



Study on Fouling Organisms on Cultivation
Nets and Shells of Scallop *Chlamys farreri*
Longline Cultured in Sanggou Bay

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Marine biofouling--a global problem



Biofouling on lantern nets of scallop in China (Sanggou Bay)

Marine biofouling--a global problem



Biofouling on lantern and pearl nets of scallop in Scotland

Influence of fouling on scallop

1. Reduce water flow through the enclosure
2. Compete for food resources and oxygen
3. Added weight to the valves

Variation of Fouling organisms on scallop nets

September



October



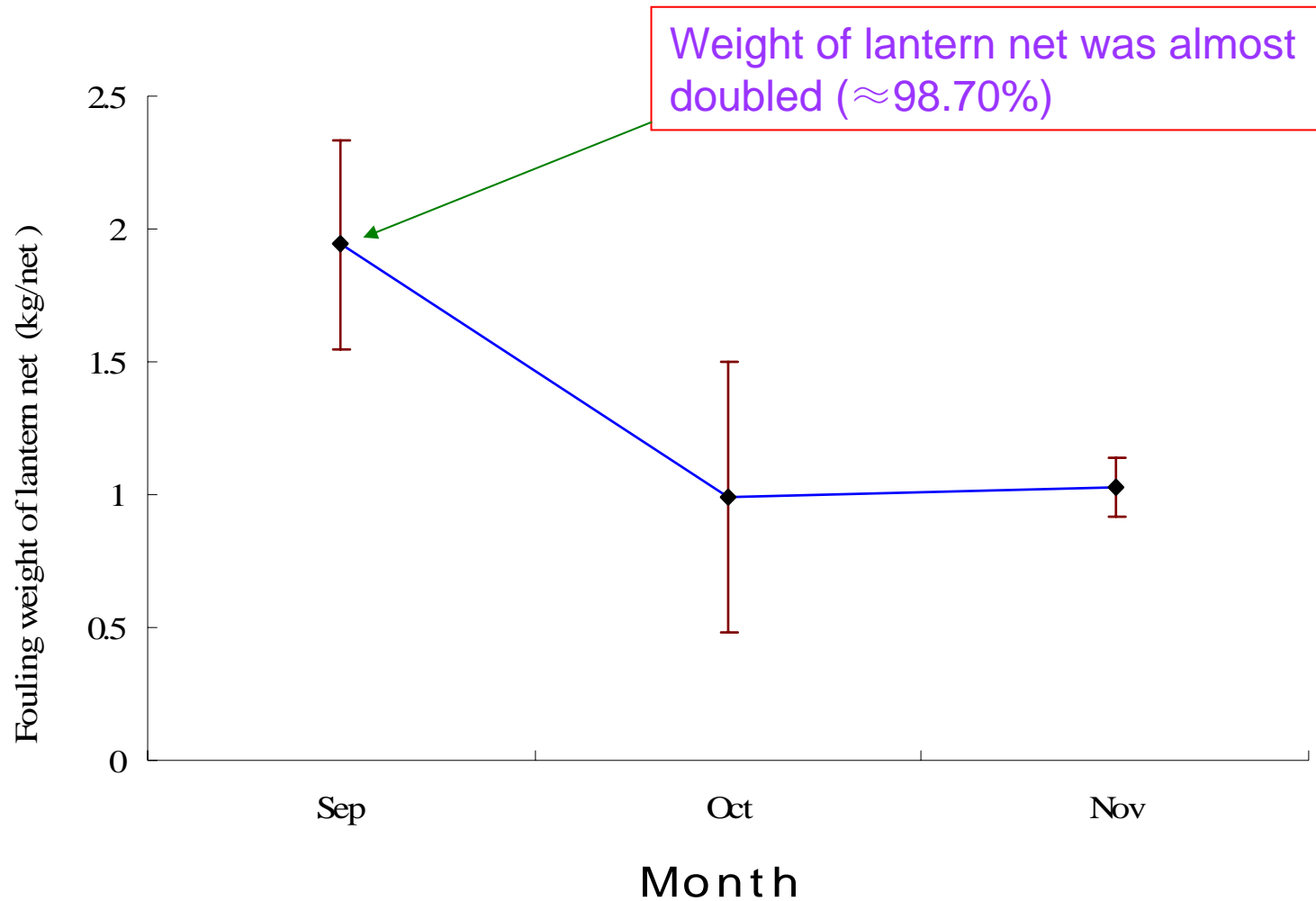
November



Species of macro-fouling organisms

Species	September	October	November
<i>Gracilaria lemaneiformis</i>	+	+	
<i>Sargassum sp</i>	+	+	+
<i>Laminaria japonica</i>	+	+	+
<i>Ulva lactuca L.</i>	+	+	+
<i>Mytilus edulis</i>	+	+	+
<i>Chlamys farreri</i>	+	+	+
<i>Crassostrea gigas</i>	+	+	+
