OIE Reference Laboratory Reports Activities

Activities in 2020

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Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Bovine babesiosis
Address of laboratory:	Obihiro University of Agriculture and Veterinary Medicine Nishi 2-13, Inada-cho Obihiro, Hokkaido 080-8555 JAPAN
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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	
Indirect diagnostic tests		Nationally	Internationally
Babesia bovis ELISA	Yes	0	401
Babesia bigemina ELISA	Yes	0	401
Babesia bovis ICT	Yes	0	401
Babesia bigemina ICT	Yes	0	401
Direct diagnostic tests		Nationally	Internationally
Babesia bovis PCR	Yes	0	725
Babesia bigemina PCR	Yes	0	725
Babesia sp. Mymensingh PCR	No	0	3585

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 and supplied	◉<10mL ○10-100mL ○100-500mL ○>500mL	◉<10mL ○10-100mL ○100-500mL ○>500mL	UGANDA
Babesia bigemina recombinant antigen	ELISA and ICT	Produced and supplied	◉<10mL ○10-100mL ○100-500mL ○>500mL	◉<10mL ○10-100mL ○100-500mL ○>500mL	UGANDA

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
SRI LANKA	February	1080	0
PHILIPPINES	January	408	0
VIETNAM	March	542	0
MONGOLIA	February	725	0
UGANDA	January	409	0
BRAZIL	February	170	0
ARGENTINA	January	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
SRI LANKA	Clinical significance of bovine babesiosis	Electronic consultation
MONGOLIA	Identification of non-cattle hosts for bovine Babesia species	Electronic consultation
THAILAND	Epidemiological survey 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 yaks, Bactrian camels, and small ruminants in Mongolia	3 years	To identify the non-cattle hosts for bovine Babesia species	Institute of Veterinary Medicine, Mongolian University of Life Sciences, Ulaanbaatar	MONGOLIA
Host range and geographical distribution of Babesia sp. Mymensingh	1 years	To identify the hosts range and global distribution of Babesia sp. Mymensingh	1. Veterinary Research, Institute, Sri Lanka 2. College of Veterinary Medicine and Institute of Molecular Parasitology and Vector-borne Diseases, Cebu Technological University, Cebu City, Philippines 3. University of Agriculture and Forestry, Hue University, Hue, Vietnam 4. Research Center for Tick and Tick-borne Diseases, College of Veterinary Medicine, Animal Resources and Biosecurity, Makerere University, Kampala, Uganda 5. Conselho Regional de Medicina Veterinária da Bahia, Bahia, Brazil 6. Instituto de Patobiología Veterinaria, (CICVyA), Instituto Nacional de Tecnología Agropecuaria (INTA), Hurlingham, Argentina	ARGENTINA BRAZIL PHILIPPINES SRI LANKA UGANDA VIETNAM
Epidemiology, isolation, and in vitro cultivation of bovine Babesia species in Thailand	3 years	To determine the current status of bovine Babesia infections and to cultivate local isolates in Thailand	Faculty of Veterinary Medicine, Chiang Mai University, Mae Hiae, Muang, Chiang Mai	THAILAND
Isolation and In vitro cultivation of Babesia species from cattle in Vietnam	2 year	To isolate and cultivate B. bovis, B. bigemina, Babesia sp. Mymensingh, and Babesia sp. Hue-1 from infected cattle in Vietnam	Hue University of Agriculture and Forestry, Hue	VIETNAM
Activities of artesunate-based combinations and tafenoquine against Babesia bovis	1 year	To evaluate the artesunate-based combinations and tafenoquine as antibabesial agents	Laboratory of Malaria Research, Oswaldo Cruz Institute, Fiocruz, Rio de Janeiro	BRAZIL

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:
Babesia bovis, B. bigemina, and Babesia sp. Mymensingh were surveyed in cattle in Mongolia. We also surveyed livestock animals, including cattle, buffalo, goats, and sheep in countries located in Asia, Africa, and America for Babesia sp. Mymensingh.

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:
The epidemiological data that we collected and analyzed have been published in peer-reviewed scientific journals.

