The effect of ozone treatment on egg and larvae performance in the gilthead seabream Sparus aurata and other marine fish species.

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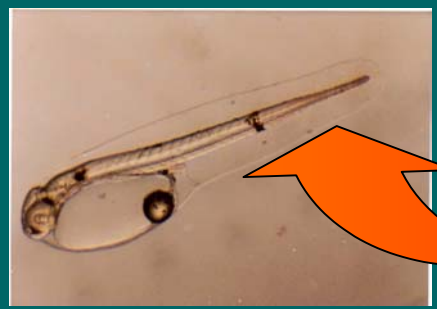
Pathogens transport axis

O_3



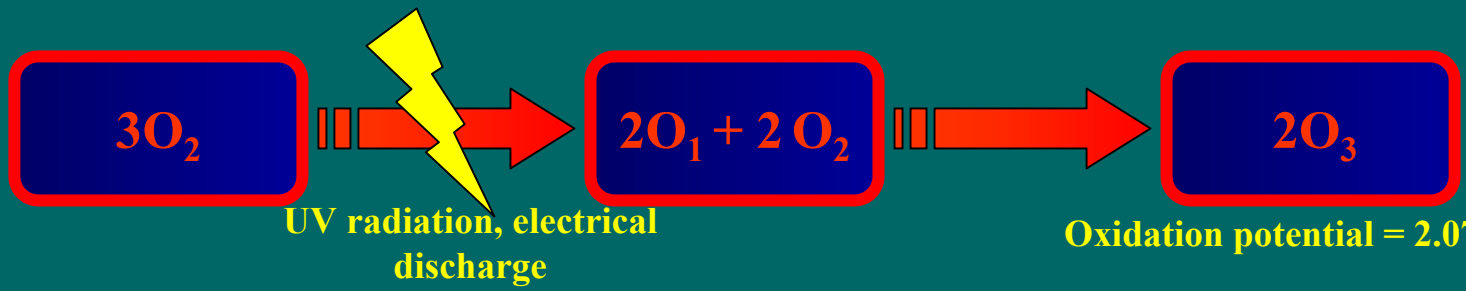
Ozone as a prophylactic agent*

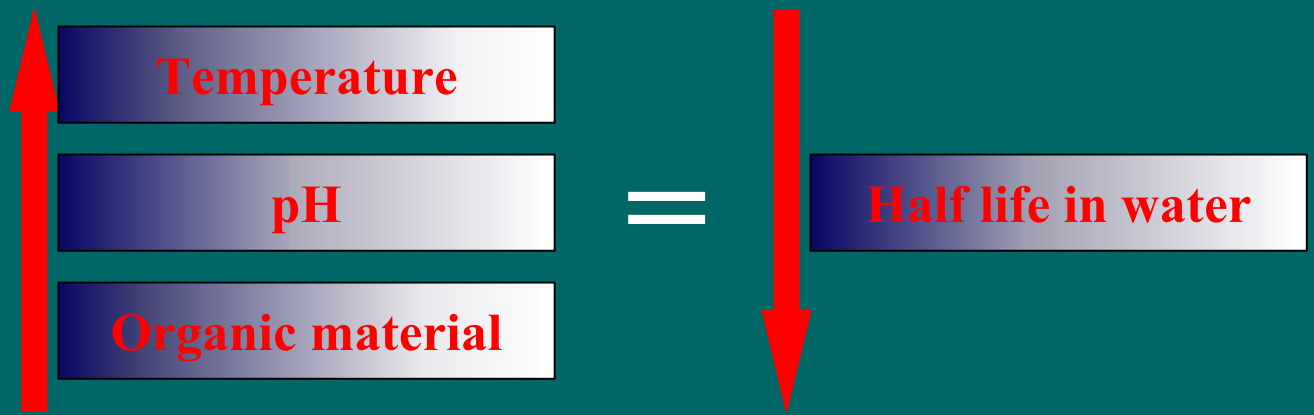
disinfectants	viruses inactivation	bacteria inactivation	cysts inactivation
ozone	1.00	0.60	1.40
chlorine	6.00	0.90	201
iodophore	not effective	1.00	not effective

CT value = Concentration(mg/L) x Time(minutes)

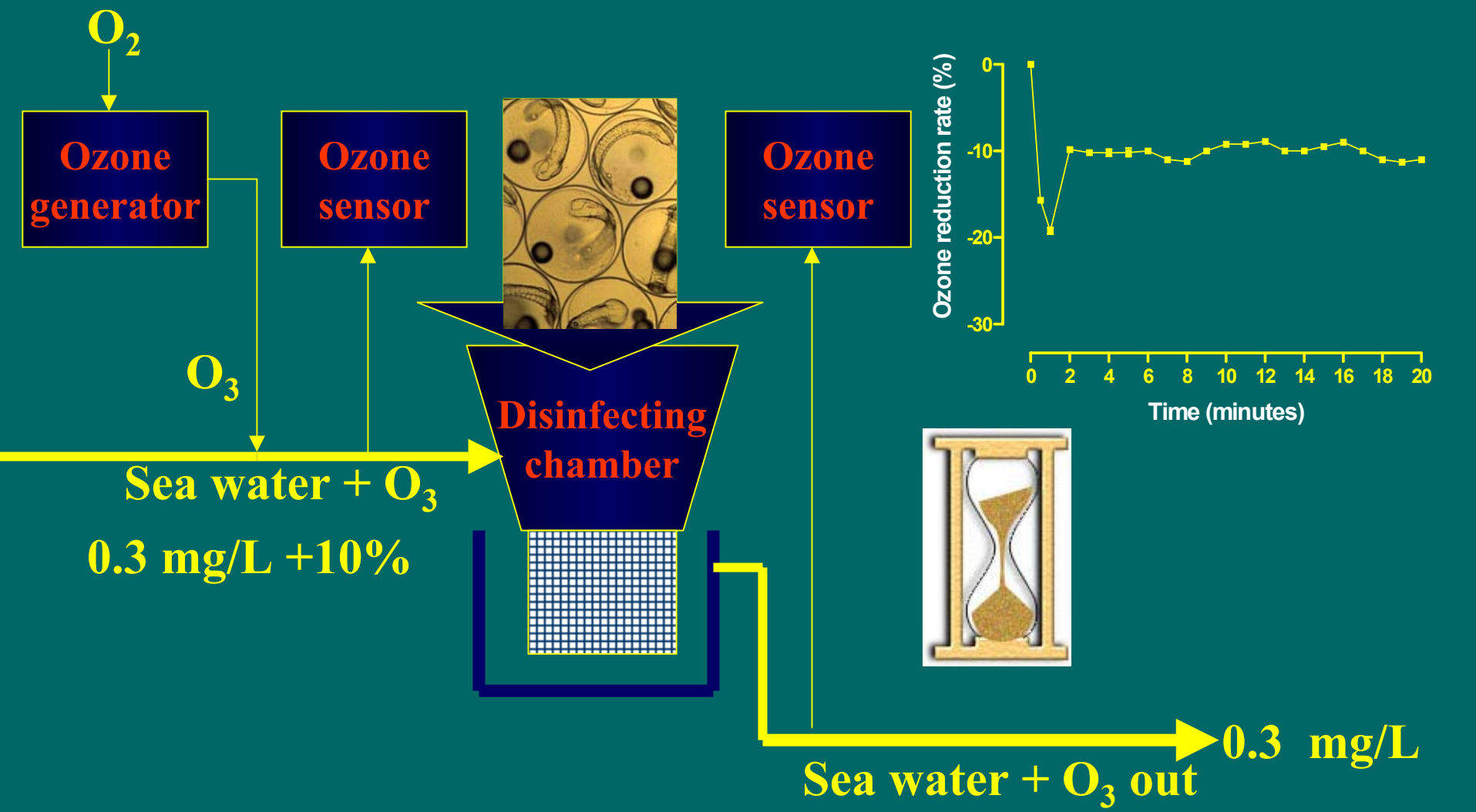
*Harrison. J. F and Blazek. P (1997)

