



## SPAWNING KINETICS OF INDIVIDUAL FEMALE MEAGRE (*ARGYROSOMUS REGIUS*) AFTER TREATMENT WITH GnRH $\alpha$ IMPLANTS

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### Introduction:

The meagre (*Argyrosomus regius*) is a new candidate species for European aquaculture [1]. Though broodstocks are maintained by many commercial operations, this species does not spawn spontaneously in captivity, necessitating the development of spawning induction protocols. The present study reports on the use of agonists of gonadotropin releasing hormone (GnRH $\alpha$ ) loaded in controlled-release implants for the induction of oocyte maturation and spawning of meagre. Both group spawnings and individual-female spawnings were induced, in order to obtain accurate information on the spawning kinetics and fecundity of this species.

### Methods:

Three different spawning induction trials were conducted between May and June 2009. Males and females (n = 10, mean body weight  $\pm$  SD of 6.9  $\pm$  1.9 Kg) were implanted with EVAc GnRH $\alpha$  implants [2] at a dose of approximately 50  $\mu$ g Kg<sup>-1</sup> body weight and placed in 9000-l tanks connected to overflow egg collectors. In 2010, six individual females were placed in separate 5000-l tanks with two males each (mean body weight of 8.2  $\pm$  2.2 Kg) during May and June. From every spawning event, an egg sample was collected for the estimation of fecundity and fertilization success. Results were analyzed by ANOVA, followed by Duncan's New Multiple Range test (DNMR), at a minimum significance of P<0.05.

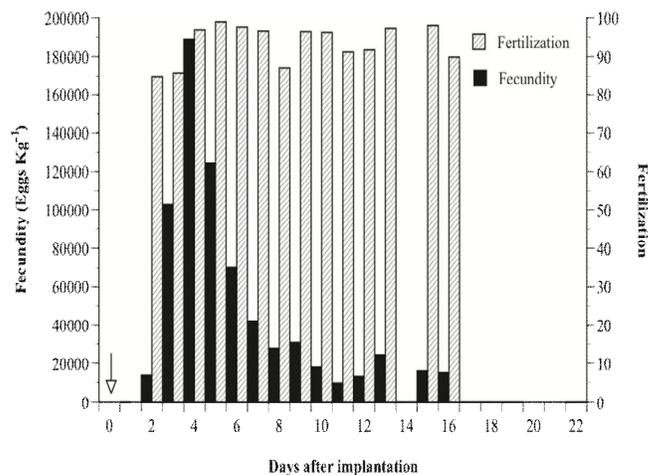
### Results:

Spawning was initiated 2 or 3 d after GnRH $\alpha$  treatment. In the group spawnings, mean relative fecundity spawn<sup>-1</sup> ranged from 24,300 to 49,900 eggs Kg<sup>-1</sup> female body weight and mean fertilization success ranged from 85 to 87%. The number of spawns was

between 7 and 17 and mean total annual relative fecundity was 365,000  $\pm$  107,000 eggs Kg<sup>-1</sup> year<sup>-1</sup>. No statistically significant difference was found in relative fecundity or fertilization success between the three different trials in 2009. In the individualized trials in 2010, the number of spawns per female ranged between 5 and 19, relative fecundity spawn<sup>-1</sup> ranged between 28,540 and 59,380 eggs Kg<sup>-1</sup> and fertilization success ranged between 85 to 95% (Table 1).

Relative fecundity was maximal on the second or third spawn and then decreased gradually (Fig. 1). On the contrary, fertilization percentage was high throughout the spawning season. The majority of the eggs (70%) were produced during the first four

**Figure 1.** Daily relative fecundity ( $\times 10^3$  eggs Kg<sup>-1</sup> female biomass) and fertilization success (%) of successive spawnings of a single female meagre after GnRH $\alpha$  implantation on June 3, 2010. The arrow refers to the day of the implantation.



**Table 1.** Number of spawns, relative fecundity spawn<sup>-1</sup>, total annual relative fecundity and fertilization percentage of the two spawning induction trials conducted in 2010.

No of female	Date of implantation	Spawns	Eggs/ Kg/ Spawn	Eggs/ Kg/ Season	Fertilization (%)
1	05/04/2010	5	33,625	168,127	89
2	05/04/2010	10	28,540	285,401	85
3	05/04/2010	6	59,381	356,286	87
4	06/03/2010	14	49,957	699,394	93
5	06/03/2010	10	52,207	522,066	95
6	06/03/2010	19	30,415	577,886	95



spawning events. No statistically significant difference was observed in daily fecundity or fertilization success, either between individual females or between different GnRH $\alpha$  implantation dates.

#### Discussion:

The present study demonstrated that GnRH $\alpha$  implants are very effective in inducing spawning in the meagre, resulting in a large number of consecutive spawns, promoting the asynchronous nature of oocyte maturation of the species. No significant differences in egg production or quality were observed between group and individual spawnings, which is contrary to what is observed in other fish, which often do not reproduce well outside a large group [3]. Meagre can respond well to hormonal induction from May to June with the same effectiveness and egg quality, resulting in a mean annual fecundity of approximately 410,000 eggs Kg<sup>-1</sup> and a mean fertilization percentage of >75%. The results obtained in the present study will be useful for the

broodstock management of meagre in commercial operations, helping hatchery managers plan better and more efficiently their production.

#### References:

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- [2]MYLONAS, C. C., ZOHAR, Y. 2001. Use of GnRH $\alpha$ -delivery systems for the control of reproduction in fish. *Rev. Fish Biol. Fish.*, 10: 463-491.
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