9:00-9:20, Sept. 9th, 2009

Early development of preleptocephalus larvae of the Japanese eel in captivity

: why *Brachionus* rotifers are not available as an initial feed for rearing eel larvae?

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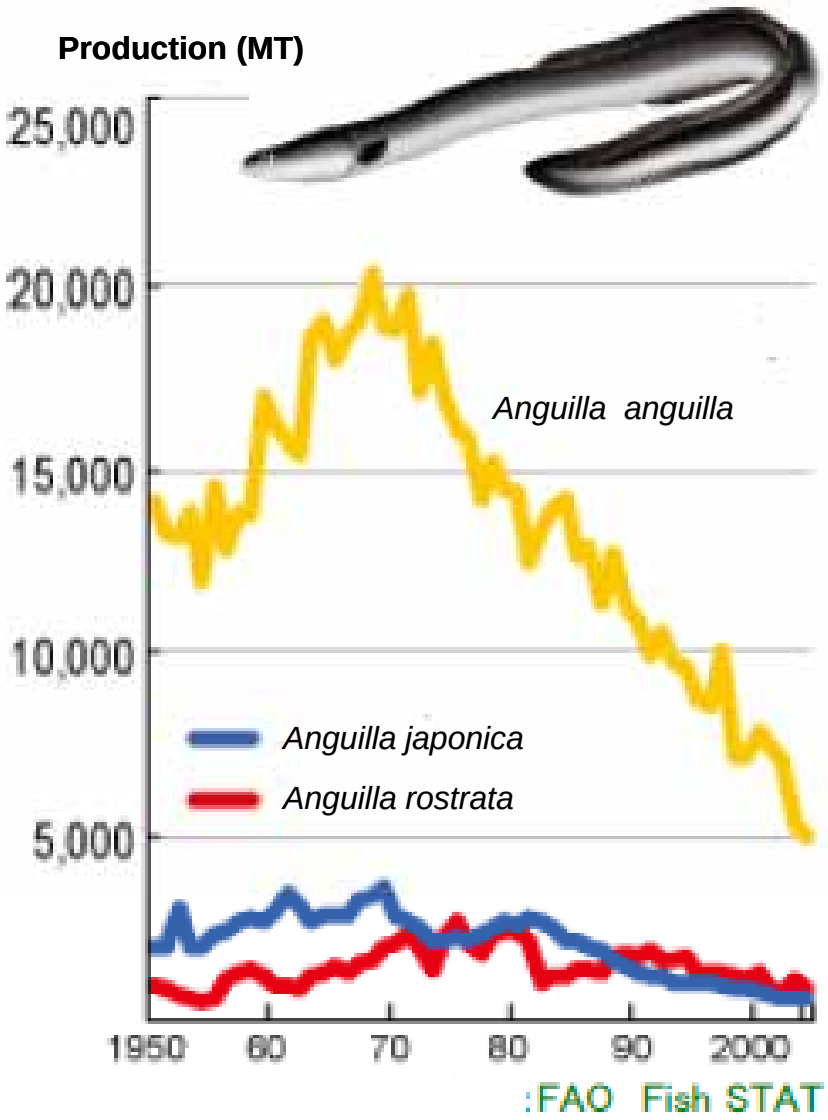
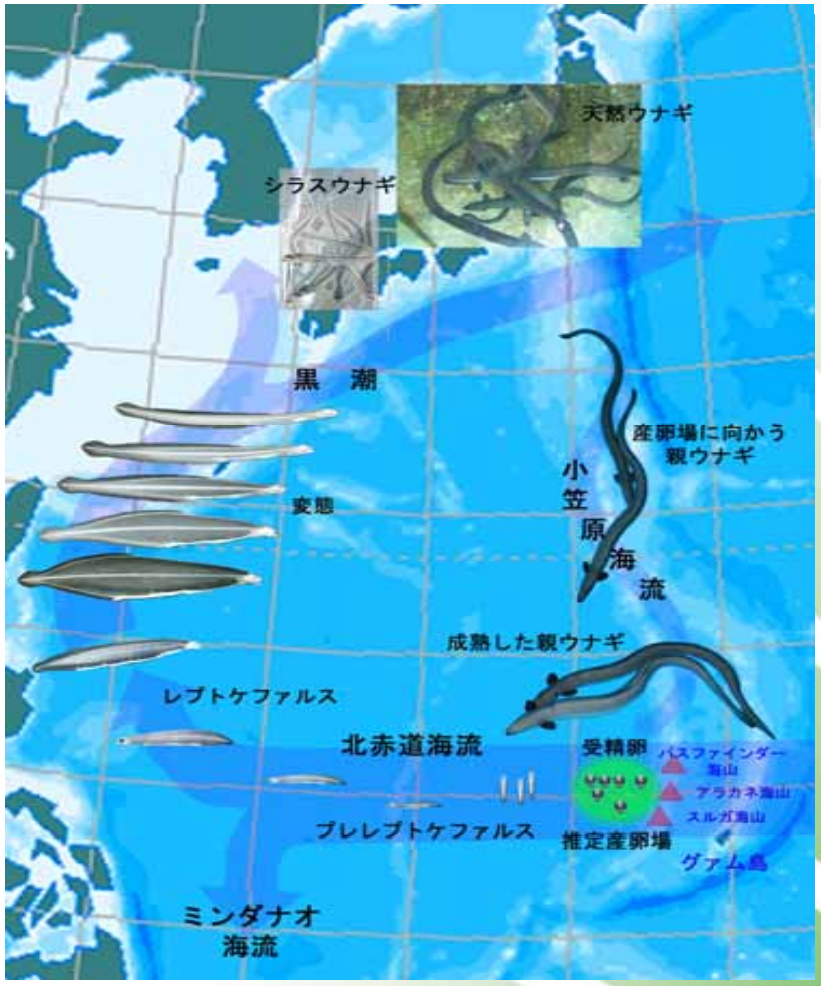
Background