Ozone physical and chemical properties





The disinfecting method



Methods

Non treated

Washing with sterile seawater

Ozone treatments at concentration of 0.3mg/L

Samples for bacterial growth detection

16 min

8 min

4 min

2 min

Control

CT 0

CT 4.8

CT 2.4

CT 1.2

CT 0.6

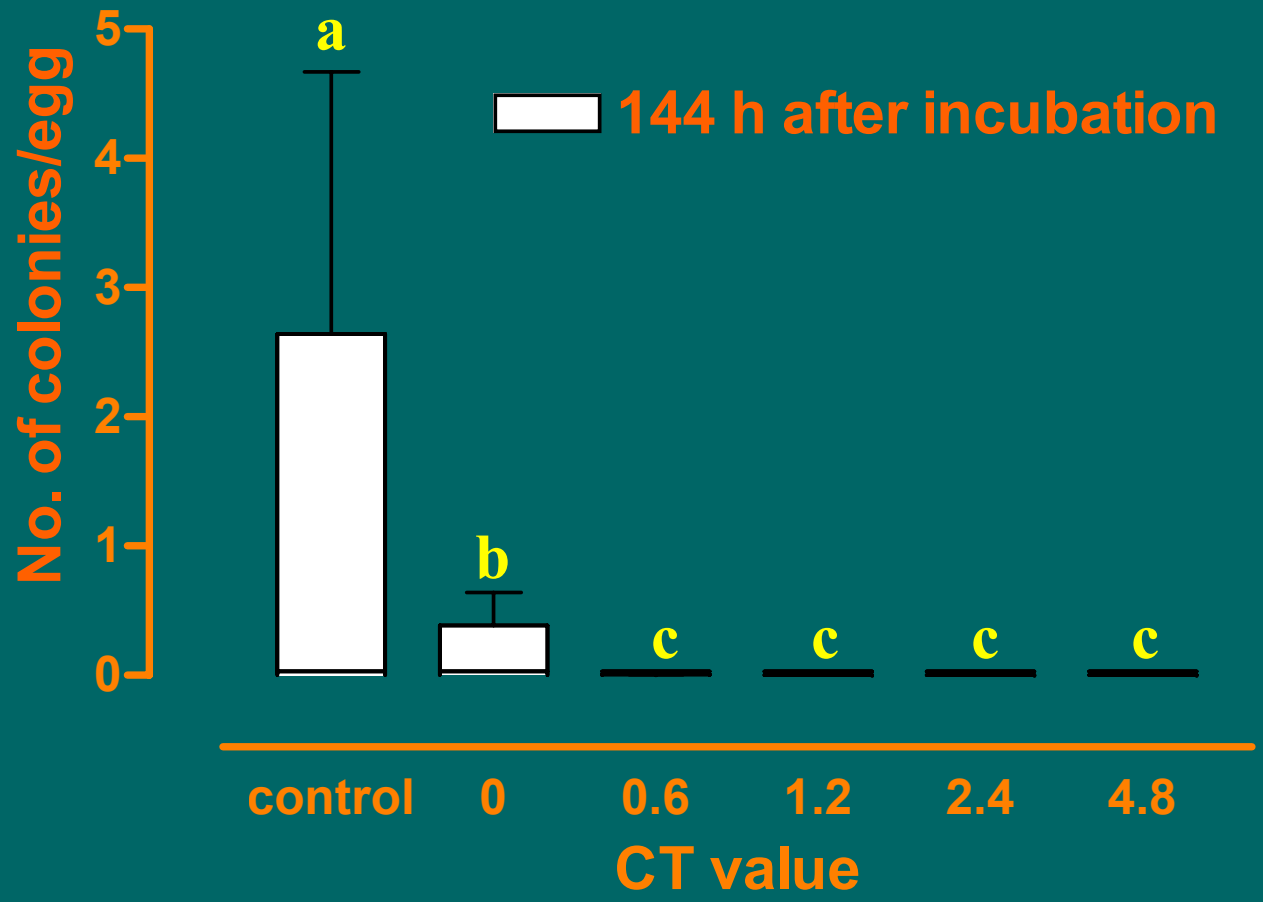