<i>Ostrea plicatula Gmelin</i>	+	+	+
<i>Erichthonius pugnax Dana</i>	+	+	
<i>Caprella scaura</i>	+		
<i>Ciona intestinalis</i>	+	+	+
<i>Styela clava</i>	+	+	+
<i>Hydroides elegans</i>	+	+	+
<i>Lumbrineris japonica</i>	+	+	+
<i>Halocordyle disticha</i>	+	+	+
<i>Reniera implexa v. baeri Wilson</i>	+		
<i>Modiolus metealfei Hanley</i>	+	+	+
<i>Obelia sp</i>	+	+	+

Quantity of fouling organisms on scallop nets



How to deal with the fouling organisms on scallop nets in summer ?

Manually scrap or

Change cultivation nets or

✓ Mechanical method such as use more floats

Numbers of dominant fouling species on scallop net

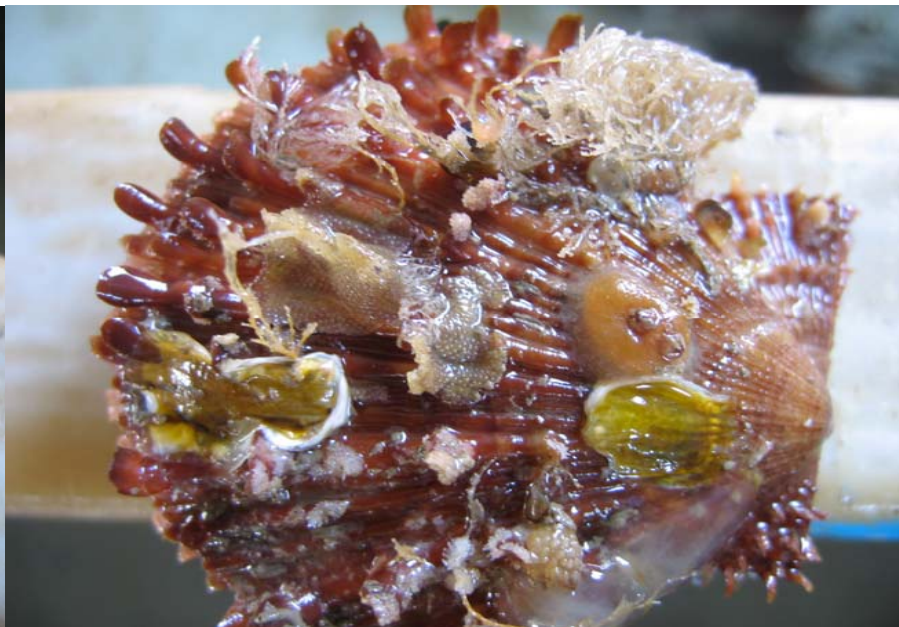
(means \pm S.D.)

	<i>C.intestinalis</i>	<i>S.clava</i>	<i>M.edulis</i>
September	364.26 \pm 28.20	19.50 \pm 5.68	440.02 \pm 48.32
October	310.50 \pm 31.85	5.10 \pm 7.36	278.50 \pm 34.56
November	100.00 \pm 13.46	3.00 \pm 6.22	232.16 \pm 22.04

