NOTE

First report of *Amyloodinium ocellatum* in farmed meagre (*Argyrosomus regius)*

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Abstract
The regular monitoring of parasitic infections in a meagre (*Argyrosomus regius*) population reared in polyculture with gilthead seabream (*Sparus aurata*) revealed that the ectoparasite dinoflagellate *Amyloodinium ocellatum* was present in both species. This parasite was detected in July 2011 and affected differently the two reared species with meagre being more resistant than seabream. This is the first report of the occurrence of *A. ocellatum* in farmed meagre.

Amyloodinium ocellatum is a parasite that causes serious problems on cultured fish either in intensive production tanks or in ornamental fish aquaria (Noga and Levy, 1995). This disease is a major bottleneck in semi-intensive aquaculture production in Southern Europe where amyloodiniosis cause high mortalities in large number of fish farms. This parasite has been reported in aquaculture in the Mediterranean area (Alvarez-Pellitero et al., 1993; Fioravanti et al., 2006) and in the neighboring region of Eilat in the Red Sea (Paperna, 1980). In Portugal the disease was first diagnosed in 1994 in gilthead seabream (*Sparus aurata*) reared in aquaculture (Menezes, 1994) and latterly in natural populations of seabass (*Dicentrarchus labrax*) from the Óbidos coastal lagoon and the Sado estuary (Menezes, 2000). Since early 2000 it has been detected every year in Portuguese fish farms causing high mortalities in seabream, seabass and more recently in turbot (*Psetta maxima*) (Saraiva et al., 2011).

Meagre (*Argyrosomus regius*) is a recent species produced in Southern Europe aquaculture (France, Spain, Italy and Portugal). Ongrowing protocols are similar to those used for culturing European seabass (*Dicentrarchus labrax*) and gilthead seabream (*Sparus aurata*). Limited data exist on diseases of meagre, with most records related to those reared in cages in the Mediterranean area which include infections with *Sciaenocotyle* spp. (Monogenea) (Merela et al., 2009; Ternengo et al., 2010), *Microcotyle pancerii* (Monogenea) (Quilichini et al., 2009), *Benedenia sciaenae* (Monogenea) (Toksen et al., 2007), *Calceostoma* spp. (Monogenea) (Duncan et al., 2008), *Philometra* sp. (Nematoda) (Moravec et al., 2007).

Ongrowing experiments with meagre in poly-

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culture with seabream (*Sparus aurata*) in 2500 m^2 earth ponds at IPIMAR's Aquaculture Research Center in Olhão, Portugal, started in August 2009. In July 2011, amyloodiniosis was detected in meagre for the first time when they represented 50% of the total biomass present in the pond with a density of 0.75 Kg/m^3. The mean weight of meagre and seabream at that time was respectively 423±110.5 g and 481±92.9 g. Daily water replenishment was 40% of the total volume of the pond and feeding rate was 2.2% of the total biomass delivered four times during the day. The outbreak happened after a period of neap tides and high water temperatures (>27 ºC). During the outbreak, which lasted for 2 months, fish were examined for presence and identification of parasites twice a week. Five specimens from each species (meagre and seabream) were captured, anaesthetized and euthanized by spinal cord sectioning. The first two branchial arches from the left side of the fish were removed for microscope observation and identification of ectoparasites. Two days after detection of *Amyloodinium* in fish there was high mortality in seabream (29% of total seabream in 2 days) but mortality of meagre was only 1.2%. During this period meagre feeding behavior was affected with few individuals in the usual feeding zone and with slower swimming movements. Seabream were seen in shoals close to the margins of those ponds where amyloodiniosis was detected. They were not seen feeding together with meagre as is their normal behaviour. Meagre started to feed normally twenty days after first detection of the disease, whilst seabream did not commence normal feeding until thirty days following first detection. The parasite was not detected in an earth pond with meagre monoculture. In this pond the environmental conditions were similar as in the trial with polyculture but the total biomass was lower.

Although meagre showed lower mortality than seabream, their gills revealed the occurrence of trophonts (parasitic stage of *A. ocellatum*) (Figure 1A) at similar levels to those seen in seabream. In both species, tomonts (parasitic reproductive

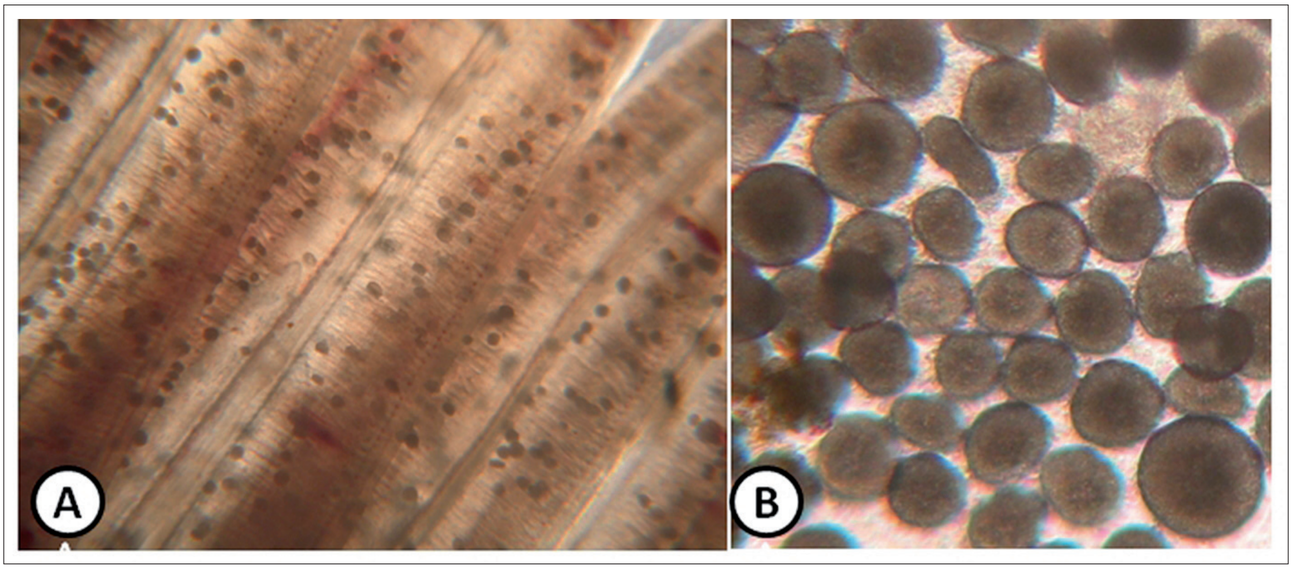

Figure 1. A – *Amyloodinium ocellatum* trophonts in meagre (*Argyrosomus regius)* gills (40x) **B**- *Amyloodinium ocellatum* tomonts detach from meagre (*Argyrosomus regius)* gills (100x).

stage) were observed detaching from the gills (Figure 1B). This stage of *A. ocellatum* undergoes several divisions and gives rise to many infective dinospores (free living stage) which become trophonts when they attach to fish gills and other exposed epithelia. Trophonts attach to host cells by the feeding apparatus. They break through the gill surface and feed along the lamellae causing hyperplasia and necrosis of the epithelium. Observed meagre and seabream gills showed extensive areas of such kind of affliction and with similar frequency. The observed higher mortality in seabream suggested that meagre might be more resistant to amyloodiniosis. Further studies need to be developed to confirm this explanation since there are several productions and environmental factors to be taken into consideration. It seems however that the biology of each species is a strong factor to explain differences in reaction to *Amyloodinium*.

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