Effects of potassium iodide (KI) immersion on gonadal development of Australian red claw crayfish (*Cherax quadricarinatus* (von Martens, 1868))

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Abstract. Potassium iodide (KI) is one of the most important sources of iodine which influences the physiological processes connected with reproduction in aquatic animals. This study evaluated the effects of KI immersion on gonadal development of Australian red claw crayfish (*Cherax quadricarinatus* (von Martens, 1868)). A total of 90 crayfish (45 male and 45 female) were immersed in different concentration of KI, the concentration composed of different levels and added to the 1 liter of water: T1 (0.0 mL L^{-1}), T2 (0.5 mL L^{-1}), T3 (1.0 mL L^{-1}), T4 (1.5 mL L^{-1}), and T5 (2.0 mL L^{-1}) for 14 days cultured under controlled conditions. At the end of the study, body weight, gonad weight, and gonadosomatic index (GSI) were determined for both male and female crayfish. The results of the study showed that KI immersion did not have significant effect ($p > 0.05$) on males because their body weight gonad weight, and GSI were comparable among treatments. On the other hand, KI immersion showed significant effect ($p < 0.05$) on females because treatment T2 showed the highest GSI value measured as 4.78±0.54%, while control treatment only recorded a GSI of 2.63±0.25%. This finding indicates that KI immersion at appropriate concentration may significantly improve ovarian development in female *C. quadricarinatus* as female GSI recorded was significantly higher than the treatment without KI.

Keywords: *Cherax quadricarinatus*, gonad, gonadosomatic index, ovarian development.

Introduction. Australian red claw crayfish (*Cherax quadricarinatus* (von Martens, 1868)) is one of the most economically important species of freshwater crustaceans in global aquaculture (Shevchenko et al., 2025). The rapid growth and high survival, as well as the adaptability and marketability of *C. quadricarinatus* (Masser & Rouse, 1997; Reynolds et al., 2013; Saoud et al., 2013; Rigg et al., 2020) have permitted the species to become a favorite for the sustainable practices of freshwater aquaculture (Wang et al., 2026). In addition to the economic significance, *C. quadricarinatus* also shows adequate reproductive characteristics in culture conditions, permitting hatcheries the ability of producing seed stock for the majority of the year (Jones, 1995; Jones & Valverde, 2020). The successful *C. quadricarinatus* aquaculture is based on the effective broodstock management and the reproductive performance (Jin, 2019; Jin et al., 2019). Gonadal development is among the key biological processes that impact fecundity, efficiency of spawning and larval output (Dildar et al., 2025; Wang et al., 2025). The maturation of gonads in crustaceans is influenced by several factors including temperature, photoperiod, and quality of water and an assortment of micronutrients in the diet of aquatic animals (Nagaraju, 2011; Harlıoğlu & Farhadi, 2017). However, asynchronous breeding in captive crayfish and delayed maturation of gonads can affect reproductive efficiency and broodstock production (Harlıoğlu & Farhadi, 2017; Wang et al., 2025). Iodide is an essential micronutrient for aquatic animals that positively impacts several biological functions including metabolism and endocrine system of aquatic species, and therefore, has an impact on the physiological functions of crustaceans, such as molting (Lall & Milley, 2008). In crustaceans, iodide serves as a foundation in hormonal pathways related to growth and reproduction and has been associated with improved molting frequency, survival, and reproductive performance (Barboza et al., 2009; Dildar et al., 2025). Previous studies have investigated dietary or waterborne iodide supplementation in various aquatic species (Hawkyard et al., 2011; Peng et al., 2024) however, the research regarding the effects of iodide immersion on the reproductive development of *C. quadricarinatus* remains limited. Specifically, there is a limited information on whether iodide immersion can stimulate gonadal maturation and enhance reproductive readiness in *C. quadricarinatus* broodstock. Therefore, this study aimed to evaluate the effects of potassium iodide (KI) immersion on the gonadal development of *C. quadricarinatus* and to provide baseline information for the development of reproductive management strategies in crayfish aquaculture.

