

Diseases of Eel in Japan

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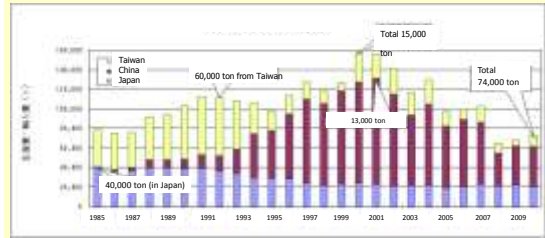


Fig. 1. Eel products in Japan and amount of imported eel from 1985 to 2010.



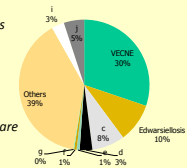
Shift of diseases by changing a culture condition

Outside pond (~1970's)

- Vibriosis : *Vibrio anguillarum*,
- Red spot disease : *Pseudomonas anguilliseptica*
- Red disease : *Aeromonas hydrophila*
- Head ulcer disease : atypical *A. salmonicida*
- Saprolegniasis : *Saprolegnia diclina* Type I
- White spot disease : *Ichthyophthirius multifiliis*
- Heterosporiosis : *Heterosporis anguillarum*

Green house (1980's~)

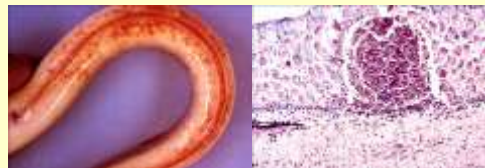
- Viral endothelial cell necrosis of eel (VECNE)
- Edwardsiellosis : *Edwardsiella tarda*
- Columnaris disease : *Flavobacterium columnare*
- Others (not infectious diseases)



Vibriosis: *Vibrio anguillarum*



Red spot disease : *Pseudomonas anguilliseptica*



Red disease : *Aeromonas hydrophila*



Fungal disease : *Saprolegnia diclina*



White spot disease: *Ichthyophthirius multifiliis*

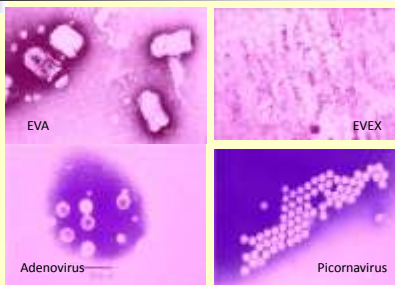


Heterosporiosis : *Heterosporis anguillarum*

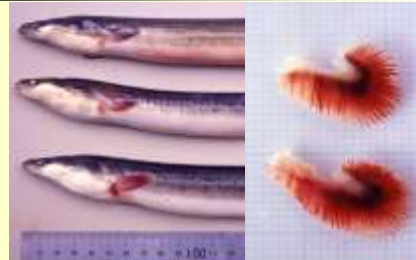


Viruses isolated or observed in eel fry
(Pathogenicity does not confirmed.)

(Photo: provided by Dr. H. Fukuda)



Viral endothelial cell necrosis of Japanese eel (VECNE)
= "intense congestion of the gill"

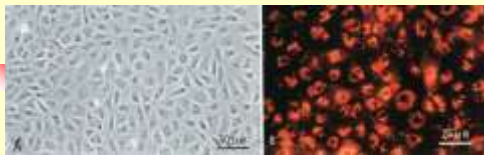


Gill filaments of diseased fish; dilatation of the central venous sinus was observed.

- In the liver, hemorrhage and destruction of blood vessels were observed.
- In the kidney, hemorrhage in the hematopoietic tissue and destruction of blood vessels were observed.



Intense congestion in central venous sinuses of gill filaments was found.



Japanese eel endothelial cell (JEEC) and CPE of causative virus. (Photo provided by Dr. Ono.)



Virus particles of 75 nm in diameter were observed in the hypertrophied nuclei.

Paracolo disease = Edwardsiellosis
: *Edwardsiella tarda* (*Paracolobacterium anguillimortiferum*)

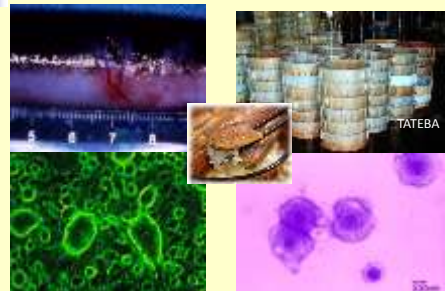


Columnaris disease : *Flavobacterium columnare*



Eel herpesvirus disease at "Tateba" (in the market)

(Photo: provided by Dr. T. Miyazaki)



Treatment and Control of VECNE

- Increasing temperature of rearing water with non-feeding.

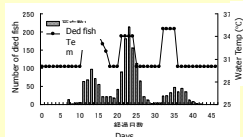


Fig. . Results of increasing temperature of rearing water at private farm .

- Poly (I:C) immunization; dsRNA injection to matured fish to prevent viral infection (plan is carrying out).

Eel culture (Breeding)

1972: Prof. Yamamoto, Hokkaido University had succeed to hatch out and to get a fry.

2010: Dr. Tanaka, National Inst. Aquaculture succeed to get eggs from culture grown eel and to hatch out.