Life cycle of *Anguilla japonica in* western Pacific Ocean

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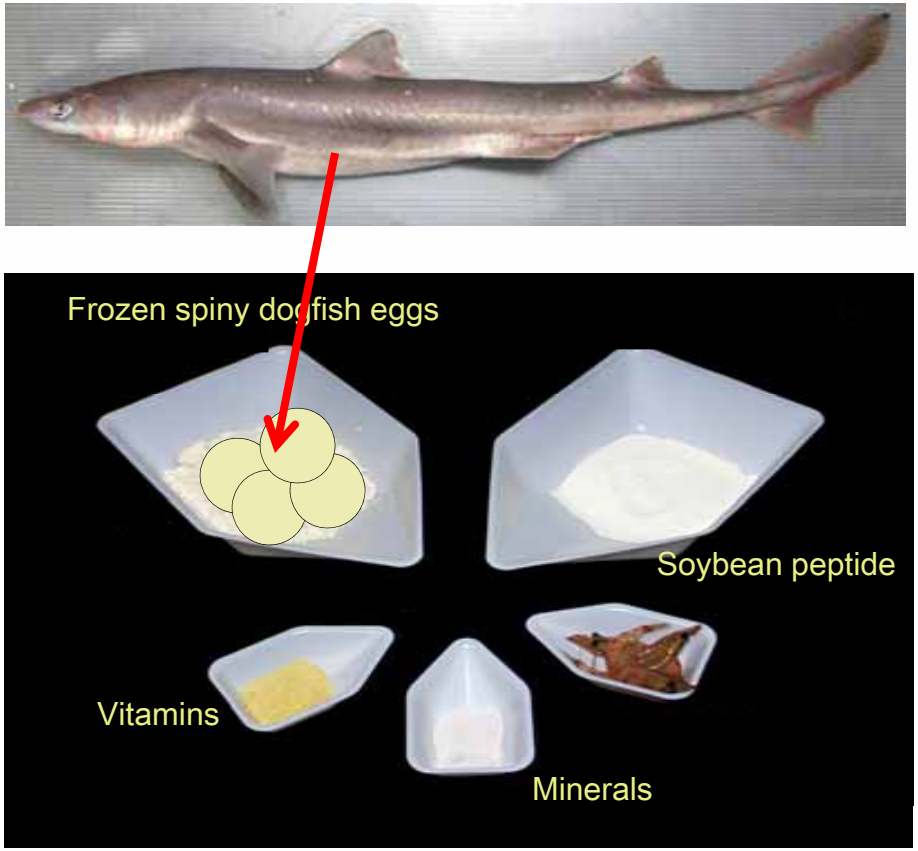


Ingredients of larval diet for eel

Eel larvae ingesting pasty liquid-type diet

Tanaka et al.

The first captive-bred grass eel was produced in 2002.

