

OIE Reference Laboratory Reports Activities

Activities in 2019

This report has been submitted : 2020-01-10 01:05:34

Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Equine piroplasmosis
Address of laboratory:	National Research Center for Protozoan Diseases Obihiro University of Agriculture and Veterinary Medicine Nishi 2-13, Inada-cho Obihiro, Hokkaido 080-8555 JAPAN
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Name (including Title) of Head of Laboratory (Responsible Official):	Prof. Naoaki Yokoyama, DVM, PhD
Name (including Title and Position) of OIE Reference Expert:	Prof. Naoaki Yokoyama, DVM, PhD
Which of the following defines your laboratory? Check all that apply:	Academic

ToR 1: To use, promote and disseminate diagnostic methods validated according to OIE Standards

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 OIE Manual (Yes/No)	Total number of test performed last year	
		Nationally	Internationally
Indirect diagnostic tests		Nationally	Internationally
Theileria equi IFAT	Yes	0	402
Babesia caballi IFAT	Yes	0	402
Theileria equi ELISA	Yes	0	400
Babesia caballi ELISA	Yes	0	400
Theileria equi cELISA	Yes	0	2
Babesia caballi cELISA	Yes	0	2
Theileria equi ICT	Yes	0	2
Babesia caballi ICT	Yes	0	2
Direct diagnostic tests		Nationally	Internationally
Theileria equi PCR	Yes	0	111
Babesia caballi PCT	Yes	0	111

**ToR 2: To develop reference material in accordance with OIE requirements, and implement and promote the application of OIE Standards.
To store and distribute to national laboratories biological reference products and any other reagents used in the diagnosis and control of the designated pathogens or disease.**

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

Yes

NOTE: Currently, there are 22 laboratories that produce Standard Reference Reagents officially recognised by the OIE for 19

diseases/pathogens. Please click the following link to the list of OIE-approved International Standard Sera: <http://www.oie.int/en/our-scientific-expertise/veterinary-products/reference-reagents/>. If the reagent is not listed on this page, it is NOT considered OIE-approved. The next two questions allow you to indicate non-OIE-approved diagnostic reagents.

Disease		Test	Available from		
Type of reagent available	Related diagnostic test	Produced/ Supply imported	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	Name of recipient OIE Member Countries
Theileria equi IFAT slides (No. 300)	IFAT	Produced and provided	<input checked="" type="radio"/> <10mL <input type="radio"/> 10-100mL <input type="radio"/> 100-500mL <input type="radio"/> >500mL	<input checked="" type="radio"/> <10mL <input type="radio"/> 10-100mL <input type="radio"/> 100-500mL <input type="radio"/> >500mL	CANADA
Theileria equi IFAT slides (No. 50)	IFAT	Produced and provided	<input checked="" type="radio"/> <10mL <input type="radio"/> 10-100mL <input type="radio"/> 100-500mL <input type="radio"/> >500mL	<input checked="" type="radio"/> <10mL <input type="radio"/> 10-100mL <input type="radio"/> 100-500mL <input type="radio"/> >500mL	SOUTH AFRICA
Babesia caballi IFAT slides (No. 300)	IFAT	Produced and provided	<input checked="" type="radio"/> <10mL <input type="radio"/> 10-100mL <input type="radio"/> 100-500mL <input type="radio"/> >500mL	<input checked="" type="radio"/> <10mL <input type="radio"/> 10-100mL <input type="radio"/> 100-500mL <input type="radio"/> >500mL	CANADA
Babesia caballi IFAT slides (No. 450)	IFAT	Produced and provided	<input checked="" type="radio"/> <10mL <input type="radio"/> 10-100mL <input type="radio"/> 100-500mL <input type="radio"/> >500mL	<input checked="" type="radio"/> <10mL <input type="radio"/> 10-100mL <input type="radio"/> 100-500mL <input type="radio"/> >500mL	FRANCE
Babesia caballi IFAT slides (No. 50)	IFAT	Produced and provided	<input checked="" type="radio"/> <10mL <input type="radio"/> 10-100mL <input type="radio"/> 100-500mL <input type="radio"/> >500mL	<input checked="" type="radio"/> <10mL <input type="radio"/> 10-100mL <input type="radio"/> 100-500mL <input type="radio"/> >500mL	SOUTH AFRICA
Babesia caballi IFAT slides (No. 150)	IFAT	Produced and provided	<input checked="" type="radio"/> <10mL <input type="radio"/> 10-100mL <input type="radio"/> 100-500mL <input type="radio"/> >500mL	<input checked="" type="radio"/> <10mL <input type="radio"/> 10-100mL <input type="radio"/> 100-500mL <input type="radio"/> >500mL	THE NETHERLANDS

