First bloom of Ostreopsis cf. ovata in the continental Portuguese coast

Blooms of Ostreopsis in coastal areas are a topic of increasing interest, mainly in the Mediterranean area, due to the potential hazard that species of this genus might cause to human health and the consequent negative effect on the tourism economy. In contrast to typical blooms of other planktonic dinoflagellates, Ostreopsis, as an epibenthic genus, proliferates to form a thin pellicle that covers the substrate. Cell aggregates are normally released into the water column after events of increasing hydrodynamism (waves, tides). These aggregates are detectable by sight as mucilaginous flocs in the water column and at surface in shallow waters. During the last decade, records of Ostreopsis events have been increasing in the Mediterranean. Following outbreaks in the W Mediterranean, in the Balearic Islands in 2005 and on the Murcia coast of Spain in 2006, Ostreopsis spp were detected in the NE Atlantic, in macroalgae samples from Madeira and the Canary Islands [1]. The species was later identified as O. cf. ovata [2]. On the Moroccan Atlantic coast off Cape Ghir, O. cf. siamensis was observed for the first time in 2004 and blooms have been increasing in intensity and frequency since then [3]. In 2008, several fishermen from the Portuguese Selvagens Islands (located at the same latitude as Cape Ghir) became sick after eating a fish from the genus Seriola. The phytoplankton community present in seawater samples from those islands and provided to the IPIMAR monitoring programme revealed the presence of Ostreopsis spp., although the relationship with the syndrome was not established. On the Portuguese mainland, during 2008, Ostreopsis cf. siamensis was identified for the first time in the SW upwelling coast of Sines [4]. In the same year, this species was detected in the Portuguese mid-Atlantic Azores Archipelago together with O. heptagona and O. cf. ovata [5].

In September 2011, as part of a sampling program started in 2010 [6], a bloom of Ostreopsis was seen on the beach of D. Ana (Lagos coast, south Portugal, Fig. 1) due to the presence of mucilaginous filaments. This information was communicated to IPIMAR, the national phytoplankton monitoring laboratory, which intensified sampling in time and in adjacent areas. The bloom reached densities as high as 5420 cells L⁻¹ although concentrations were lower (40 to 320 cells L⁻¹) in adjacent areas. A forecast of bloom transport and aggregation/dispersion was made with the MOHID operational model for the Portuguese coast (http://forecast.maretec.org/), under the framework of FP7-ASIMUTH project (IST-IPIMAR). Local authorities closed several beaches for bathing once informed about the bloom occurrence and model predictions for its transport.

Identification of Ostreopsis solely on morphological criteria is difficult, even when details of the thecal plates are taken into account. As in most Ostreopsis blooms, there was great morphological and size variability in cells from the Lagos coast. Cell dimensions fell within the range of O. cf. siamensis and O. cf. ovata and were smaller than the other described Ostreopsis species (Figs. 2 and 3). Due to the difficulty of finding a conclusive morphological identification, a genetic analysis was performed to both field and cultured strains based on the ITS1-5.8S-ITS2. Genetic analyses revealed the presence of Ostreopsis cf. ovata. Our sequences, when compared...
to the ones of GenBank showed high similarity (99%) with strains from the Mediterranean Sea (e.g. Aegean Sea, Catalan Coast, and Tyrrhenian Sea) [2].

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Fig. 3. Field sample of Ostreopsis: (a) Light microscopy; (b) Calcofluor stained specimens showing morphological variability.

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