FisheriesSciences.com©
4 (17) 2023 : 001-002 • Mini Review

Salmonids' a disinfectant with a capacity of a fisheries approach

Lucy Hannah*
Department of Fisheries Science, Faculty of Aquaculture, Fate Well University, Argentina

AUTHORS' CONTRIBUTION: (A) Study Design · **(B)** Data Collection . **(C)** Statistical Analysis · **(D)** Data Interpretation · **(E)** Manuscript Preparation · **(F)** Literature Search · **(G)** No Fund Collection

SUMMARY

Infectious diseases, including those that are bacterial in origin, continue to pose a threat to the aquaculture industry. Aquaculture has displaced capture fisheries as the primary method for producing fish protein, despite the disease burden. The culture of salmonids, which are (a) the most valuable finfish per unit of weight and (b) under unique pressure due to overfishing, is an appealing sector within this industry. Antibiotics are frequently used to combat bacterial disease outbreaks because there are still knowledge gaps regarding fish immunity, which results in vaccines that are not as effective as those for terrestrial species. Even though it works, this method makes it more likely that antibiotic-resistant bacteria will grow. A deeper comprehension of the immune system of teleosts is necessary in order to facilitate the development of vaccines and/or alternative treatments. The state of teleost antibacterial immunity in salmonid aquaculture is highlighted in this review. In addition, the effectiveness of the current approaches to fighting bacterial diseases in salmonid aquaculture will be discussed. In the future, reducing aquaculture losses will be made easier by filling the knowledge gaps in immunology that have been highlighted here.

Keywords: Aquaculture; Salmonids; Bacterial pathogens; Comparative immunology; Adjuvants

Address for correspondence:

Lucy Hannah,
Department of Fisheries Science, Faculty of Aquaculture, Fate Well University, Argentina
E-mail: hannahlucy678@gmail.com

Word count: 1056 **Tables:** 00 **Figures:** 00 **References:** 10

Received: 03.04.2023, Manuscript No. ipfs-23-13594, **Editor assigned:** 05.04.2023, PreQC No. P-13594, **Reviewed:** 19.04.2023, QC No. Q-13594, **Revised:** 21.04.2023, Manuscript No. R-13594, **Published:** 28.04.2023

INTRODUCTION

It was only a matter of time before aquatic environments became the new frontier for agriculture given that freshwater and saltwater make up 72% of the Earth's surface area. It is not surprising that advances in aquatic animal husbandry have lagged behind those in terrestrial species because the majority of food animals are raised on land [1]. It is obvious that aquatic habitats must be utilized for the production of animal food as a result of the growing global population and the limited availability of productive land. In this day and age, when cardiovascular disease is the leading cause of death worldwide, many aquatic species provide an alternative protein source that is heart-healthy due to their high polyunsaturated fatty acid content [2]. Worldwide demand for fish protein is high for all of these and other reasons. In point of fact, it is at a level so high that fisheries are unable to satisfy the global demand while also adhering to the harvesting restrictions that are in place at the moment [3]. Because it is logistically difficult to effectively enforce these restrictions, this puts a strain on wild populations.

Aquaculture, or the cultivation of aquatic species, may offer a solution to some of the pressure that is placed on wild populations [4]. This culture production is still in its infancy for many aquatic species, so it will take time to comprehend and improve these industrial practices. The rising incidence of infectious diseases, including those caused by bacterial pathogens, is one manifestation of the challenges aquaculture faces [5]. Bacteria are able to thrive in novel farm environments with high density. As a consequence of this, a lot of these common microorganisms become opportunistic pathogens in aquaculture settings [6]. Getting a more profound comprehension of bacterial sicknesses that influence hydroponics, as well as what is a viable safe reaction in important hosts, is significant to improve this industry. The cultivation of various species of fish will be referred to as "aquaculture" for the purposes of this review [7].

Innate immunity of fish

Teleost adaptive immunity has its limitations, such as a limited antibody repertoire and slow initiation. The innate immune system bears the majority of the responsibility for preventing and combating infectious diseases [8]. It has been demonstrated that fish possess all of the physical barriers (skin and mucous membranes) and humoral parameters (complement, natural antibody, toll-like receptors, etc.) that are typically associated with innate immunity in mammals and components of cells (such as

NK cells and phagocytosis) [9]. The fact that the majority of the broad-spectrum parameters of innate immunity are highly conserved across species and taxa as the first line of defense is not surprising. The innate immune system of all jawed vertebrates has a rapid defense against invading pathogens and tissue damage. However, it is unable to provide long-term immunological memory or well-targeted protection against individual pathogens [10].