3. Did your laboratory supply standard reference reagents (non OIE-approved) and/or other diagnostic reagents to OIE Member Countries?

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient OIE Member Countries	Region of recipients
Theileria equi recombinant antigen	ELISA and ICT	Produced and provided	0	5 mg	Mongolia	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
Babesia caballi recombinant antigen	ELISA and ICT	Produced and provided	0	5 mg	Mongolia	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
Theileria equi recombinant antigen	ELISA	Produced and provided	0	2 mg	South Africa	<input checked="" type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
Babesia caballi recombinant antigen	ELISA	Produced and provided	0	2 mg	South Africa	<input checked="" type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to OIE Member Countries?

No

ToR 3: To develop, standardise and validate, according to OIE Standards, new procedures for diagnosis and control of the designated pathogens or diseases

6. Did your laboratory develop new diagnostic methods validated according to OIE Standards for the designated pathogen or disease?

No

7. Did your laboratory develop new vaccines according to OIE Standards for the designated pathogen or disease?

No

ToR 4: To provide diagnostic testing facilities, and, where appropriate, scientific and technical advice on disease control measures to OIE Member Countries

8. Did your laboratory carry out diagnostic testing for other OIE Member Countries?

Yes

Name of OIE Member Country seeking assistance	Date (month)	No. samples received for provision of diagnostic support	No. samples received for provision of confirmatory diagnoses
UNITED KINGDOM	August	0	1
SRI LANKA	August	111	0
UNITED KINGDOM	September	0	1
SOUTH AFRICA	November	400	0

9. Did your laboratory provide expert advice in technical consultancies on the request of an OIE Member Country?

Yes

Name of the OIE Member Country receiving a technical consultancy	Purpose	How the advice was provided
CHINA (PEOPLE'S REP. OF)	Diagnostic assays for testing imported horses in animal quarantine and interpretation of test results	Electronic consultation
ECUADOR	Reasons for asymptomatic infection with <i>Theileria equi</i> in horses	Electronic consultation
ARGENTINA	Inconsistent test results from different diagnostic assays	Electronic consultation
THE NETHERLANDS	In vitro cultivation of <i>Babesia caballi</i>	Electronic consultation
SOUTH AFRICA	Interpretation of diagnostic test results	In loco
SRI LANKA	Epidemiology of equine piroplasmiasis in Sri Lanka	In loco
IRAN	Diagnostic tests for detecting sub-clinical equine piroplasmiasis in horses	Electronic consultation
UNITED KINGDOM	Mode of transmission of <i>Theileria equi</i>	Electronic consultation

ToR 5: To carry out and/or coordinate scientific and technical studies in collaboration with other laboratories, centres or organisations

10. Did your laboratory participate in international scientific studies in collaboration with OIE Member Countries other than the own?