Hatching

Survival

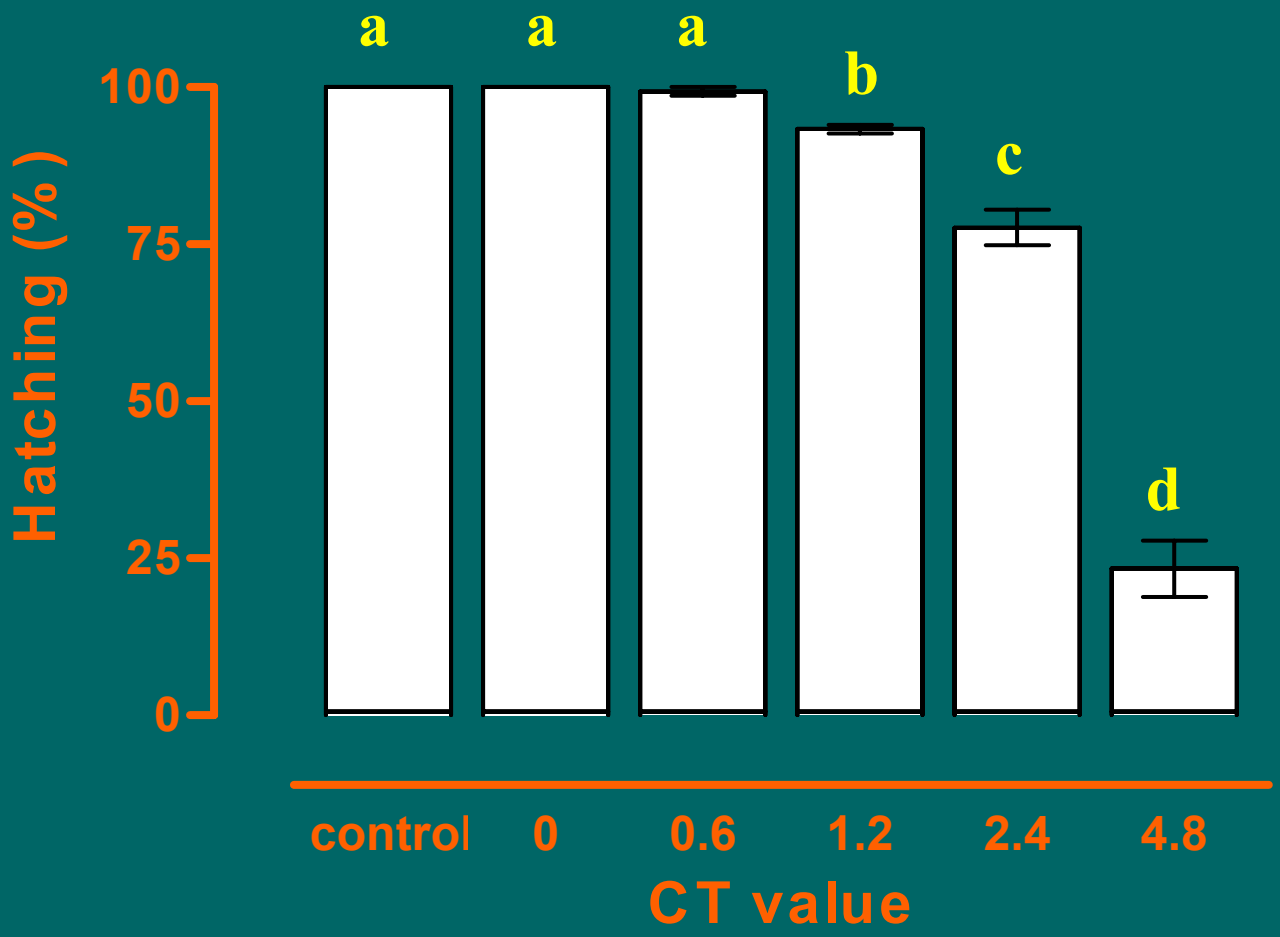
Swim bladder inflation

Larvae deformation appearance

The effect of ozone treatments in gilthead seabream eggs on bacterial growth in marine agar



The effect of ozone treatment in gilthead seabream egg on the ability of larvae to hatch



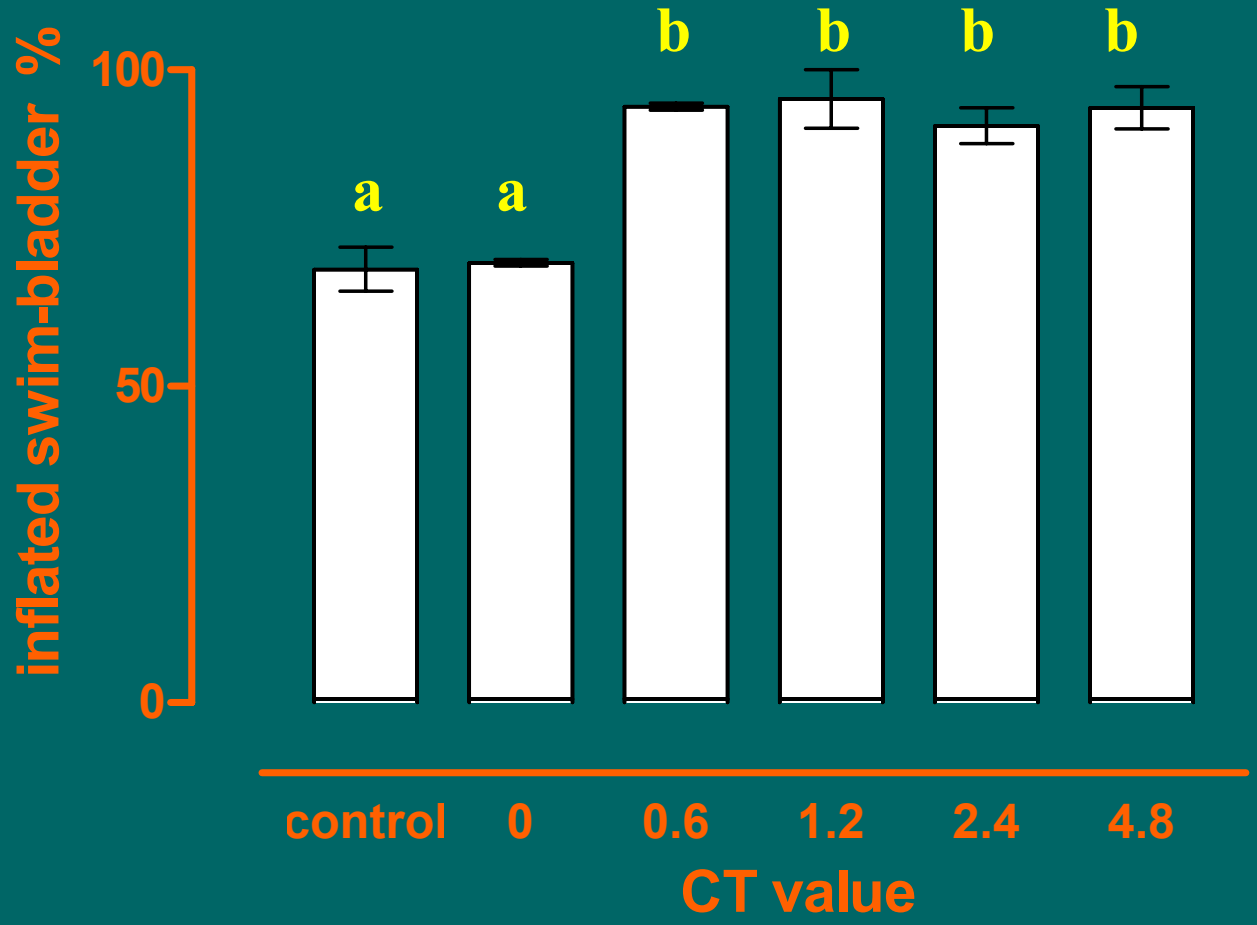
Effects of prophylactic treatment on larval performance

Previous studies showed:

- connection between non inflation of larval swim bladder and bacteria infection *.

*Marty et al. (1995)

The effect of ozone treatments in seabream egg on swim-bladder inflation



Effects of prophylactic treatment on larval performance

Previous studies showed:

