

Standard management practices in shellfish culture

Shellfish culture in shandong

Shandong mariculture Institute.

Mainpoint(要点)

- 一、 Feed cultivation(饵料培育)
- 二、 shellfish seedling culture(贝类苗种培育)
- 三、 Ruditapes philippinarum larva culture
(菲律宾蛤仔苗种培育)
- 四、 Pacific Oyster seedling culture
(太平洋牡蛎苗种培育)
- 五、 Mercenaria larva culture
(美国硬壳蛤苗种培育)
- 六、 Coelomactra antiquata larva culture
(西施舌苗种培育)
- 七、 suggestion and discussion(建议与讨论)

一、 feed cultivation technique

- 1. Breed choice: (consideration elements: moderate temperature, feed nutrition character, feed additive nutritional salt, control light exposure degree, how to charge, growing velocity under different conditions).
- 饵料培养技术
- 品种选择：（考虑因素：培养与适宜温度，饵料本身营养特点，饵料添加营养盐，控制光照强度，如何充气，不同条件生长速度等）

first-seeding(一级保种)



feed cultivation in vertical bags

(二级立袋式饵料培养)



the mostly yield （饵料主要生产方式）





T:10~25°C S :18~32 2-5d 100-300×10⁴



shellfish seedling culture

- **breeding step**(育苗步骤与实施过程)
 - 1、**feed choice** 饵料选择与培养。
 - 2、**shellfish choice 、 cultivate.**亲贝选择、处理与畜养。
 - 3、**shellfish deeply cultivate.**亲贝的再选与性腺促熟培养。
 - 4、**germ cells hatching.**诱导亲贝产卵排精、受精卵的处理与孵化、选幼。
 - 5、**larva cultivate** 。幼虫培养与附着技术。
 - 6、**young shellfish cultivate**
稚贝 苗种的中间培育技术。

shellfish larvae breeding workshop

(贝类苗种培育车间)





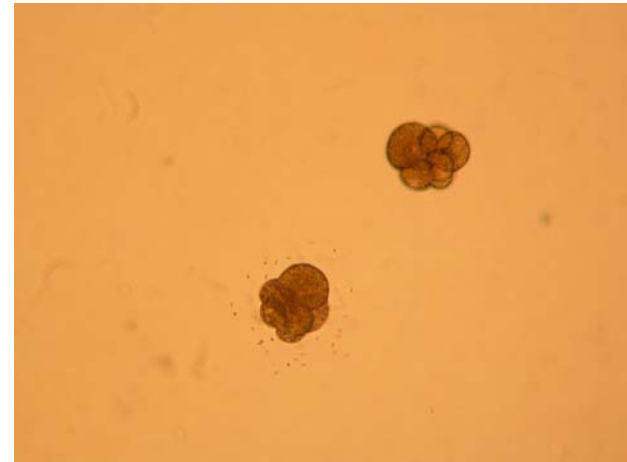
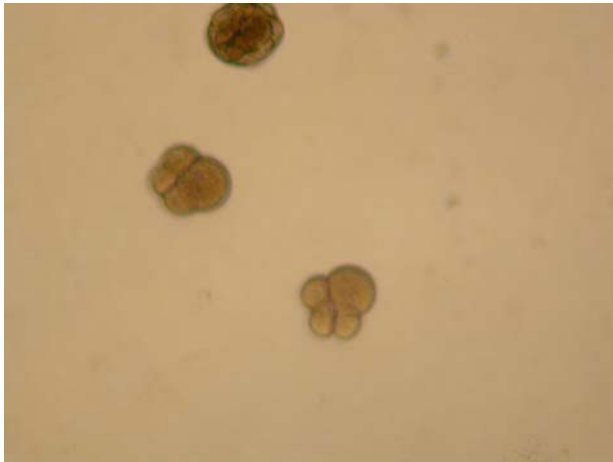
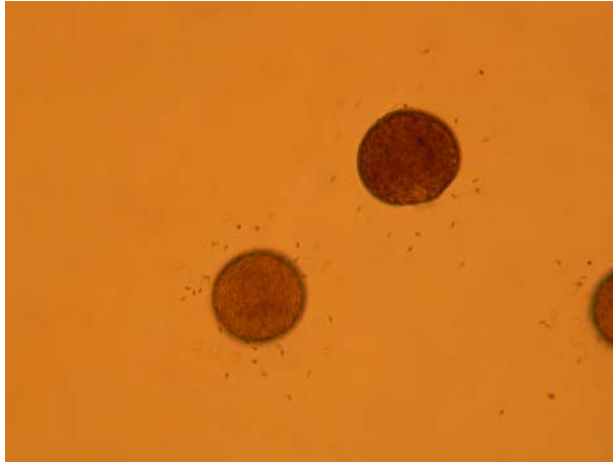


三、Ruditapes philippinarum larvae culture

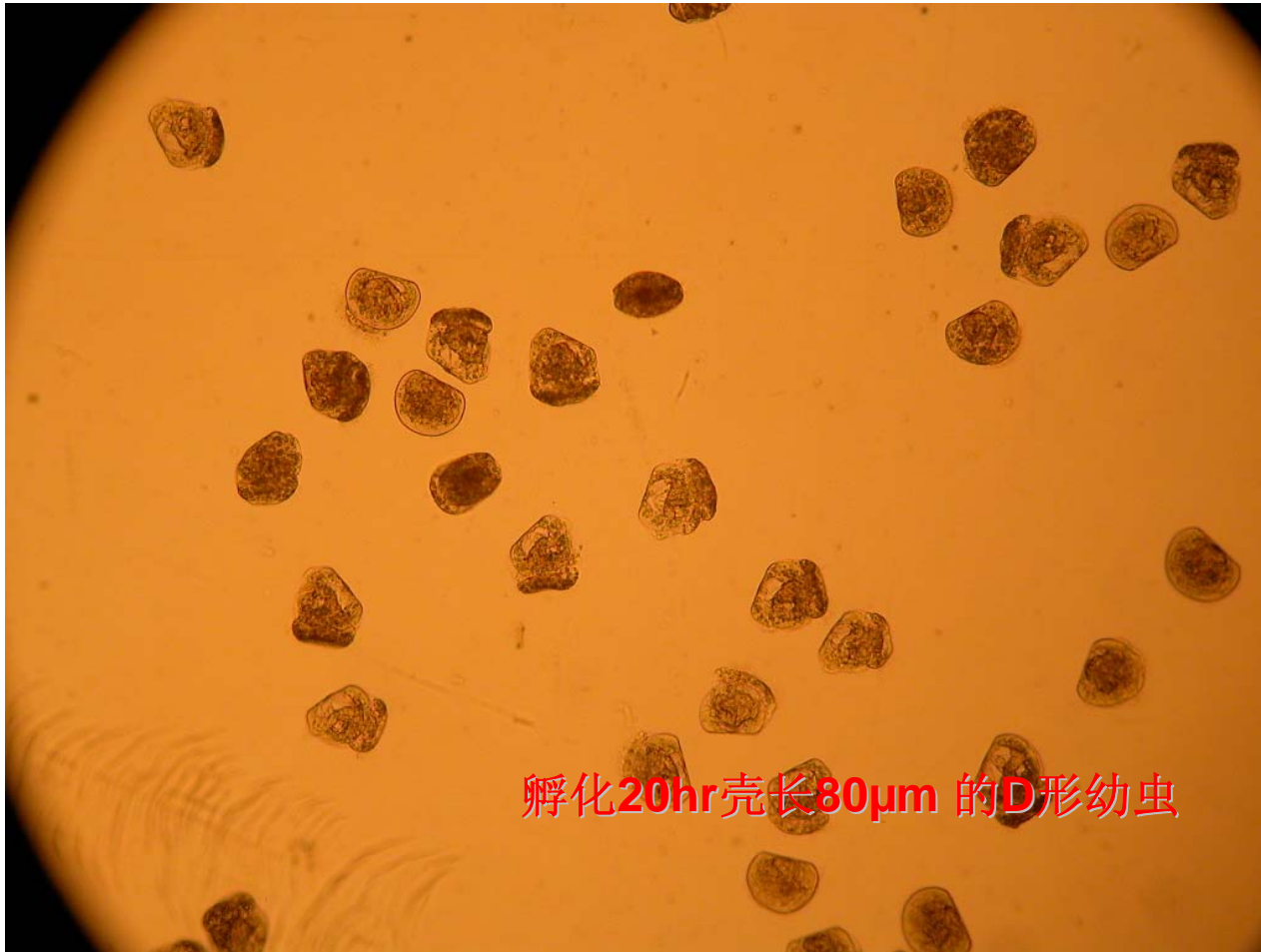
(菲律宾蛤仔苗种培育)