Material and Method

Study site and duration. The study was conducted at the Multi-Species Hatchery of the College of Oceanography, Fisheries, Environmental Science and Technology (COFEST), Mindanao State University–Tawi-Tawi College of Technology and Oceanography (MSU-TCTO), located in Barangay Sanga-Sanga, Bongao, Tawi-Tawi, Philippines (5°02.233′ N, 119°44.508′ E). The experiment lasted for 14 days from February 2026 (Figure 1).

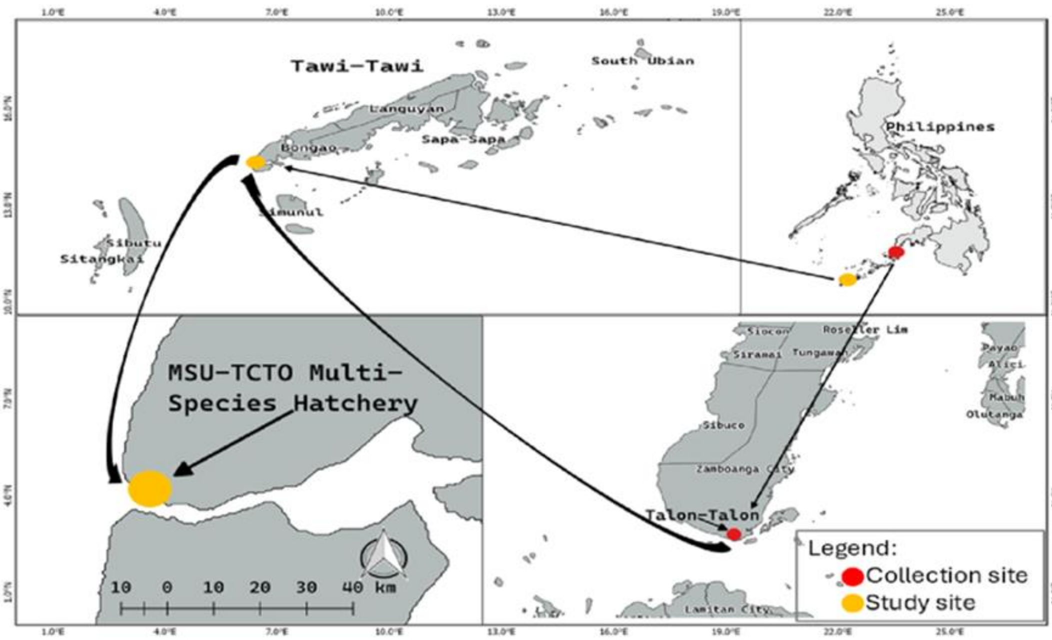

Figure 1. Map of the experimental site and the source of the *Cherax quadricarinatus* (QGIS version 3.30.3).

Source of mature Cherax quadricarinatus. The 90 mature crayfish, averaging 8.31 g, were acquired from the certified hatchery farm of Barangay Talon-Talon, Zamboanga City. They were transported to the culture site via ferry. During transport, crayfish were placed in styrofoam boxes measuring 15.24 cm × 10.16 cm × 7.62 cm. To prevent suffocation, the boxes were covered and provided with upper side ventilation holes. After arrival to the culture site, the crayfish were readied for acclimation and held for 30 minutes before being stocked.

Experimental layout and design. The study followed a Completely Randomized Design (CRD) consisting of five treatment groups and three replicates per treatment. Treatments were randomly allocated to the experimental units using a CRD. The randomization of treatments was conducted using the random numbers presented by Gomez & Gomez, (1984). Random numbers were selected by closing the eyes and pointing to values in the table, which were subsequently ranked from highest to lowest to assign treatments (Ahajan et al., 2026). This procedure was applied to minimize experimental bias and ensure a random distribution of treatments among the replicates (Table 1). A total of fifteen experimental units were used in the study, with each unit containing 3 male and 3 female crayfish, resulting in a total of 90 mature crayfish distributed among the culture units.

