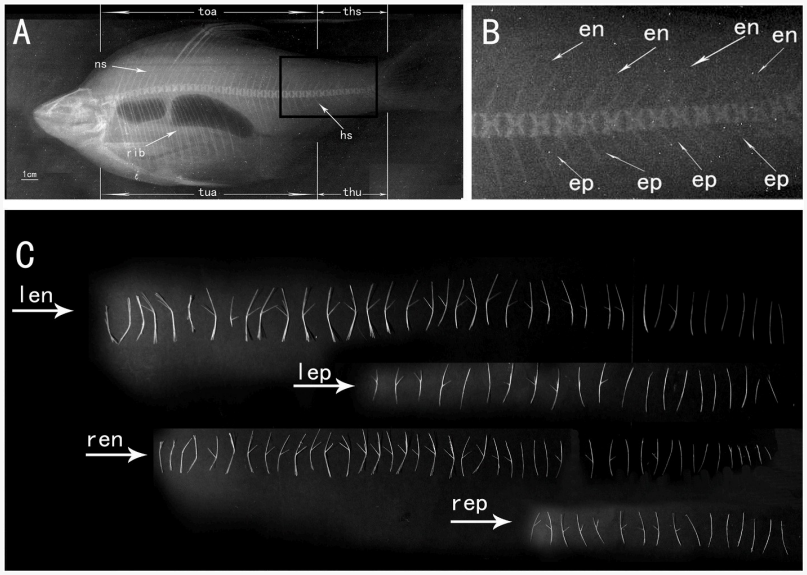
Comparative Analysis of Intermuscular Bones in Hybrid Fish (BTB) and Its Parents

GA, UNITED STATES, April 11, 2026 /EINPresswire.com/ -- A recent study investigates the intermuscular bones (IBs) of a novel hybrid fish (BTB), derived from female Megalobrama amblycephala (BSB) and male Culter alburnus (TC), and its parents. The research reveals that BTB exhibits a reduced number of IBs per sarcomere compared to its parents, showcasing the potential of distant hybridization in developing fish varieties with fewer IBs, which is advantageous for both consumer preference and industrial processing.



Note: A: Whole-mount X-ray diagram of BSB skeleton. Toa: trunk on axis; tua: trunk under axi; ths: tail hindquarters shaft; thu: tail hindquarters shaft under; rib; ns: neural spine; hs: hemal spine. B: Enlarged view of the panel in A. en: epineural bone;

Intermuscular bones (IBs) are bony structures found in the muscle septa of teleost fishes, influencing both consumer preference and processing efficiency in aquaculture. Fish with fewer IBs are generally more favored by consumers and pose fewer challenges during processing into products like fish balls and fillets. However, the supply of such preferred varieties often fails to meet market demand, making the breeding of new varieties with reduced IB counts a priority in genetic improvement programs.

A research team led by Kaikun Luo and Zhongyuan Shen from the Engineering Research Center of Polyploid Fish Reproduction and Breeding at Hunan Normal University has proposed a new method to reduce intermuscular bones in offspring through hybridization. The findings, published in the KeAi journal Reproduction and Breeding, provide a molecular biological basis for understanding the phenotypic changes in hybrid lineages and their derivatives, offering insights into the genetic mechanisms behind IB reduction.

The study focused on the number, morphology, and distribution of IBs in BSB, TC, their F1 hybrid (BTF1), and the backcross hybrid (BTB). The results demonstrated that BTB inherited the

advantageous trait of fewer IBs from its female parent (BSB) while exhibiting a novel reduction in IBs per sarcomere, highlighting its potential for culinary consumption and industrial processing."

"In terms of morphology, IBs were classified into seven types: 'I', '□', 'Y', one-end-multi-fork, two-end-bi-fork, two-end-multi-fork, and tree-branch types.", shares Shen, "We found that the epineural bones were more complex in morphology than the epipleural bones, with the anterior region of the fish body having a higher proportion of complex IBs."

"The distribution of IBs varied across different body regions, with the anterior parts generally having more complex morphologies. This is important for evolutionary research and the development of new germplasm," says Luo.

The study underscores the effectiveness of distant hybridization in creating new fish varieties with reduced IBs. "This method not only integrates desirable traits from different species but also expands genetic variation, leading to novel germplasm resources," adds Luo.

References
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