germ cells hatching



Larva with shell length 80 μm



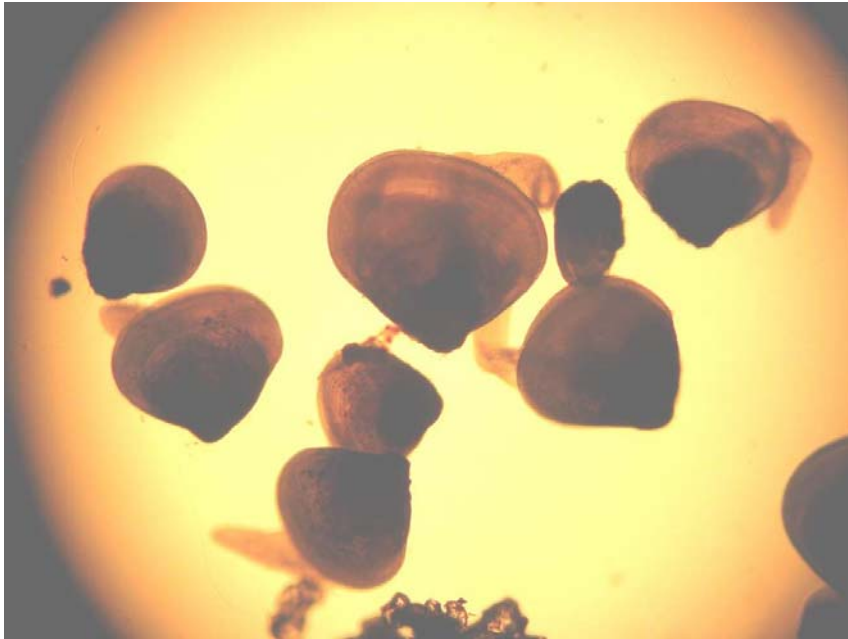
孵化20hr壳长80 μm 的D形幼虫

Larva with shell length 90 μm

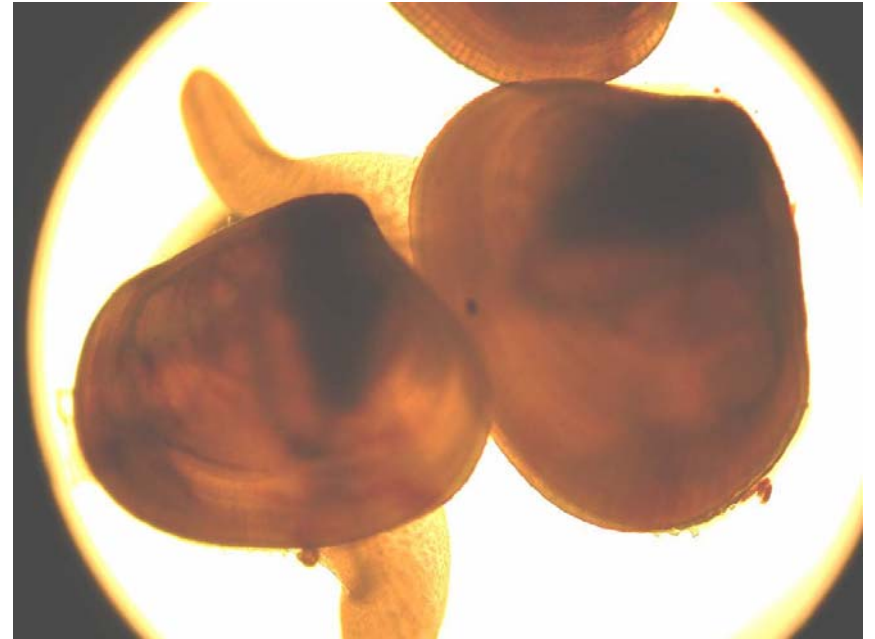


孵化24hr的壳长90 μm D形幼虫

larvae shellfish



培育30天壳长0.5—1mm稚贝
30 days larvae shellfish, 0.5—
1mm



培育90天壳长3—5mm稚贝
90 days larvae shellfish, 3-
5mm

young shellfish



10月上旬室外池贝苗shellfish seedlings cultured in outdoor ponds in early Oct.



