A simple calculation method of biological indices for blood cockle resource management through aquaculture fishing ground selection and harvest time determination

Production | Demonstration | Item: Blood cockles | Resource management

Outline

To properly conduct blood cockles resource management in Southeast Asia, where its production has been drastically decreasing, we improved the calculation method of indicators of bivalve growth conditions, including the sharpness index and condition factor. This facilitates the identification of optimal aquaculture fishing grounds that can ensure a high survival rate of spat, determine appropriate harvest time when production can be increased, ultimately enhancing the utilization efficiency of natural spat.

Background/effect/note

The blood cockle, *Tegillarca granosa* (Fig. 1), is rich in minerals and vitamins and is an indispensable ingredient to the local people. Presently, the production of blood cockle in Southeast Asia is alarmingly decreasing because of environmental deterioration. Therefore, appropriate resource management and technical measures to recover the resource are required. We developed simple biological indices that can easily evaluate the fishing ground environment and growth condition of the blood cockle by improving the sharpness index and the condition factor (Fig. 2). These indices can be calculated by simply measuring three variables: shell length, shell width, and total weight, facilitating ease of monitoring of the environmental and growth conditions, enabling selection of optimal aquaculture fishing grounds (Fig. 3) and identification of appropriate harvest times.

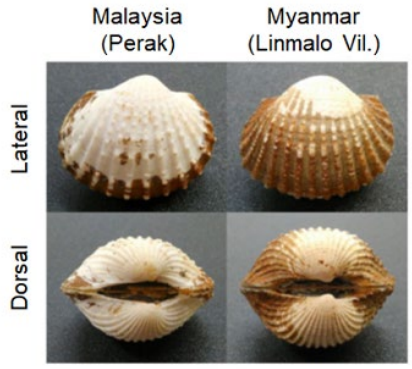


Fig. 1. Blood cockle (*Tegillarca granosa*)

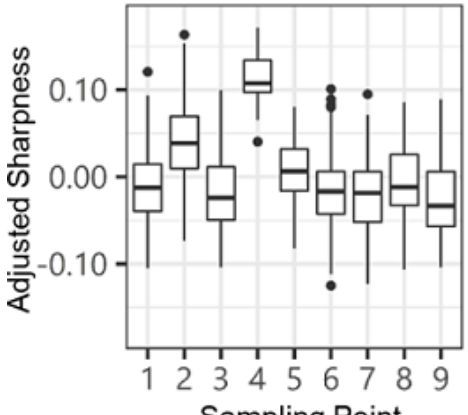
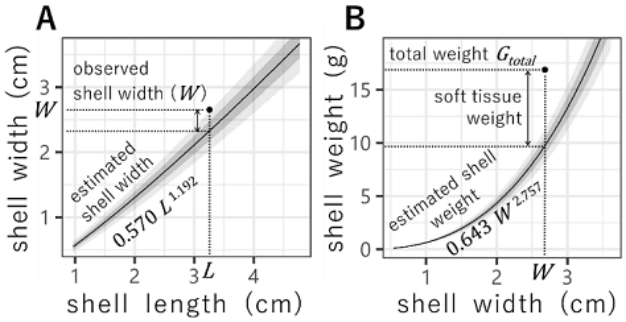


Fig. 3. Comparison of adjusted sharpness indices
Smaller values indicate a more suitable environment for cultivation of blood cockles.



$$SI_{adj} = \frac{W - 0.570L^{1.192}}{L} \quad \cdots\cdot \text{(Eq. A)}$$

$$CF = \frac{G_{total} - 0.643W^{2.757}}{G_{total}} \quad \cdots\cdot \text{(Eq. B)}$$

SI_{adj}: Adjusted sharpness index, W: Shell width (cm),
L: Shell length (cm), CF: Condition factor, G_{total}: Total wet weight (g)

Fig. 2. Derivation of estimate equations for the adjusted sharpness index (A) and the condition factor (B)
Each plot was superimposed with the allometry curve (black line) and 68% (light grey) and 95% (grey) prediction intervals.

Technical details:
https://www.jircas.go.jp/en/publication/research_results/2020_c10
https://www.jstage.jst.go.jp/article/jarq/57/2/57_165/_article/-char/ja/

Contact
info-greenasia@jircas.affrc.go.jp

Japan International Research Center for Agricultural Sciences