Yes

Title of the study	Duration	Purpose of the study	Partners (Institutions)	OIE Member Countries involved other than your country
Epidemiology of Theileria equi and Babesia caballi in donkeys in Sri Lanka	1 year	To investigate whether Theileria equi and Babesia caballi are endemic in Sri Lanka	Veterinary Research Institute, Sri Lanka	SRI LANKA
Molecular and serological survey and clinical impact of equine piroplasmosis in Nigeria	1 year	To determine the molecular and serological prevalence and clinical impact of Theileria equi and Babesia caballi in Nigeria	Unit for Environmental Sciences and Management, North-West University, Potchefstroom, South Africa	NIGERIA SOUTH AFRICA
Seroepidemiological Survey of Theileria equi and Babesia caballi in Horses in Mongolia	3 years	To map the epidemiology of Theileria equi and Babesia caballi infections in horses in Mongolia	Institute of Veterinary Medicine, Mongolian University of Life Sciences, Ulaanbaatar, Mongolia	MONGOLIA

ToR 6: To collect, process, analyse, publish and disseminate epizootiological data relevant to the designated pathogens or diseases

11. Did your Laboratory collect epizootiological data relevant to international disease control?

Yes

If the answer is yes, please provide details of the data collected:
We collected epizootiological data and prepared an epidemiological map illustrating global distribution of equine piroplasmosis.

12. Did your laboratory disseminate epizootiological data that had been processed and analysed?

Yes

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

Epizootiological data of equine piroplasmosis have been summarized in a review article entitled "A Review on Equine Piroplasmosis: Epidemiology, Vector Ecology, Risk Factors, Host Immunity, Diagnosis and Control". An epidemiological map of equine piroplasmosis has also been included in the same article.

**13. What method of dissemination of information is most often used by your laboratory?
(Indicate in the appropriate box the number by category)**

a) Articles published in peer-reviewed journals: 10

El-Sayed, S.A.E., Rizk, M.A., Yokoyama, N., and Igarashi, I.: Evaluation of the in vitro and in vivo inhibitory effect of thymoquinone on piroplasm parasites. *Parasit. Vectors.* 12: 37, 2019.

Mungun-Ochir, B., Horiuchi, N., Altanchimeg, A., Koyama, K., Suganuma, K., Nyamdolgor, U., Watanabe, K.I., Baatarjargal, P., Mizushima, D., Battur, B., Yokoyama, N., Battsetseg, B., Inoue, N., and Kobayashi Y.: Polyradiculoneuropathy in dourine-affected horses. *Neuromuscul. Disord.*, S0960-8966(18)30277-3, 2019.

Batiha, G.E., Beshbishy, A.M., Tayebwa, D.S., Shaheen, H.M., Yokoyama, N., and Igarashi, I.: Inhibitory effects of *Syzygium aromaticum* and *Camellia sinensis* methanolic extracts on the growth of *Babesia* and *Theileria* parasites. *Ticks Tick Borne, Dis.*, 10: 949-958, 2019.

Batiha, G.E., Beshbishy, A.M., Tayebwa, D.S., Adeyemi, O.S., Shaheen, H., Yokoyama, N., and Igarashi, I.: The effects of trans-chalcone and chalcone 4 hydrate on the growth of *Babesia* and *Theileria*. *PLoS Negl. Trop. Dis.*, 13: e0007030, 2019.

Beshbishy, A.M., Batiha, G.E., Yokoyama, N., and Igarashi I.: Ellagic acid microspheres restrict the growth of *Babesia* and *Theileria* in vitro and *Babesia microti* in vivo. *Parasit. Vectors.* 12: 269, 2019.

Nugraha, A.B., Tuvshintulga, B., Guswanto, A., Tayebwa, D.S., Rizk, M.A., Gantuya, S., El-Saber Batiha, G., Beshbishy, A.M., Sivakumar, T., Yokoyama, N., and Igarashi I.: Screening the Medicines for Malaria Venture Pathogen Box against piroplasm parasites. *Int. J. Parasitol. Drugs Drug Resist.*, 10:84-90, 2019.