Methods:

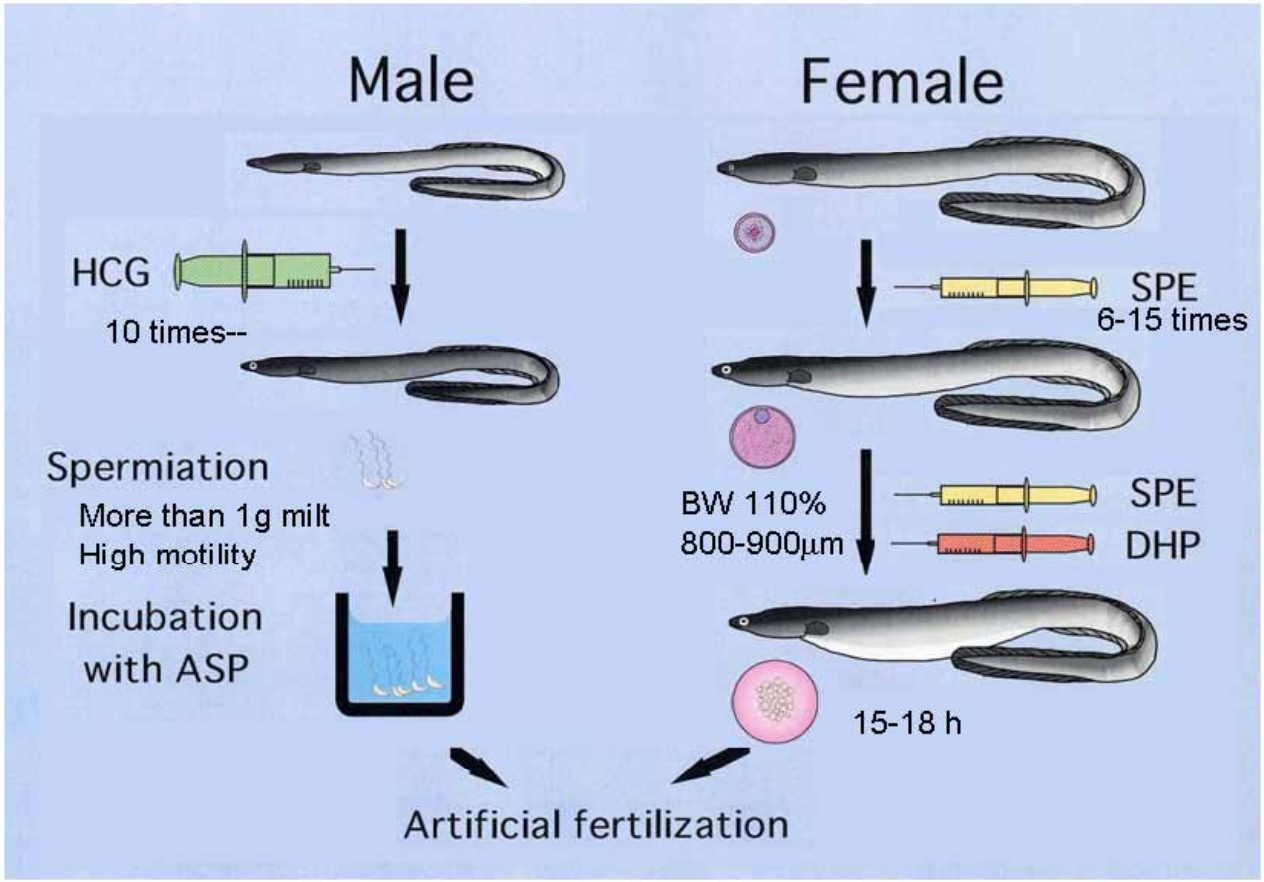
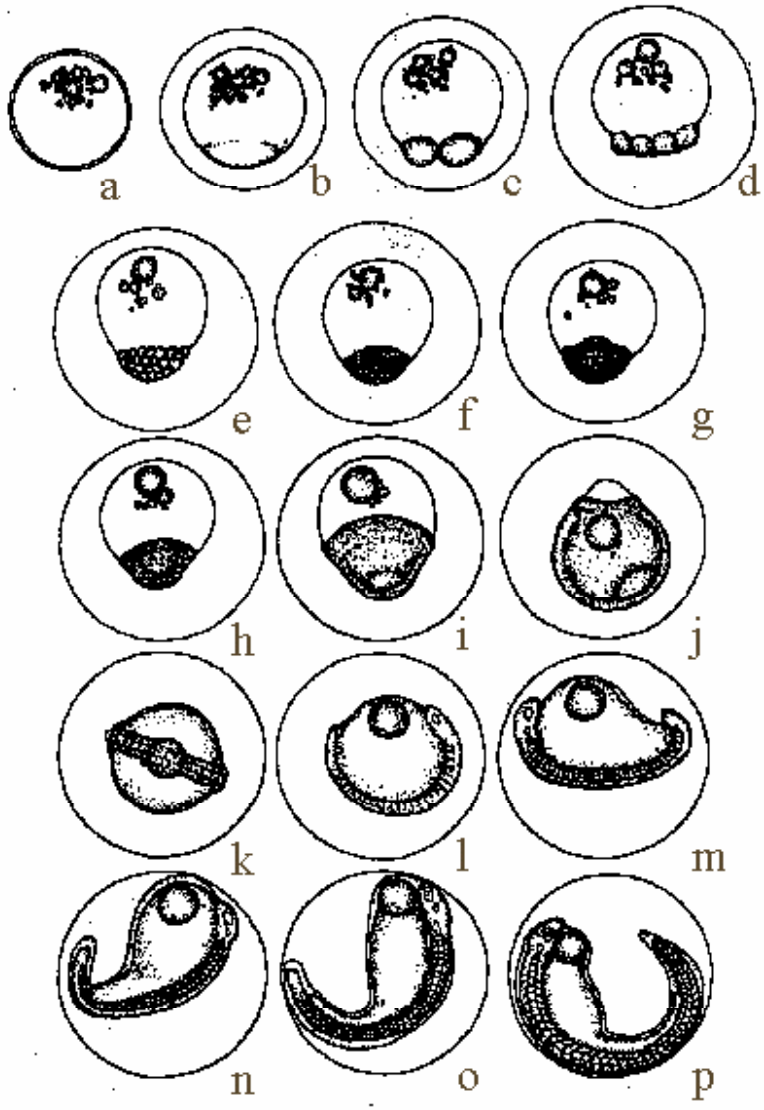


