EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 6
Issue: 3
550-551
Year: 2019

ENTEROBACTERIACEAE IN FISHES: A SHORT NOTE

Pranjali Borkar*[1], Ragini Gothalwal[1] and Manju Tembhre[2]

[1]Department of Biotechnology, Barkatullah University, Bhopal, India.
[2]MK Ponda College, Barkatullah University, Bhopal-462038, M.P., India.

***Corresponding Author: Pranjali Borkar**
Department of Biotechnology, Barkatullah University, Bhopal, India.

Article Received on 21/01/2019 **Article Revised on 11/02/2019** **Article Accepted on 01/03/2019**

INTRODUCTION

Freshwater fishes which dwell in ponds, lakes, estuaries and rivers are always vulnerable to infectious environment. Under ideal environmental conditions, healthy looking fish without a clinical sign or lesion can carry pathogens that create serious risks for the spread of contagious diseases in the fish populations. In the intensive pisciculture conditions the risk of pathogen stress increases and a significant proportion of the stock may become infected. Under different circumstances fish immunity get affected by variety of factors like environmental stress, external damages, weak musculature and GI track. This provides good environment for the bacterial infection to spread upon.

Varieties of factors affect the healthy environment of fish viz. fungal, algal and microbial. Among these infections, bacterial infection commonly occurs in the fishes as they are more susceptible to these microorganisms. Many bacterial diseases are widespread in aquatic ecosystems, for example, Motile aeromonad infection (*Aeromonas spp*, Baran *et al*., 1980), Vibriosis (*Vibrio parahaemolyticus*, Aydin, 2000a), Pseudomonas (El-Hady and Samy, 2011) and Bacterial gill disease, (*Flavobacterium branchiophilum*, Yildirim ve Ozer, 2010).

Fish represents 16 percent of all animal protein consumed globally, and this proportion of the world's food basket is likely to increase which will be responsible for higher revenue generation in international markets as well as increased per capita income (FAO 2016). Considering the increasing significance of pisciculture, the present conditions need to be analyzed and evaluated earliest.

Prevalence of Enterobacteriaceae in fishes

Freshwater fishes are one of the most diverse groups of vertebrate species in India and they represent around one quarter of all vertebrates worldwide. As fishes are the most consumable and cheaper source of protein it has earned significant economic value in the food industry. Among the fishes carps play major role in aqua industry of India as they are omnipresent and are the most edible one. Enterobacteriaceae is a common disease causing group of bacteria in fishes.

Austin (2002) synchronized the available information on fish-associated bacteria, focusing on the numbers, nature and role of bacteria on or in healthy finfish. Likewise, Novotny *et al.* (2004) elaborated an overview of significant bacterial causative agents of human diseases transmitted from fish used as food or by handling them. Enterobacteriaceae correlate to the sewage and fecal pollution in water and the surrounding environment in which fish lives (Aly *et al.*, 2012; Hassan *et al.*, 2012; Elsherief *et al.*, 2014; -Sichewo *et al.*, 2014). Surendraraj *et al.* (2009) showed that *Escherichia coli* have an assertive existence at all sample sites in all samples analysed. Enterobacteriaceae dominates the gut microflora in fishes. Likewise, liver also dominated by the enteric microbacteria. Dang and Dalsgaard (2012) investigated the *Escherichia coli* Contamination in muscle and intestine of Grass carp (*Ctenopharyngodon idellus*), silver carp (*Hypophthalmichthys molitrix*), and rohu (*Labeo rohita*) and found high levels of *E. coli* in their gut. Atwa (2017) isolated and identified pathogenic bacterial species from the skin, muscle, intestines and liver of living diseased cultured Tilapia (*Oreochromus niloticus)*. Here, the result revealed the isolated enterobacterial species viz. *E. coli, Salmonella, P. aeruginosa, P. fluorescens* and Enterobacteriaceae. Study depicts 26% isolation of bacteria from liver and 22% from intestine. Klūga *et al.* (2019) findings also gives a picture of the dominancy of Enterobacteriaceae in freshwater fishes.

Prevalence of Enterobacteriaceae was also noticed from water samples. Here, physioco-chemical parameters of water affect the water quality which also affects the

microflora in aquatic systems. Oxygen depletion in water leads to poor feeding of fish, starvation, reduced growth and more fish mortality, either directly or indirectly (Bhatnagar and Devi, 2013).

