

## Age and Growth of the Bombay-duck (*Harpadon microchir*) in the Waters off Southwestern Taiwan

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### ABSTRACT

The bombay-duck, *Harpadon microchir*, is the by-catch species of trawl fishery in southwestern Taiwan waters but it has been regarded as noticed fish due to its increasing economic value in recent years. Age and growth of the bombay-duck was examined using specimens collected from the waters off southwestern Taiwan, from September 2007 to September 2008. Age was determined by sagittae otolith ring counting. No significant difference on the relationship between body weight (BW) and fork length (FL) between sexes was found, and the sexes combined BW-FL relationship was  $BW = 2 \times 10^{-7} FL^{3.5259}$  ( $n = 513$ ,  $r^2 = 0.98$ ). The relationship between fork length and centrum radius (R) was estimated as  $FL = 246.09 R - 75.056$  ( $n = 236$ ,  $r^2 = 0.88$ ,  $p < 0.05$ ) for females, and  $FL = 210.69 R - 36.373$  ( $n = 168$ ,  $r^2 = 0.89$ ,  $p < 0.05$ ) for males. An existing hypothesis of the ring marks suggested the ring forms once a week. The von Bertalanffy growth parameters are  $L_{\infty} = 789.4$  mm,  $k = 0.111/\text{yr}$ ,  $t_0 = 0.4267$  yr for females;  $L_{\infty} = 622.4$  mm,  $k = 0.143/\text{yr}$ ,  $t_0 = 0.3901$  yr for males.

**Key words:** Age and growth, *Harpadon microchir*, Otolith, Southwestern Taiwan waters.

### INTRODUCTION

The bombay-duck, *Harpadon microchir*, is distributed widely in the northwest Pacific Ocean including the waters around Taiwan and Japan. In Taiwan, it is found in the waters island wide except for the eastern waters. This species is a small demersal species and inhabits in the muddy and sandy sediment or the deep water near the continental shelf. They mainly prey on small fish and crustaceans (Russell *et al.*, 1999). The bombay-duck is abundant off southwestern Taiwan and is one of the major bycatch species for the commercial bottom trawl fishery in this area. According to catch statistics from the Fisheries Yearbook Taiwan Area (2000), annual landing of bottom trawl fishery decreased from 220,000 MT in 1980 to 58,000 MT in 1999 in this area. The body sizes of landed fishes became smaller while the proportion of bycatch was increasing (Wu

*et al.*, 2005). The sizes of landed bombay-duck also showed the similar pattern.

Bombay-duck was a bycatch species of bottom trawl and had no economic value before. However, it has become the famous seafood in various types since the last decade according to fishermen's reports. Today, its unit price is about NT\$120 per Kg and has a considerable degree of contribution in economics for the bottom trawl fishery in southwestern Taiwan. Unfortunately, the catch data for this species is still unavailable as this species is not sold through regular channel. So, the variation of population dynamics of bombay-duck is little known. According to the records of sampling vessels, over 500 individuals of bombay-duck could be captured in a single haul. Wu *et al.* (2005) mentioned that bombay-duck was the dominant demersal species in this region according to the results of their stratified fishing surveys. Chen *et*