Received: 2 September 2020 | Revised: 14 May 2021 | Accepted: 13 June 2021

DOI: 10.1111/are.15424

Aquaculture Research WILEY

ORIGINAL ARTICLE

Reproductive performance, salinity tolerance, growth and production performance of a cryptic species *Penaeus (Marsupenaeus) japonicus*

Biju Francis[1] | **Jose Antony**[2] | **Radhakrishnapillai Aravind**[1] | **Panantharayil Shyne Anand**[1] | **Changaramkumarath P. Balasubramanian**[1] | **Sundaram Rajamanickam**[1] | **Pappunaicker Veerachamy**[3] | **Kondusamy Ambasankar**[1] | **Chavali Gopal**[1] | **Koyadan Kizhakedath Vijayan**[1]

[1]ICAR-Central Institute of Brackishwater Aquaculture (CIBA), Chennai, Tamil Nadu, India

[2]ICAR-Navsari Gujarat Research Centre of Central Institute of Brackishwater Aquaculture (CIBA), Navsari, Gujarat, India

[3]Vasanti aqua Farm, Kotha Peta Rural, Andhra Pradesh, India

Correspondence
Biju Francis, ICAR-Central institute of brackishwater aquaculture, no.75, MRC Nagar, Santhome high road, Chennai 600028, Tamil Nadu, India.
Email: biju.francis@icar.gov.in

Abstract

Kuruma shrimp *Penaeus* (*Marsupenaeus*) *japonicus* is a high-value penaeid shrimp in Japanese live fish markets owing to its characteristic colour and flavour. Although this species was believed to be the single species of subgenus *Marsupenaeus*, the existence of two morphotypes (Form I and Form II) have been confirmed recently. Recent studies classified the native stock from Indian coast as Form II. Four different experiments were carried out to study the reproductive performance, larval survival, salinity tolerance and growout performance of *P. japonicus* Form II. The reproductive performance experiment was conducted using two treatment groups comprising female shrimp differentiated by the maturity stages (T1–Early maturing and T2–Immature). Female shrimp were unilaterally eyestalk ablated to accelerate the reproductive maturation. Although no significant differences ($p > 0.05$) were found in fecundity, spawning frequency, number of nauplii and hatching percentage between the treatments, early maturing shrimp had significantly lower ($p < 0.05$) latency period than the immature group (T1–14 ± 1.37 days vs., T2–25 ± 2.20 days). Additionally, larvae produced from the early maturing group (T1) had significantly higher ($p < 0.05$) survival rate (37.7 ± 2.7%) at PL (post larvae) stage compared to the immature group (T2–26.82 ± 2.38%). In the salinity tolerance study, PL reared at low salinities (5, 10 g/L) demonstrated similar ($p > 0.05$) mean body weight (BW) and survival (1.31–1.39 g, 63.3%) compared to shrimp reared at 25 g/L (1.46 g, 79.9%) at the end of 60 days. The 167 days farming trial at stocking density of 50 PL/m^2 resulted in productivity of 0.55 kg/m^2, with a mean BW of 20.48 ± 0.68 g and 55% survival. Low salinity production performance observed in this study indicates that the native *P. japonicus* Form II may be physiologically distinct from the other forms/stock elsewhere. The study also concludes the suitability of the species for brackishwater aquaculture.

KEYWORDS
growth, latency period, *P. japonicus* Form II, reproduction, salinity