

# SEXUAL MATURITY OF LITTLE TUNNY, *EUTHYNNUS ALLETTERATUS*, IN THE NORTH-EASTERN LEVANTINE BASIN

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## Abstract

A total of 96 little tunny, *Euthynnus alletteratus*, caught in the north-eastern Levantine Basin with commercial purse-seiners and trolling lines, were examined in order to determine the sexual maturity and the age and size distribution. The maximum age was 6 years. The length-weight relationship was  $W = 0.0381 L^{2.77}$ . Out of a total of 60 females examined 8 were mature.

**Keywords :** *Fishes, Growth, Reproduction, Spawning, Levantine Basin.*

In this study, we determined the sexual maturity of the little tunny. The age determination, first maturity length, gonadosomatic index, sex ratio, and spawning period have been investigated by [1, 2, 3] in various areas. The spawning period in the Mediterranean has been reported to occur from June to September [2, 3]. Sexual maturity of the females is reached at 55-60 cm FL [1].

In this study, a total of 96 little tunny were caught by commercial purse-seiners and trolling lines used by artisanal fishermen in the north-eastern Levantine Basin (especially Mersin Bay and northern Cypriot waters-off Kyrenia) between November 2002 and May 2005, and studied. For each specimen, fork length (FL), total weight (TW), and gonad weight (GW) were measured, and their sex was determined. The age analysis was performed according to [4]. Furthermore, the length and weight relationship was calculated. A total of 96 gonads were examined externally, and the reproductive aspects of the species were observed. The gonadosomatic index (GSI) of both males and females were calculated according to [5]. The minimum, maximum, and mean values of FL and TW were 43 cm, 87 cm, 69.5 cm (SE=0.948) and 1215 g, 8930 g, 5070 g (SE=0.183), respectively. The a and b values of the length-weight relationship (Figure 1) were compared with those reported by other authors. In the Mediterranean, these values were 0.0476 and 2.723 for 1085 individuals of sizes 52-97.5 cm [6]; in the south western Spanish coast: 0.0441 and 2.755 for 217 individuals of sizes 56-67.7 cm [7]; and in this study, 0.0381 and 2.77 for 96 individuals (sizes 43-87 cm). Our findings for a and b values are compatible with the results of [6] and [7]. A total of 36 male and 60 female gonads were examined. The sex ratio was 1:1.7 M/F. The GSI values of both males and females are shown in Figure 2. GSI reached a peak in July, and generally GSI remarkably increased in summer, when the reproductive activities were intensive. It is reported that the gonads of the 1 and 2 year old specimens are not mature, as opposed to those of the 3 year old ones [1]. In this study, all specimens were larger than 60 cm, and their ages were 3-4 years. It is reported that the spawning period of the species ranges between May and September [1]. In the Mediterranean, spawning occurs from late spring through summer [8]. In our study, spawning occurred in July and August, being compatible with other studies. Our results support [9] that this basin is a new spawning area.

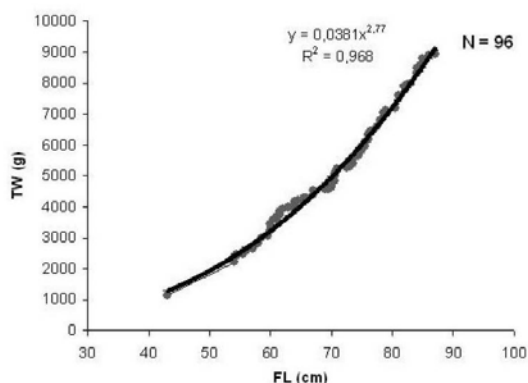


Fig. 1. Length-weight relationship.

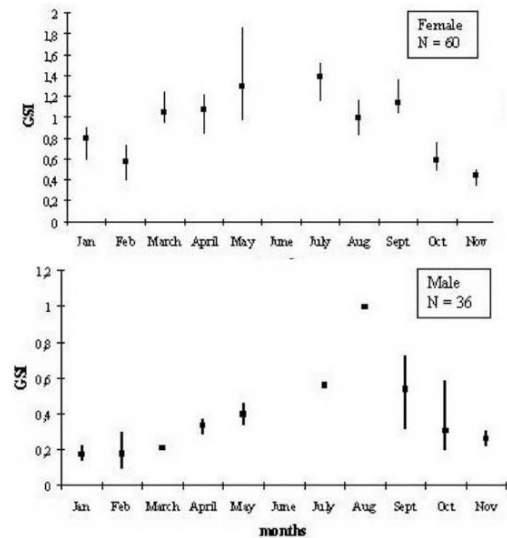


Fig. 2. GSI values of males and females.

## References

- 1 - Landau R., 1965. Determination of age and growth rate in *Euthynnus alletteratus* and *Euthynnus affinis* using vertebrae. Rapports et Proces. Verbaux des Reunions. Publié par les Soins de Jean Furnesting Commission Internationale pour L'Exploration Scientifique de la Méditerranée, Vol. XVIII, Fas. I, pp 241-244.
- 2 - Rodriguez-Roda J., 1979. Edad y Crecimiento de la Bacoreta, *Euthynnus alletteratus* (Raf.) de la Costa Sudatlántica de España. *Inv. Pesq.* Vol 43(3): 591-599.
- 3 - Cayré P.M. and Diouf T., 1983. Estimating age and growth of little tunny, *Euthynnus alletteratus*, off the coast of Senegal using dorsal fin spine sections. NOAA Tech. Rep. NMFS, (8):105-110.
- 4 - Johnson A. G., 1983. Comparison of dorsal spines and vertebrae as ageing structures for little tunny, *Euthynnus alletteratus*, from the North-east Gulf of Mexico. U.S. Department of Commerce, NOAA Technical Report NMFS 8:111-115.
- 5 - Kume S. and Joseph J., 1969. Size composition and sexual maturity of billfishes caught by the Japanese longline fishery in the Pacific Ocean east of 130° W. *Bull. Far Seas Fish. Res. Lab* (Shimizu) 2:115-162.
- 6 - Kahraman A.E. and Oray I.K., 2001. The determination of age and growth of Atlantic little tunny (*Euthynnus alletteratus*, Rafinesque 1810) in Turkish waters. Col. Vol. Sci. Pap. ICCAT 52:719-732.
- 7 - Macías D., Lema L., Gómez-Vives M.J., Ortiz de Urbina J.M. and de la Serna J. M., 2006. Some biological aspects of small tunas (*Euthynnus alletteratus*, *Sarda sarda* & *Auxis rochei*) from the south western Spanish Mediterranean traps. Col. Vol. Sci. Pap. ICCAT, 59(2): 579-589.
- 8 - Collette B.B. and Nauen C.E., 1983. FAO species catalogue. Vol. 2. Scombrids of the world. An annotated and illustrated catalogue of tunas, mackerels, bonitos and related species known to date. *FAO Fish. Synop.* 125(2):137
- 9 - Oray, I.K., Karakulak, F.S., Alicli, Z., Ates, C., Kahraman, A. 2005. First evidence of spawning in the eastern Mediterranean Sea, Preliminary results of tuna larval survey in 2004. Col. Vol. Sci. Pap. ICCAT, 58(4):1341-1347.