

SARDINELLA AURITA EGG AND LARVAL DISTRIBUTIONS AND SEA TEMPERATURE IN THE TUNIS GULF

R. Zarrad¹, H. Missaoui², M.S. Romdhane², O. Jarboui¹, R. M'Rabet¹ *

¹ Institut National des Sciences et Technologies de la Mer (INSTM), Port de pêche La Goulette 2060 Tunis, Tunisie

² Institut National Agronomique de Tunisie (INAT) - ridha.mrabat@instm.rnrt.tn

Abstract

Sardinella aurita eggs and larvae were investigated in the Tunis Gulf by four seasonal surveys from the summer 2002 to the spring 2003. This species spawns mainly in summer, when the sea surface temperature (25.5°C) and the water stratification were maximal. In this period, eggs were concentrated in the south of Zembra Island and in the west of the Gulf. However, the larvae were concentrated in the centre of the Gulf and in the north of Cape Fartas.

Keywords : *Temperature, Spawning, Ichthyoplankton.*

Introduction

Sardinella aurita is the second most important small pelagic species in Tunisian waters. Indeed, it represents 17.5% (16 000 t) of the small pelagic exploitable biomass [1]. In spite of the fishery importance of the species, there is no information on its early life stage in Tunisian waters. Indeed, this work investigated *Sardinella aurita* egg and larval distributions in the Tunis Gulf in relation to hydrographical conditions.

Material and Methods

Four ichthyoplankton surveys were conducted in the Tunis Gulf, one in each season: summer (August 2002), autumn (October 2002), winter (February 2003) and spring (April 2003). Samples were taken on a grid of 29 stations. Temperature and salinity was measured at each station. CTD profiles were obtained using a Sea-Bird911+. Plankton samples were taken by oblique tows with a 60 cm mouth diameter Bongo gear, fitted with nets of 335 μ m mesh size and a HydroBios flowmeter. Following each tow, the plankton samples were preserved in 4% formaldehyde solution.

Results and Discussion

In summer, the sea surface temperature (SST) ranged between 25.1 and 26.2°C with an average of 25.5°C. A patch of warmer waters was detected near Cape Sidi Bou Said. Column water was stratified and the thermocline was localized between the depths 25 and 45 m. Autumn distribution showed some heterogeneity. The patch of the relatively colder water (20°C) was found near Cape Sidi Bou Said and the patch of warmer waters (22.6°C) was in the south-west of Zembra Island. In winter, surface waters were cold with an average of 13.4°C. The heterogeneity was important and the spatial difference was around 4.2°C. Between the winter and spring (16.1°C) there was a light enhancement of temperature equal to 2.7°C.

Sardinella aurita eggs were found in the Tunis Gulf only in summer and autumn with average abundances 35 eggs/10 m² and 2 eggs/10 m², respectively. In the main spawning period (summer), the highest abundances (221 eggs/10 m²) were obtained in the south of Zembra Island (fig. 1) that extend to the north of Cape Fartas and in the west of the Gulf (116 eggs/10 m²). We note that no eggs were collected in the Bay and in the western coasts. In autumn, only low abundances were localised from Cape Sidi Bou Said to Majreda mouth, in the north of the Gulf and the north of Cape Fartas.

The larvae were most abundant in summer (27 larvae/10 m²). In this season, the highest concentrations (118 larvae/10 m²) were in the north of Cape Fartas and the centre of the Gulf. In autumn, low abundances were localised in the north of Cape Fartas to the north of the Gulf and near Sidi Daoud. However, in winter high abundance (117 larvae/10 m²) was found in the south of Majreda mouth.

In conclusion, there is no significant spatial correlation between the distributions of eggs and larvae and SST. However, our results agree with the studies in the Mediterranean [2, 3] that this species spawns mainly in summer, with maximal SST and water stratification.

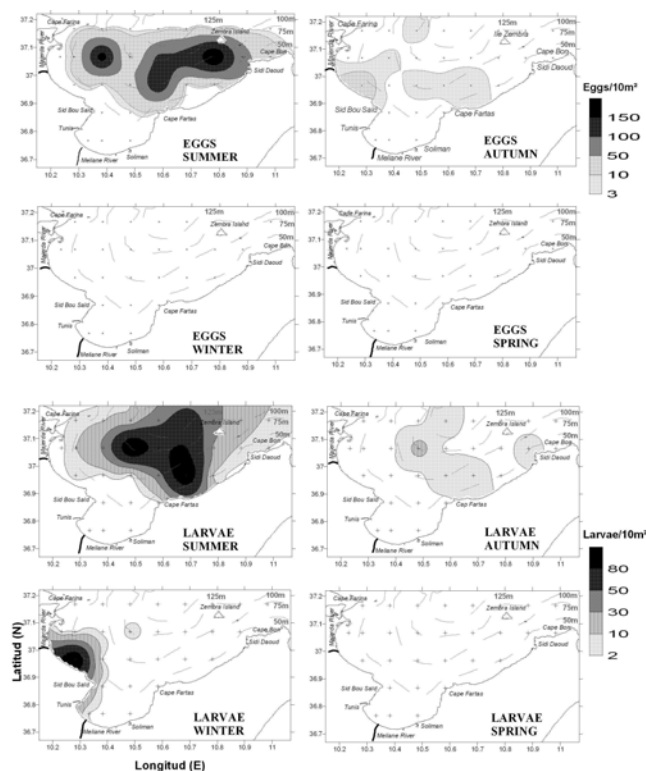


Fig. 1. *Sardinella aurita* eggs and larval distributions in the Tunis Gulf.

References

- 1 - Ben Abdallah L. and Gaamour A., 2004. Répartition géographique et estimation de la biomasse des petits pélagiques des côtes tunisiennes. In: Levi D., Bahri T., Basilone G., Ben Abdallah L., Bonanno A., Gaamour A., Patti B. and R. Zarrad (eds), Rep. E. C. on Small Pelagic Fishes: stock identification and oceanographic processes influencing their abundance and distribution. MedSudMed Tech. Doc. n° 5: 28-38.
- 2 - Ben Tuvia A., 1959. Synopsis of biological data on *Sardinella aurita* of Mediterranean and other waters. FAO Fish. Biol. Synop., 14: 287-312.
- 3 - Palomera I. and Sabatés A., 1990. Co-occurrence of *Engraulis encrasicolus* and *Sardinella aurita* eggs and larvae in the northwestern Mediterranean. Sci. Mar., 54(1): 61-67.