GROWTH STRATEGIES OF THE SWORDTIP SQUID, *UROTEUTHIS EDULIS*, IN RESPONSE TO ENVIRONMENTAL CHANGES IN THE SOUTHERN EAST CHINA SEA—A COHORT ANALYSIS


ABSTRACT

Studies of the biology and population structure of the swordtip squid, *Uroteuthis edulis* (Hoyle, 1885), have been performed along the southwestern edge of the Sea of Japan to the South China Sea, but limited information is available on how environmental variation affects the seasonal cohorts. The size and growth rates of seasonal cohorts of the swordtip squid in the southern East China Sea were investigated using samples obtained from commercial catches and research fishing vessels during the period from February 2006 to November 2010. Cohorts that hatched during the winter achieved larger mantle lengths (ML) and exhibited faster growth. Favorable feeding and temperature conditions during the following summer and autumn months increased both their growth rates and reproductive ability. In contrast, cohorts that hatched during the summer showed slower ML growth due to the lower water temperatures during the winter and spring, which they experienced at approximately 180 d of age. Our results demonstrate that size and growth of the swordtip squid varies seasonally, suggesting that differences in the growth rates and size at maturity are related to variation in water temperature.

The swordtip squid, *Uroteuthis edulis* (Hoyle, 1885), is a large-sized loliginid squid that inhabits the continental shelf of northern Australia, the Philippine Islands, the northern South China Sea and central Japan in the western Pacific (Jereb and Roper 2010). Currently, the species is exploited mainly by Taiwan, the People’s Republic of China, and Japan in the South China Sea, the East China Sea, and the southwestern coast of the Sea of Japan (Song et al. 2008, Wang et al. 2010, Yoda 2011). However, the most abundant stock of the swordtip squid is in the southern East China Sea (25°N–30°N), which is rich in prey organisms due to the freshwater discharge from the Changjiang River and the cold dome of subsurface Kuroshio water (Gong et al. 2003).

Over the past 50 yrs, the swordtip squid has supported an important commercial fishery in Taiwan, promoting the utilization of torch-light, trawler, and pole-and-line boats during April and October each year. With the growing scale of fishing boats and the advancements in fishing equipment, the squid fishing grounds have been extended from inshore to >200 nmi. From the late 1950s to 1993, annual landings were <6000 t, but they reached 8000–21,000 t between 1994 and 2005. However, in 2011 landings were <3000 t (Taiwan Fishery Yearbook, 1959–2011). The annual catches in Taiwan have decreased in recent years, likely due to an increase in the number of fishing boats from Mainland China, which have operated in the southern East China Sea since 2003 (Shen et al. 2008).