

EFFECT OF MALE ROTATION ON INDUCED PAIR SPAWNING OF MEAGRE *Argyrosomus regius*

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Introduction

The meagre (*Argyrosomus regius*) is a fast-growing species that has been recently introduced to the European aquaculture industry. Due to the low number of meagre populations in the Mediterranean Sea, there is limited genetic variability in the meagre broodstocks in Europe, leading to the need to produce new families for breeding programs. However, spawning of meagre in captivity is scarce and inconsistent. Therefore, a number of studies have been undertaken on the induced spawning of this species in captivity (Mylonas et al., 2015) and a protocol of weekly injections of GnRHa under constant temperatures of 19-20°C in April-May has been proposed for the production of a large number of high quality eggs (Mylonas et al., 2016). In the present study, this protocol was applied to meagre pair spawning, in combination to weekly male rotations, in order to establish a method for the production of many different families of meagre at a short time for breeding programs.

Materials and Methods

Ten-year-old fish (4 females and 4 males) of a mean body weight of 11.3±1.7kg were selected based on their maturation stage and were placed in pairs in 4 different 5-m³ tanks at a temperature of 19.3°C. Selected females had vitellogenic oocytes of >580 µm in diameter and selected males released sperm after gentle abdominal pressure. Fish pairs were named after famous romantic couples of different cultures: Helena and Paris, Cecy and Peri, Cleopatra and Julius Caesar and Juliet and Romeo. Every week, a GnRHa injection of 15µg kg⁻¹ was applied to all of the fish and the male of one pair replaced the male of another pair. In this way, sixteen different pairs were created over the course of 4 weeks and were induced to spawn with weekly injections of GnRHa. Eggs were collected after each spawn and relative fecundity (eggs kg female body weight⁻¹) and fertilization percentage (%) were estimated. Eggs from each spawn were incubated individually in 96-well microtiter plates in duplicates and their hatching percentage (%) and larval survival (%) until 5 d after hatching were monitored.

Results and Discussion

Spawning commenced 2 days after the GnRHa injection. After the first injection, all females spawned for 3 consecutive days and after the second injection all females spawned for two consecutive days (Figure 1). Examined biopsies of Helena and Cecy after the fourth injection exhibited complete absence of vitellogenic oocytes, which means that these two females could not be induced to spawn again. Overall, the highest relative fecundity was observed after the first hormonal application (101,145eggs kg⁻¹). Fertilization remained high (>85 % in all spawns) and eggs of all females exhibited very high hatching and 5-day larval survival percentages (>95%).

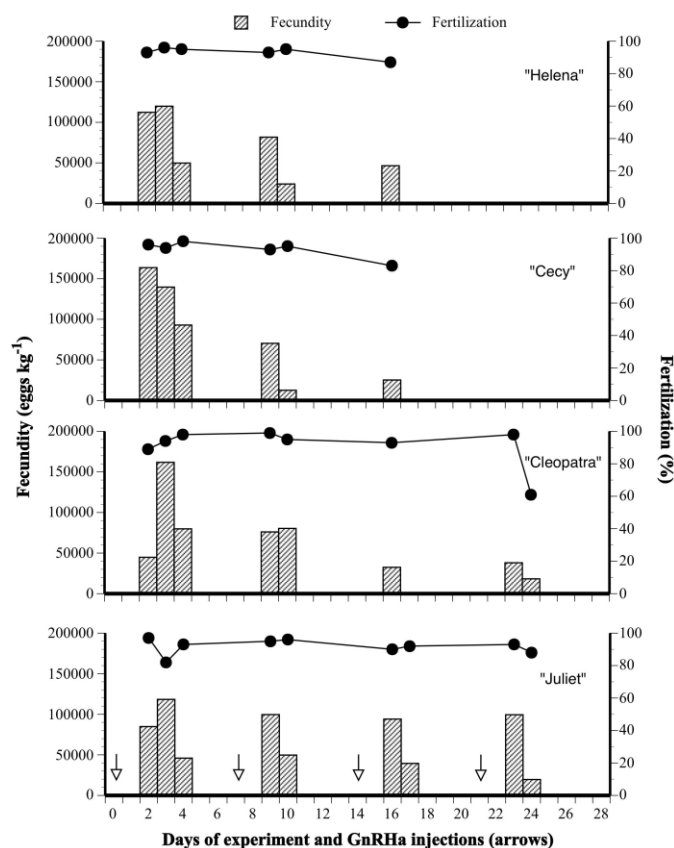


Figure 1. Daily relative fecundity and fertilization success of meagre females after each GnRH α injection. Arrows represent the time of injection.

Conclusions

Male rotation can be considered a good way to produce many meagre families at a short time for breeding programs. However, females may stop spawning, possibly due to the stress imposed to them by male rotation in their tanks. Care must be taken to avoid this phenomenon, possibly through reduction of the number of male rotations.

References

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