Table 1

Potassium iodide concentration in water

Treatments	*Potassium iodide solution*
T1 (control)	0.0 mL L^{-1}
T2	0.5 mL L^{-1}
T3	1.0 mL L^{-1}
T4	1.5 mL L^{-1}
T5	2.0 mL L^{-1}

Application of potassium iodide. The KI solution (Scientific Phygene®) was measured at the desired concentrations and diluted in one liter of water according to each treatment. The experiment consisted of four treatments with different KI concentrations, while the treatment without KI served as the control. The KI solution was thoroughly mixed before use. During the immersion period, male and female crayfish were separated individually in plastic bottles to prevent mating. The crayfish were immersed in the respective treatment solutions for one hour daily at 8:00 AM for 14 consecutive days. This method was adapted from Cipriano et al., (2001) and Chambel et al., (2014) with minimal modification. After each immersion period, the matured crayfish were returned to their respective culture containers.

Water parameters. Water parameters were measured daily (8 AM and 4 PM) throughout the experiment. Water temperature and pH were measured using a multifunctional water quality meter (Yago, YY-1010), while salinity was measured using a refractometer (ATC™).

Gonadal monitoring and measurement. Gonadal development in male and female crayfish was identified through the observation of external secondary sexual characteristics, particularly the presence of a white patch on the uropod. Once maturity was confirmed, 3 female and 3 males from each treatment were selected and removed from the culture tanks for gonadosomatic index (GSI) determination. Prior to dissection, the crayfish was weighed using an analytical weighing scale (0.01 g) to obtain the total body weight. The gonads were then extracted and weighed following standard dissection procedures as described by Rodríguez-González et al., (2006), and the GSI was calculated based on the given formula below (Helmizuryani et al., 2020):

$$GSI = (\text{Gonad weight}/\text{Body weight}) \times 100$$

Data analysis. Data were analyzed using one-way analysis of variance (ANOVA). Prior to analysis, the assumptions of normality and homogeneity of variances were evaluated. When significant differences were detected ($p < 0.05$), Tukey's honestly significant difference (HSD) post hoc test was performed. All statistical analyses were conducted using JASP™ version 0.96, and the results are presented as mean±standard deviation (SD).

Results. Water parameters remained stable throughout the 14-day culture period. The mean value of water parameters such as temperature, pH, and salinity was 30°C, 7.56, and 2.0 ppt, respectively.

Table 2 presents the gonadal development of mature male and female *C. quadricarinatus* after a 14-day culture under varying iodide concentrations. Body weight, gonad weight, and GSI were evaluated for both sexes. In male crayfish, body weight, gonad weight, and GSI did not differ significantly among treatments ($p > 0.05$). In female crayfish, body weight differed significantly among treatments ($p < 0.05$). T4 (20.11±2.25 g) had a significantly greater body weight than T2 (11.84±0.90 g), whereas T1 (14.76±1.23 g), T3 (14.12±1.02 g), and T5 (14.34±1.10 g) were not significantly different from other treatments. Female gonad weight did not differ significantly among treatments ($p > 0.05$). Female GSI differed significantly among treatments ($p < 0.05$). T2 (4.78±0.54%) had a significantly higher GSI than T1 (1.10±0.29%), T3 (1.75± 0.50%), T4 (1.08±0.27%), and T5 (2.22±0.55%).

Table 2

Gonadal development of *Cherax quadricarinatus* for 14 days culture period under different potassium iodide concentration levels

Treatments	*Weight of male mature crayfish (g)*	*Male gonad weight (g)*	*Male GSI (%)*	*Weight of female mature crayfish (g)*	*Female gonad weight (g)*	*Female GSI (%)*
T1	18.13±0.97^{a}	0.1±0.01^{a}	0.54±0.09^{a}	14.76±1.23^{ab}	0.17±0.05^{a}	1.10±0.29^{a}
T2	16.04±1.30^{a}	0.36±0.17^{a}	2.21±0.91^{a}	11.84±0.90^{a}	0.56±0.06^{a}	4.78±0.54^{b}
T3	17.44±1.57^{a}	0.12±0.01^{a}	0.69±0.04^{a}	14.12±1.02^{ab}	0.25±0.07^{a}	1.75±0.50^{a}
T4	16.27±0.86^{a}	0.08±0.01^{a}	0.49±0.05^{a}	20.11±2.25^{b}	0.21±0.06^{a}	1.08±0.27^{a}
T5	18.05±0.98^{a}	0.09±0.01^{a}	0.52±0.04^{a}	14.34±1.10^{ab}	0.30±0.05^{a}	2.22±0.55^{a}

Values within the same column with different superscript letters are significantly different ($p < 0.05$). Values are means of triplicate.

