Indon. J. Trop. Agric. 6 (1) : 1 - 2. 1995.

SERO-EPIDERMIOLOGICAL STUDIES OF *Trypanosoma evansi* BY USING CARD AGGLUTINATION TEST (CATT) IN WEST JAVA, INDONESIA

M. P. Tampubolon*

ABSTRACT

Sero-epidemiological studies on surra was conducted in West Java. Blood samples were collected from 237 cattle and 48 buffaloes in 5 livestock milk cooperation in Bogor and vicinity, Sukabumi and buffaloes blood samples from a slaughter house in Bogor. Whole blood was examined for trypanosomes by the microhaematocrit (MHCT) method and serum samples were examined for the presence of antibodies to *T. evansi* with Card Agglutination Test (CATT). *T. evansi* was detected by MHCT in 1.3% of the cattle examined and 2.1% of buffaloes while antibodies were detected in 10% of the cattle and 66.7% of the buffaloes. The percentage of animals parasitologically possitive for *T. evansi* was low. However, sero-diagnostic was quite high. It was suggested that this condition was chronic in a population of animals.

Keywords : Trypanosomes, microhematocrit.

Infection with *Trypanosomea evansi* in cattle, water buffaloes, has caused a great loses in Indonesia. Usually the disease decreases in productions, weight gains, and sometimes death occurred. The disease mortality is low, but the morbidity is very high. So far the diagnosis for surra can be made when trypanosomes are found in the blood sample. This, however, only possible during a parasitemia. Since the parasitema occurs intermittenly, chances of making diagnosis based on direct demonstration of parasite are relativelly small. Consequently, a number of immunological reactions has been developed to demonstrate the parasite indirectly. Among others are immunological test that can be applied as flourescent antibody test, radio immuno assay, enzyme linked immuno assay (ELISA) and recently a card agglutination test with stained trypanosomes (CATT).

CATT formerly was used for the serological diagnosis of *T.b. gambiense* trypanosomiasis caused sleeping sickness in Africa (Magnus *et al.*, 1987). Fourteen years later, since 1992, this CATT has been developed for the detection of antibodies in serum or plasma of infected animals caused by *Trypanosoma evansi* (van Meirvenne and Magnus, 1992).

The aim of the present study was to provide information on the current distribution of *T. evansi* in cattle and buffaloes in several livestock milk cooperation in West Java as well as blood samples of buffaloes obtained through the slaughter house in Bogor. The combination of sensitive diagnosis techniques for trypanosoma and trypanosoma antibody detection would be an important prerequisite in formulating control measure for *T. evansi*.

MATERIALS AND METHODS

Survey Locations

Blood samples were collected from animals in livestock milk cooperatives in Bogor and vicinity, and from Sukabumi of West Java. Livestock available for sampling at each site consisted of Frisian Holstein, local Peranakan ongole (PO) (*Bos indicus*) and buffaloes (*Bubalis bubalis*). The animals aged. between four months and four years. Samples were collected using venoject, either through jugular vein or coccigeal vein.

In many cases farmers were reluctant to allow blood to be collected from their herds, so only very limited blood samples could be obtained. Samples were kept in vacutainer and taken to the laboratory for testing.

The number of cattle and buffaloes samples were 237 and 48, respectively. Each animals was sampled once at a time. Blood samples for serum were collected into plain vacutainer, allowed to clot for one to two hours and then stored in ice box until serum was able to be separated by centrifugation. After centrifugation the serum were stored in -20^{0}C for further used.

Parasitological Examinations

The samples of whole blood were examined for the presence of trypanosomes using the microhaematocrit centrifugation technique (MHCT) of Woo (1970). If the sample was positive, staining with Giemsa was performed.

Serological Examinations

CATT/*T. evansi* as described by van Meirvenne and Magnus (1992) was employed in this work to examine each serum sample for the presence of antibodies to *T. evansi*. The test is conducted on a plastic card. Resuspended antigen was mixed with diluted serum or

* M.P. Tampubolon. Depart. of Parasitology and Pathology, Faculty of Veterinary Medicine Bogor Agricultural University, Indonesia.

plasma and agitated for five minutes. Blue clamping indicated a positive result.

