

# FIRST DATA ON THE NUTRITIONAL CONDITION OF THE MEDITERRANEAN BULLET TUNA LARVAE, *AUXIS ROCHEI*, FROM THE BALEARIC ARCHIPELAGO

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## Abstract

Nutritional condition of bullet tuna post-flexion larvae was analysed by the quantification of nucleic acids and protein content from samples collected off the Balearic archipelago. Highest RNA/DNA and protein/DNA ratios were observed in a cold water mass south of Mallorca.

## Introduction

The waters off the Balearic archipelago constitute an optimum spawning habitat for several tuna species, among which the bullet tuna *Auxis rochei* is the most abundant, as shown by the results of the TUNIBAL surveys (1), conducted during the spawning season of this species, from June to September (2).

During the last decade some research has been done on morphological, physiological and nutritional aspects of this species with laboratory-reared specimens. Nutritional condition of wild-caught bullet tuna larvae from the Panama Bight estimated by histological techniques was examined by Margulies (3).

The present paper provides data on the nutritional status of individual bullet tuna post-flexion larvae from the Balearic spawning grounds.

## Material and methods

The methodological protocols used to determine the content of RNA, DNA and protein is described in (4). Larvae were collected by means of 1-m Bongo net (1mm mesh size) towed at the surface during the TUNIBAL 06/01 survey.

## Results and discussion

A total of 118 bullet tuna post-flexion larvae were analysed for RNA, DNA and protein content. The samples were obtained at different sites off the Balearic islands each characterized by particular hydrographic conditions (Fig. 1). The average size of the sampled population was 7.3mm standard length (SL) (sd=1.24) and 1.12 mg dry weight (DW) (sd=0.86). The biochemical parameters showed a significant exponential increase with length and weight ( $p<0.05$ ).

temperature of 24°C. The average size of the sampled population and biochemical parameters by site are given in Table 1.

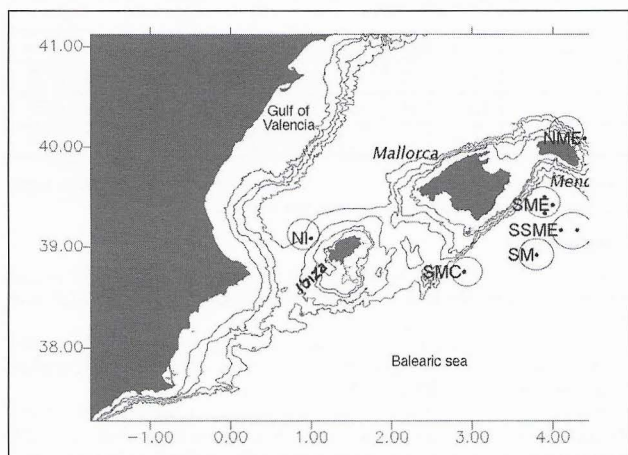
**Table 1. Average values of the sampled population and the biochemical parameters by site (NI, North Ibiza; SMC, South Mallorca Channel; SM, South Mallorca; SME, South Menorca; SSME, Southermost Menorca; NME, North Menorca; SL, standard length; DW, dry weight).**

Site	SL	DW	DNA/larva	RNA/larva	protein/larva	RNA/DNA	protein./DNA
NI	8.2	1.46	22.31	98.91	493.06	3.9	21.0
SMC	6.8	0.64	8.07	29.64	169.87	3.8	21.9
SM	6.5	0.51	3.64	22.78	236.04	6.3	65.1
SME	7.6	1.35	12.87	60.98	331.75	4.9	27.0
SSME	8.1	1.82	13.83	61.18	315.74	4.3	27.1
NME	5.9	0.45	4.25	16.48	129.95	4.2	33.4

The RNA/DNA and protein/DNA ratios were significantly higher (ANOVA-Tukey post hoc comparison;  $p<0.05$ ) in the samples originating from the cold water site (SM). The remaining areas, that had similar temperature regimes, did not show any significant differences in biochemical ratios, with the exception of the slightly higher values in the site SME. The higher values observed at SM do not necessarily imply a better nutritional status for bullet tuna larvae. The RNA/DNA dependence on temperature might cause variability in the ratios (6). Larvae located at SME showed better condition with respect to larvae sampled at other sites with similar temperature regimes. In general, the nutritional condition of the sampled population can be considered adequate, in agreement with (3) who did not find signs of malnourishment of bullet tuna post-flexion larvae from the Panama Bight.

## References

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**Fig. 1. Sampled sites of the bullet tuna larvae.**

The survey area is characterized by the encounter of two water masses: Mediterranean waters from the north meeting waters of Atlantic origin, which cause important frontal systems and an intense ageostrophic circulation. (5). The sampled population belong to sites with different hydrographic characteristics (1). The north Ibiza (NI) and Mallorca channel (SMC) sites were located within intense frontal structures. Mean surface temperature (at 5 m) in these sites was 24°C. Another larval sample was collected south of Mallorca (SM) within a colder water mass (22°C). South off Menorca (SME), larvae were sampled within an anticyclonic gyre. South of this anticyclonic gyre, at SSME, another larval sample was collected. In the latter two areas, the mean surface temperature was 24-25°C. Another larval sample was collected at a site north of Menorca (NME) with a surface