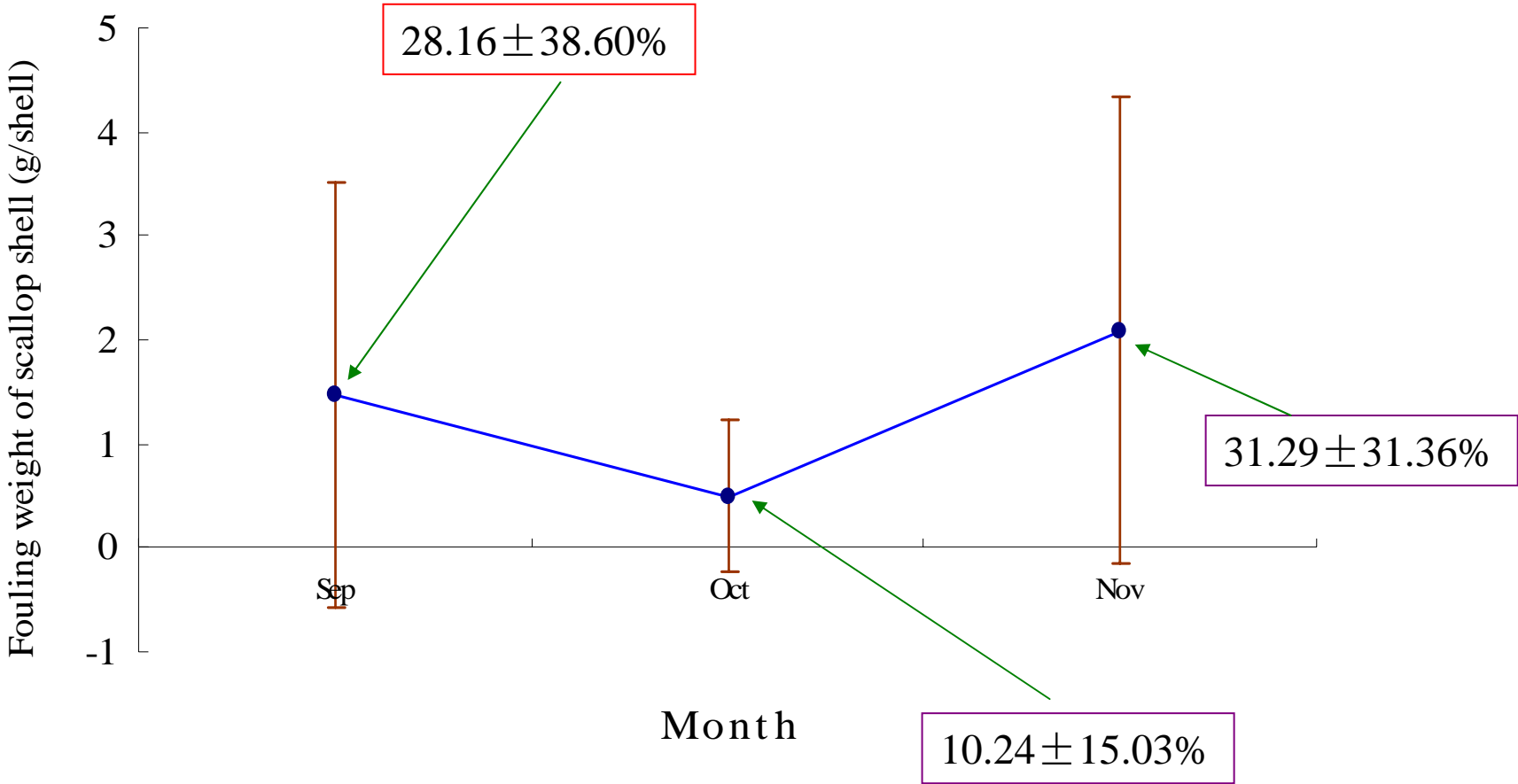
There are about 240 scallops in one lantern net.

Their competition for food resources should be considered in the assessment of carrying capacity and ecosystem modeling.

Fouling organisms on scallop shell



Mass of fouling on scallop shell



It is supposed that shell fouling affect the growth and survival of scallops by added additional weight on the upper valve, thereby increase the force required to open the valves.

Whether the mass of fouling on the shell would detrimentally affect the growth and survival of scallops ???