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

Li, Y., Liu, M., Rizk, M.A., Moumouni, P.F.A., Lee, S.H., Galon, E.M., Guo, H., Gao, Y., Li, J., Beshbishy, A.M., Nugraha, A.B., Ji, S., Tumwebaze, M.A., Benedicto, B., Yokoyama, N., Igarashi, I., and Xuan X.: Drug screening of food and drug administration-approved compounds against Babesia bovis in vitro. Exp. Parasitol., 210: 107831, 2020.

Batiha, G. E-S., Beshbishy, A.A., Adeyemi O.S., Nadwa, E., Rashwan, E., Yokoyama, N., and Igarashi, I.: Safety and efficacy of hydroxyurea and eflornithine against most blood parasites Babesia and Theileria. PLoS One, 15: e0228996, 2020.

Beshbishy, A.M., Batiha, G.E., Alkazmi, L., Nadwa, E., Rashwan, E., Abdeen, A., Yokoyama, N., and Igarashi, I.: Therapeutic Effects of Atranorin towards the Proliferation of Babesia and Theileria Parasites. Pathogens, 9: E127, 2020.

Sivakumar, T., Tuvshintulga, B., Kothalawala, H., Silva, S.S.P., Lan, D.T.B., Long, P.T., Ybañez, A.P., Ybañez, R.H.D., Francisco, Benitez D., Tayebwa, D.S., D.E. Macedo, A.C.C., Schnittger, L., and Yokoyama, N.: Host range and geographical distribution of Babesia sp. Mymensingh. Transbound. Emerg. Dis., 67: 2233-2239, 2020.

Otgonsuren, D., Sivakumar, T., Amgalanbaatar, T., Enkhtaivan, B., Narantsatsral, S., Tuvshintulga, B., Zoljargal, M., Munkhgerel, D., Davkharbayar, B., Baatarjargal, P., Davaasuren, B., Myagmarsuren, P., Battsetseg, B., Battur, B., and Yokoyama, N.: Molecular epidemiological survey of Babesia bovis, Babesia bigemina, and Babesia sp. Mymensingh infections in Mongolian cattle. Parasitol. Int., 77: 102107, 2020.

Batiha, G.E., Tayebwa, D.S., Beshbishy, A.M., N'Da, D.D., Yokoyama, N., and Igarashi, I.: Inhibitory effects of novel ciprofloxacin derivatives on the growth of four Babesia species and Theileria equi. Parasitol. Res., 119: 3061-3073, 2020.

Carvalho, L.J.M., Tuvshintulga, B., Nugraha, A.B., Sivakumar, T., and Yokoyama, N.: Activities of artesunate-based combinations and tafenoquine against Babesia bovis in vitro and Babesia microti in vivo. Parasit. Vectors, 13:362,

2020.

Stuart Tayebwa, D., Magdy Beshbishy, A., Batiha, G.E., Komugisha, M., Joseph, B., Vudriko, P., Yahia, R., Alkazmi, L., Hetta, H.F., Yokoyama, N., and Igarashi, I.: Assessing the Immunochromatographic Test Strip for Serological Detection of Bovine Babesiosis in Uganda. Microorganisms, 8: E1110, 2020.

Batiha, G.E., Beshbishy, A.M., Alkazmi, L.M., Nadwa, E.H., Rashwan, E.K., Yokoyama, N., and Igarashi I.: In vitro and in vivo growth inhibitory activities of cryptolepine hydrate against several Babesia species and Theileria equi. PLoS. Negl. Trop. Dis., 14: e0008489, 2020.

Tuvshintulga, B., Kawaguchi, R., Batmagnai, E., Kothalawala, H., Guanasekara, E., Banzragchgarav, O., Nugraha, A.B., Otgonsuren, D., Silva, S.S.P., Sivakumar, T., and Yokoyama, N.: Effects of ethanol and water extracts from Phyllanthus emblica fruits on the growth of bovine Babesia and equine piroplasma parasites in vitro and Babesia microti in mice. Jpn. J. Vet. Parasitol. 19: 21-29, 2020.

b) International conferences: 0

c) National conferences: 0

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?

No

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)
ISO17025	ISO17025_2017ver.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	February/2020	Chiang Mai/Thailand	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?

Yes

Kind of consultancy	Location	Subject (facultative)
Revision of OIE Terrestrial manual	Paris	The bovine babesiosis chapter of OIE Terrestrial manual was revised.

25. Additional comments regarding your report: