



ORAL PRESENTATION #213

Increased resistance against marteiliosis in the cockle *Cerastoderma edule* population of the inner area of the Ría de Arousa (Galicia NW Spain) through natural selection.

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Infection of cockles *Cerastoderma edule* with the protistan *Marteilia cochillia* was first detected in Galicia in 2012; it caused the cockle fishery collapse in the Rías de Arousa, Pontevedra and Vigo. Surveillance of marteiliosis in the inner area of the Ría de Arousa showed that its prevalence and the cockle mortality trended to decrease since 2017. Additionally, cockles collected from Noia (Ría de Muros-Noia), where marteiliosis outbreaks have never been detected, and transplanted into the shellfish bed of Lombos do Ulla (inner area of Ría de Arousa) in 2017 and 2018, showed higher marteiliosis prevalence and mortality than the cockles naturally recruited in Lombos do Ulla. These results suggested the hypothesis that marteiliosis-resistance was being enhanced in the inner area of the Ría de Arousa through natural selection.

A study was launched to (1) test the above mentioned hypothesis, (2) assay every stage in the process of restoration in marteiliosis-affected cockle beds, involving two shell-fisher associations, and (3) validate fifty candidate genetic markers of marteiliosis-resistance identified through population genomic and transcriptomic approaches, which can be used in marker-assisted selection programmes. Adult cockles were collected from Lombos do Ulla (hypothetically, resistant stock) and from Noia (susceptible stock) in May 2020 and transported to the hatchery facilities of ECIMAT, to be used as broodstock. Various batches of cockle seed obtained from each stock were transferred to a raft in the Ría de Arousa for outdoor pre-growing in August 2020. Two months later, batches of cockle seed from each stock were deployed in two shellfish beds of the Ría de Arousa, namely Ariño and O Sarrido, where mortality and prevalence and severity of marteiliosis are being surveyed. Cockles of the susceptible stock have been heavily affected by marteiliosis (prevalence >90%), reaching very high cumulative mortality (>90%) in each bed, in March and April 2021, respectively, whereas cockles of the hypothetically resistant stock have been very lightly affected by marteiliosis











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(prevalence <5%) and show significantly higher survival in both beds. These results confirm the marteiliosis-resistance of the stock from the inner area of Ría de Arousa and its potential for restoring marteiliosis-affected beds.



EAFP 2021 20 - 23 September • Virtual