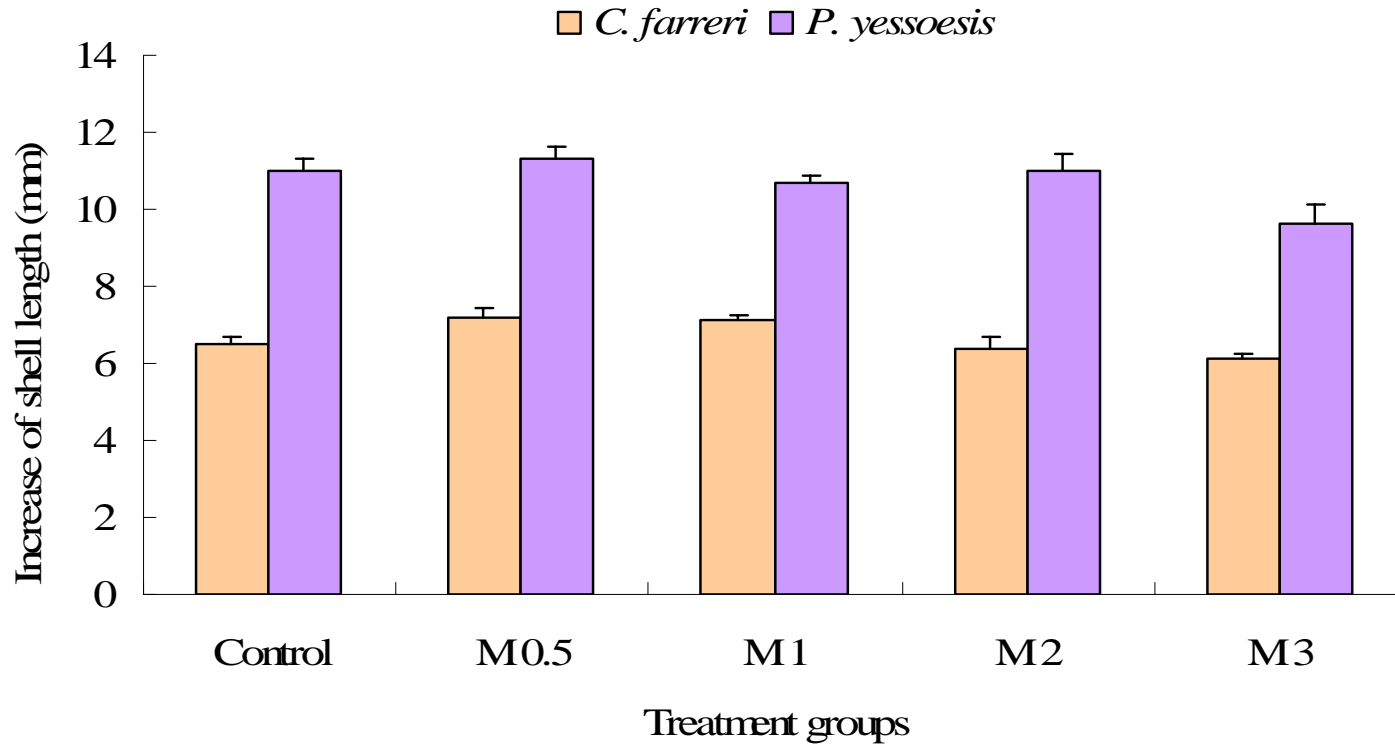
Materials and methods

“Instant Cement” equal to 0.5, 1, 2 and 3 times of the upper valves of *C. farreri* and *P. yessoesi* (called M 0.5, M 1, M 2 and M 3, respectively), were added to the upper valves.