11月上旬室外池贝苗shellfish seedlings cultured in outdoor ponds in early Nov.

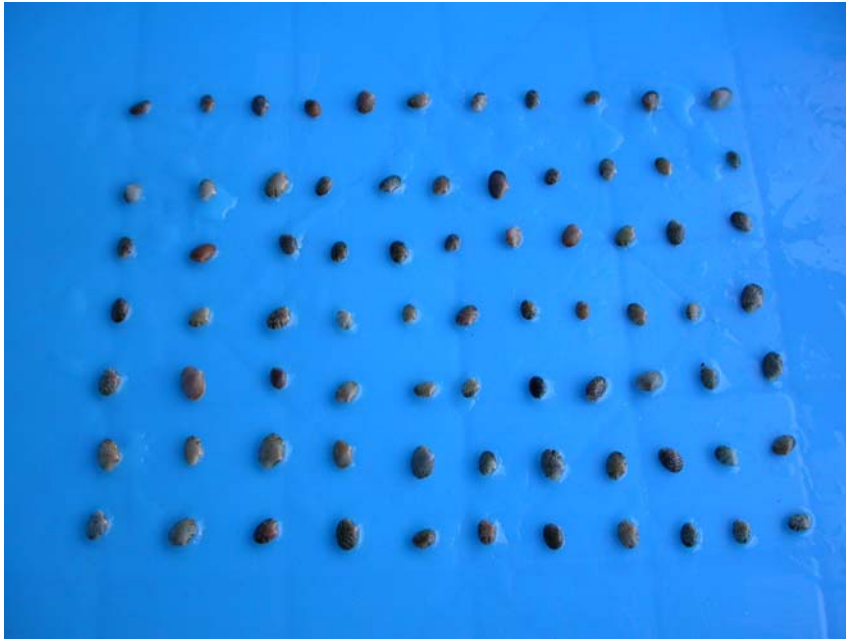
culture different color seedlings

不同花色苗种培育



子一代 一齡蛤仔

different color seedlings



子一代杂花色



子一代杂花色

the first generation white clam

子一代白色蛤仔



the first generation double-veins clam

子一代二条纹



fast growing clam

生长较快的花色



all is possible

(一切都有可能)



四、Pacific Oyster seedling culture

(太平洋牡蛎苗种培育)



shandong mariculture institute 山东省海水养殖研究所
Pacific oyster seeding breeding experiment specimen
太平洋牡蛎苗种培育试验标本



1980 Enter from japan

specimen display 标本陈列



parent pacific oyster breeding
太平洋牡蛎亲体培育



pacific oyster shell experiment

太平洋牡蛎贝壳附苗试验



pacific oyster experiment in glass flume
太平洋牡蛎玻璃钢水槽试验



2-4mm seedlings
壳长2—4mm附着苗种



200-300 are attached on single shell
单个贝壳附苗达200—300粒



attach seedlings on shell strand
贝壳串附苗



pacific oyster seedlings breeding for production
太平洋牡蛎生产性育苗



suspending breeding on raft strand in the sea
海上筏架式串绳吊养



large area breeding on raft in the sea

大面积海上筏式养殖



harvest (autumn and spring)

