

GRAPHICAL ABSTRACT

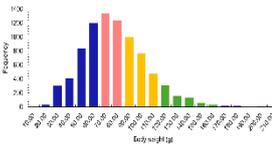
Genetic Insights and Trait Relationships in Domesticated Snakeskin Gourami (*Trichopodus pectoralis*): A Focus on Growth and Related Traits at Harvest

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CENTRAL CONCEPT:

A population-level genetic evaluation of growth and body-shape traits in domesticated snakeskin gourami reveals strong trait interdependence, pronounced sexual dimorphism, and clear implications for multi-trait breeding.

Population & Data	Phenotypic Patterns	Genetic Architecture	Breeding Implication
<ul style="list-style-type: none"> ◆ 8,345 domesticated snakeskin gourami ◆ Harvest age: 9 months (270 DAH) ◆ Traits measured: <ul style="list-style-type: none"> ○ Body weight (BW) ○ Total length (TL) ○ Corrected length (CL) ○ Body depth (BD) ○ Body thickness (BT) ○ Condition factor (K) 	<ul style="list-style-type: none"> ◆ Strong positive phenotypic correlations among growth traits ◆ Females larger and more variable than males ◆ >91% of fish classified in small size classes (XXS–S) 	<ul style="list-style-type: none"> ◆ Low heritability: 0.059–0.190 ◆ Moderate common environmental effects: 0.063–0.214 ◆ Very high genetic correlations among growth traits: BW–TL–CL–BD–BT = 0.901–0.994 ◆ Weak genetic association between TL and K ($r_g = 0.232$) 	<ul style="list-style-type: none"> ◆ Multi-trait selection is effective despite low heritability ◆ Sex-informed breeding improves growth efficiency and body conformation ◆ Supports long-term genetic improvement for tropical aquaculture