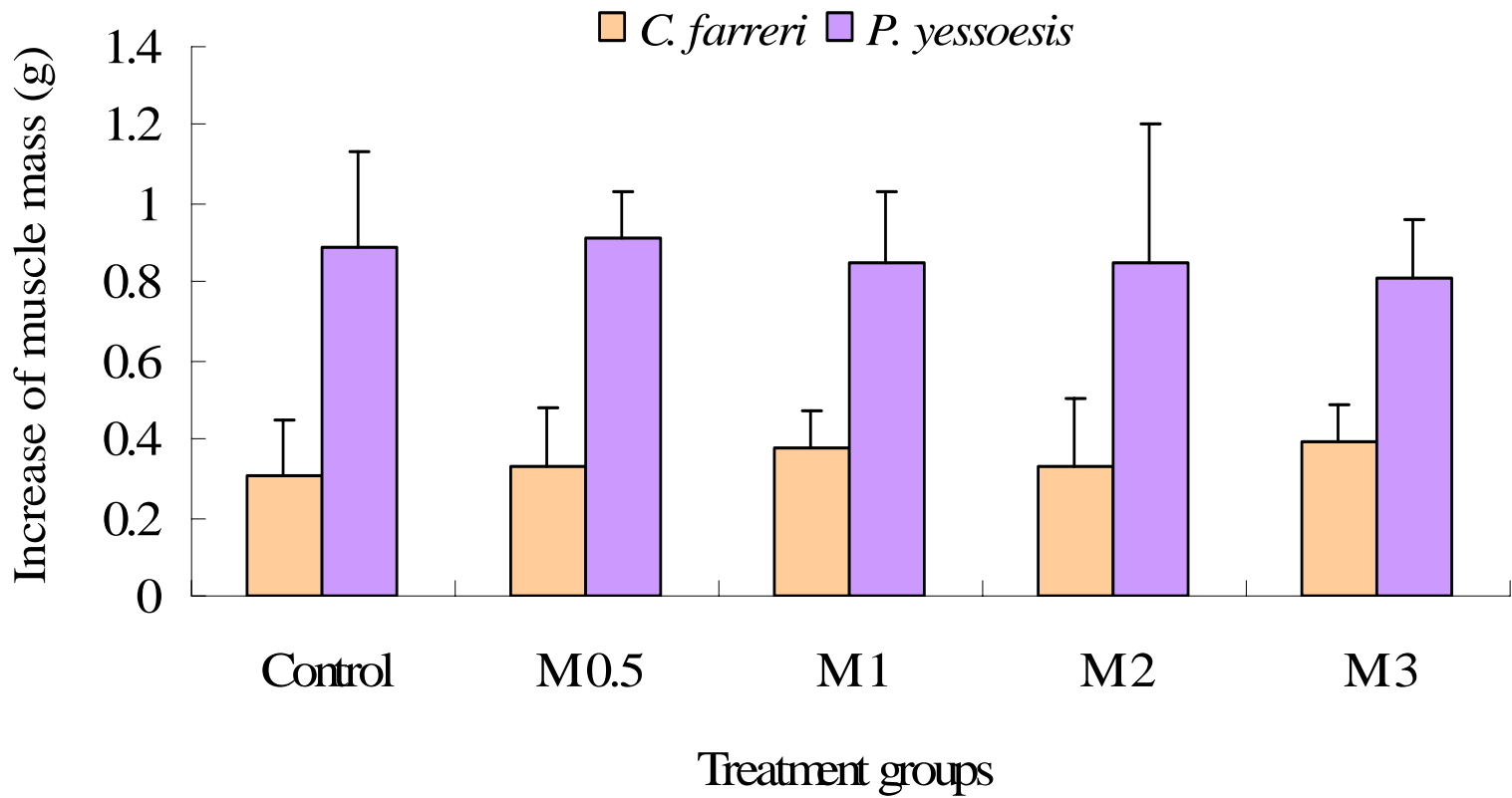
Experimental scallops were cultured in lantern nets for 60 days.