Fig. NRIA protocol for induced breeding

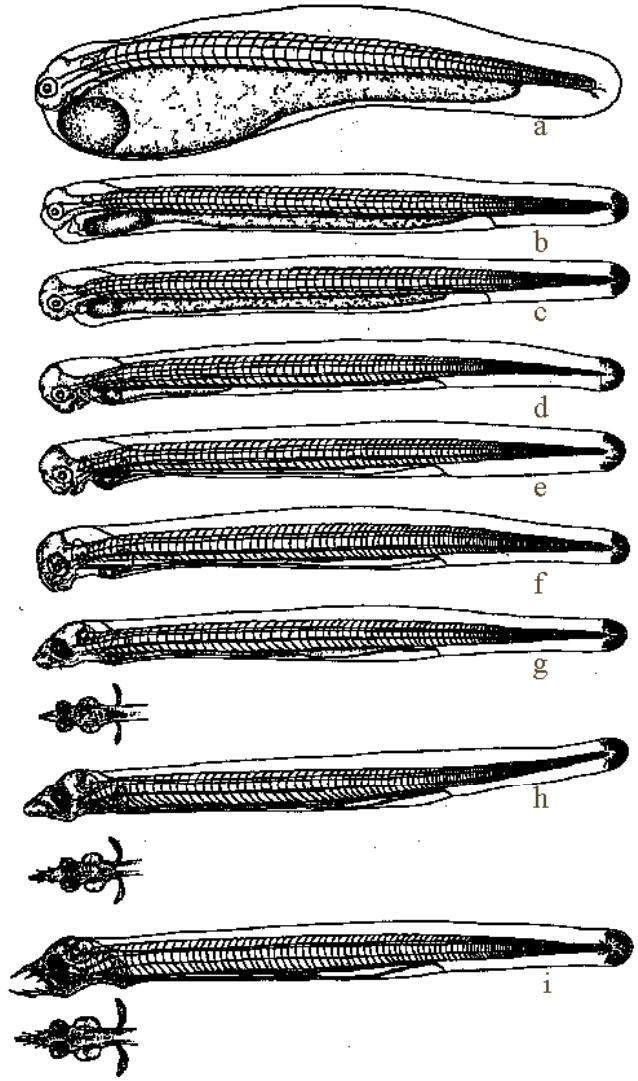
Ota, Kagawa and Tanaka.

