



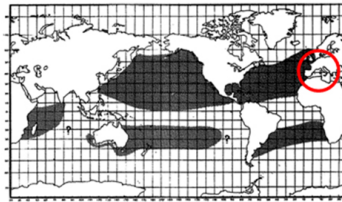
Findings Of The Neon Flying Squid *Ommastrephes bartramii* (Cephalopoda: *Ommastrephidae*) In The Eastern Aegean Sea: Evidence Of Its Spawning Ground Expansion



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INTRODUCTION

The neon flying squid is a cephalopod distributed in subtropical and partly temperate waters of both hemispheres [1]. It is a migratory species which moves from subtropical spawning to subarctic feeding grounds [2]. Females are generally larger than males, reaching a mantle length (ML) up to 900 mm. Within the Aegean (eastern Mediterranean) its reported frequency has increased considerably over time. The first sighting of this species on the South Aegean was reported in 1976 [3]. Findings in the Cretan Sea (South Aegean) have suggested a permanent population which forms dense schools at 200-250 m [4]. Along the north coast of Crete there have been several strandings of large (mature) females. These facts have led to the proposal of the basin of Crete as an *O. bartramii* spawning ground [5].



[Cephalopods of the World; 1984 & 2010]

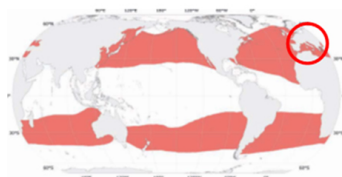


Fig. 1

O. bartramii penetrates into warm and cold boundary currents travelling within subtropical gyres and is generally found at the sea surface between temperatures of 10 to 25°C [1]. It is proposed that its abundance is directly linked to water temperature and salinity, with temperature being the principal component of this correlation. It has been described as a moderately high (150-300 gC/m²-yr) productivity ecosystem where the zooplankton biomass fluctuates within the year [6].

FINDINGS

Two individuals were found on March 2012:

- Mature female (Fig. 2)
- Incomplete specimen identified by its tentacles

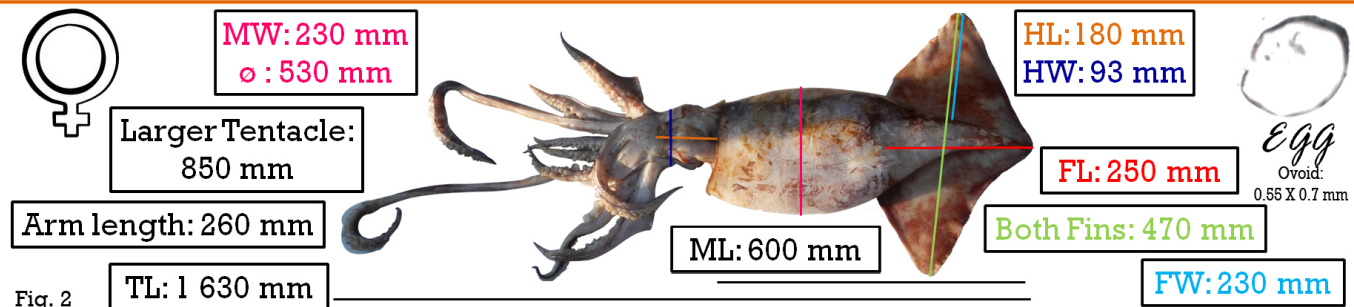


Fig. 2

CONCLUSIONS AND DISCUSSION

The Levantine Intermediate Water (LIW; Fig. 3) is a warm body of water and the most saline water mass in the eastern Mediterranean basins [7]. LIW originates from the Cretan Sea [8], and flows until Lemnos Island in the North Aegean [9]. Due to global warming and meteorological forcing, the thermohaline conditions of the eastern Mediterranean have risen since the 1990s. The temperature increase of the upper water column has led to an up-welling of nutrient rich deeper waters (like the LIW), which may enhance biological activity [10]. Slight changes in water temperature have potential to significantly impact upon cephalopod's growth patterns [11] and distribution. Therefore, the present findings support the theory that global warming alterations in the LIW are partially responsible for the increasing trend of *O. bartramii* encounters within the eastern Mediterranean, and are potentially altering its growth patterns. Ocean temperature is predicted to continue rising over time as a consequence of climate change; if so, alien species will thrive and accelerate settlement [12]. As such, we expect the distribution of *O. bartramii* to continue expanding Northwards in the Aegean Sea with a resultant increase in findings in the eastern coast and islands.

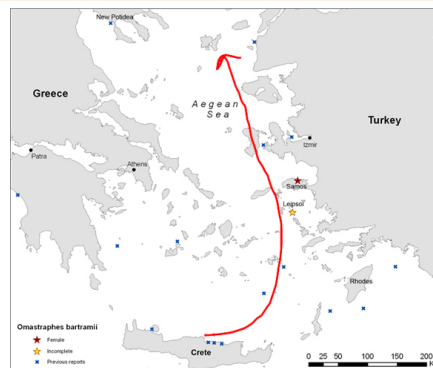


Fig. 3: Map of the Aegean Sea showing findings of *O. bartramii*. Blue crosses (x) indicate past findings. Findings of the present report are indicated by stars. ☆: Incomplete squid (Mouth, tentacles and arms); ★: Mature female. Location of past findings [5]. Map created by Kristiina Hakkala.

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