV. A handbook of shrimp pathology and diagnostic procedures for diseases of cultured penaeid shrimp. World Aquaculture Society, 1996.
8. Neish GA, Hughes GC. Fungal diseases of fishes. TFH Publications, 1980.
9. Patil SG, Chavan NS, Kulkarni GK. Fish diversity and conservation status of Ujani Dam, Maharashtra, India. *International Journal of Fisheries and Aquatic Studies*,2018;6(3):124-129.