Results: 1. Embryonic development at 21℃



Eggs were transparent, non-adhesive, pelagic, segmented and spherical in shape with wide perivitelline space
Spawned egg: 0.98 mm
Max. egg diameter: 1.5-16 mm (o.g 20%)
Hatching: 45 h-49 h

Results: 2. Early development of preleptocephalus larvae at 25℃



0 dph: 2.75±0.08 mm TL

1 dph: 4.96±0.14 mm TL

2 dph: 5.96±0.22 mm TL

3 dph: 6.58±0.14 mm TL

4 dph: 6.63±0.11 mm TL

5 dph: 6.90±0.19 mm TL

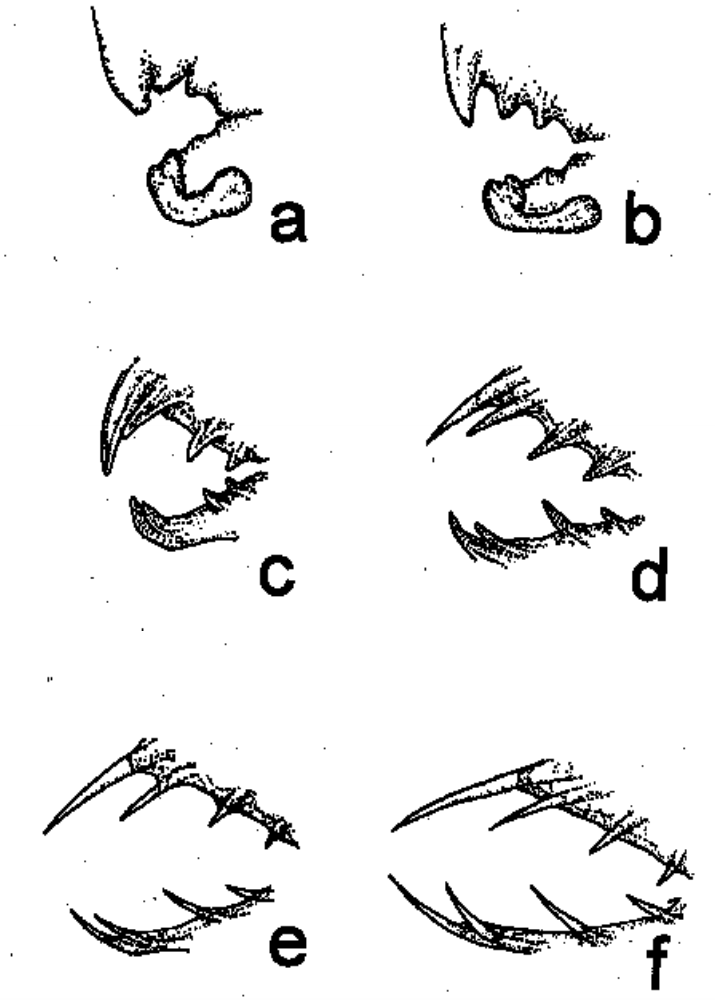
6 dph: 7.18±0.13 mm TL

7 dph: 7.26±0.08 mm TL

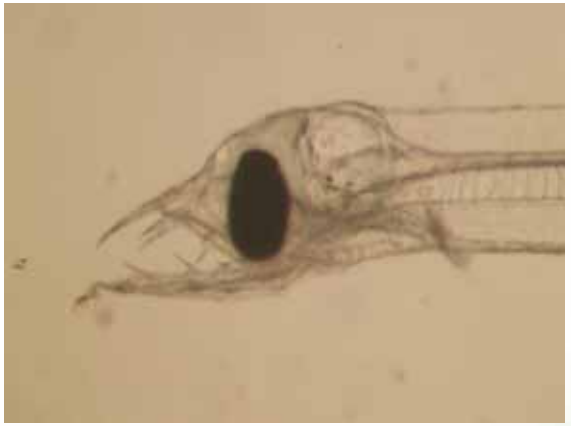
8 dph: 7.13±0.14 mm TL

Mouth opening: 3 dph
Rudimental larval teeth: 4-5 dph
Larval teeth move to snout: 6 dph
Completion of yolk absorption:
8 dph (201.5 day-degrees)

