

OIE Reference Laboratory Reports Activities

Activities in 2019

This report has been submitted : 2020-01-10 01:20:51

Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Bovine babesiosis
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
Tel.:	+81-155 49.56.49
Fax:	+81-155 49.56.43
E-mail address:	yokoyama@obihiro.ac.jp
Website:	https://www.obihiro.ac.jp/facility/protozoa/en
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
Babesia bovis ELISA	Yes	0	200
Babesia bigemina ELISA	Yes	0	200
Babesia bovis ICT	Yes	0	150
Babesia bigemina ICT	Yes	0	150
Direct diagnostic tests		Nationally	Internationally
Babesia bovis PCR	Yes	0	850
Babesia bigemina PCR	Yes	0	850
Babesia sp Mymensingh PCR	No	0	725

**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
Babesia bovis recombinant antigen	ELISA and ICT	Produced	<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	MONGOLIA
Babesia bigemina recombinant antigen	ELISA and ICT	Produced	<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	MONGOLIA
Babesia divergens IFAT slides (No. 1300)	IFAT		<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	AUSTRIA

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

No

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
MONGOLIA	December	725	0
SRI LANKA	February	125	0
BANGLADESH	May	59	0
ARGENTINA	February	150	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
MONGOLIA	Epidemiology and clinical impact of bovine babesiosis	In loco
VIETNAM	Detection of clinical babesiosis and isolation and in vitro cultivation of Babesia isolates from cattle	In loco
SRI LANKA	Isolation and in vitro cultivation of bovine Babesia species	In loco

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
Molecular epidemiology of bovine Babesia species in cattle in Mongolia	2 year	To determine the infection rates of Babesia species in cattle from various Mongolian provinces.	Institute of Veterinary Medicine, Mongolian University of Life Sciences, Ulaanbaatar, Mongolia	MONGOLIA
Epidemiological survey of Babesia species in cattle in Sri Lanka	1 year	To identify Babesia-infected cattle farms prior to isolation and cultivation	Veterinary Research Institute, Sri Lanka	SRI LANKA
Epidemiological survey of Babesia bovis and Babesia bigemina in Argentina	1 year	To investigate the epidemiology of Babesia bovis and Babesia bigemina in cattle herds with clinical babesiosis.	Instituto de Patobiología Veterinaria, (CICVyA), Instituto Nacional de Tecnología Agropecuaria (INTA), 1686, Hurlingham, Argentina	ARGENTINA
Molecular epidemiology of hemoprotozoan parasites in cattle from Bangladesh	1 year	To identify the major hemoprotozoan parasite species infecting cattle in Bangladesh.	Department of Animal Husbandry and Veterinary Science, Faculty of Agriculture, University of Rajshahi, Rajshahi, 6205, Bangladesh	BANGLADESH

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 are collecting epizootiological data in order to summarize them in a review article and prepare global distribution maps of Babesia species causing bovine babesiosis.

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

No

If the answer is no, please provide a brief explanation of the situation:
The analysis of collected data is ongoing.

**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: 15

Enkhtaivan, B., Narantsatsral, S., Davaasuren, B., Otgonsuren, D., Amgalanbaatar, T., Uuganbayar, E., Zoljargal, M., Myagmarsuren, P., Suganuma, K., Molefe, N.I., Sivakumar, T., Inoue, N., Battur, B., Battsetseg, B., and Yokoyama, N.: Molecular detection of *Anaplasma ovis* in small ruminants and ixodid ticks from Mongolia. *Int. Parasitol.*, 69: 47-53, 2019.

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.

Tuvshintulga, B., Sivakumar, T., Yokoyama, N., and Igarashi, I.: Development of unstable resistance to diminazene aceturate in *Babesia bovis*. *Int. J. Parasitol. Drugs Drug Resist.* 9: 87-92, 2019.

Gunasekara, E., Sivakumar, T., Kothalawala, H., Abeysekera, T.S., Weerasingha, A.S., Vimalakumar, S.C., Kanagaratnam, R., Yapa, P.R., Zhyldyz, A., Igarashi, I., Silva, S.S.P., and Yokoyama, N.: Epidemiological survey of hemoprotozoan parasites in cattle from low-country wet zone in Sri Lanka. *Parasitol. Int.*, 71: 5-10, 2019.

Suganuma, K., Kondoh, D., Sivakumar, T., Mizushima, D., Elata, A.T.M., Thekiso, O.M.M., Yokoyama, N., and Inoue, N.: Molecular characterization of a new *Trypanosoma* (*Megatrypanum*) *theileri* isolate supports the two main phylogenetic lineages of this species in Japanese cattle. *Parasitol. Res.*, 118:1927-1935, 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.

Moni, M.I.Z., Hayashi, K., Sivakumar, T., Rahman, M., Nahar, L., Islam, M.Z., Yokoyama, N., Kitoh, K., Appiah-Kwarteng, C., and Takashima, Y.: First molecular detection of *Theileria annulata* in Bangladesh. *J. Vet. Med. Sci.*, 81: 1197-1200, 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.

Zhyldyz, A., Sivakumar, T., Igarashi, I., Gunasekara, E., Kothalawala, H., Silva, S.S.P., and Yokoyama, N.: Epidemiological survey of *Anaplasma marginale* in cattle and buffalo in Sri Lanka. *J. Vet. Med. Sci.*, 81: 1601-1605, 2019.

Pagmadulam, B., Myagmarsuren, P., Yokoyama, N., Battsetseg, B., and Nishikawa, Y.: Seroepidemiological study of *Toxoplasma gondii* in small ruminants (sheep and goat) in different provinces of Mongolia. *Parasitol. Int.*, 74: 101996, 2019.

Sivakumar, T., Fujita, S., Tuvshintulga, B., Kothalawala, H., Silva, S.S.P., and Yokoyama, N.: Discovery of a new *Theileria* sp. closely related to *Theileria annulata* in cattle from Sri Lanka. *Sci. Rep.*, 9:16132, 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: 3

The 88th Annual Meeting of the Japanese Society of Parasitology, Nagasaki, Nagasaki, March 15-16, 2019

The 162th Annual Meeting of the Japanese Society of Veterinary Science. Tsukuba, Ibaraki, September 10-12, 2019

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) 0

<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: 5

b) Seminars: 80

c) Hands-on training courses: 9

d) Internships (>1 month): 1

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	Mongolia	5
b	Mongolia	30
c	Sri Lanka	9
b	Vietnam	50
d	Thailand	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 Babesia bovis	Perry Johnson laboratory Accrediation, Inc. (PJLA)
PCR for Babesia bigemina	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?

Yes

Title of event	Date (mm/yy)	Location	Role (speaker, presenting poster, short communications)	Title of the work presented
Seminar on bovine babesiosis	November/2019	Hue, Vietnam	Speaker	The role of OIE reference laboratory in control of bovine babesiosis

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?

Yes

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?

No

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?

No

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: