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Influence of environmental factors on biology and catch composition of Barbonymus schwanenfeldii in a tropical lake, northern Malaysia: implications for conservation planning

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Abstract

Very little work has determined the relative importance of uncontrolled environmental factors for affecting fish biology , and how these might influence gillnet catches. This study addresses this deficit for an important Southeast Asian cyprinid (Barbonymus schwanenfeldii). Fish were caught monthly for 12 months using gillnets of three different mesh sizes, each of which was deployed in duplicate at the surface of one of three randomly selected sites in Lake Kenyir, Malaysia , concurrent with determining various environmental parameters and the abundance of phytoplankton (chlorophyll– a). Results indicated that growth co-efficient of B. schwanenfeldii was positively influenced by dissolved oxygen and negatively influenced by total inorganic nitrogen, whereas an opposite result was observed in case of the hepatosomatic index of fish. Water turbidity was a limiting factor only for small fish (mean total length: 15.74±1.10 cm). B. schwanenfeldii could best be caught during the period of high phytoplankton abundance or at the location of high phytoplankton density in the water. Water temperature negatively influenced the gillnet catches of the fish. The remaining environmental factors such as water depth, pH, and phosphate had a weak and insignificant influence ($P > 0.05$) on the biology and gillnet catches of fish. The observed results can be very useful for the ecological monitoring and conservation plans for this species in relation to climate change. Furthermore, the utility of the similar data for other species would be useful not only forregional but also forinternational fishery by optimizing catches considering environmental conditions.

Author keywords

Dissolved oxygen; Ecology; Gillnet; Lake Kenyir; PERMANOVA; Phytoplankton; RDA; Water quality

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