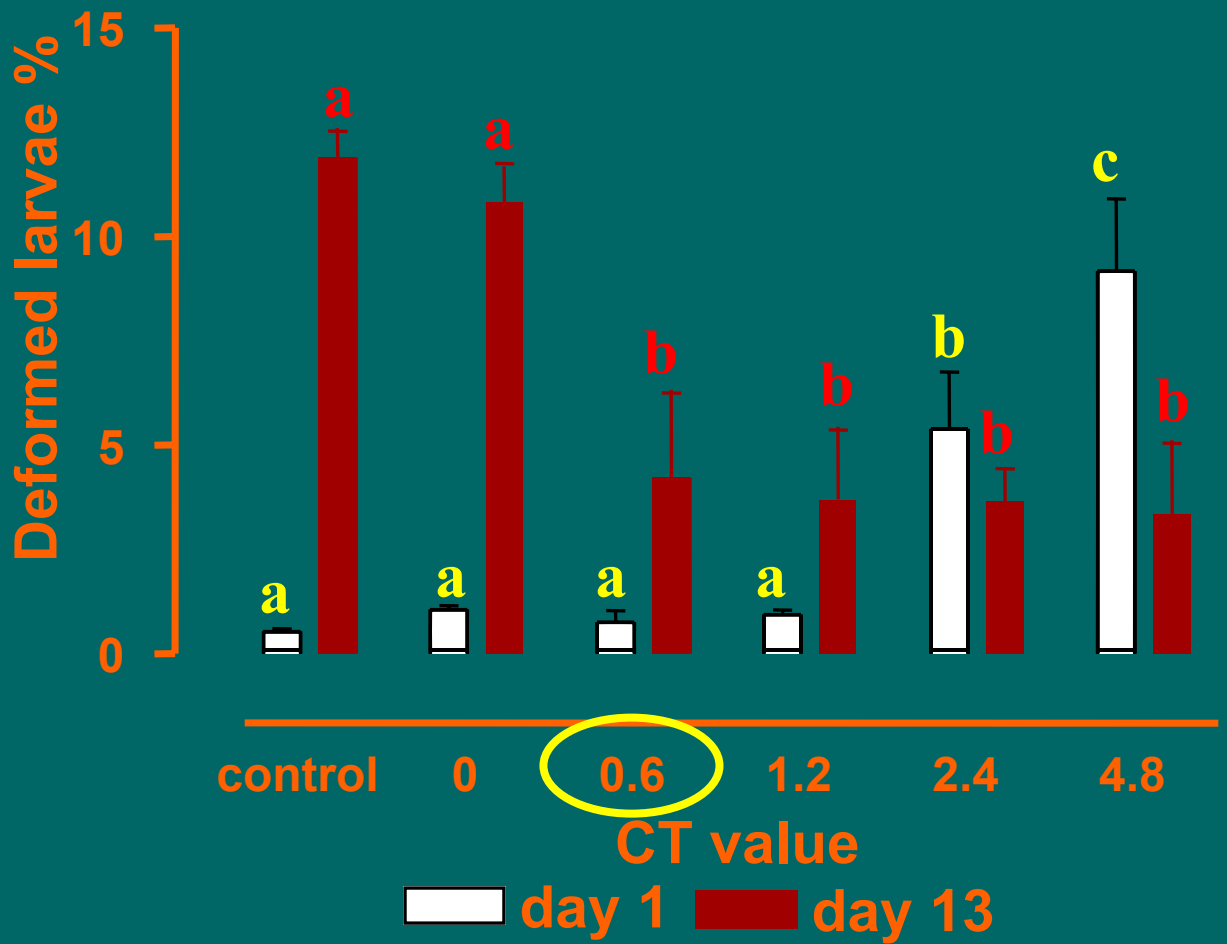
The connection between bacteria infection and larval deformation*.

* Bergh et al. (1992), Brown & Nunez (1998), Madsen et al. (2001),