Discussion. This study investigated the impact of KI immersion on gonadal development of *C. quadricarinatus* during a 14-day cultivation period. There were no effects of KI immersion on the male body weight, gonad weight and GSI. However, the female crayfish in T2 had a significantly higher GSI than the control and other treatments. This indicates that KI immersion at the given concentration may assist in the development of ovaries in *C. quadricarinatus*. Iodide supplementation is reported to improve reproductive performance and gonadal maturation in aquatic species (Thi et al., 2024). Iodine may assist in the maturation of gonads in crustaceans because of its regulatory role in endocrine and metabolic systems (Barboza et al., 2009; Dildar et al., 2025).

The increase in female GSI observed in T2 may be attributed to the physiological role of iodine in crustacean metabolism and reproduction. Iodine is involved in hormonal pathways associated with molting, metabolism, and reproductive processes, which are essential for gonadal maturation (Lall & Milley, 2008; Truong et al., 2020). Adequate iodine availability may enhance nutrient utilization and energy allocation toward ovarian development, thereby increasing the proportion of gonad weight relative to body weight. Although female gonad weight did not differ significantly among treatments, the higher GSI indicates that reproductive tissues received a greater allocation of available resources rather than exhibiting a marked increase in absolute gonad mass. dos Santos et al., (2020) similarly reported that increases in GSI may reflect changes in resource allocation to reproductive tissues instead of substantial increases in gonad weight.

Female body weight differed significantly among treatments, with T4 producing the highest mean body weight. However, this treatment did not produce the highest GSI, indicating that greater somatic growth does not necessarily correspond to greater reproductive development. In crustaceans, growth and reproduction often compete for available energy, and nutrients may be preferentially allocated either to body growth or gonadal development depending on physiological condition and environmental factors (Nagaraju, 2011). Consequently, individuals exhibiting higher body weight may not always display greater reproductive investment.

In contrast to the female response, KI immersion did not significantly influence male body weight, gonad weight, and GSI. This result suggests that the KI concentrations used, or the 14-day immersion period, were insufficient to induce measurable changes in male reproductive development. Male gonadal maturation may respond differently from female ovarian development because of differences in endocrine regulation and reproductive physiology. Previous studies have shown that reproductive responses to nutritional or mineral supplementation often vary between sexes and among crustacean species depending on their reproductive stage and physiological condition (Harlıoğlu & Farhadi, 2017; Dildar et al., 2025).

The absence of significant differences in female gonad weight among treatments also indicates that ovarian development may not always be reflected by increases in absolute gonad mass during the early stages of maturation. GSI is widely recognized as a more sensitive indicator of reproductive development because it reflects the relative investment of body resources into gonadal tissues (dos Santos et al., 2020). Therefore, the significant increase in female GSI observed in T2 suggests that KI immersion promoted reproductive readiness despite the lack of significant changes in gonad weight.

The findings of the present study indicate that KI immersion may enhance ovarian development in female *C. quadricarinatus* when applied at an appropriate concentration, whereas male gonadal development appears less responsive under the conditions evaluated.

Conclusions. Potassium iodide immersion had a significant effect on the gonadosomatic index (GSI) of female *C. quadricarinatus*, while no significant effects were observed on male body weight, gonad weight, GSI, or female gonad weight after the 14-day culture period. The highest female GSI was obtained in treatment 2 (0.5 mL L^{-1} potassium iodide immersion). Further studies on the reproductive physiology of *C. quadricarinatus* are recommended using longer immersion periods, additional potassium iodide concentrations, and histological evaluation of gonadal tissues to optimize broodstock reproductive performance.