DISCUSSION

Although eukaryotic cell lines are an extremely useful tool for conducting biological experiments, they should not be regarded as an alternative to conducting research on whole animals. In circumstances where in vivo examinations are unrealistic or there are mechanical constraints, cell lines can give primer outcomes that is theory creating. However, it is essential to keep in mind that each cell line represents a single cell type from a single individual. As a result, these model systems cannot be expected to accurately represent entire animals or processes, such as immune responses, that require the interactions of multiple cell types. This is upheld by various examinations wherein mammalian cell lines have uncovered that section number and culture time can impact quality articulation, protein movement, and morphology and cell reactivity/responsiveness. Although little research has been done to document this disconnect in teleost cell lines, it is certain to have similar limitations.

CONCLUSION

The vertebrate immune system is a complex system that works together to protect the body from infectious agents and other foreign substances. It is made up of molecules with complementary and antagonistic actions, cells that interact, and cell-forming tissues. The immune system's complexity is the result of over 500 million years of evolution, not a single event. The immune system has continuously evolved between taxa throughout this time, preserving valuable components and eliminating useless ones. Because aquatic and terrestrial organisms live in such distinct habitats, they are subject to distinct evolutionary pressures. As a result, environmental differences are reflected in species-specific differences in immune system composition. As a result, it should come as no surprise that we have been able to use comparative models to (a) improve our comprehension of immunity in mammals, (b) enhance species-specific animal husbandry, and (c) discover useful immunological tools for applications in molecular biology. This review attempted to list some of the most recent findings regarding teleost antibacterial immunity.

REFERENCES

1. **Hendrickson, Dean A, Krejca Jean K, Martinez Juan, et al.** Mexican blindcats genus Prietella (Siluriformes: Ictaluridae): an overview of recent explorations. *Environmental Biology of Fishes.* 2001; 62: 315-337.
2. **Nico Leo G, Martin R, Trent**. The South American Suckermouth Armored Catfish, Pterygoplichthys anisitsi (Pisces: Loricaridae), in Texas, with Comments on Foreign Fish Introductions in the American Southwest. *Southwest Nat.* 2001; 46: 98-104.
3. **Wakida-Kusunokia Armando T, Ruiz-Carusb Ramon, Amador-del-Angelc Enrique**. Amazon Sailfin Catfish, Pterygoplichthys pardalis (Castelnau, 1855) (Loricariidae), Another Exotic Species Established in Southeastern Mexico. *Southwest Nat.* 2007; 52: 141-144.
4. **Chavez Joel M, de la Paz Reynaldo M, Manohar Surya Krishna, et al.** New Philippine record of South American sailfin catfishes (Pisces: Loricariidae) (PDF). *Zootaxa.* 2007; 1109: 57-68.
5. **Nico Leo G, Martin R, Trent**. The South American Suckermouth Armored Catfish, Pterygoplichthys anisitsi (Pisces: Loricaridae), in Texas, with Comments on Foreign Fish Introductions in the American Southwest. *Southwest Nat.* 2001; 46: 98-104.
6. **Wakida-Kusunokia, Armando T, Ruiz-Carusb Ramon**. Amazon Sailfin Catfish, Pterygoplichthys pardalis (Castelnau, 1855) (Loricariidae), Another Exotic Species Established in Southeastern Mexico. *The Southwestern Naturalist.* 2007; 52: 141-144.
7. **Friel J P, Lundberg J G**. Micromyzon akamai, gen ET sp Nov, a small and eyeless banjo catfish (Siluriformes: Aspredinidae) from the river channels of the lower Amazon basin. *Copeia.* 1996: 641-648.
8. **Ballen Gustavo A, De Pinna Mario C**. A standardized terminology of spines in the order Siluriformes (Actinopterygii: Ostariophysi). *Zool J Linn Soc.* 2022; 194: 601-625.
9. **Ferreira JG, Hawkins AJS, Bricker SB**. Management of productivity, environmental effects and profitability of shellfish aquaculture-The Farm Aquaculture Resource Management (FARM) model (PDF). *Aquaculture.* 2007; 264: 160-174.
10. **Corpron KE, Armstrong DA**. Removal of nitrogen by an aquatic plant, Elodea densa, in recirculating Macrobrachium culture systems. *Aquaculture.* 1983; 32: 347-360.