



# Monitoring the reproductive status of resident and migrant Atlantic bluefin tuna in the Strait of Gibraltar

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**ABSTRACT:** Two distinct contingents of Atlantic bluefin tuna (ABFT), migrants and residents, occur in the Strait of Gibraltar (SoG). Long-term residents are commercially exploited all year round using hook and line gears, whereas migrants are caught by traps in springtime as they pass through the SoG towards Mediterranean spawning grounds. While reproductive features of migrants have been widely studied, the life history of residents remains poorly investigated. The relative contribution of this subpopulation to ABFT eastern stock productivity is therefore unknown. Reproductive traits of resident ABFT were monitored throughout the year, and were compared with those of migrants crossing the SoG in spring. To assess maturation timing, gonads were classified into maturation stages based on histological features. Our results indicate biometric and reproductive differences between SoG residents and migrants. ABFT caught by hook and line gears were smaller on average than those collected from traps. The females sampled from the hook and line fishery in May and early June showed, on average, significantly lower GSI values than those caught by trap. In contrast, the GSI values of males sampled in May were not significantly different between gears. Histological analyses showed a more advanced reproductive condition in trap-caught migrants. Delayed maturation schedules of residents in comparison to migrants would result in less egg production and poorer larval survival rates. The present findings encourage further investigation of reproductive schedules in unstudied subpopulations for a better understanding of ABFT dynamics.

**KEY WORDS:** *Thunnus thynnus* · Strait of Gibraltar · Migrants · Residents · Reproduction · Gonad histology

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## 1. INTRODUCTION

The Atlantic bluefin tuna (ABFT) *Thunnus thynnus* (Linnaeus, 1758) is a highly migrant teleost that has been heavily exploited across its range, which spans the Atlantic and Mediterranean seas (Mather et al. 1995). Two distinct but intermixing ABFT stocks (western and eastern) are recognised by the International Commission for the Conservation of Atlantic Tunas (ICCAT) based on the location of their respective spawning grounds, either the Gulf of Mexico or

the Mediterranean Sea (Mather et al. 1995, Teo & Boustany 2016, Porch et al. 2019).

Evaluation of the reproductive performance in fishes is important to improve estimations of spawning potential, stock-recruitment analyses and predictions of the impact of environmental changes in the population productivity (Morgan & Bratley 2005, Spencer & Dorn 2013). Thorough monitoring of the reproductive biology of fishes is thus essential to understand their population dynamics and provide scientific advice for fisheries management and con-

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