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ABSTRACT BOOK

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Mass mortality events in marine protected areas: the case of *Pinna nobilis* (Mollusca, Bivalvia)

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Introduction: Marine Protected Areas (MPAs) represent a privileged observatory to monitor disease outbreaks in the marine environment. Recently, several episodes of mass mortality events (MME) of the noble pen shell *Pinna nobilis* occurred in different parts of the Mediterranean Sea. In the present work we report a MME occurred in 2018, involving a protected population of *P. nobilis* within the MPA of Porto Cesareo (Southern Italy, Ionian Sea) which had been previously characterized and monitored within the framework of the "Marine Strategy" Directive (2008/56/EC).

Methodology: Data on abundance and size structure of the *P. nobilis* population had been collected since September 2017 through scuba diving visual census. Following a MME occurred in June 2018, one moribund specimen was sampled by professional divers of Porto Cesareo MPA within the reserve boundaries. The specimen was subjected to a complete diagnostic exam, including parasitological, histopathological and molecular analyses.

Results: The mortality affected 100% of the protected population. The diagnostic exams allowed to detect the presence of *Haplosporidium pinnae*, identified through amplification and sequencing of partial 18S rDNA region, in the intestine and digestive gland. Histopathological analyses revealed the presence of haplosporidian-like protozoa in different life cycle stages within the digestive gland. The epithelium of digestive tubuli showed a diffused degeneration with extended infiltrate of brownish pigment referable to brown cells, which replaced almost completely the decaying glandular tissue.

Conclusion: *Haplosporidium pinnae* has been already indicated as responsible for other MME of *P. nobilis* occurred in Western and Central Mediterranean Sea. The implementation of routine monitoring programs to assess the presence and distribution of transmissible agents in wild marine environment is an essential step to protect biodiversity. Such procedures are especially relevant within the context of a MPA, and should focus on the identification of sanitary risks that could impair conservation efforts. With respect to *H. pinnae*, further studies aimed at elucidating the life-cycle of the parasite and its causative role in recent MME of noble pen shell are of primary importance for a correct management and successful conservation of *P. nobilis* populations.

Keywords: mass mortality, marine protected areas, *Pinna nobilis*, *Haplosporidium pinnae*