

# Baseline information of reproduction parameters of an amphidromous croaker *Johnius coitor* (Hamilton, 1822) from Ganga river basin, India with special reference to potential influence of climatic variability

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**Abstract** – Reproductive biology of female amphidromous croaker *Johnius coitor* (Hamilton, 1822) was studied for the first time from various freshwater stretches of Ganga river basin, India in relation to climatic variability. The species showed high spatial variation in reproductive phenology and capable of breeding during pre-monsoon, monsoon, post-monsoon and winter. Water temperature is the most crucial environmental parameter influencing gonadal maturation and breeding. Generalized additive model (GAM) models revealed water temperature near 23–25 °C as optimum and threshold *GSI* above 3 units necessary for breeding. Pre-spawning fitness ( $K_{spawn50}$ ) and size at 50% maturity ( $L_{M50}$ ) benchmarked through Kaplan-Meier survival fit estimates were in the range 1.27–1.37 units and 19–24.5 cm respectively. First maturity of females was encountered at 11.4 cm within the size range 7.2–28.5 cm. Egg parameters in mature-ripe females ranged between 0.29–0.80 mm (diameter), 0.05–0.19 mg (weight) and 5687–121 849 eggs (absolute fecundity). Mapping of climate preferendum through LOESS smoothing technique hinted water temperatures <20 °C and >32 °C to be detrimental for attainment of pre-spawning fitness while no dependence on rainfall was observed. Based on the climato-hydrological influence on breeding and regional trends of changing climate along river Ganga, we infer minimal climate driven changes in breeding phenology of this amphidromous fish species. Results of this study may serve as baseline information for future studies assessing climate driven changes and evolutionary adaptations in croakers from river Ganga.

**Keywords:** Breeding phenology / threshold *GSI* / pre-spawning fitness / egg parameters / size at maturity / climatic influence