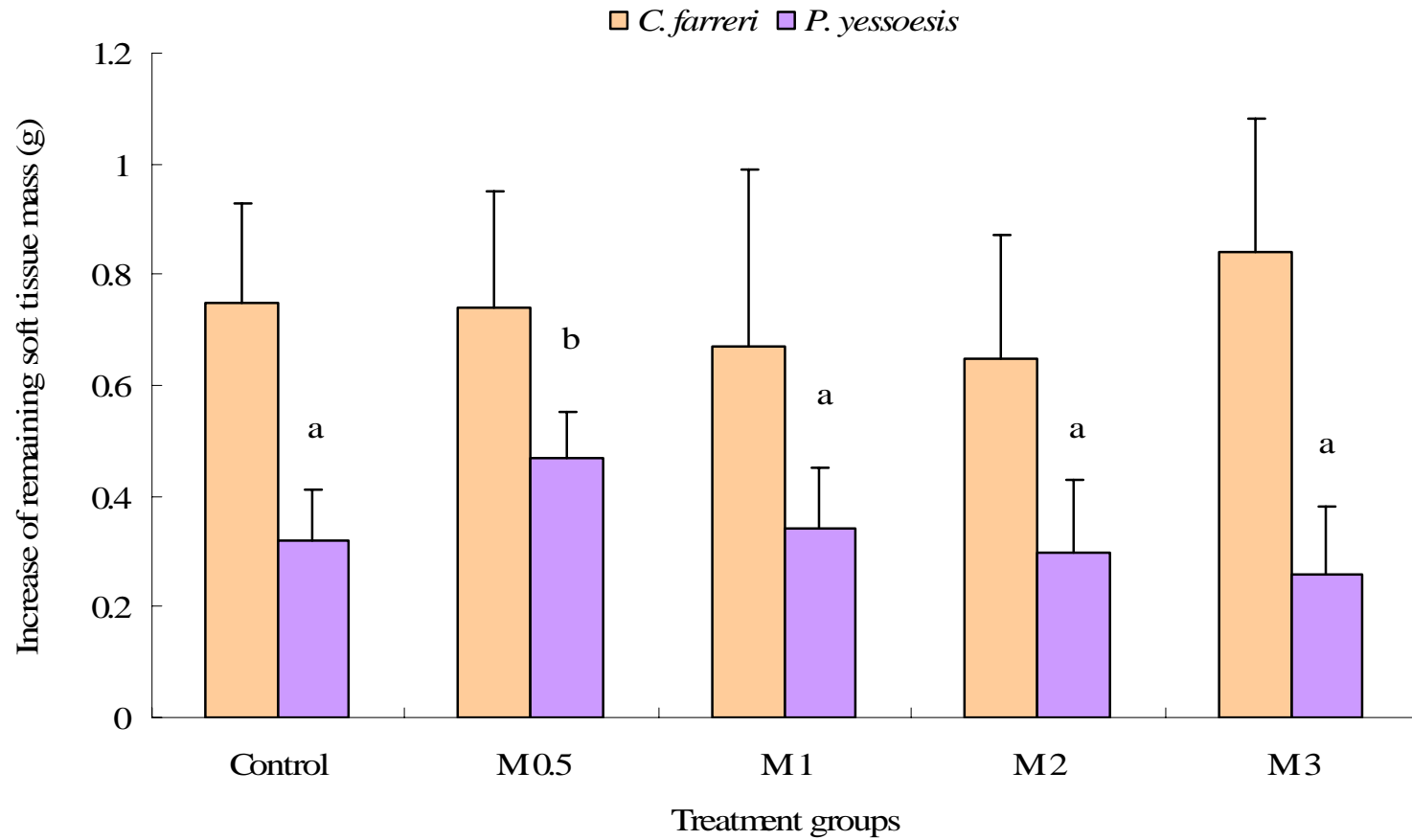
Results



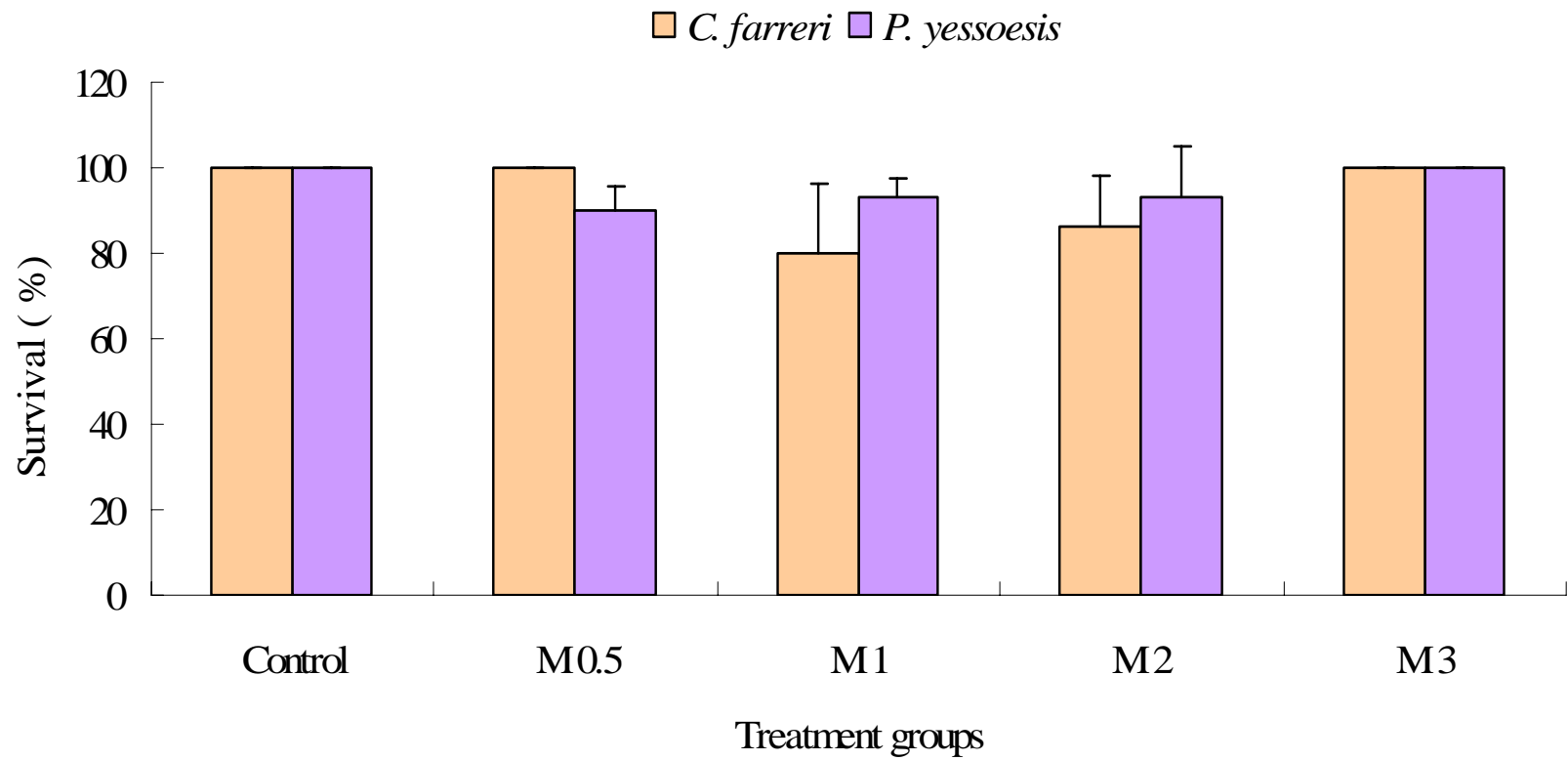
Effect of fouling mass on the growth of shell length