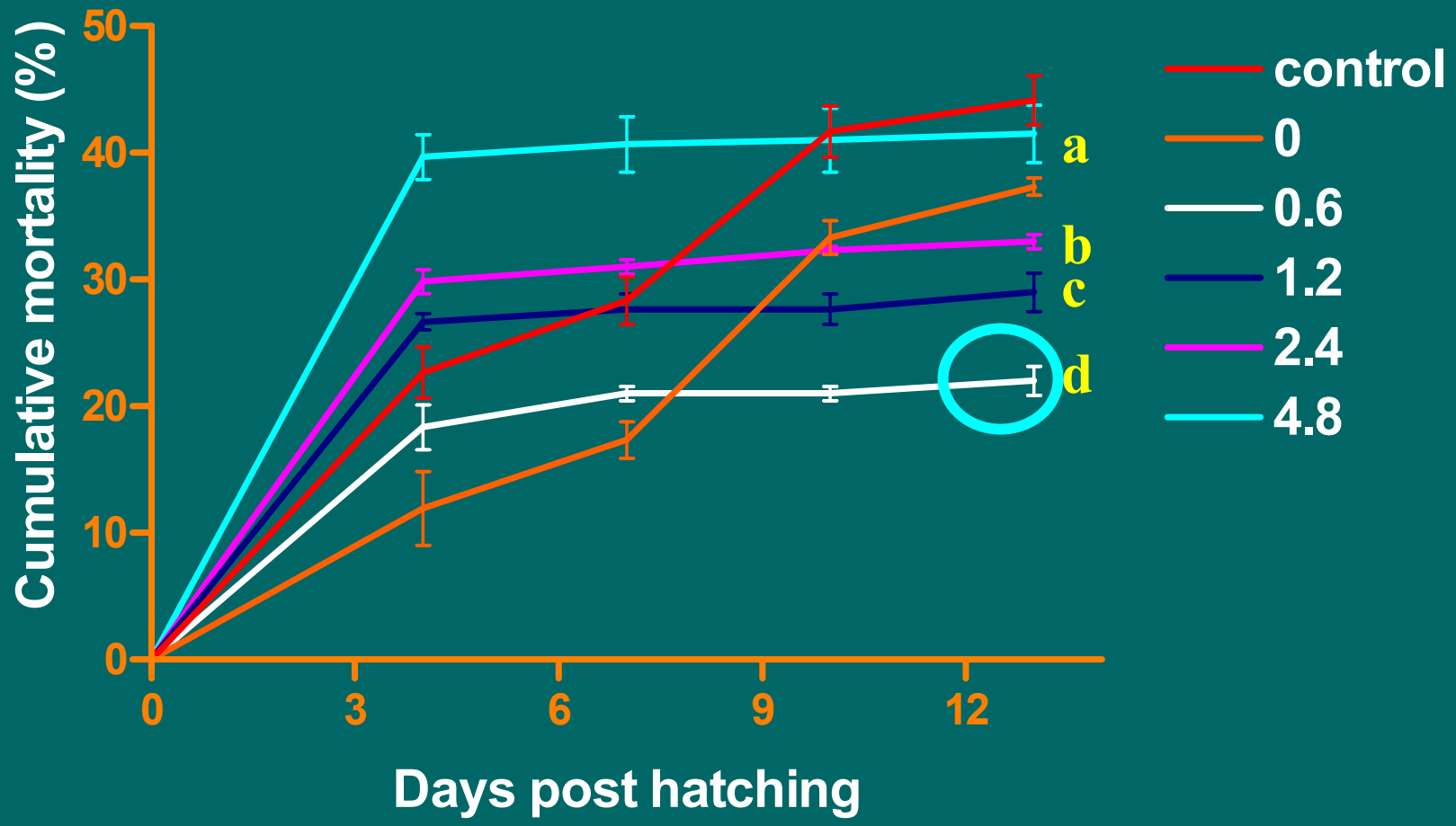
The connection between the non inflation of larvae swim bladder and larval deformation**.

