SURVIVAL ESTIMATION BASED ON LENGTH-FREQUENCY ANALYSIS OF GOLDEN THREAD (*NEMIPTERUS PERONII*) IN THE NORTHWEST SHELF OF AUSTRALIA[1]

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ABSTRACT

This paper deals with the survivals of golden thread (*Nemipterus peronii*) resource in the northwest shelf of Australia based on size frequency data obtained from surveys at Kaohsiung Fishing Port. Conversion of age distribution from size frequency data by using maximum likelihood estimate criterion is adopted.

The results show that (1) age composition can be reasonably derived from a length frequency data by using maximum likelihood estimate criterion, and the fitting between the observed and the calculated frequencies has been very successful; (2) there is no significant difference in length frequency of market size categories in recent years; (3) age II to age IV are the main age groups in *N. peronii* catches harvested from the northwestern shelf of Australia; (4) fully recruited age of the resource appears to be age III; (5) the yearly total instantaneous mortality rate (Z) of the resource was estimated as: 0.9029, 0.9002, and 0.9064 for the years from 1984 to 1986, accordingly.

INTRODUCTION

The continental shelf off north and northwestern Australia has been one of the most important trawling grounds for the Taiwanese pair trawlers since early 1970s. It was not until 1979, when the Australian Government established its Australia Fishing Zone (AFZ), the catch of Taiwanese trawl fishery in the northwestern shelf region declines but still contributes a significant portion to the total groundfish catches from the Australian waters. According to the catch statistics of the Taiwanese trawl fisheries (Anon. 1970–1984), the yearly catch from the northwestern shelf region occupied the majority (at least 40%) of the total annual groundfish catch in the Australian waters.

Although the multitude of groundfish species in this area are so many and none of which appears really dominant (Liu and Yeh 1984), which is one of the profound characteristics of the tropical groundfish community; *Nemipteridae* are the most abundant and economically important species group in the groundfish catches. The five most abundant species in the *Nemipteridae* are: *N. peronii, N. tolu, N. hexodon, N. tambuloides*, and *N. bathybus*; among them the *N. peronii* species are the most abundant, consisting about 84% of the nemipterid.

In order for better understanding the dynamics of the resource by using analytical models, a knowledge of its survival or mortality is essential. Even though it is possible to aging the species by ring-reading method (Wu, Liu, and Yeh 1986), it is very expensive therefore economically infeasible to perform such age distribution survey annually.

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