Effect of fouling mass on the growth of adduct muscle



Effect of fouling mass on the growth of remaining soft tissue



Effect of fouling mass on scallop survival

Discussion and Suggestions

- In Sanggou Bay, in September, the mean wet weight of natural fouling on the shell of *C. farreri* was about 28.16% of the mass of scallop upper valve.
- Thus, the mass of natural fouling unlikely to negatively affect the growth and survival of cultured scallops.
- In commercial production, it is unnecessary to frequently clean the fouling organism on scallop shells, especially in summer seasons.
- Shell fouling could be cleaned when the temperature was lower to reduce their competition for food resources and before harvest for a better appearance and marketability.

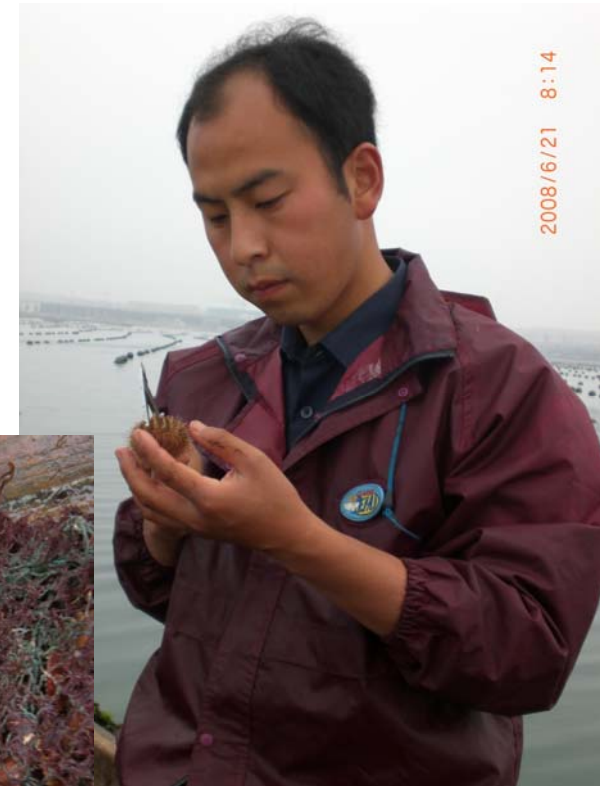
Other research works:

Biological solution to biological problem— Sea urchin *Hemicentrotus pulcherrimus*



Without
sea urchin

With
sea urchin



Thanks very much for your time and Attention !!!

