

**Brief review of the past stock assessments of  
the Indian Ocean albacore (*Thunnus alalunga*) resource**

**Local Secretariat**

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## 1. Introduction

The stock assessments of this species has been reported by the IPTP (Indo-Pacific Tuna Development and Management Programme) before 1998 and by the IOTC (Indian Ocean Tuna Commission) from 1998. The stock assessment has been carried out by production models, longline CPUE analyses and cohort analyses (VPA). In the recent stock assessment, MSY was estimated at 31,000 tons through the production model analysis carried out in 1998.

As the last assessment of the Indian Ocean albacore (ALB) stock was carried out six years ago by Chen (1988), there are considerable time lapse for the relevant scientists to recall. Thus, it is essential to review the situation of the past assessments. The documents briefly reviews the past assessments from 1993-1998. The review before 1993 is available in Chen (see in Appendix p117-124, IPTP Collective volume No. 8).

## 2. Reviews

Authors	Title	Method	Results
Chen (1998)	Stock assessment on the Indian Ocean albacore tuna	Surplus Production model analyses (Schaefer)	MSY= 31,000 tons
Lee and Liu (1995)	An updated VPA of the Indian ALB stock (1980-1992)	VPA	- Total population: 3-15 million fish - Total biomass : 0.04- 0.15 million tons
Chang and Liu (1995)	Adjusted Indian Ocean ALB CPUE series of Taiwanese LL and GILL (1968-92)	CPUE standardization by GLM	- Trend of GILL CPUE fluctuated - For LL CPUE, increase trend in 1968-1978, afterwards the decrease trend
Chang and Hsu (1993)	An updated assessment of Indian Ocean ALB stock by ASPIC (1975-90)	ASPIC	$r = 0.29$ MSY=14,600 tons $B_{MSY} = 100,500$ $F_{MSY} = 0.15$
Lee and Liu (1993)	The VPA of the Indian albacore stock (1980-90)	VPA	VPA explains well following events : - A large GILL exploitation of Age 3 fish in 1986 reduced the age 4 fish in 1987 - A large surface fisheries exploitation for Age 4 in 1986-87 reduced Age 5 in 1987-88. - Total population : 1.8-6.6 million fish - Total biomass : 0.22 – 0.39 million tons

## IOTC-WPTMP-2004-INF03-Addendum

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During the meeting, five more recent papers of the ALB assessments were introduced by Dr Hsu as below and the copies of these papers are attached:

- ① Management implication on Indian Ocean ALB from simple yield analysis incorporating parameter uncertainty (Chang *et al*, *Fishery Research* 51, 2000: 1-10)
- ② A new assessment approach using fuzzy surplus production model to evaluate the ALB stock in the Indian Ocean (Wang *et al*, *Journal of the Fisheries Society of Taiwan*, Vol. 28 No. 4, Dec. 2001)
- ③ Using fuzzy synthesis approach to extract fishing efforts directed on ALB for Taiwanese logline fleet in the Indian Ocean (Wang *et al*. *Journal of the Fisheries Society of Taiwan*, Vol. 28 No. 2, Dec. 2001)
- ④ On the dynamics of ALB population in the Indian Ocean (Hsu, *Journal of the Fisheries Society of Taiwan*, Vol. 29 No. 2, June 2002)
- ⑤ Stock assessment of ALB, *Thunnus alalunga*, in the Indian Ocean by surplus production models with a new relative abundance index (Huang *et al*, *Terrestrial, Atmospheric and Ocean Science*, TAO, Vol. 14, No 2, 201-220, June 2003)