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Sustainable Aquaculture for a Secure Future

Title: Comparison of ploidy level screening methods in Chinese dojo loach (*Misgurnus anguillicaudatus*)

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Abstract: In search for an easy, rapid and cost-effective method to determine the ploidy levels of diploid and tetraploid dojo loaches *Misgurnus anguillicaudatus* distributed naturally in China, direct (karyotyping) and indirect (flow cytometry, erythrocyte nuclear measurements and morphometric analysis) methods were compared. The results revealed that all techniques employed may be successfully used to determine the ploidy levels. It was discovered that karyotyping is cumbersome; flow cytometry is expensive whereas erythrocyte nuclear measurement requires a long time and intensive labour. On the other hand, the morphometric analysis method, especially the measurement of head length (HL), snout length (SL) and depth of caudal peduncle (CPD), is the simplest, with no damage to the fish and can be considered a practical alternative to other techniques. The discriminant function developed from the specimens, $D = 7.539(\text{HL}/\text{CPD}) - 2.342(\text{HL}/\text{SL}) - 5.636$, categorized an observation as a diploid if the discriminant analysis gave a positive score, while negative scores were categorized as tetraploids.

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