收获（秋—春）



oyster culture in beach

滩涂牡蛎养殖



harvest: over 6tons per 666square meters

收 获： 亩产6吨以上



五、Mercena ria parents

美国硬壳蛤亲贝





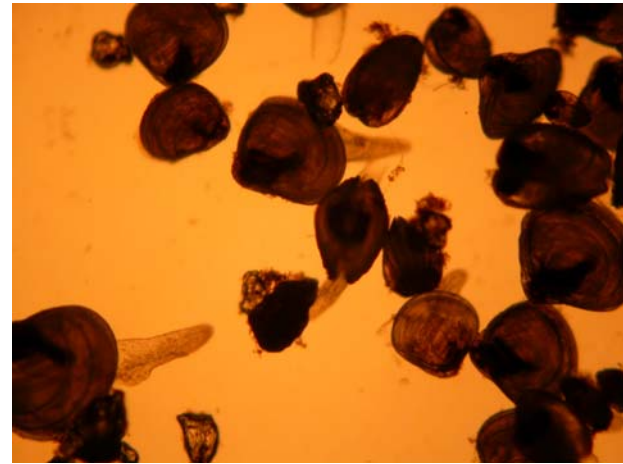
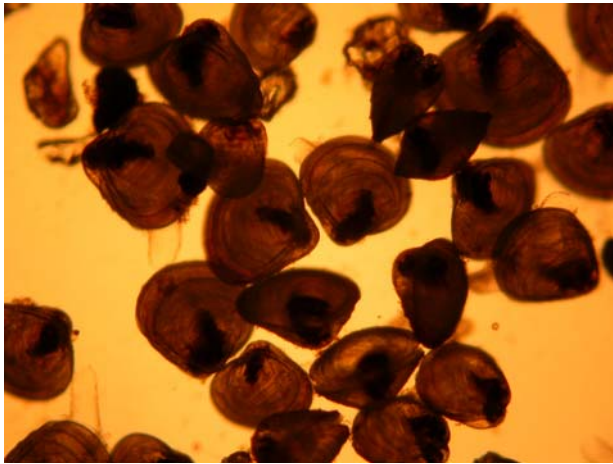
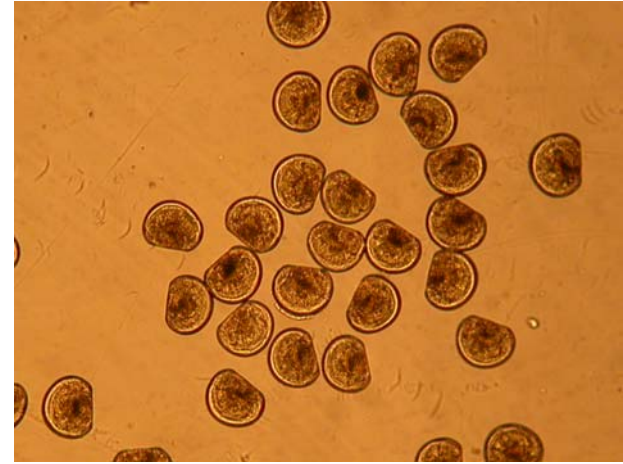
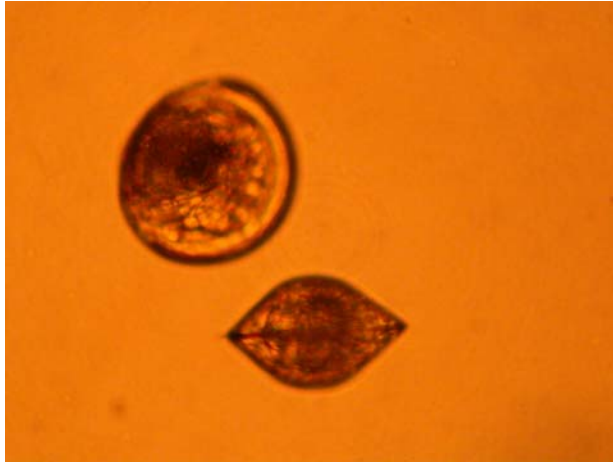
(5~6cm) Mercenaria parents

