REPRODUCTIVE BIOLOGY OF *DIPLODUS VULGARIS* IN EGYPTIAN WATERS

Magda. I. Zaki *, M.Abdallah, F. Abou-Zaid and S. Salem

* National Institute of Oceanography and Fisheries, Kaet Bay, Alexandria, Egypt - * DrMagdaZaki@ hotmail.com

Abstract

The monthly distribution of the different sexual maturity stages for *Diplodus vulgaris* and gonado somatic index indicated that the spawning season extended from November to February with a peak in December. The analysis of egg diameter distribution during the spawning season indicated that this *species* characterized by a prolonged rather than a fractional spawning. The absolute fecundity ranged from 16,552 to 79,807 eggs for mean total length ranging between 15.5 and 20.4 cm

Key words: Diplodus vulgaris ; Reproductive Biology; Sparidae

Introduction

It is well known that the gonads in fish show a seasonal variation which however might vary from one species to another, as well as within the same species in different geographic localities in response to environmental factors which affect the physiological activity of the fish(1). This study presents data on maturity stages, length at first maturity, gonado somatic index, egg diameter, and fecundity of *Diplodus vulgaris* collected off the Egyptian coast of the Mediterranean Sea.

Material and methods

Diplodus vulgaris were collected monthly from Kayed Bay, Alexandria, Egypt. The total length (TL), gutted weight (W) and gonad weight (GW) to nearest mg, sex and maturity stages were recorded (2). Length at first sexual maturity is the length at which 50% of the fish reached sexual maturity. Gonadosomatic index (GSI) is calculated as the percentage of the gonad weight to the gutted weight. Egg diameter was measured. Estimation of fecundity was based on counting the mature yolked and ripe eggs in the ripe ovaries during the spawning season. The absolute and relative fecundity was calculated (3).

Result and discussion

Monthly distribution of maturity stages: Immature fish were found throughout the year, with their highest proportions between February and June (63.64% for females and 44.44% - for males). Between August and July, however, most of the fish matured (86.67% of females and 66.67% of males)

In October, fish from the nearly ripe stage represented by 11.76 % for females and 15.38% for males then increased to a peak (29.41% for females and 30.77% for males) in November and decreased at the end of December. Spawning fish were detected during November to February. The spent stage was detected form February to May for females and from February to April.

Fish with immature gonads were regarded as immature, and those with maturation, nearly ripe, spawning and spent stage gonads were considered as mature individuals. Females of TL < 14 cm and males of TL<13 cm were immature. Larger fish showed an increase in the frequency of mature specimens, and all females and males larger than 17.9 cm were fully mature with no significant difference (4).

The GSI started to increase in November (1.56 and 1.54 for females and males, respectively) and reached a maximum in December (5.63 and 2.21 for females and males, respectively) (Fig. 1). The female GSI was higher than that of males; but both displayed nearly the same cyclic trend during the period of study. These results indicated that the spawning season extended from November to February with a peak in December.

The ripe female had three batches of ova. The first one included eggs with a diameter ranging from 0.1 to 0.4 mm. These were immature eggs found in all the examined ovaries during the spawning season. The second batch included the mature; yolky; eggs with a diameter ranging from 0.4 to 0.8 mm. Finally the third batch included the ripe ovulated eggs of diameters ranging from 0.8 to 1.26 mm.

The ovaries sampled at the end of November with a GSI of 2.86 showed that the immature; mature egg ratio 1.9:1. The ovaries at the beginning of December (GSI=5.00) had immature eggs representing 20% and mature eggs representing 80% of the total number of eggs. At the end of December the GSI increased to maximum value, 11.67, with the three batches of eggs; representing 17.2%, 42.6% and 40.2% of the total number of eggs, respectively.

In January, GSI decreased to 3.49. The ovaries had immature eggs. During February the GSI decreased to 3.57. In early March the ovaries were at the spent stage (containing only immature eggs).

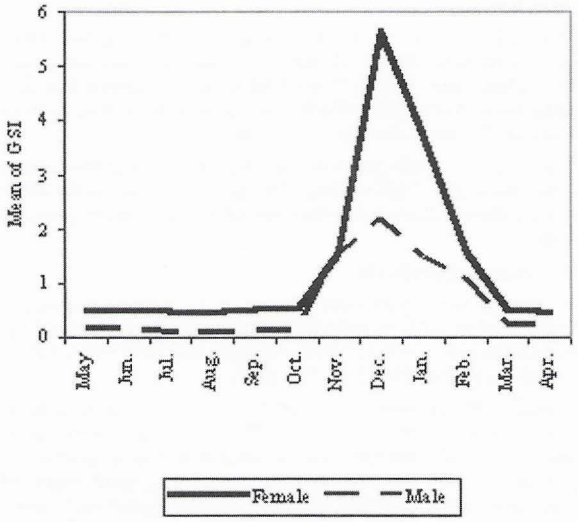

Fig. 1. Monthly variation in the gonadosomatic index (GSI) of male and female *Diplodus vulgaris*.

The absolute Fecundity (F_a) - total length (TL) relationship was:
Log F_a= -1.05838256 + 4.561628117 log TL (n=55, p< 0.05).

The number of eggs produced during spawning season (F_a) increased from 16552 to 79807 eggs with a change in TL from 14.5 to 20.4 cm.

The relative fecundity (F_r) in relation to TL, the following equation is derived:
Log F_r = - 1.05749653 + 3.560942817 logTL (n=55, p<0.05)
F_r ranged from 877 to 3873 eggs/cm.

The absolute fecundity (F_a)-gutted weight (wt) relationship was:
F_a = - 16136.996 + 791.5738694 wt (n=55, p<0.05)
43.2% and mature eggs constituting 56.8% of the total number of eggs.
eggs / fish with an increase in average gutted weight from 45.4 to 122.9 (g).
F_r in relation to wt was:
F_r = 352.2987 + 2.7004 wt (n=55, p<0.05)
The mean F_r rose from 449 to 649 eggs/gm wt.

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