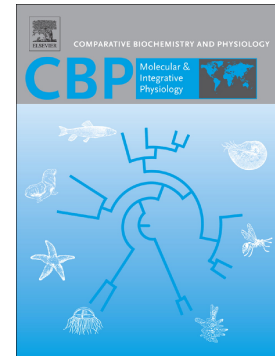


Accepted Manuscript

Regulation of mitochondrial biosynthesis and function by dietary carbohydrate levels and lipid sources in juvenile blunt snout bream *Megalobrama amblycephala*

Xiang-Fei Li, Bing-Ke Wang, Chao Xu, Hua-Juan Shi, Li Zhang, Jia-Dai Liu, Hong-Yan Tian, Wen-Bin Liu



PII: S1095-6433(18)30129-6
DOI: doi:[10.1016/j.cbpa.2018.08.008](https://doi.org/10.1016/j.cbpa.2018.08.008)
Reference: CBA 10366

To appear in: *Comparative Biochemistry and Physiology, Part A*

Received date: 6 February 2018
Revised date: 4 August 2018
Accepted date: 13 August 2018

Please cite this article as: Xiang-Fei Li, Bing-Ke Wang, Chao Xu, Hua-Juan Shi, Li Zhang, Jia-Dai Liu, Hong-Yan Tian, Wen-Bin Liu, Regulation of mitochondrial biosynthesis and function by dietary carbohydrate levels and lipid sources in juvenile blunt snout bream *Megalobrama amblycephala*. *Cba* (2018), doi:[10.1016/j.cbpa.2018.08.008](https://doi.org/10.1016/j.cbpa.2018.08.008)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Regulation of mitochondrial biosynthesis and function by dietary carbohydrate levels and lipid sources in juvenile blunt snout bream *Megalobrama amblycephala*

Xiang-Fei Li, Bing-Ke Wang, Chao Xu, Hua-Juan Shi, Li Zhang, Jia-Dai Liu, Hong-Yan Tian, Wen-Bin Liu* wbliu@njau.edu.cn

Key Laboratory of Aquatic Nutrition and Feed Science of Jiangsu Province, College of Animal Science and Technology, Nanjing Agricultural University, No.1 Weigang Road, Nanjing 210095, People's Republic of China

*Corresponding author.

Abstract

This study aimed to investigate the effects of dietary non-protein energy adjustments on the mitochondrial biosynthesis and function of juvenile *Megalobrama amblycephala*. Fish (average weight: 37.98 ± 0.07 g) were fed eight diets containing two dietary carbohydrate levels (30% and 43%) and four lipid sources (fish oil, soybean oil, palm oil and the mixed oil) for 11 weeks. Liver mitochondrial respiratory chain complex V activity and ATP (adenosine triphosphate) content both increased significantly with increasing dietary carbohydrate levels, whereas the opposite was true for the AMP (adenosine 5'-monophosphate)/ATP ratio, hepatic transcripts of AMP-activated protein kinase $\alpha 1$ (AMPK $\alpha 1$), AMPK $\alpha 2$, peroxisome proliferators γ -activated receptor coactivator-1 α (PGC-1 α), NADH dehydrogenase 1 and cytochrome c oxidase 1 (COX1) as well as the activities of Na⁺-K⁺-ATPase, succinate dehydrogenase (SDH), citrate synthase (CS) and mitochondrial respiratory chain complex I, III and IV. Additionally, hepatic ATP content, the transcripts of AMPK α , COX1 and ATP6 and the activities of Na⁺-K⁺-ATPase, SDH, CS and mitochondrial respiratory chain complex III were all significantly affected by lipid sources. Furthermore, an interaction between dietary carbohydrate levels and lipid sources was also observed in the activities of liver mitochondrial Na⁺-K⁺-ATPase and respiratory chain complex III as well as the transcripts of ATP6 and PGC-1 α . Overall, these findings suggested that dietary carbohydrate levels and lipid sources remarkably affected the mitochondrial biosynthesis and function of *M. amblycephala*. A diet containing 30% carbohydrate and FO could boost its

Download English Version:

<https://daneshyari.com/en/article/10156818>

Download Persian Version:

<https://daneshyari.com/article/10156818>

[Daneshyari.com](https://daneshyari.com)