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Health & Welfare

Auburn researchers map the blue catfish genome

15 August 2022

By Responsible Seafood Advocate

Genome editing could lead to better breeds for the U.S. catfish industry

An **Auburn University (https://www.auburn.edu/)** research team from the College of Veterinary Medicine and the College of Agriculture recently became the first to map a high-quality genome assembly of the blue catfish (*Ictalurus furcatus*).

The genome, published in the journal *GigaScience,* is essential for genetic improvement using gene-editing or genome-assisted selection and will aid in the genetic enhancement of better catfish breeds for the multimillion-dollar catfish farming industry.

Catfish farming is the largest aquaculture industry in the United States, accounting for approximately 70 percent of the nation's total aquaculture output. Mississippi, Alabama, Arkansas and Texas account for the great majority of total U.S. freshwater catfish production. The primary fish utilized for farming purposes is a hybrid produced by breeding male blue catfish with female channel catfish.

"The hybrid catfish is superior in growth and disease resistance," said Xu Wang, assistant professor of comparative genomics in animal health in the College of Veterinary Medicine's Department of Pathobiology and adjunct faculty investigator with the HudsonAlpha Institute for Biotechnology, one of

Auburn University postdoctoral student Baofeng Su is part of an Auburn research team that recently became the first to map a high-quality genome assembly of the blue catfish. Courtesy photo.

the project leaders.

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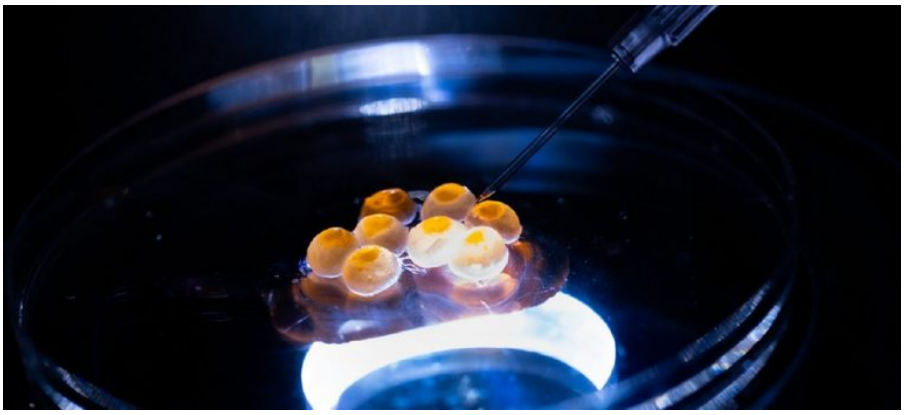
“Faster growth means more profit,” Wang added. “Originally, farmed fish were primarily channel catfish, but three major bacterial pathogens resulted in a 40 percent loss of production and annual economic damage of over $100 million in the U.S. industry alone. The hybrid mix of the blue and channel catfish has improved disease resistance and reduced mortality by half.”



With tools like CRISPR, can genome editing deliver more resilience for aquaculture?

Research in Japan shows genome editing can improve muscle growth in farmed fish, resulting in less feed and boosting disease resistance.

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Wang added that there is a critical need for further genetic improvement.

“The channel catfish genome was mapped in 2016 by John Liu’s lab at Auburn [now at Syracuse University], but the blue catfish genome was not available until we published it,” Wang said. “Our high-quality blue catfish genome addresses the urgent needs to achieve the long-term goal of improving growth, feed utilization, stress and disease resistance and reproduction.”

Read the full study (https://academic.oup.com/gigascience/article/doi/10.1093/gigascience/giac070/6636942?searchresult=1).

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