Batiha, G.E., Beshbishy, A.M., Tayebwa, D.S., Adeyemi, O.S., Yokoyama, N., and Igarashi, I.: Evaluation of the inhibitory effect of ivermectin on the growth of *Babesia* and *Theileria* parasites in vitro and in vivo. *Trop. Med. Health.*, 47:42, 2019.

Myagmarsuren, P., Sivakumar, T., Enkhtaivan, B., Davaasuren, B., Zoljargal, M., Narantsatsral, S., Davkharbayar, B., Mungun-Ochir, B., Battur, B., Inoue, N., Igarashi, I., Battsetseg, B., and Yokoyama N.: A Seroepidemiological Survey of *Theileria equi* and *Babesia caballi* in Horses in Mongolia. *J. Parasitol.*, 105:580-586, 2019.

Onyiche, T.E., Suganuma, K., Igarashi, I., Yokoyama, N., Xuan, X., and Thekiso, O.: A Review on Equine Piroplasmosis: Epidemiology, Vector Ecology, Risk Factors, Host Immunity, Diagnosis and Control. *Int. J. Environ. Res. Public Health.* 16: E1736, 2019.

Rizk, M.A., El-Sayed, S.A.E., El-Khodery, S., Yokoyama, N., and Igarashi I.: Discovering the in vitro potent inhibitors against *Babesia* and *Theileria* parasites by repurposing the Malaria Box: A review. *Vet. Parasitol.*, 274: 108895, 2019.

b) International conferences: 0

c) National conferences: 1

The 60th Annual Meeting of the Japanese Society of Tropical Medicine, Ginowan, Okinawa, November 8-10, 2019

d) Other:

(Provide website address or link to appropriate information) 1

<https://www.obihiro.ac.jp/facility/protozoa/en>

ToR 7: To provide scientific and technical training for personnel from OIE Member Countries**To recommend the prescribed and alternative tests or vaccines as OIE Standards**

14. Did your laboratory provide scientific and technical training to laboratory personnel from other OIE Member Countries?

Yes

- a) Technical visits: 1
- b) Seminars: 0
- c) Hands-on training courses: 0
- 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
a	South Africa	1

ToR 8: To maintain a system of quality assurance, biosafety and biosecurity relevant for the pathogen and the disease concerned

15. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)
ISO/IEC 17025:2005	□□□_English2018.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
PCR for Theileria equi	Perry Johnson laboratory Accrediation, Inc. (PJLA)
PCR for Babesia caballi	Perry Johnson laboratory Accrediation, Inc. (PJLA)

17. Does your laboratory maintain a "biorisk management system" for the pathogen and the disease concerned?

Yes

(See Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, Chapter 1.1.4)

ToR 9: To organise and participate in scientific meetings on behalf of the OIE

18. Did your laboratory organise scientific meetings on behalf of the OIE?

No

19. Did your laboratory participate in scientific meetings on behalf of the OIE?

No

ToR 10: To establish and maintain a network with other OIE Reference Laboratories designated for the same pathogen or disease and organise regular inter-laboratory proficiency testing to ensure comparability of results

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

Not applicable (Only OIE Reference Lab. designated for disease)

21. Was your laboratory involved in maintaining a network with OIE Reference Laboratories designated for the same pathogen or disease by organising or participating in proficiency tests?

Not applicable (Only OIE Reference Lab. designated for disease)

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

Not applicable (Only OIE Reference Lab. designated for disease)

ToR 11: To organise inter-laboratory proficiency testing with laboratories other than OIE Reference Laboratories for the same pathogens and diseases to ensure equivalence of results

23. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than OIE Reference Laboratories for the same disease?

No

*Note: See Interlaboratory test comparisons in: Laboratory Proficiency Testing at:
<http://www.oie.int/en/our-scientific-expertise/reference-laboratories/proficiency-testing> see point 1.3*

ToR 12: To place expert consultants at the disposal of the OIE

24. Did your laboratory place expert consultants at the disposal of the OIE?

No

25. Additional comments regarding your report: