

Román Rodríguez, M.J. 1994. Age and growth of the Totoaba (*Totoaba macdonaldi*) Gilbert in the Upper Gulf of California. M.S. thesis. Centro de Investigacion Cientifica y Educacion Superior de Ensenada.

In nine field trips to evaluate the shrimp resource, 1125 juvenile totoabas were collected during 1989-1991. During the reproductive season (February-April) 176 adults were sampled in 1986, 1987, and 1989-1991. The lengths distribution of adults and juveniles was between 104 and 1600 mm of standard length (SL) ($X=362 \pm 379.2$, $n=1301$). The average length of juveniles increased from July to October. The juvenile growth rate was similar during the three sampling years, and ranged between 2.6 and 4.4 cm/year. This was similar to that of three individuals held in captivity (2.8 cm/year). The adults length frequency composition was homogeneous in the northern Gulf of California ($X=1347.9 \pm 90.1$ mm). The overall length-weight relationship was $W_t=6.46 \times 10^{-4} L^{2.5}$ ($r^2 = 0.98$, $n=705$). The juvenile condition factor was highest during August 1991; for adults the condition factor was highest during April 1986 and February 1987. Seventy-seven juvenile and 43 adults otoliths were thin sectioned for aging. The correlation between fish standard length and three unsectioned otolith dimensions (Total otolith length = LTO, otolith width = AO and otolith thickness = EO) were calculated. The best fit was obtained for the relationship LTO and fish standard length by the Gompertz model. The same model was fitted to the relationship between three axis of the thin section and the fish standard length. Lengths at past ages were obtained by backcalculation considering that each ring-pair represents a year in time. An indirect validation was suggested by using growth data of three juveniles held in captivity. The age structure of the totoaba population was represented by young-of-the-year organisms to 25 year old adults. The equation for the von Bertalanffy model was $L_t = 1390\{1 - \exp[-0.231(t-(-1.10))]\}$ ($r^2 = 0.95$, $n=104$). The age of first maturity was confirmed at the 6+ and 7+ year class, although it is possible to find mature individuals in the 3+ year class. I suggest that the moratorium on fishing since 1975 has contributed to the recovery of a stable age population structure for totoaba in the Gulf of California because the current age and length structure appears to be similar to that of past years.