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Authors Contributions. AML - data gathering; AML & NAA - data analysis and drafting the manuscript; YUJ - study supervision; YUJ, GAJT, IPM, WMJ, and MAMC - reviewing and finalizing the manuscript. All authors read and approved the final version of the manuscript.

Conflict of Interest. The authors declare that there is no conflict of interest.

Data Availability. The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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References

Ahajan, N. A., Jumah, Y. U., Tupas, G. J., Amlani, M. Q., Jamil, W. M., Pan, M. V., & Robles, R. J. F. (2026). Length-weight relationship and condition factor of papain-fed *Cherax quadricarinatus* craylings. *AACL Bioflux, 19*(2), 665-673.

Barboza, P. S., Parker, K. L., & Hume, I. D. (2009). Metabolic constituents: water, minerals and vitamins. In: Integrative wildlife nutrition. Barboza, P. S., Parker, K. L., & Hume, I. D. (eds), Springer Berlin Heidelberg, pp. 157-206.
Chambel, J., Costa, R., Gomes, M., Mendes, S., Baptista, T., & Pedrosa, R. (2014). Hydrogen peroxide, iodine solution and methylene solution highly enhance the hatching rate of freshwater ornamental fish species. *Aquaculture International, 22*(6), 1743-1751.
Cipriano, R. C., Novak, B. M., Flint, D. E., & Cutting, D. C. (2001). Reappraisal of the federal fish health recommendation for disinfecting eggs of Atlantic salmon in iodophor. *Journal of Aquatic Animal Health, 13*(4), 320-327.
Dildar, T., Cui, W., & Ma, H. (2025). Physiology of ovarian development in crustaceans: interactions among hormones, nutrients, and environmental factors from integrated perspectives. *Aquaculture Nutrition, 2025*(1), 4900891.
dos Santos, R. A. P., da Silva, A. R., de Moraes, I. R. R., Antunes, M., Lopes, A. E. B., da Costa, R. C., & Castilho, A. L. (2020). Gonadosomatic index and weight/length relationship in females of three penaeoidean shrimps impacted by fisheries on the southeastern Brazilian coast. *Nauplius, 28*, e2020045.
Gomez, K. A., & Gomez, A. A. (1984). Statistical procedures for agricultural research. 2nd edition. John Wiley & Sons, New York, 680 pp.
Harlıoğlu, M. M., & Farhadi, A. (2017). Factors affecting the reproductive efficiency in crayfish: implications for aquaculture. *Aquaculture Research, 48*(5), 1983-1997.
Hawkyard, M., Sæle, Ø., Nordgreen, A. H., Langdon, C., & Hamre, K. (2011). Effect of iodine enrichment of *Artemia* sp. on their nutritional value for larval zebrafish (*Danio rerio*). *Aquaculture, 316*(1-4), 37-43.
Helmizuryani, Djumanto, Muslimin, B., Aminah, R. I. S., & Khotimah, K. (2020). The gonadal maturation of climbing perch, *Anabas testudineus* (Bloch, 1792) with dietary supplement add on feed. *AACL Bioflux, 13*(2), 885-892.
Jin, S. (2019). Reproductive and feeding ecology of red swamp crayfish *Procambarus clarkii* (Girard, 1852) in China. Doctoral dissertation, Université Paul Sabatier-Toulouse III, 150 pp.
Jin, S., Jacquin, L., Xiong, M., Li, R., Lek, S., Li, W., & Zhang, T. (2019) Reproductive pattern and population dynamics of commercial red swamp crayfish (*Procambarus clarkii*) from China: implications for sustainable aquaculture management. *PeerJ, 7*, e6214.
Jones, C. M. (1995). Production of juvenile redclaw crayfish, *Cherax quadricarinatus* (von Martens) (Decapoda, Parastacidae) I. Development of hatchery and nursery procedures. *Aquaculture, 138*(1-4), 221-238.
Jones, C. M., Valverde, C. (2020). Development of mass production hatchery technology for the redclaw crayfish, *Cherax quadricarinatus*. *Freshwater Crayfish, 25*(1), 1-6.
Lall, S. P., & Milley, J. E. (2008). Trace mineral requirements of fish and crustaceans. In: Trace elements in animal production systems. Schlegel, P., Durosoy, S., & Jongbloed A., W. (eds), Wageningen Academic Publisher, pp. 203-214.
Masser, M. P., & Rouse, D. B. (1997). Australian red claw crayfish. SRAC Publication, No. 244, 8 pp.
Nagaraju, G. P. C. (2011). Reproductive regulators in decapod crustaceans: an overview. *Journal of Experimental Biology, 214*(1), 3-16.
Peng, D., Li, Y. X., Dong, L. X., Cheng, K., Wen, H., Tian, J., Zhang, J. M., Liu, Y. Y., Gao, W. H., Min, Y., Liu, M. D., & Jiang, M. (2024). Dietary iodine can effectively alleviate the adverse effects of fermented rapeseed meal on the growth, liver health, and antioxidant capacity of tilapia (GIFT, *Oreochromis niloticus*). *Fishes, 9*(12), 501.
Reynolds, J., Souty-Grosset, C., & Richardson, A. (2013). Ecological roles of crayfish in freshwater and terrestrial habitats. *Freshwater Crayfish, 19*(2), 197-218.
Rigg, D. P., Seymour, J. E., Courtney, R. L., & Jones, C. M. (2020). A review of juvenile redclaw crayfish *Cherax quadricarinatus* (von Martens, 1898) aquaculture: global production practices and innovation. *Freshwater Crayfish, 25*(1), 13-30.