RESULTS AND DISCUSSION

The percentage of cattle and buffaloes parasitologically positive for *T. evansi* by MHCT (Table 1) was only 1.3% and 2.1%, resprectivelly. Antibodies to *T. evansi* were detected in 4.2% cattle and 12.5% of buffaloes. Table 1 shows that one of 10 cattle and four of six buffaloes were parasitologically negative by MHCT but seropositive CATT/*T. evansi*.

Table 1. **Number of cattle and buffaloes positives *T. evansi* by MHCT and CATT.**

Location	MHCT Positive		CATT Positive		CATT + and MHCT -	
	Cattle	Buffaloes	Cattle	Buffaloes	Cattle	Buffaloess
Cipanas	0/52	0/5	4/52	1/5	0/4	0/1
Ciujung	0/49	0/0	2/49	0/0	0/2	0/0
Cilebut	3/51	1/3	3/51	1/3	0/3	0/1
Sukabumi	0/40	0/0	1/40	0/0	1/1	0/0
Kedung halang	0/45	0/0	0/45	0/0	0/0	0/0
Slaughter house	0/0	0/40	0/0	4/40	0/0	4/4
Total	3/327	1/48	10/237	6/48	1/10	4/6
Percentage	1.3%	2.1%	4.2%	12.5%	10%	66.7%

Notes : 0/52 means 52 cattle examined, MCHT positive 0

In this study only one cattle died of surra and none of the buffaloes. The mortality rates in cattle and buffaloes usually low. The disease in these animals is usually chronic. A number of these animals have latent infections and they form parasite reservoirs. The parasite reservoirs are the main sources of new infections, since these animals, especially local Peranakan Ongole are often graze together on rice fields after harvest, so the chance of surra transmission between species is very large.

Surra occurs throughout most of Indonesia archipelagoes and outbreaks regularly. Sumatra used to be one of the most important surra-area, but it seems that there are more surra outbreak in Java. There was a major outbreak of surra among cattle and buffaloes in 1989 in Madura (Payne *et al.*, 1990). Thirteen percent of the cattle and 50% of buffaloes were found to be parasitologically positive for *T. evansi* by the MHCT technique.

In the study in West Java, the low percentage of parasitologycally positive animals for *T. evansi* suggested that this condition was chronic in the animal population. Serogical reactions were slightly higher positive for *T. evansi*. However, micorscopic blood examination by Giemsa's stain were negative.

CONCLUSSIONS

CATT/*T.evansi* was used for the detection of antibodies in serum of samples for *T. evansi*, instead of ELISA. This technique is relatively new, but it is sensitive, accurate, practical and can be performed in the field. Since the study was conducted in a small scale in West Java, a larger area of study in Indonesia should be conducted in the future.

ACKNOWLEDGEMENTS

This study was supported financially by the IPB/KUL Veterinary Project Belgian Project Cooperation. The author would like to thank Prof. Dr. B. Goddeeris, Belgian counterpart, and the coordinator of the project in Leuven. The author's gratitude also goes to Prof. Dr. Stanny Geerts (Counterpart), and Prof. Dr. Kageruka Pasteur for their valuable help during internship (with the financial support/grant from the Life Science, IUC, IPB/W.B. XVII project) in their laboratory in Antwerpen and Prof Dr. Van Meirvenne Nestor, Prine Leopold Institute of Tropical Medicine, Antwerpen, Belgium, for supplying the CATT/*T. evansi*.

REFERENCES

Dieleman, E. F. 1983. Trypanosomiasis in Indonesia. A. review and a report of studies on chemotherearpy in experimentally infected mice. Researceh Institute for Animals Disease (RIAD), Bogor, Indonesia.

Magnus, E; T Vervoort, and van. Meirvenne. 1978. A card Magnus, E; T. veeelvoort, and agglutination test with stained Trypanosomes (CATT) for serological diagnosis of *T.b. gambiense* trypanoomiasis. Am. Soc. Belge Med. Trop., 58 : 169 - 176.

Payne, R. C; I.P. Sukanto, R. Graydon; H. Saroso, and S. H. Jusuf, 1990. An outbreak of trypanosomiasis caused by *Trypanosoma evansi* on the island of Madura, Indonesia.

van Meirvenne, N. and E.Magnus,. 1992. Institute of Tropical Medicine Laboratory of Serology. Antwerpen, Belgium. (Production and distribution of kits).

Woo, P.T.K. 1970. Evaluation of the microhaematocrit centrifuge and other techniques for field diagnosihuman trypanosomiasis and filariais. Canad. J. Zool. 47 : 921-923.