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VIRUS INDUCED DISEASE IN EEL (*Anguilla anguilla*) AQUACULTURE AND IN WILD IN EUROPEAN WATERS - Herpesvirus *Anguillae* HVA -

S.M. Bergmann¹, H. Wonneermann², M. Dauber¹, M. and D. Fichtner¹

¹Friedrich-Loeffler-Institut (FLI), German Reference Laboratory for Fish Diseases, Federal Research Institute for Animal Health, Insel Riems, Germany
²Federal State Laboratory of Schleswig-Holstein, Neumünster, Germany

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Investigations on HVA

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„Red head disease“

- skin and gill lesions (head and stomach area)
- increased mucus development
- red and swollen anus
- necrosis in skin, gills, spleen and kidney
- mass mortalities in hot summers 2003-2006 (wild and farmed elvers/glas eel to adults)

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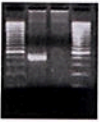



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Virus search in eel samples

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    graph TD
      Tissue[tissue] --> Bacteriology[bacteriology]
      Tissue --> Grinding[grinding]
      Grinding --> Digestion[digestion + nucleic acid extraction]
      Grinding --> ELMI[ELMI]
      Digestion --> Pellet[pellet]
      Digestion --> Supernatant[supernatant]
      Pellet -.-> ELMI
      Supernatant -.-> ELMI
  
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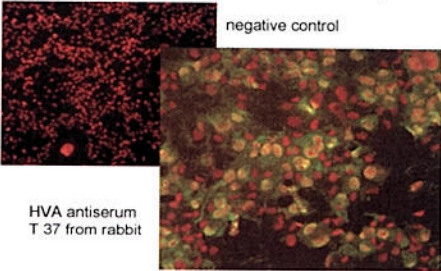



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Detection of HVA in EK-1 cells by iIFA

negative control



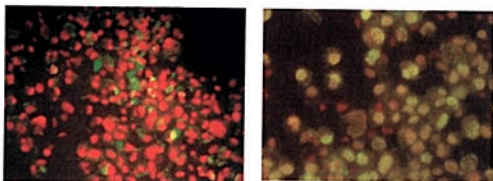
HVA antiserum
T 37 from rabbit

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α-HVA-mabs

7 A 9 12 E 5



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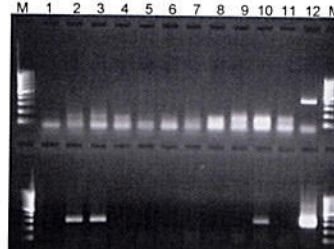
Detection of HVA in tissue samples by PCR

M 1 2 3 4 5 6 7 8 9 10 11 12 M

PCR


nested PCR

M 100 bp marker
1 neg. control
2 W1
3 W2
4 W3
5 W4
6 W5
7 W6
8 W7
9 W8
10 W9
11 W10
12 pos. control



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Methods established in the lab for eel virus detection


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1. PCR, nested PCR, Taqman real-time PCR (HVA, EVEX)
2. RT-PCR (Birna) (marine - fresh hwater)
3. IFAT with pab and mab (HVA, Birna, Picorna, EVEX)
4. ab ELISA with mab (HVA, Birna, Picorna)
5. in-situ hybridization (HVA)
6. vaccines against HVA and birnavirus (reovirus in preparation)
7. ELMI (Dr. Granzow)

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Viruses isolated from European eel (*Anguilla anguilla*)

1. HVA, elvers and adults
2. EVEX (rhabdovirus) elvers and adults
3. Perch RV-like, elvers
4. Eel reovirus, elvers
5. Eel picornavirus, adults
6. Eel birnavirus, elvers and adults (serotype Sp, not Ab)

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Investigations on eel picornavirus

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Sample: F 15/05, F24/05 and F28/05
DANNER, CASPARI (CVUA Freiburg)
BOCKLISCH (Bad Langensalza)

Anamnesis:
 ulcera and red skin (suspicion HVA)
 increased mucus production and detachment

Results:
 cell cultivation: CPE
 PCR from organs : HVA
 EM from passages: Picornavirus
 double infection

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Animal experiment

conditions:
 elvers (10 cm)
 water temperature 20°C
 infection for 1 h by immersion

Results:

	infected group	control group
mortality	7/16 (43%)	1/12 (injury)
virus isolation	10/10	0/4
histology / ELMI		NOT YET FINISHED

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Cumulative mortality during the experiment

Eel experiment 01/06

Day (dpi)	Infected elvers (%)	Controls (%)
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	20	0
8	35	0
9	35	0
10	35	0
11	35	0
12	35	0
13	35	0
14	43	10
15	43	10
16	43	10
17	43	10
18	43	10
19	43	10
20	43	10
21	43	10

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