Rodríguez-González, H., Hernández-Llamas, A., Villarreal, H., Saucedo, P. E., García-Ulloa, M., & Rodríguez-Jaramillo, C. (2006). Gonadal development and biochemical composition of female crayfish *Cherax quadricarinatus* (Decapoda: Parastacidae) in relation to the gonadosomatic index at first maturation. *Aquaculture, 254*(1-4), 637-645.

Saoud, I. P., Ghanawi, J., Thompson, K. R., & Webster, C. D. (2013). A review of the culture and diseases of redclaw crayfish *Cherax quadricarinatus* (von Martens 1868). *Journal of the World Aquaculture Society, 44*(1), 1-29.

Shevchenko, V. N., Maltseva, T. A., Olshevskaya, A. V., Odabashyan, M. Y., Teplyakova, S. V., Mangasaryan, D. S., & Cholutaeva, E. E. (2025). Feeding specifics of the Australian red claw crayfish *Cherax quadricarinatus* (von Martens, 1868) in aquaculture. *Siberian Journal of Life Sciences and Agriculture, 17*(6-2), 430-451.

Thi, H. K., Tran, V. P., Tran, N. N., Ngo, T. H. G., Ho, N. T. A., Nguyen, X. H., & Nguyen, Q. L. (2024). Effects of iodine treatment on the development of eggs and larvae of rabbitfish (*Siganus guttatus* Bloch, 1787). *Jurnal Ilmiah Perikanan dan Kelautan, 16*(1), 265-273.

Truong, H. H., Moss, A. F., Bourne, N. A., & Simon, C. J. (2020). Determining the importance of macro and trace dietary minerals on growth and nutrient retention in juvenile *Penaeus monodon*. *Animals, 10*(11), 2086.

Wang, P., Bakari, J. S., Han, Y., Hu, H., Liu, Z., Zhang, Y., Chen, Z., Huang, C., Wang, M., Chen, H., Jing, X., & Su, S. (2026). Effects of thermal stress on growth and reproduction of *Procambarus clarkii* and aquaculture best practices. *Animals, 16*(3), 495.

Wang, Y., Xu, D., Guo, C., Zhang, T., Liu, J., & Li, W. (2025). Gonadal development and its influencing factors in the red swamp crayfish (*Procambarus clarkii*): a review. *Biology, 14*(9), 1138.

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