CONCLUSION

Enterobacteriaceae are one of the important disease causing bacterial species for both fish and human beings and involved in serious caution to pisciculture systems and fish processing mechanisms as well. This group of bacteria may generally inhabit in the various tissues of apparently healthy fish, and the gastrointestinal tract of animals and human being resulting in deprived fish farming as well as food poisoning. Therefore, onset of Enterobacteriaceae infection in fish is required to assess and diagnose.

REFERENCES

1. Aly, S.M., Nouh, W.G. and Salem-Bekhit, M.M., Bacteriological and Hstopathological Studies on Enterobacteriacea in Nile Tilapia *Oreochromis Niloticus. J Pharmaceutic Biomed Sci*, 2012; *2*(7): 94-104.
2. Austin, B., The bacterial microflora of fish. *The Scient W J*, 2002; *2*: 558-572.
3. Atwa, E.I., Bacteriological Study of Fish Samples Collected from Different Markets in Some Egyptian Governorates and Antimicrobial Sensitivity of Isolates. *Int. J. Curr. Microbiol. App. Sci*, 2017; *6*(5): 2765-2776.
4. Aydin, S., Celebi, S. and Akyurt, I. Clinical, haematological and pathological investigations of Escherichia vulneris in Rainbow trout (Oncorhynchus mykiss). *Fish Pathol*, 1997; 32: 29-34.
5. Baran, E., Van Zalinge, N. and Bun, N.P., August. Floods, floodplains and fish production in the Mekong Basin: present and past trends. *In Contribution to the Asian Wetlands Symposium*, 2001; 27-30.
6. Bhatnagar, A. and Devi, P., Water quality guidelines for the management of pond fish culture. *Int J of Env Sci*, 2013; *3*(6): 1980-2009.
7. Dang, S.T.T. and Dalsgaard, A., Escherichia coli contamination of fish raised in integrated pig-fish aquaculture systems in Vietnam. *Journal of food protection*, 2012; *75*(7): 1317-1319.
8. El-Hady, M. A., & Samy, A. A. Molecular typing of Pseudomonas species isolated from some cultured fishes in Egypt. Global Veterinaria, 2011; 7(6): 576–580.
9. Elsherief, M.F., Mousa, M.M., Galil, H.A.E., Bahy, E.F.E., Enterobacteriaceae Associated with Farm Fish and Retailed Ones. *Alexandria J Vet Sci.*, 2014; 42: 99-104.
10. FAO, I., WFP 2015. The State of Food Insecurity in the World 2015. Meeting the 2015 international hunger targets: taking stock of uneven progress. Food and Agriculture Organization Publications, Rome, Italy, 2016; 200.
11. Hassan, A.H.M., Noor-El Deen, A.E., Galal, H.M., Sohad, M.D., Bakry, M.A. and Hakim, A.S., Further Characterization of Enterobacteriaceae isolated from cultured freshwater fish in Kafr El Shiek Governorate: Clinical, biochemical and histopathological study with emphasis on treatment trials. *Global Veterinaria*, 2012; 9(5): 617-629.
12. Klūga, A., Kačániová, M. and Terentjeva, M., Identification and antibiotic susceptibility of bacterial microbiota of freshwater fish. *Potravinarstvo Slovak Journal of Food Sciences*, 2019; *13*(1): 408-414.
13. Novotny, L., Dvorska, L., Lorencova, A., Beran, V. and Pavlik, I., Fish: a potential source of bacterial pathogens for human beings. A review. *Veterinarni Medicina-UZPI* (Czech Republic), 2004.
14. Sichewo, P.R., Gono, R.K., Muzondiwa, J. and Mungwadzi, W., Isolation and identification of pathogenic bacteria in edible fish: A case study of rural Pisciculture projects feeding livestock manure to fish in Zimbabwe. *Int. J. Curr. Microbiol. App. Sci*, 2014; *3*(11): 897-904.
15. Isolation and Identification of E. coli from Cultured Freshwater Fish Soliman, M. K.; Khalil, R. H.; Saad, T. T* El-Gamal M. H. L. and Gebril, A. E. Poultry and Fish Diseases, Fac. Of Vet. Med., Aex. Univ.
16. Surendraraj, A., Farvin, K.S., Yathavamoorthi, R. and Thampuran, N., Enteric bacteria associated with farmed freshwater fish and its culture environment in Kerala, India. *Research Journal of Microbiology*, 2009; *4*(9): 334-344.