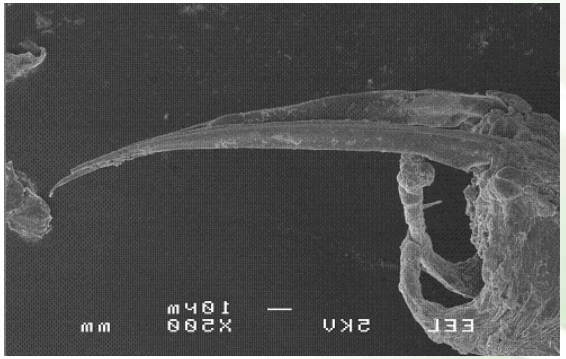
Results: 3. Development of larval teeth at 25 ℃



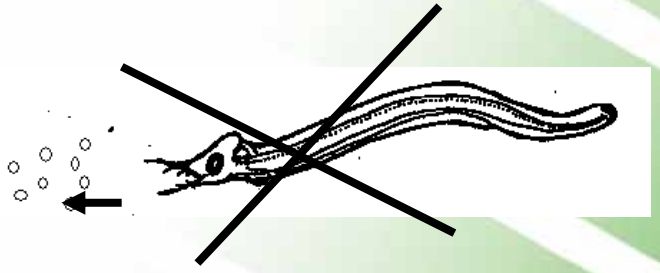
a: 3 dph, b: 4 dph, c: 5 dph,
d: 6 dph, e: 7 dph, f: 8 dph



8 dph



SEM



No active feeding behavior.
Larval teeth are not for catching prey.

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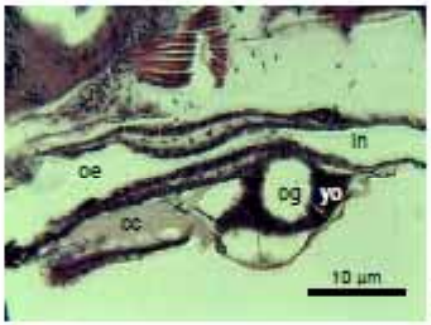
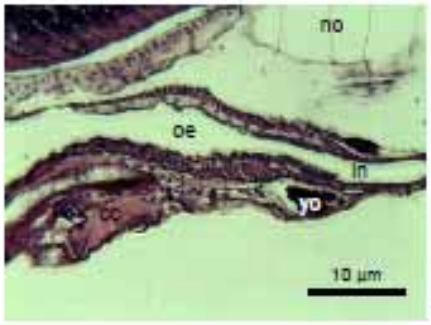
Results: 4. Histological structure of oesophagus in preleptocephalus larvae

