



## Dietary lacto-sacc improved growth performance, food acceptability, body indices, and basic hematological parameters in empurau (*Tor tambroides*) fries reared in the aquaponics system

Sharifah Lia Farliana Wan Alias, Mohammad Bodrul Munir, Roslianah Asdari, Md. Abdul Hannan & Md. Jahidul Hasan

To cite this article: Sharifah Lia Farliana Wan Alias, Mohammad Bodrul Munir, Roslianah Asdari, Md. Abdul Hannan & Md. Jahidul Hasan (2022): Dietary lacto-sacc improved growth performance, food acceptability, body indices, and basic hematological parameters in empurau (*Tor tambroides*) fries reared in the aquaponics system, Journal of Applied Aquaculture, DOI: [10.1080/10454438.2022.2095239](https://doi.org/10.1080/10454438.2022.2095239)

To link to this article: <https://doi.org/10.1080/10454438.2022.2095239>



Published online: 08 Jul 2022.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)



## Dietary lacto-sacc improved growth performance, food acceptability, body indices, and basic hematological parameters in empurau (*Tor tambroides*) fries reared in the aquaponics system

Sharifah Lia Farliana Wan Alias<sup>a</sup>, Mohammad Bodrul Munir<sup>a</sup>, Roslianah Asdari<sup>a</sup>, Md. Abdul Hannan<sup>b</sup>, and Md. Jahidul Hasan<sup>c</sup>

<sup>a</sup>Faculty of Resource Science and Technology, Universiti Malaysia Sarawak, Sarawak, Malaysia;

<sup>b</sup>Department of Aquatic Animal Health Management, Sher-e-Bangla Agricultural University, Dhaka, Bangladesh; <sup>c</sup>Quality Control Laboratory, Department of Fisheries, Khulna, Bangladesh

### ABSTRACT

The slow growth rate of empurau (*Tor tambroides*) fish has been reported, impeding its aquaculture practice extensively in Malaysia. It mainly occurs at the fry to fingerling phase. Hence, the present research evaluated the dietary lacto-sacc feed supplement on the growth performance and health status of *T. tambroides* fries. The fish growth was outperformed significantly ( $P < 0.05$ ) after 12 weeks in fish fed with the lacto-sacc supplemented fish feed compared to the nonsupplemented control diet. As with the growth performance, the basic hematological parameters were significantly ( $P < 0.05$ ) improved. This study was the first attempt to indicate the suitability of dietary lacto-sacc for empurau fries nursery in an aquaponics system. Although this study was performed in four types of aquaponics systems, the factorial analysis confirmed that diet had a strong effect for this occurrence.

### KEYWORDS

Malaysian mahseer; *Tor tambroides*; growth; probiotics; lacto-sacc

## Introduction

Malaysian mahseer, the fish with the scientific name of *T. tambroides* (Bleeker) or locally popular as empurau or kelah, within the freshwater carps or cyprinids family (Adrian et al. 2019), has a great demand for religious food, sports, and ornamental fish in the Asia Pacific region (Esa et al. 2008). Hence, efforts are made to adopt the pond aquaculture (Ingram et al. 2005, 2007; Ng 2004) for *T. tambroides* through induced spawning of reared broodstock. The problem associated with this phase is slow growth (Soon et al. 2014) mainly at the fry to fingerling phase, which is considered the utmost critical period for intensive care (Azfar-Ismail et al. 2020; Lau, Lim, and Ishak et al. 2021). Although the dietary protein and lipid requirements of empurau fries have been analyzed in detail (Ng,

**CONTACT** Mohammad Bodrul Munir ✉ [hsjewel730@yahoo.com](mailto:hsjewel730@yahoo.com) 📧 Faculty of Resource Science and Technology, Universiti Malaysia Sarawak, Kota Samarahan, Sarawak 94300, Malaysia

This article has been republished with minor changes. These changes do not impact the academic content of the article.

system directly in the fish (Munir et al., 2016a). Because of having these attributes, the factorial analysis in this study also exhibited that using of dietary lacto-sacc in the fish feed formulation is the major reason (Table 5). Thus, dietary lacto-sacc feed supplement led to enhance well growth performance and immunological health status of empurau fish in the four aquaponics system.

## Conclusion

The present study is the first attempt to report that formulated lacto-sacc fish diet can enhance the growth performance and well-being of empurau (*T. tambroides*) fries in aquaponics systems. Aquaponics systems were adopted because they use flowing water, which is reported to be mandatory for empurau fish growth. As this fish is very sensitive, the results of this study might be considered as preliminary; further detailed research is suggested.

## Acknowledgments

Special thanks go to Borneo Empurau Farm Sdn Bhd., the research collaborator of UNIMAS, for allowing us to conduct this research in their aquaponics area and Honey Aquaculture and Asian Eco Fish, AllTech@Malaysia for providing free of cost fish fries and lacto-sacc.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Funding

This research project was carried out with financial support from the Small Grant Scheme Project (Ref: F07/SGS/1624/2017) of UNIMAS.

## References

- Adrian, C. P., B. J. Robert, J. H. Andrew, N. Prakash, S. D. Bower, S. J. Cooke, S. Lockett, M. Everard, U. Katwate, K. Ranjeet, et al. 2019. Mahseer (Tor spp.) fishes of the world: Status, challenges and opportunities for conservation. *Reviews in Fish Biology and Fisheries*. 29(2):417–52. doi:10.1007/s11160-019-09566-y.
- Ahmad, M., T. A. Qureshi, and A. B. Singh. 2012. Effect of dietary protein, lipid and carbohydrate contents on the viscera composition and organ Indices of *Cyprinus carpio* communis fingerlings. *African Journal of Biotechnology* 11 (33):8361–66.