World Organisation for Animal Health

Irene Cano Cejas - - UNITED_KINGDOM

WOAH Reference Laboratory Reports Activities 2024

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LABORATORY INFORMATION

***Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:**	Koi herpesvirus disease
***Address of laboratory:**	Barrack Road, The Nothe, Weymouth, Dorset DT4 8UB
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***E-mail address:**	irene.canocejas@cefas.gov.uk
Website:	https://www.cefas.co.uk/
***Name (including Title) of Head of Laboratory (Responsible Official):**	Dr Rachel Hartnell, Science Director
***Name (including Title and Position) of WOAH Reference Expert:**	Dr Irene Cano Cejas, Principal Virologist and Immunologist
***Which of the following defines your laboratory? Check all that apply:**	Governmental

TOR1: DIAGNOSTIC METHODS

1. Did your laboratory perform diagnostic tests for the specified disease/topic for purposes such as disease diagnosis, screening of animals for export, surveillance, etc.? (Not for quality control, proficiency testing or staff training)

Yes

Diagnostic Test	Indicated in WOAH Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
Histopathology	Yes	10	0
Direct diagnostic tests		Nationally	Internationally
Conventional PCR (CyHV-pol and/or TK Bercovier)	Yes	77	0
PCR amplicon sequencing	Yes	18	0

Real-time PCR	Yes	26	0
LAMP	Yes	0	0
Cell culture (CCB and/or KF cells)	Yes	15	0

TOR2: REFERENCE MATERIAL

2. Did your laboratory produce or supply imported standard reference reagents officially recognised by WOAH?

No

3. Did your laboratory supply standard reference reagents (nonWOAH-approved) and/or other diagnostic reagents to WOAH Members?

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient WOAH Member Countries	Country of recipients
KHV positive material consisting of two plasmid DNA	Plasmid CyHV-3 suitable to use with conventional PCR (Marc Y. Engelsma et al 2013) + Plasmid KHV suitable to sue with conventional PCR (Bercovier et al 2005)	Produced and provided	0	Each plasmid DNA containing 105 copies of the PCR garget KHV gene	1	SRI LANKA,

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAH Members?

No

TOR3: NEW PROCEDURES

6. Did your laboratory develop new diagnostic methods for the designated pathogen or disease?

No

7. Did your laboratory validate diagnostic methods according to WOAH Standards for the designated pathogen or disease?

No

8. Did your laboratory develop new vaccines for the designated pathogen or disease?

No

9. Did your laboratory validate vaccines according to WOAH Standards for the designated pathogen or disease?

No

TOR4: DIAGNOSTIC TESTING FACILITIES

10. Did your laboratory carry out diagnostic testing for other WOAH Members?

No

11. Did your laboratory provide expert advice in technical consultancies on the request of an WOAH Member?

No

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOAH Members other than the own?

No

13. In exercising your activities, have you identified any regulatory research needs* relevant for WOAH?

Yes

Research need : 1

Please type the Research need: Diagnostic development and validation for non-lethal KHV testing in asymptomatic fish

Relevance for WOAH Disease Control,

Relevance for the Code or Manual Manual,

Field Epidemiology and Surveillance, Diagnostics,

Animal Category Aquatic,

Disease:

Infection with koi herpesvirus

Kind of disease (Zoonosis, Transboundary diseases)

If any, please specify relevance for Codes or Manual, chapter and title

(e.g. Terrestrial Manual Chapter 2.3.5 - Minimum requirements for aseptic production in vaccine manufacture)

Answer: Infection with Koi herpesvirus; 3.4 - Non-lethal sampling

Notes:

Answer: Further research is needed to validate diagnostic tests for detecting KHV in non-lethal samples from asymptomatic fish, i.e. high-value Koi carp specimens involved in trade.

TOR6: EPIZOOLOGICAL DATA

14. Did your Laboratory collect epidemiological data relevant to international disease control?

Yes

If the answer is yes, please provide details of the data collected:

The routine national surveillance program includes testing to retain freedom in approved compartments, ad hoc testing programme of susceptible ornamental imports and course fish testing on suspicion.

15. Did your laboratory disseminate epidemiological data that had been processed and analysed?

Yes

If the answer is yes, please provide details of the data collected:
We keep an up-to-date record of relevant published data on KHV. There have been no major changes in the distribution or severity of KHV.

16. What method of dissemination of information is most often used by your laboratory? (Indicate in the appropriate box the number by category and list the details in the box)

a) Articles published in peer-reviewed journals:

1
https://www.mdpi.com/1999-4915/16/3/380
Cano, I.; Blaker, E.; Hartnell, D.; Farbos, A.; Moore, K.A.; Cobb, A.; Santos, E.M.; van Aerle, R. Transcriptomic Responses to Koi Herpesvirus in Isolated Blood Leukocytes from Infected Common Carp. Viruses 2024, 16, 380. https://doi.org/10.3390/v16030380

b) International conferences:

0

c) National conferences:

1
Networking 5th EAFP UK & Ireland branch meeting, UK

d) Other (Provide website address or link to appropriate information):

0

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOAH Members?

