

## **EIGHT YEARS OF RESEARCH ON BLUEFIN TUNA (*THUNNUS THYNNUS*) CULTURE AT THE SPANISH INSTITUTE OF OCEANOGRAPHY (IEO)**

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### **Introduction**

The Atlantic Bluefin tuna (BFT, *Thunnus thynnus*, L. 1758) is an emblematic fish exploited during centuries in the entire Mediterranean area, especially in the South of Spain, Morocco and Italy, where it is captured using a set net called in Spanish Almadraba. Some authors have pointed out that the BFT was already fished by the hominids living in the South of Spain, 20.000 years ago (Cort, 2007).

From the end of the 1990's, especially in the Murcia Region (Spain) as well as in many Mediterranean countries, an activity what is called "fattening" has been carried out. This ones involves the capture, during the months of May-June, of adult individuals, which enter for reproduction purposes in the Mediterranean sea. Once captured, tunas are introduced in floating cages where they stays for a six months period fed with highly fat content fish. After this period, the tunas are slaughtered and sent to the Japanese markets (Ottolenghi et al., 2004). But the overfishing of the wild stock is threatening its conservation as it is pointed out by many experts (Fromentin and Powers, 2005) and in a special manner by the International Council for Conservation of the Atlantic Tuna (ICCAT).

Since 2000 the Spanish Institute of Oceanography (IEO) is participating in several research projects on BFT culture with the aim of contributing of the Domestication of this species, for improving the productive process and reducing the pressure on the wild stock as it has already happened with other full cycle cultured species.

### **Projects**

(2000-2001) Development of electro-slaughtering and electro-stunning techniques to the Bluefin tuna sector. 2000-2001. Funded by Programm PEITT: 200.000 € Coordinator: Joaquín Roca Dorda. University of Cartagena (Spain). The main result was the improvement of tuna meat quality when slaughter on tuna farms was carried out using electrostunning and electrofishing techniques which have been used with small freshwater fishes for a century. This method was chosen because it offers a number of advantages: selection capacity and low stress level for tuna. Due to the large difference between freshwater and seawater conductivity, the discharge is applied using a harpoon rather than by generating an electric field. (see Soto et al., 2006)

(2001-2002) Domestication of *Thunnus thynnus*, the Blue Fin Tuna. Strategies for European Development in the Context of a Global Market (DOTT) (Q5AM-2001-00063). Funded by EC: 100.000 €. Coordinator: Hillel Gordin NCM-IOLR (Israel). Objectives: a) Organize an International Symposium entitled "Domestication of *Thunnus thynnus*, the Bluefin Tuna – Strategies for Sustainable European Development in the Context of a Global Market" in which state of the art would be presented and discussed, b) Initiate discussions on European RTD projects in which the BFT will be the subject organism towards the domestication of this species. The projects will involve scientific as well as industrial partners, c) Commission a preliminary

study on “The First Socio-economical Indicators” and d) Initiate an international cooperation in developing the technologies require for the domestication of the BFT (Europe, USA, Japan, Australia). (see Anon, 2003)

(2002-2004) Development of a visual automated inspection to control the quality of the bluefin tuna meat (SIVATUN). Funded by Murcia Regional Community (Spain): 5.000 €. Coordinator: Joaquín Roca Dorda University of Cartagena (Spain). The main target of this project consisted of developing an automated system of visual inspection that allows the determination of the meat quality of the BFT. The ultimate aim was to establish quality indicators and classifiers accompanying tuna meat from the capture and that way making it possible to track this product in the main tuna meat export markets. (see Mateo et al., 2006).

(2003-2006) Domestication of *Thunnus thynnus*, the bluefin tuna (BFT). A Feasibility Study on its Reproduction in captivity (REPRO-DOTT). (Q5RS-2002-01355). Funded by EC: 1.5 M €. Coordinator: Antonio García, IEO (Spain). The REPRODOTT Project has demonstrated that BFT is able to mature and spawn in captivity and also is feasible to obtain viable larvae. The propagation of BFT in captive conditions may alleviate the fishing pressure on wild BFT stock which are now using for farming purposes and contributes to a real self-sustained aquaculture in the Mediterranean (see Mylonas et al., 2007).

(2006-2007) Advances in Domestication of Bluefin tuna. Capture and Domestication of the bluefin tuna juveniles (ADAR-AJAR). Funded by the IEO (Spain). Coordinator: Fernando de la Gándara, IEO (Spain). In this Project the knowledge-base of the capturing and handling BFT juveniles (young of the year, around 1 kg) was achieved (see De la Gándara and Ortega, 2007).

(2008-2010) From capture based to SELF-sustained aquaculture and Domestication Of bluefin tuna, *Thunnus Thynnus* (SELFDOTT). Funded by EC: 3 M €. Coordinator: Fernando de la Gándara. IEO (Spain). SELFDOTT proposes to implement knowledge already obtained on the artificial control of reproduction of the Atlantic bluefin tuna (BFT), *Thunnus thynnus*, to obtain viable eggs, and study embryonic and larval development for the production of fry (juveniles). At the same time, suitable and environmentally performing feeds for the growth of BFT will be developed, thus reducing or eliminating the practice of raw fish importation and feeding by the fattening industry.

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