

REPRODUCTION OF COMMON CUTTLEFISH (*SEPIA OFFICINALIS*, L.,1758) IN ANTALYA BAY

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Abstract

The reproduction of common cuttlefish was studied between September 2002 and March 2004 in Antalya Bay. 490 individuals were collected during the studied period. The mantle lengths and total weight of common cuttlefish varied from 55 to 177 mm, and 29.7 to 652.3 g for females and 45-170 mm, 16.8-510.8 g for males (mean total mantle length and body mass for females and males: 105 ± 1.6 mm, 174.83 ± 7.79 g and 98.8 ± 0.15 mm, 135.46 ± 5.65 g, respectively). Four maturity stages were described. Based on the proportions of each maturity stage, as well as on various maturity indices, spawning was found to take place throughout the year with an increase between May and August.

Keywords : *Cephalopods, Reproduction.*

Introduction

The reproduction of the common cuttlefish of the Eastern Atlantic and Western Mediterranean Sea is known in considerable detail [1,2,3,4,5,6]. Its life cycle is closely related to environmental factors. Thus, in the northern part of their distribution, they begin their reproduction cycle in the second year of their life, during a short breeding season lasting 2 to 3 months. In contrast, in warmer waters such as the Western Mediterranean, the majority of cuttlefish reproduce when 1 year old and over a long period [5]. Little is known about its reproductive biology in the Mediterranean coast of Turkey.

Material and methods

Samples were collected between September 2002 and March 2004, from local fishermen and the industrial fishing fleet of Antalya Bay. A total of 490 individuals (246 female and 244 male) were examined. Mantle length (ML), to the nearest 1 mm, and total body mass (BM), to the nearest 0.1 g, were recorded. For females the ovary mass (OM), and nidamental gland mass (NGM), and for males testis mass (TM) and spermatophoric complex mass (SCM), were also recorded. Four maturity stages for each sex were determined using a scale proposed by [7]: females, I-immature, II-maturing, III-prespawning and IV-spawning; males, I-immature, II-maturing, III-fully mature, and IV-spawning. The spawning peaks were identified using the indices of reproductive status [3,7]: (a) females: GSI (Gonadosomatic index): $100 \times OM / BM$, and NGI (Nidamental gland index): $100 \times NGM / BM$; (b) males: GSI: $100 \times TM / BM$ and SCI (Spermatophoric organ index): $100 \times SCM / BM$.

Results and discussion

The length distributions are shown in figure 1a. To determine the spawning season the occurrence of mature females and males was examined [Fig.1b]. Spawning females (Stage IV) were observed from March to July, while most of the males fully matured (Stage III) from March to July. Female maturity indices increased in February and peaked between May and July. All maturity indices declined gradually starting in August, and reached their lowest values between October and December (Fig. 1d). Male maturity indices increased in December and peaked in June and July (Fig. 1c). This coincides with the peak percentage values of specimens in spawning conditions. During the spawning season (from May to August), only one generation can be distinguished based on ML [Fig.1a]. The change in mean number of ova with ML, BM and NGM are shown in Table 1.

This study indicated that the main spawning season of *S. officinalis* in Antalya Bay started in spring and lasted through summer with a peak in June and July. This agrees with most of other studies [8,5,6]. In all months some maturing and mature individuals were found, indicating that this species probably spawns during the whole year, but its reproduction peaks during June-July. Maturity indices show that cuttlefish are able to mature before they are 1 year old in the Mediterranean Sea as noted by [1], while they mature at an age 1 and 2 years in the Atlantic [5].

Tab. 1. The change in mean number of ova with ML, BM and NGM.

N	ML (mm)		BM (g)		NGM (g)		Number of ova	
	min - max	M ± sd	min - max	M ± sd	min - max	M ± sd	min - max	M ± sd
2	60 - 75	69.5 ± 4.9	43.0 - 53.7	48.35 ± 7.57	1.221 - 2.698	1.960 ± 1.044	51 - 106	78.5 ± 38.89
21	75 - 90	81.5 ± 3.6	52.1 - 116.9	76.11 ± 16.09	2.083 - 3.842	2.083 ± 0.475	56 - 202	115.14 ± 35.59
18	90 - 105	97.6 ± 3.9	89.7 - 150.2	124.98 ± 18.67	2.447 - 6.404	4.422 ± 1.103	50 - 298	141.61 ± 61.88
25	105 - 120	111.3 ± 4.6	126.5 - 231.1	182.93 ± 22.53	3.676 - 9.521	6.300 ± 1.397	74 - 324	173.84 ± 79.57
18	120 - 135	126.2 ± 4.0	199.8 - 348.8	251.53 ± 41.99	4.258 - 20.642	10.177 ± 4.277	83 - 543	238.83 ± 99.54
8	135 - 150	141.1 ± 4.5	294.7 - 382.6	340.10 ± 31.27	6.593 - 15.495	12.945 ± 3.231	127 - 529	274.75 ± 118.62
7	150 - 165	155.3 ± 3.8	380.5 - 540.4	447.86 ± 63.91	9.502 - 19.278	12.755 ± 4.005	208 - 348	253.43 ± 30.55
2	165 - 180	172.0 ± 7.1	627.0 - 652.3	639.65 ± 17.89	16.238 - 24.156	20.192 ± 5.606	337 - 425	381.00 ± 62.23

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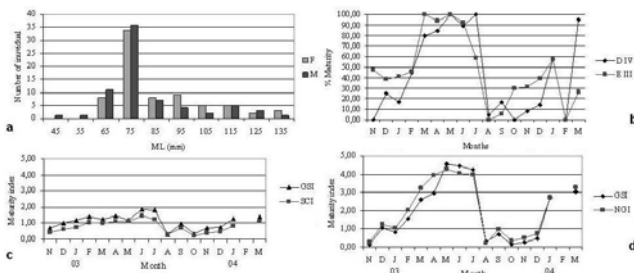


Fig. 1. (a) Length frequency distribution of females and males; (b) Monthly frequency distribution of spawning females (Stage IV) and males (Stage III); (c) Variations in monthly means of GSI and SCI for males; (d) Variations in monthly means of GSI and NGI for females.