APC1.25 CRUDE OIL EXPOSURE DOES NOT AFFECT THE CONTRACTILE PROPERTIES OF MAHI MAHI *(CORYPHAENA HIPPURUS)* CARDIAC MUSCLE

TUESDAY 5 JULY, 2016 **POSTER SESSION**

TERENCE S GARNER (UNIVERSITY OF MANCHESTER, UNITED KINGDOM), HOLLY A SHIELS (UNIVERSITY OF MANCHESTER, UNITED KINGDOM), JOHN STIEGLITZ (UNIVERSITY OF MIAMI, UNITED STATES), DANIEL D BENETTI (UNIVERSITY OF MIAMI, UNITED STATES), GINA LJ GALLI (UNIVERSITY OF MANCHESTER, UNITED KINGDOM), DANE A CROSSLEY II (UNIVERSITY OF NORTH TEXAS, UNITED STATES), MARTIN GROSELL (UNIVERSITY OF MIAMI, UNITED STATES)

@ TERRYSGARNER@GMAIL.COM

In 2010, the Deepwater Horizon oil spill released 210 million gallons of crude oil into the Gulf of Mexico. Crude oil has been shown to have cardiotoxic effects on fish and prior work on mahi mahi has highlighted a reduced cardiac output in response to short-term oil exposure. We investigated the effects of acute and chronic crude oil exposure on the contractility of isolated cardiac tissue from adult mahi mahi and used chemical inhibitors to identify any effect on calcium cycling targeting the sarcoplasmic reticulum and adrenergic signalling pathways. Direct exposure of cardiac muscle to high energy water accommodated fractions (HEWAF) of crude oil at 10% concentration had no effect on muscle contractility. Further, cardiac tissue collected from fish exposed to 10% HEWAF solution for 24h did not display reduced contractility, compared with controls. Concurrent with this, there was no difference in the contribution of the sarcoplasmic reticulum to contractility between fish exposed to HEWAF for 24h and unexposed fish. Our data is consistent with the effects of oil on cellular calcium cycling in mahi mahi but contrary to data previously obtained for bluefin tuna and suggests that the reduced cardiac output previously observed in juvenile mahi mahi after oil exposure may result from some factor other than contractility.

APC1.26 INTERACTIVE EFFECT OF OCEAN ACIDIFICATION AND SALINITY REDUCTION ON ECOPHYSIOLOGICAL PERFORMANCE OF EUROPEAN SEABASS *(DICENTRARCHUS LABRAX)*

TUESDAY 5 JULY, 2016 **POSTER SESSION**

NITIN PIPRALIA (UNIVERSITY OF ANTWERP, BELGIUM), AMIT KUMAR SINHA (UNIVERSITY OF ANTWERP, BELGIUM), RONNY BLUST (UNIVERSITY OF ANTWERP, BELGIUM), GUDRUN DE BOECK (UNIVERSITY OF ANTWERP, BELGIUM)

@ NITIN.PIPRALIA@UANTWERPEN.BE

A rise in pCO_2 results in higher dissolution in ocean surface water. This leads to a decrease in ocean pH, referred as ocean acidification. This is a potential threat to marine fish, and effects may get worse for estuarine fish which deal with the additional stress of salinity changes due to the migration into low salinity water. To understand the interactive impact of these two environmental stresses on the ecophysiological performance of fish, we investigated various physiological, biochemical and ion-regulatory adaptive response in European sea bass at pCO_2 levels of 380 µatm, 900 µatm and 1900 µatm, along with salinity gradients of 32ppt, 10ppt and 2.5ppt. Overall, we hypothesize that effect of ocean acidification would be exacerbated with a shift to decreased ambient salinity. Plasma acid-base balance, iono-osmoregulation, oxygen consumption, ammonia metabolism, energy budget and ion-regulatory enzymes were assayed as the potential indices of compensatory responses. Results show that ammonia excretion rate was facilitated under the combined effect of ocean acidification and salinity reduction while oxygen consumption and hepatic energy budget of fish were well regulated. Acid-base balance in terms of plasma pH and HCO_3- were adversely affected following ocean acidification and salinity stress as single and combined factor. Na^+ and Cl^- levels in plasma remained stable, suggesting an excellent ion-regulatory capacity of the fish which was also reflected by the kinetic profile of Na^+/K^+-ATPase activity. In brief, the combined effect of ocean acidification and salinity reduction significantly affect the fish acid-base balance, but not iono-osmoregulation or energy metabolism.

APC1.27 THE PHYSIOLOGY OF GROWTH IN THE BLOOM-FORMING GREEN ALGA *ULVA SPP*

TUESDAY 5 JULY, 2016 **POSTER SESSION**

KEVIN J YUN (DURHAM UNIVERSITY, UNITED KINGDOM), CHRISTOPHER D SAUNTER (DURHAM UNIVERSITY, UNITED KINGDOM), JOHN H BOTHWELL (DURHAM UNIVERSITY, UNITED KINGDOM), GEORGIA E CAMPBELL (DURHAM UNIVERSITY, UNITED KINGDOM), TIM J HAWKINS (DURHAM UNIVERSITY, UNITED KINGDOM)

@ JONGKUK.YUN@DURHAM.AC.UK

Macroalgal blooms ('green tides') are a growing problem on many coastlines worldwide, including here in the UK. These blooms can suffocate marine life and decimate local populations, but their environmental and anthropogenic drivers remain poorly understood. Accordingly, we are using the bloom-forming green seaweed species, *Ulva spp.* (a.k.a. 'sea lettuce') to understand how the physiology of their growth and reproduction can both lead to blooms and be exploited for conservation. Using a combination of mathematical modelling, high-resolution imaging, and molecular approaches, we ask two main questions: a) how do physiological responses at the cellular scale drive seaweed thallus growth and b) how can patterns of thallus growth inform marine conservation efforts? Currently, the main method of tracking the growth of macroalgal biomass is its physical removal and measurement on weighing scales. This method is limited by its poor temporal resolution and intrusiveness. We have therefore developed an optical imaging system linked to automated image analysis software to allow real-time measurement of circadian growth rhythms in response to the environmental factors that determine *Ulva spp.* proliferation. These macroscopic growth results are supplemented by Light Sheet Microscopy data of stained samples, which correlates overall growth rates with patterns of cellular size and distributions. This combination of methods provides much greater resolution of the growth responses of *Ulva* in various conditions; this is now being linked to global bloom formation using hydrodynamic models.