美国硬壳蛤亲贝



Mercenaria larvae culture

美国硬壳蛤苗种培育



Hidden in the sand 潜沙

Larvae 40-50d



Mercena ria larvae

美国硬壳蛤苗种



Mercena ria larvae experiment culture

美国硬壳蛤苗种中间培育



one 1 old Mercena ria cultured in Lianjiang

Fujian province

福建连江养殖1年硬壳蛤



1 year and half old Mercenaria cultured in shrimp ponds outdoor

室外虾池养殖1年半





养殖两年 2 years old *Mercenaria*



2 years old Mercenaria cultured in Ganyu, Jiangsu Province

江苏赣榆养殖2年的美国硬壳蛤



六、Parents *Coelomactra antiquata*

西施舌亲贝



1 year

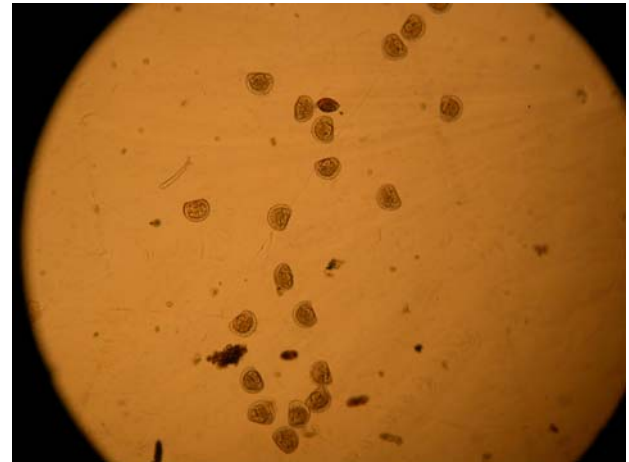
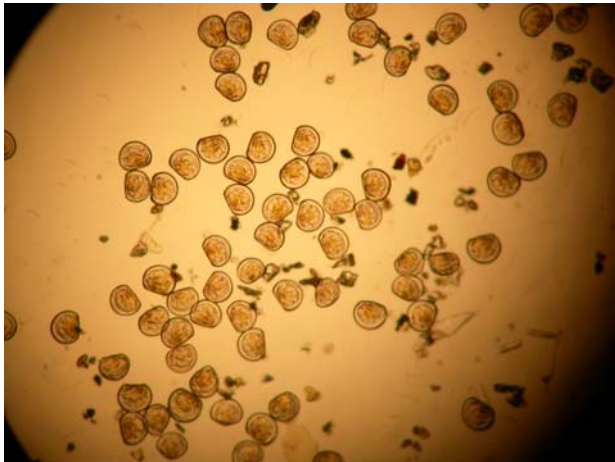
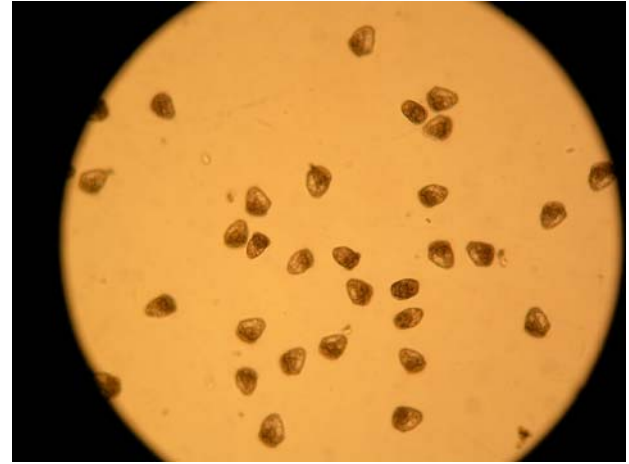
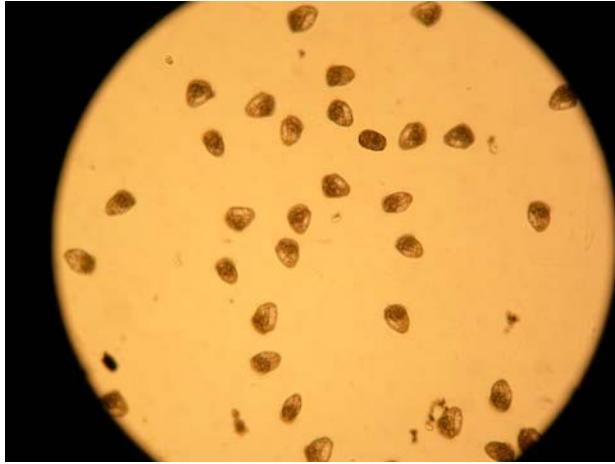
2year

