

**Appearance or disappearance of species vs. global warming. Are the outbreaks timing of *Pelagia noctiluca* (Forskäl, 1771) getting more frequent in the Mediterranean basin?**

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The holoplanktonic scyphomedusa *Pelagia noctiluca* (Forskäl, 1771) is known to reach cyclic outbreaks in the western Mediterranean Sea. Major outbreaks have been noticed during the years 1957–1959, 1969–1970, 1982–1984 and 1993–1995. The analysis of recent decades however suggests that the intensity, timing and distribution of *Pelagia noctiluca* populations outbreaks is changing under environment and/or climate factors.

In this work, we investigated decadal records of population density changes of *Pelagia noctiluca* size in different Mediterranean areas (Balearic Sea, Gulf of Tunis, North and South Adriatic Sea and Aegean Sea).

Three different patterns are observed: in the Aegean Sea, outbreaks occur repeatedly every 10 years and persisting 2 or 3 years; in the Balearic Sea this current pattern is observed but the cyclicity and the durability of the outbreaks is changing since 1997 with important outbreaks observed from 1998 to 2000; in Tunis Gulf and until 2007, the outbreaks periodicity is 11–12 years similar to that described by Goy *et al.* (1989) for the West Mediterranean Sea.

In addition, non – regular events are observed: in Tunis Gulf, the outbreaks appear generally in November and last till January. During the warmest years in 1999 and 2003, outbreaks events were detected over a whole Western Mediterranean Sea. The recent timing and installation of *Pelagia noctiluca*, observed from 2003 until 2008, is exceptional for the South Western Mediterranean basin with densities reaching 27,4 individual.m<sup>-3</sup> in January 2005 in the Gulf of Tunis and 38,2 ind.m<sup>-3</sup> in the same area in January 2008. The dynamic of outbreaks in the North and South Adriatic Sea is more difficult to understand. It seems that the periodicity of outbreaks is about 20 years, but in those areas when *Pelagia noctiluca* outbreaks, local hydrological and trophic conditions seems to be favourable to maintain high abundance of *Pelagia noctiluca* for period lasting for more than 10 years.

Such recent ecological changes observed in the timing and strength of *Pelagia noctiluca* outbreaks appeared related to large – scale atmospheric fluctuations ultimately mediated by the ocean – atmosphere system playing out in the Atlantic Ocean.