6 dph



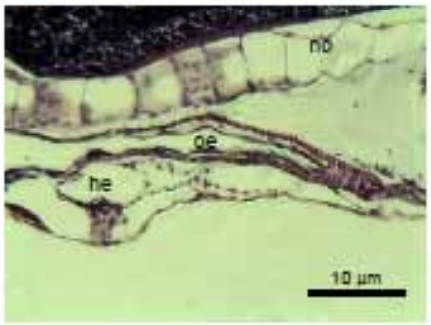
cc:cordial cavity

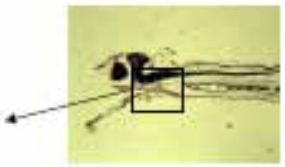
8 dph



Onset of initial feeding at 25℃

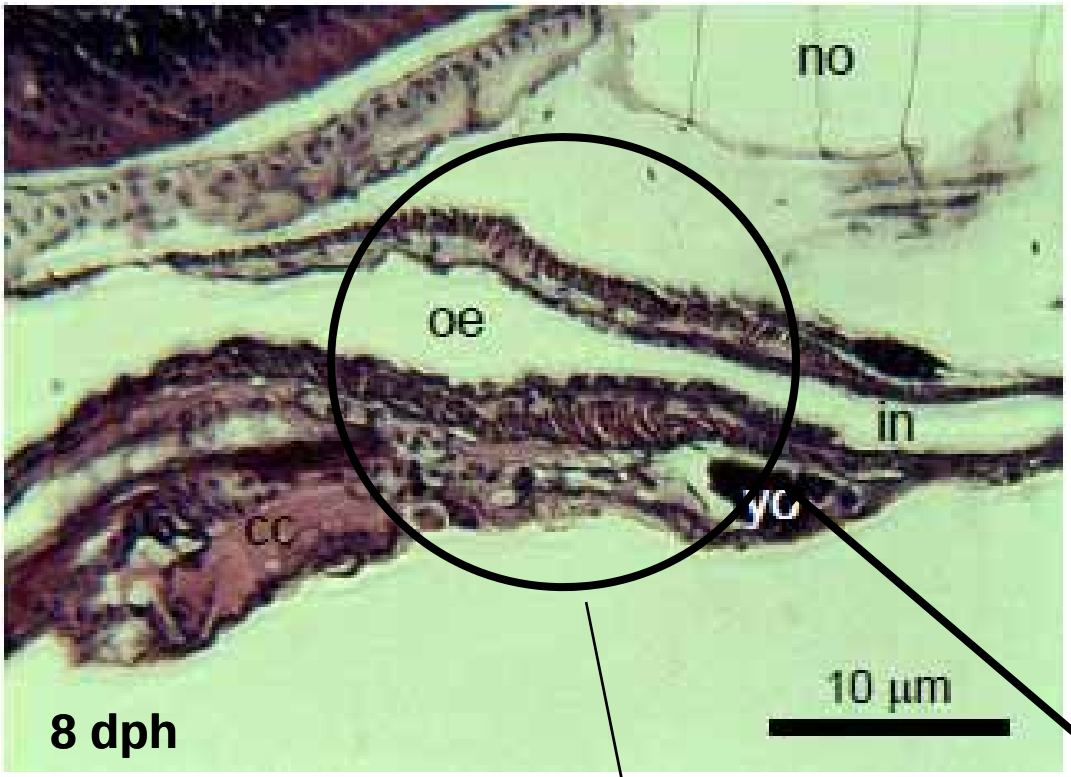
10 dph

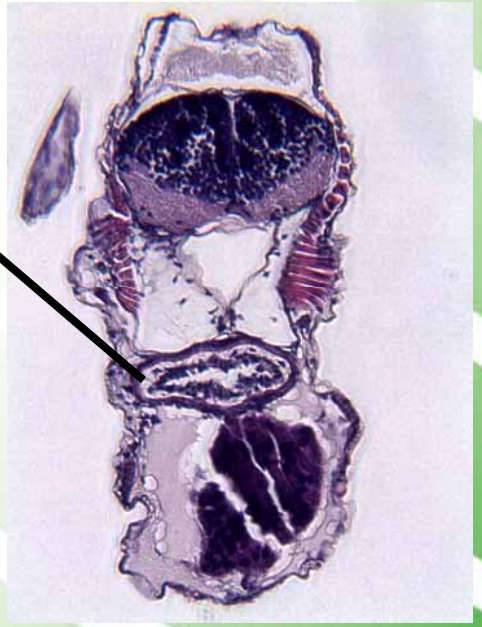




Hematoxylin and eosin stain

Results: 4. Histological structure of oesophagus in preleptocephalus larvae





Characteristic structure found in eel larvae: thick tissue layer in oesophageal part without mucous cells

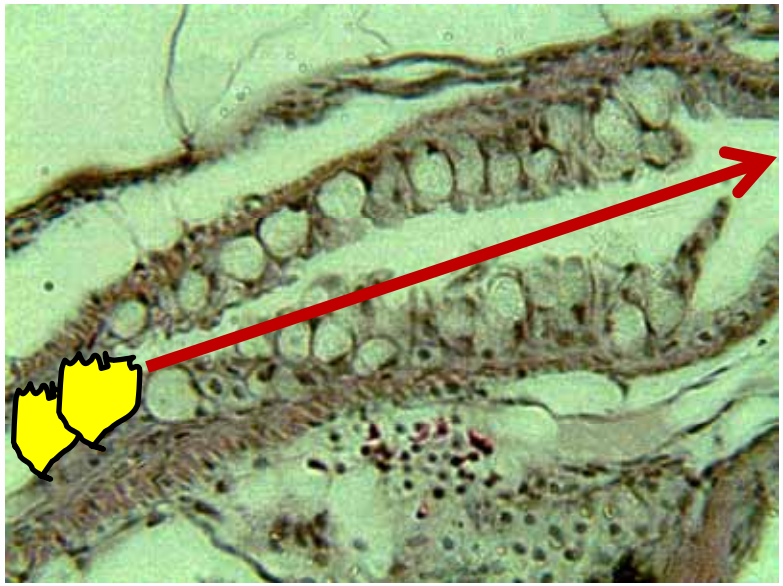
In case of ordinary marine teleosts:

