The feasibility study on trapping experiments with lights in Barito river of Indonesia

Ahmadi *
Faculty of Marine and Fisheries, Lambung Mangkurat University, Indonesia

Abstract: This study provides scientific evidence on the catchability of low-powered incandescent light and LED light traps in catching crustacean and fish from highly turbid water in Barito River, South Kalimantan. The experimental conditions encompassed highly turbid water, slow flowing, blocked water, and rarely vegetated habitat with water depths ranging from 2 to 4 m. The traps used were collapsible box shaped trap, wire-square trap, acrylic-square trap, PVC box shaped trap, wire fish trap, bamboo fish trap and minnow nets.

Keywords: *Barito River, incandescent light, LED light, Macrobrachium sp, traps*

I. INTRODUCTION

South Kalimantan is one of the five provinces in Kalimantan (formerly called Borneo) with capital city of Banjarmasin. It is bordered with East Kalimantan at the north, with Makassar Strait at the east, with Java Sea at the south and with West Kalimantan and Central Kalimantan at the west. South Kalimantan is also often known as Province with a thousand-river where the Barito River is the largest and the longest river in Indonesia with more than 6.000 km long. The Barito River allows for transportation, drinking water sources, floating market and fisheries, among others.

A number of researches has been addressed to explore the characteristic habitats and fish species in Barito River [1], [2], [3] the abundance and diversity of typical plankton [4] fishing activities in river [4], [5], [6], [7].

II. MATERIALS AND METHODS

A. *Study Site*

Collapsible trap fishing with different coloured incandescent or LED lamps. Five collapsible box-shaped traps were modified in their funnel entrances by replacing the two slit all-web entrances at the ends with two open slackness nylon monofilaments 23 mm mesh size. Additional net bag was placed at the bottom of the trap to prevent juveniles from dropping.

B. *Statistical Analysis*

Mann-Whitney test was used to determine which catch differed between incandescent and LED light traps. Kruskal-Wallis test was used to investigate if there were significant differences in the total catches of the four or five different trapping treatments. A post-hoc analysis test was performed using the Multiple Comparison to see which catch differed significantly among the traps. All tests were evaluated at the 0.05 level of significance.

III. RESULTS

The trials with the collapsible box-shaped traps containing different light intensities of incandescent lamps in Experiment 1 showed that there were no significant differences in the total number of catches among the four traps (Kruskal-Wallis test, $H = 2.839$, $p > 0.05$). The overall, the traps had some success in catching Macrobrachium sp.

*Corresponding Author: Ahmadi . E-mail: abc@gmail.com

(total 39), Glossogobius giuris (5), Mystus gulio (1) and Mastacembelus erythrotaenia (1).

$$cos(2) = cos2sin2 \tag{1}$$

$$-I\omega^2 + (k_1 + k_2 + k_3 + k_4 + k_5 + k_+k_7 + k_8)e^2 = 0 \;\; \omega_T \sqrt{\frac{k_1 + k_2 + k_3 + k_4 + k_5 + k_+k_7 + k_8}{I}} \tag{2}$$

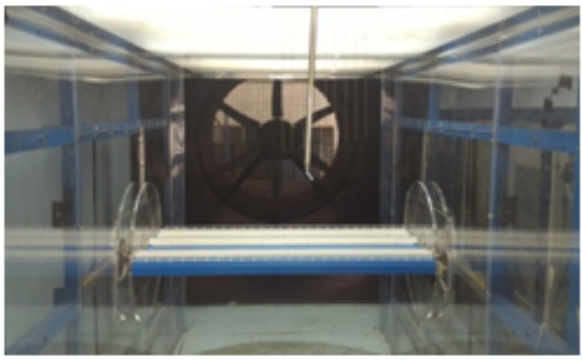

Fig. 1. Caption of the figure should be below the picture

TABLE 1
TABLES CAPTION SHOULD BE ABOVE THE TABLE

Variable	*df*	*F*	*p*
Row 1	1	0.67	.41
Row 2	2	0.52	.39
Row 3	3	0.13	.33
Row 4	4	1.15	.30

IV. DISCUSSION

The present study clearly demonstrates that trapping with low-powered underwater lamps are adaptable and applicable in turbid water of Barito River. Data on phototactic response showed that the selected colours or relative light intensity of incandescent and LED lamps uses in this study had strong effects on the number of catches sampled, where LED light traps are outperformed to the incandescent ones.

V. CONCLUSION

This study provides scientific information on the catchability of low-powered incandescent light and LED light traps in catching crustacean and fish from highly turbid water in Barito River. Collapsible fish traps with incandescent lights were as effective at sampling as wire square trap with LED lights.

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