



## OPEN ACCESS

EDITED AND REVIEWED BY  
Chou Min Chong,  
Putra Malaysia University, Malaysia

## \*CORRESPONDENCE

Kai Wang  
✉ wangkty@163.com

†These authors have contributed equally to this work

RECEIVED 15 May 2023

ACCEPTED 05 June 2023

PUBLISHED 15 June 2023

## CITATION

Zhang L, Wang F, Jia L, Yan H, Gao L, Tian Y, Su X, Zhang X, Lv C, Ma Z, Xue Y, Lin Q and Wang K (2023) Corrigendum: *Edwardsiella piscicida* infection reshapes the intestinal microbiome and metabolome of big-belly seahorses: mechanistic insights of synergistic actions of virulence factors. *Front. Immunol.* 14:1222662. doi: 10.3389/fimmu.2023.1222662

## COPYRIGHT

© 2023 Zhang, Wang, Jia, Yan, Gao, Tian, Su, Zhang, Lv, Ma, Xue, Lin and Wang. This is an open-access article distributed under the terms of the [Creative Commons Attribution License \(CC BY\)](https://creativecommons.org/licenses/by/4.0/). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

# Corrigendum: *Edwardsiella piscicida* infection reshapes the intestinal microbiome and metabolome of big-belly seahorses: mechanistic insights of synergistic actions of virulence factors

Lele Zhang<sup>1,2†</sup>, Fang Wang<sup>3†</sup>, Longwu Jia<sup>1,2</sup>, Hansheng Yan<sup>1,2</sup>, Longkun Gao<sup>1,2</sup>, Yanan Tian<sup>1,2</sup>, Xiaolei Su<sup>1,2</sup>, Xu Zhang<sup>1,2</sup>, Chunhui Lv<sup>1,2</sup>, Zhenhao Ma<sup>1,2</sup>, Yuanyuan Xue<sup>1,2</sup>, Qiang Lin<sup>4</sup> and Kai Wang<sup>1,2\*</sup>

<sup>1</sup>School of Agriculture, Ludong University, Yantai, China, <sup>2</sup>Research and Development Center of Science, Technology and Industrialization of Seahorses, Ludong University, Yantai, China,

<sup>3</sup>Department of Pathology, the Affiliated Yantai Yuhuangding Hospital of Qingdao University, Yantai, China, <sup>4</sup>Key Laboratory of Tropical Marine Bio-resources and Ecology, South China Sea Institute of Oceanology, Chinese Academy of Sciences, Guangzhou, China

## KEYWORDS

*Edwardsiella piscicida*, metagenome, metabolome, virulence factor, big-belly seahorse, pathogenesis

## A Corrigendum on

***Edwardsiella piscicida* infection reshapes the intestinal microbiome and metabolome of big-belly seahorses: mechanistic insights of synergistic actions of virulence factors**

by Zhang L, Wang F, Jia L, Yan H, Gao L, Tian Y, Su X, Zhang X, Lv C, Ma Z, Xue Y, Lin Q and Wang K (2023) *Front. Immunol.* 14:1135588. doi: 10.3389/fimmu.2023.1135588

In the published article, there was an error in **Figure 2A** as published. E9 1-4 and E21 1-4 should be changed to E9D 1-4 and E21D 1-4, respectively. The corrected Figure 2 and its caption appear below.

**Figure 2.** Effects of *Edwardsiella piscicida* infection on kingdom-level composition (A), structure (B), and diversity (C) of intestinal microbiota in big-belly seahorses. (B, C) represent bacterial intestinal microbiota at the species level. Con represents healthy controls (4.1–4.5 g, PSS); E9D and E21D represent the samples collected on days 9 and 21 of *E. piscicida*-challenged group (4.1–4.5 g,  $1 \times 10^5$  cfu/mL), respectively (similarly hereinafter). \*\*  $P < 0.01$ .

In the published article, there was an error. A repeated and wrong sentence was found in the last paragraph of the **Results** section.

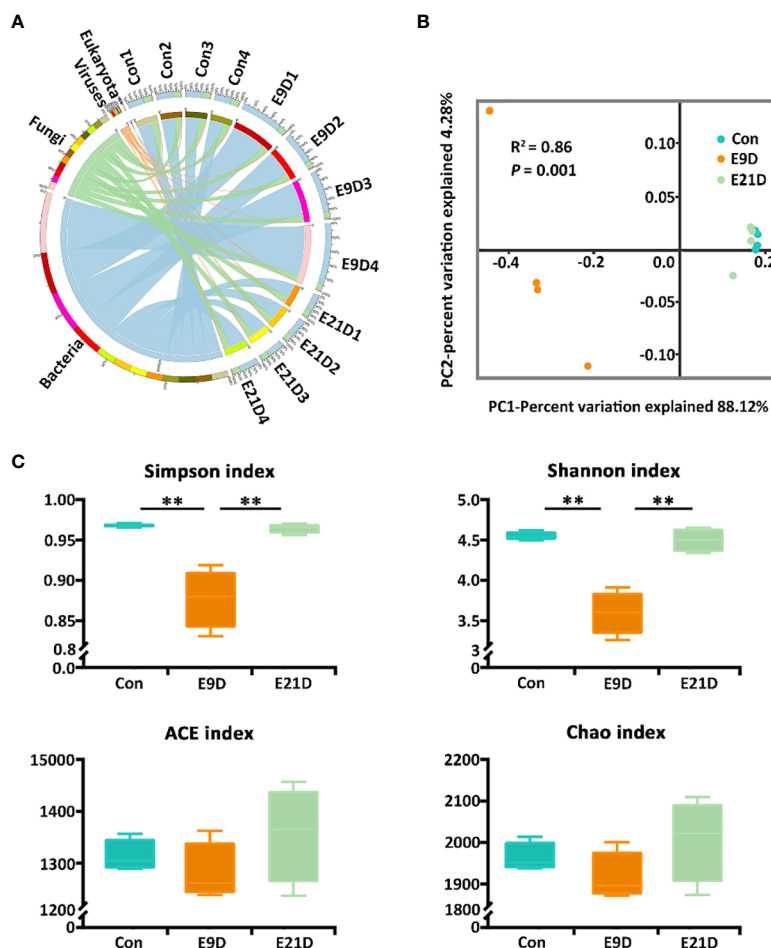


FIGURE 2

Effects of *Edwardsiella piscicida* infection on kingdom-level composition (A), structure (B), and diversity (C) of intestinal microbiota in big-belly seahorses. (B, C) represent bacterial intestinal microbiota at the species level. Con represents healthy controls (4.1–4.5 g, PSS); E9D and E21D represent the samples collected on days 9 and 21 of *E. piscicida*-challenged group (4.1–4.5 g,  $1 \times 10^5$  cfu/mL), respectively (similarly hereinafter). \*\* $P < 0.01$ .

A correction has been made to **3 Results, 3.6 Molecular pathogenesis of *E. piscicida*-induced enteritis**. This sentence previously stated: “In addition, seven of the eight KMBs L-Malic acid and L-Glutamate significantly decreased ( $P < 0.05$ ) (Figures 7A; 4D left panel; 5C). In addition, seven of the eight KMBs with central roles were enriched and significantly negatively correlated with two key intestinal microbiota functions, TCS and ABC transporters ( $P < 0.05$ ).”

The corrected sentence appears below:

“In addition, seven of the eight KMBs with central roles were enriched and significantly negatively correlated with two key intestinal microbiota functions, TCS and ABC transporters ( $P < 0.05$ ).”

The authors apologize for these errors and state that they do not change the scientific conclusions of the article in any way. The original article has been updated.

## Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.