** Chatain et al. (1994), Kitajima et al. (1994)

The effect of ozone treatments in sea bream eggs on the % deformed larvae

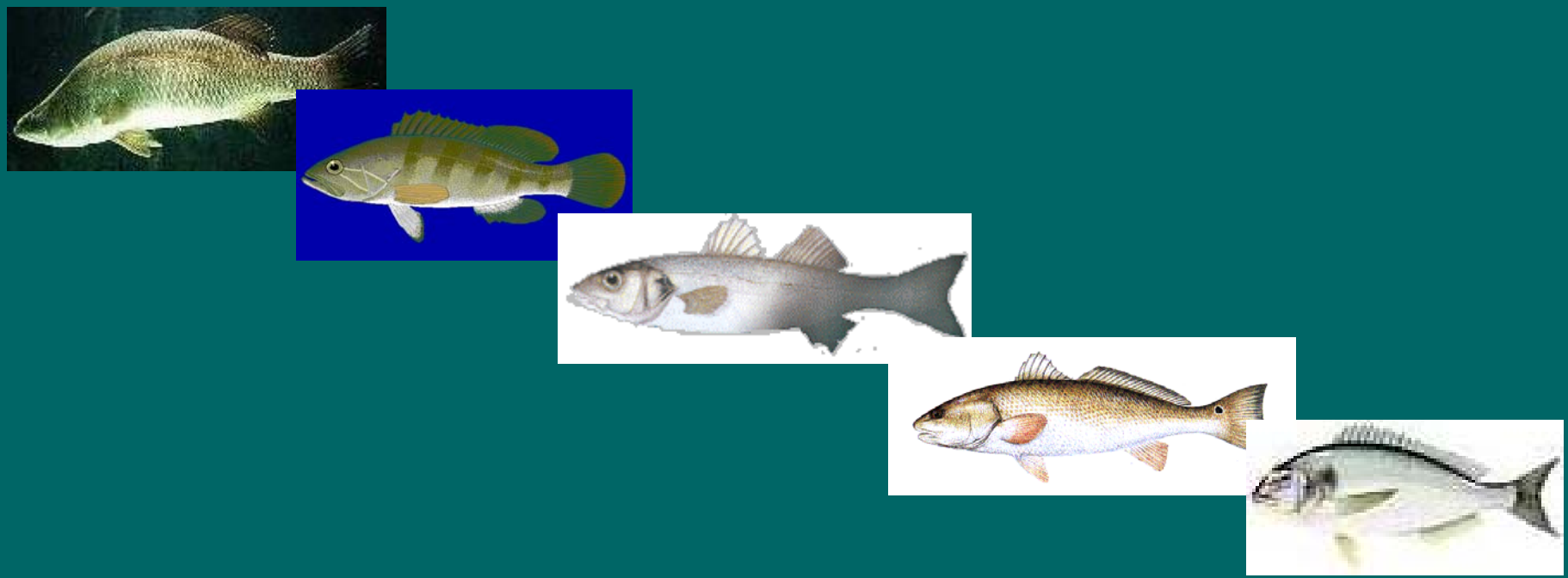


The effect of ozone treatments in seabream eggs on larvae mortality

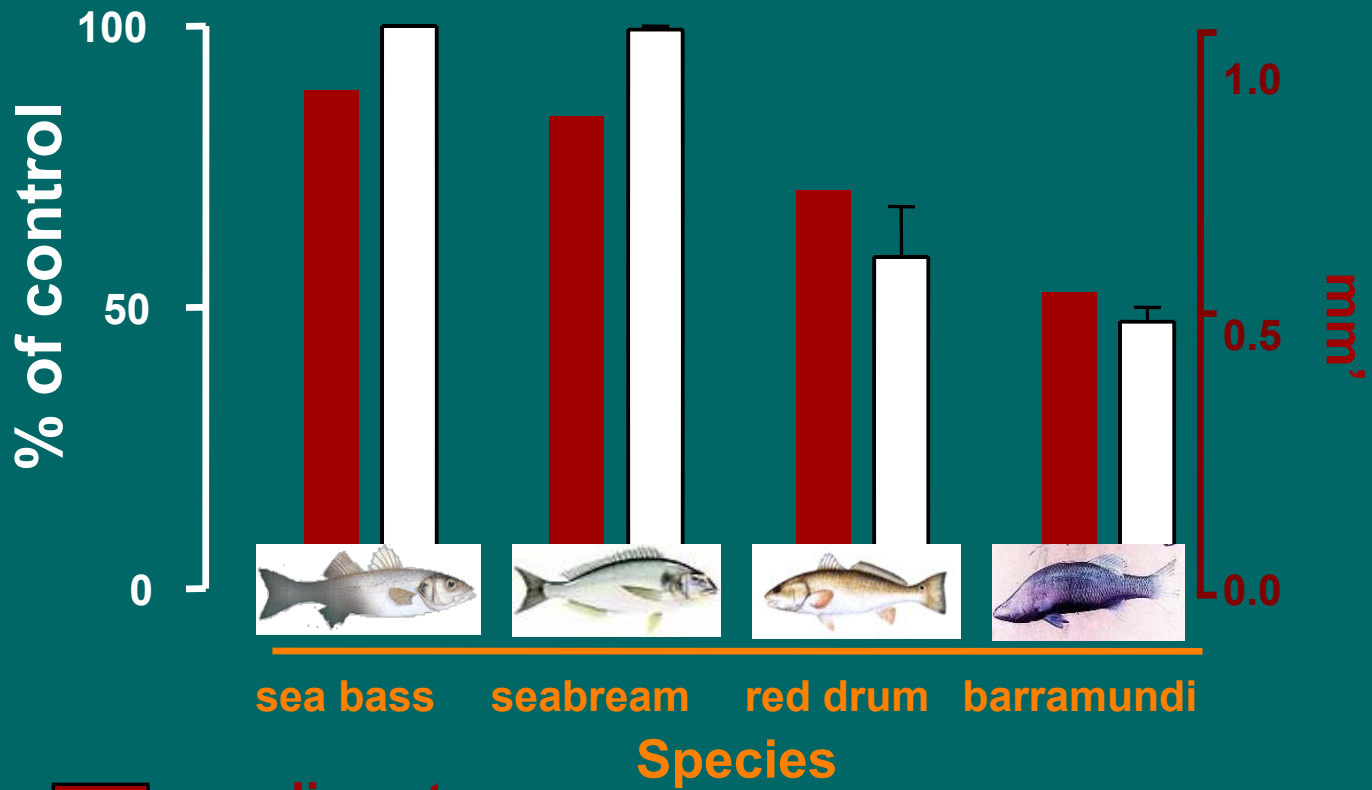


Ozone as prophylactic treatment for eggs in other marine species

- Eggs resistance to Ozone-is it species specific?



The effect of ozone on hatching success in different marine fish species



Conclusions

The exposure of marine fish eggs to ozone as prophylactic treatment reduces significantly the risk of bacteria and other pathogen transfer from broodstock to eggs.

Ozone as prophylactic treatment of fish eggs improves larvae performance.

There is a correlation between egg diameter and resistance to ozone exposure.