by Tadahide Kurokawa

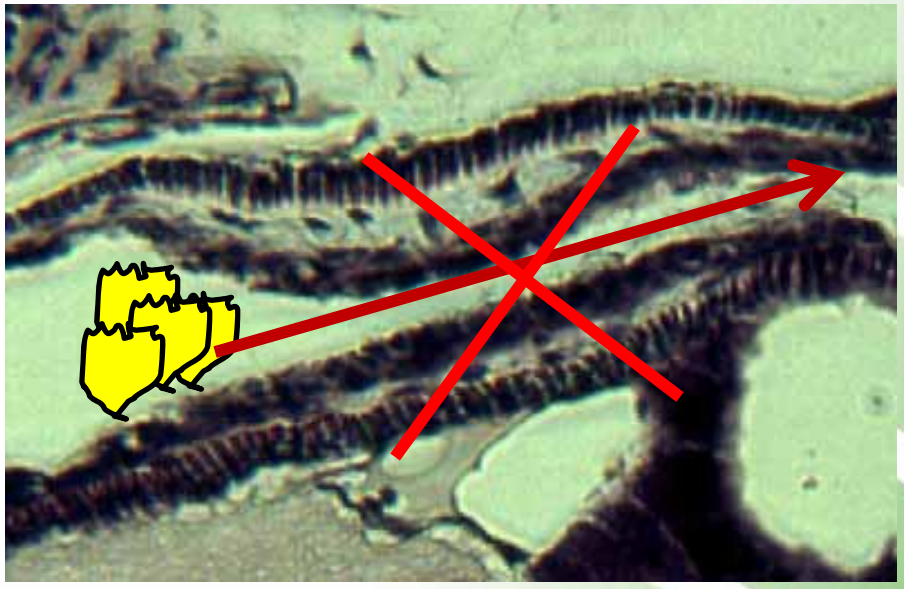
Development of mucous cells on oesophagus of larval *Plecogrossus altivelis* (10 dph)

Diadromous migration

Huge difference found in oesophageal parts between ordinary teleost and eel larvae



Ordinary marine teleost larva



Eel preleptocephalus larva

i.e. **no development of mucous cells and thick gullet tissue and circular muscle**

Conclusion:

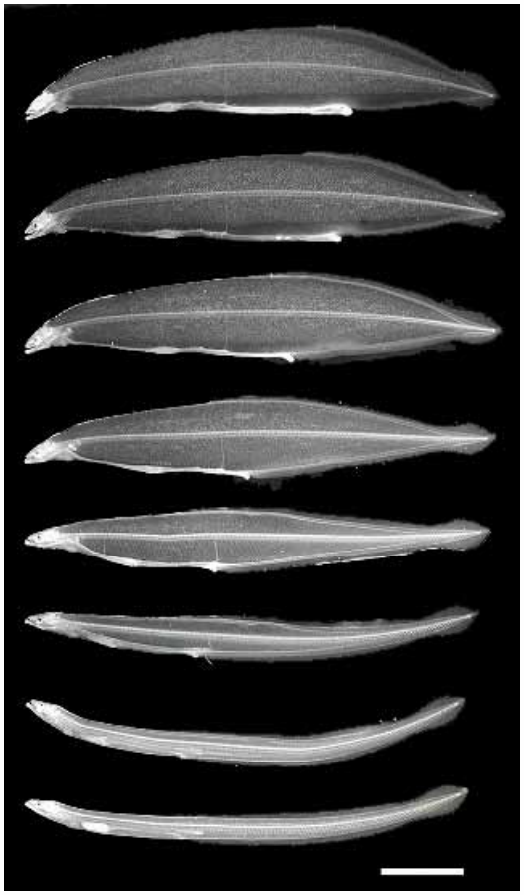
The embryonic and early development of the Japanese eel was studied in captivity.

Fertilized eggs were hatched out 45 to 49 hours after insemination at 21℃.

Newly hatched larvae completed yolk absorption 8 days after hatching at 201.5 day-degrees on 25℃.

Due to its characteristic feeding behavior and specific physical structure in oesophageal part, eel larvae cannot intake rotifers as an initial food item.

:This substantially makes the mass production of eel larvae difficult.



Acknowledgements

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Thank you for your kind attention

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