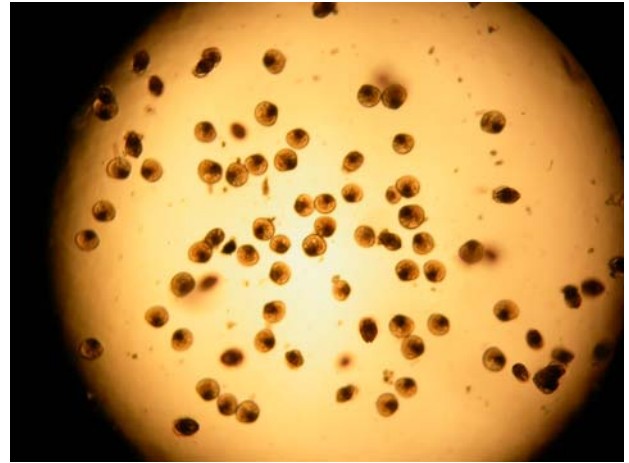
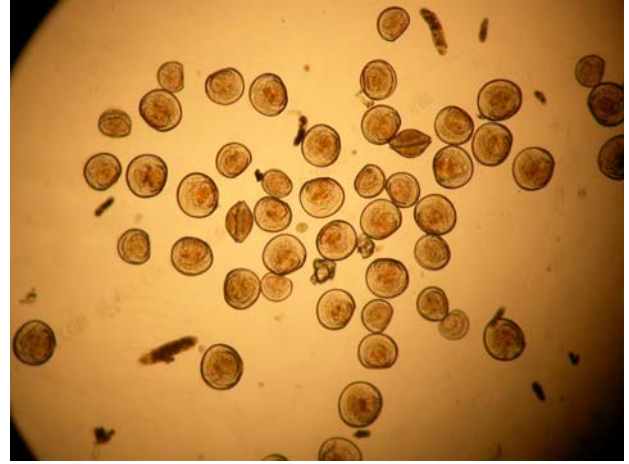
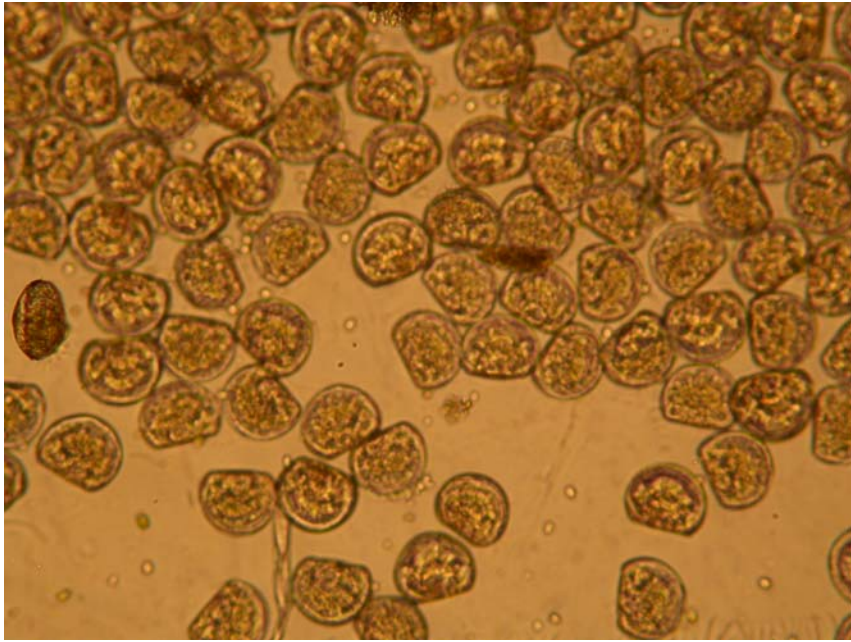
3year