Yes

a) Technical visit : 0

b) Seminars : 0

c) Hands-on training courses: 2

d) Internships (>1 month) 0

Type of technical training provided (a, b, c or d)	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
C	TUNISIA	16

C	TUNISIA	18

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
ISO17025	scan attached	2293Testing-Single Weymouth UKAS Accred ISO17025 cert 2024.pdf
ISO9001	scan attached	11 102147 HSEQ CORP Quality ISO 9001 certificate.PDF_2.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Detection and confirmation of Koi herpesvirus (KHV) DNA by PCR	UKAS
Detection and confirmation of CyHV-3 (KHV) DNA by PCR	UKAS

20. Does your laboratory maintain a “biorisk management system” for the pathogen and the disease concerned?

Yes

Cefas Biorisk management system includes a range of practices and procedures to ensure biosecurity, biosafety, and biocontainment of infectious agents including security measures for laboratories, from standard operating procedures to physical measures to individual practices in the laboratory. This includes a dedicated Biosafety and Biosecurity Committee with lead and deputy officers and a internally published laboratory Biosecurity Handbook.

TOR9: SCIENTIFIC MEETINGS

21. Did your laboratory organise scientific meetings related to the pathogen in question on behalf of WOAH?

No

22. Did your laboratory participate in scientific meetings related to the pathogen in question on behalf of WOAH?

Yes

Title of event	Date	location	Role (speaker, presenting poster, short communications)	Title of the work presented
WOAH 4th cycle training of Aquatic Animal Health Focal Points in Africa	2024-07-07	Tunisia	Invited expert, facilitator	Use of passive surveillance to develop an early detection system to assess the likelihood of the country being free of disease

TOR10: NETWORK WITH WOAH REFERENCE LABORATORIES

23. Did your laboratory exchange information with other WOAH Reference Laboratories designated for the same pathogen or disease?

Yes

24. Do you network (collaborate or share information) with other WOAH Reference Laboratories designated for the same pathogen?

Yes

NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOAH REF. LABS
Infection with Koi herpesvirus	Organiser - online meeting	5	German Reference Laboratory for Koi Herpesvirus Disease and Aquaculture Research Department, Fisheries Technology Institute,

25. Did you organise or participate in inter-laboratory proficiency tests with WOAH Reference Laboratories designated for the same pathogen during the past 2 years?

No

Inter-laboratory proficiency tests were conducted with non-ref labs

26. Did your laboratory collaborate with other WOAH Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?

No

TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING

27. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than WOAH Reference Laboratories for the same pathogen during the past 2 years?

Yes

Purpose for inter-laboratory test comparisons1	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Name of the test	WOAH Member Countries
EURL annual Comparative test of diagnostic procedures for EU listed fish diseases	Participant	43	Inter-Laboratory Proficiency Test 2024 for identification and titration of VHSV, IHNV, EHNV (fish ranaviruses), SVCV and IPNV (PT1) and identification of CyHV-3 (KHV), SAV and ISAV (PT2)	DENMARK,
Validation of diagnostic protocols	Participant	13	To validate and confirm the presence of KHV in positive material used for an interlaboratory proficiency test	UNITED KINGDOM,

TOR12: EXPERT CONSULTANTS

28. Did your laboratory place expert consultants at the disposal of WOAH?

Yes

Kind of consultancy	Location	Subject (facultative)
Invited expert, facilitator	Tunisia, Africa	WOAH 4th cycle training of Aquatic Animal Health Focal Points in Africa (08-10/07)
Invited expert, facilitator	Tunisia, Africa	WOAH workshop on AMR in Aquaculture for French-speaking Africa (11-12/07)
Technical advice	National laboratory	Drafting new diagnostic chapter for TiLV - ongoing

29. Additional comments regarding your report:

Yes

Limited activity under the designated disease however further work was done under our current WHOA CC to provide general advice and training on diagnostic tests.

On 2024, methods for whole genome sequencing of KHV were developed using long read sequencing (Oxford Nanopore Technologies). This has resulted in the assembly of a KHV genome with ca. 272 kb using a de novo approach. Further work is ongoing to resolve the repeated regions to complete the sequence of the whole genome. Several KHV isolates were identified and cultured for WGS, which is planned for 2025. Research was carried out on development and optimisation of methods for host-depletion by affinity capture, enzymatic depletion and adaptive sequencing. Methods for assessing capsid integrity by qPCR assays/ PMAxx were also trialled.