TARGET STRENGTH STUDIES OF LIVE AND DEAD *PUNTIUM SCHWENENFELDII,* UNDER CONTROLLED CONDITION AND *IN SITU*

Mohd. Zaidi Zakaria, Khalid bin Samo, Mohd. Azmi Ambak and Maman Hermawan

Faculty of Applied Sciences and Technology
Universiti Putra Malaysia Terengganu, Mengabang Telipot, 21030 Kuala Terengganu, Malaysia

Keywords: echo sounder, fish stock assessment, *In situ* target strength, *Puntium Schwenenfeldii,* scientific echo-sounder.

Introduction

Among the fish species present in Kenyer Lake, *Puntium Schwenenfeldii* is the most important species; it is than 40% in species composition. The information of fish population status is an important tool for management proposes but the collection of biological data for analysis the population parameters are time and labour consuming. Echo sounder perhaps could be more reliable tool for assessing the population of fish either marine or fresh water without effecting the population mortality by removing the fish from their natural habitat. However, the major constraints in applying acoustic techniques to fisheries assessment are identification and our lack of knowledge to their target strength (TS) properties. TS is the scaling factor required to convert echo intensity to fish density. More of the attempts that have been applied for measuring the TS of individual fish were using the dead fish in the environmental tank. Therefore, the aim of this study was to measure the TS of *Puntium Schwenenfeldii in situ* and compare dead under controlled condition.

Materials and Methods

The *in situ* target strength data of Lampan Sungia, *Puntium Schwenenfeldii* were determined at Sungai Kiang of Kenyir Lake in February 1998 using BioSonic Split beam echo sounder DT6000. A digital split beam echo sounder model equipped with 200 kHz was used in this study. The system was calibrated prior to the data acquisition by using a standard tungsten carbide (36 mm) diameter with known target strength. The standard target ball was set in the transducer's main beam at a 3-meter distance from the transducer. The water temperature was also measured at both Kenyir and experiments in the tank. A total of 14 life fish and dead were collected using a various mesh sizes of gillnets in order to catch various length sizes of fishes. The fish caught were kept alive and acclimatised for one day in a small cage and only the healthy live fishes were used in the experiment. The raw data of each specimen were recorded in a PC for further analysis. The same specimens used for in situ measurements were also tested for their target strength in the experimental tank after they died. The raw data of both live and dead fish were then processed by using visual analyser software provided by BioSonics. (Ver. 1.13) The output of the results was then read and plotted in an Excel Microsoft program.

Results and Discussion

Target strengths of *Puntium Schwenenfeldii* had been investigated and the results were presented using scatter plots. The average target strength for live and dead fishes with a total length of 13.3 cm to 29.0 cm were -45.0 dB and -43.2 dB respectively. This showed that the target strength in the experimental tank was higher than in situ target strength at Kenyir Lake. This may be possibly because of the target strength is affected by physiological change of the dead fish. However, the standard equation relating TS and length for each species have been formulated.

Live fish:

TS (dB) (Avg. TL = 10.3 cm): $TS = 20 \log TL - 76.3$

Dead fish:

TS (dB) (Avg. TL = 12.6 cm): $TS = 20 \log TL - 81.6$

Conclusions

The target strength expressions obtained on *Puntium Schwenenfeldii* could be not be compared as no previous reports were available.

Supported by IRPA Grant 01-02-04-0159