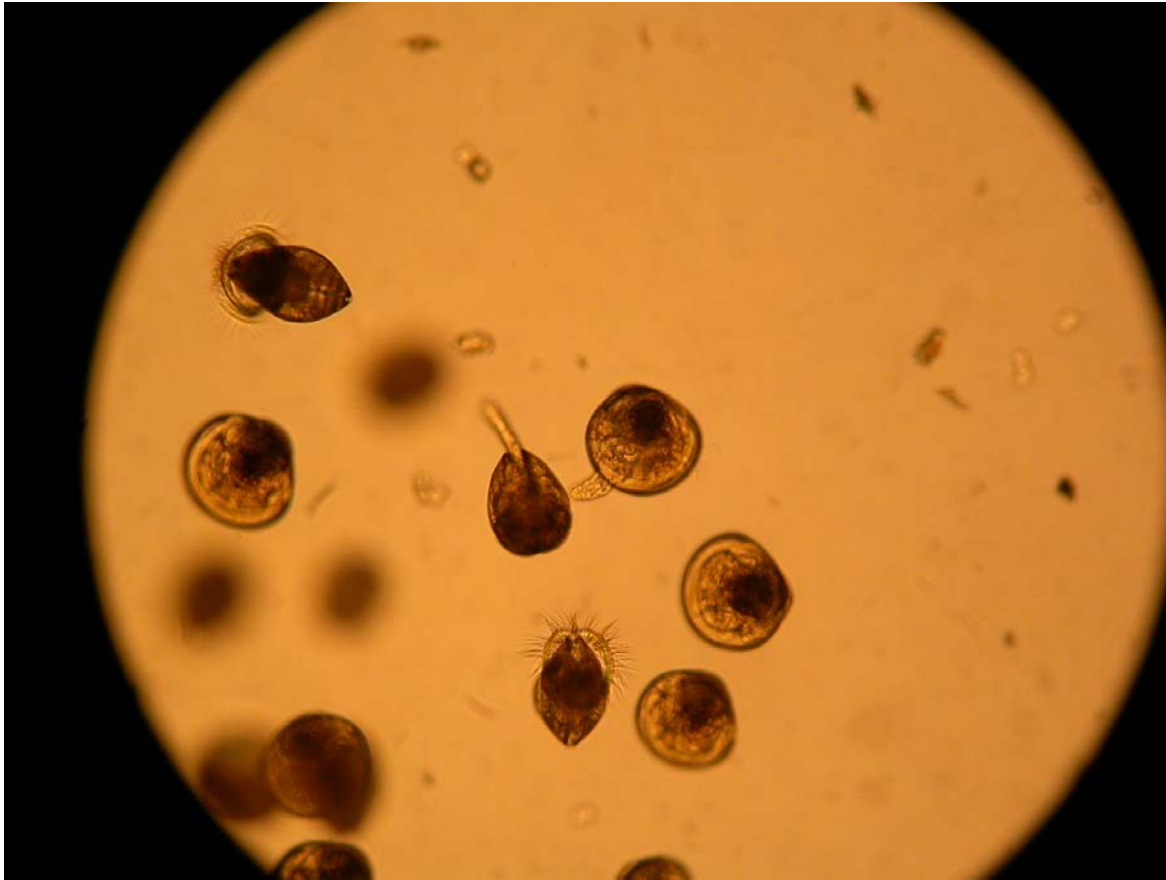
larvae





Coelomactra antiquata seedlings hypermetamorphosis

西施舌苗种变态期（伸足、面盘）



2 months



3months (壳长1.2~2.4cm)





several questions need to be pointed out

需要强调的几个问题

- hatch seedlings 苗种孵化
- breeding seedlings 苗种培育
- The bottom is very important in seedlings culture 苗种中间培育 附着基选择十分重要
- culture clam 蛤仔养殖
- Seedlings is very important, so as density. Moderate density is of great significance.
- 种很重要，密度也很重要，合理密度是非常必要的。

- Seedling culture can be carried out outdoor or indoor.
- 苗种中间培育分室内和室外两种培育方式。
- Usually ,When seedlings are cultured to a certain specification, 2-3mm in general, move seedlings to other pond for further culture, till the seedlings grows to required specification.
- 苗种培育至一定规格，一般是壳长2—3mm后，出池或移池继续进行培育，直至壳长达到养殖苗种规格的时间过程。

Suggestions

- several questions need to attach great importance in seedlings breeding.
- 育苗过程需要引起重点注意的几个问题
- 1、 It is very important to select fitting sea areas for seedlings.
- 选择所育品种适宜的海区十分必要。
- 2、 Patient selection and culture of parents shellfish is the foundation for smooth seedling culture.
- 对亲贝的认真选择和强化培养是苗种培养顺利的基础。
- 3、 Healthy culture of seedlings needs several times elimination through selection.
- 苗种的健康培育必须结合多次选择和淘汰。



THANK YOU