

Farming *Thunnus thynnus* in Mediterranean Sea: Is an Illusion?

Monique Mancuso*

Institute for Coastal Marine Environment (IAMC) - National Research Council (CNR) -Section of Messina, Italy

Abstract

Thunnus thynnus is one of the most popular species in the world. Tuna fishing is an economic activity of prime importance and a booming business. The reproduction control in captivity represents the first step for the production of Tuna in captivity. Tuna, thanks to its palatability, would be an excellent candidate for aquaculture, but unfortunately the current knowledge and especially with organic and physiological limitations of the species, especially related to reproduction and a suitable diet, does not allow us to consider it at the moment as a can especially innovative.

Keywords: Tuna; Breeding; Mariculture; Farming

Introduction

Thunnus thynnus (Linnaeus 1758) is one of the most popular species in the world. Tuna fishing is an economic activity of prime importance and a booming business. During the last decade intense research has been carried out in the Mediterranean region to reproduce *T. thynnus* in captivity [1-4]. Among the most important problems are: to reach the reproduction in captivity, the great economic investment, the development of a balanced diet, environmental pollution problems, management problems and finally the outbreak of diseases. The reproduction control in captivity represents the first step towards the conversion of the "capture-based" bluefin tuna industry that has developed in the Mediterranean Sea over the last 15 years into a true, self sustained, aquaculture (FAO, 2006). When reared in captivity, many fish exhibit some degree of reproductive dysfunctions [5]. Females fail to undergo oocyte maturation at the completion of vitellogenesis and, thus, do not spawn [5]; while in males a qualitative and/or quantitative decrease in milt production is observed [6,7]. In 2007 a research project on the set up of an integrated system for bluefin tuna farming carried out experimental reproduction of the bluefin tuna in captivity that allowed the successful fertilization of eggs after spawning induction with an ad hoc designed GnRHα delivery system [3], but the reproduction trials were characterized by a high mortality, in fact only 5% of fish survived until 30 days after the hatching. The availability of viable eggs and fertilized by *T. thynnus*, after deposition induced in captivity, has been shifting the focus of research on breeding and larval enlargement of knowledge regarding the stages larval and post larval, which represent the critical step to obtain a stable production over time of youth reared in captivity [8]. Because the state of the art, there is no definition of the whole process of breeding for this valuable species, except for some excellent practice for the control of reproduction and development larval and post larval [3], the expansion of the knowledge on the reproductive biology of this species and the embryonic and larval development is therefore a fundamental strategic shift in order to develop technologies that enable sustainable production from aquaculture without the supply of wild youth. Tuna is a fish resistant to disease; it is likely only a few diseases such as: viral, bacterial parasitic [9]. Tuna, thanks to its palatability, would be an excellent candidate for aquaculture, but unfortunately the current knowledge and especially with organic and physiological limitations of the species, especially related to reproduction and a suitable diet, does not allow us to consider it at the moment as a can especially innovative.

Unfortunately to date tuna farming remains a great illusion or... why not, a dream that has not yet been realized!

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*Corresponding author: Monique Mancuso, Institute for Coastal Marine Environment (IAMC) - National Research Council (CNR) -Section of Messina, Spianata S. Raineri 86, 98122 Messina, Italy, E-mail: monique.mancuso@iamc.cnr.it

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