SHORT COMMUNICATION

COMMON BLOOD PARASITES DIAGNOSED IN RUMINANTS FROM 2011 TO 2015 AT THE CENTRAL VETERINARY LABORATORY, SEPANG, MALAYSIA

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SUMMARY. A total of 2803 blood samples from ruminant livestock were received for diagnosis for parasitic infections from 2011 to 2015. The ruminant samples were from small holder and commercial farms from the states of Negeri Sembilan, Melaka, Selangor and the Federal Territory. The results indicate the presence of theileriosis, anaplasmosis, babesiosis and trypanosomiasis in these animals. The most common parasite identified annually is theileriosis in cattle. This information is vital for disease control strategies as most blood protozoa cause morbidity and is transmitted by vectors such as ticks.

Keywords: blood parasites, ruminants, Malaysia

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Blood parasite infections cause significant economic losses in livestock and is commonly found in livestock of the tropical regions such as Malaysia (Chandrawathani *et al*., 1994). The infection is characterized by anemia, emaciation, jaundice and in severe cases, mortality. Blood parasite infections in ruminants are primarily caused by the protozoans such as *Babesia* sp, *Trypanosoma* sp, *Anaplasma* sp, and *Theleria* sp. These protozoans are transmitted by arthropod vectors such as ticks and flies. In Malaysia, the common ticks that can transmit these are *Dermatocentor* sp., *Hyalomma* sp., *Boophilus* sp. or *Rhipicephalus* sp. (Cheah *et al*., 1999). Flies such as Tabanids and Stomoxys are also commonly found thus, vector control is an important activity in a farm to reduce the morbidity and mortality caused by these infections.

According to Levine (1985), babesiosis is caused by intraerythrocytic protozoan parasites of the genus Babesia. Transmitted by ticks, babesiosis affects a wide range of domestic and wild animals and occasionally people. Although the major economic impact of babesiosis is on the cattle industry, infections in other domestic animals, including horses, sheep, goats, pigs, and dogs, assume varying

degrees of importance throughout the world. Two important species in cattle are *B. bigemina* and *B. bovis*, are widespread in tropical and subtropical areas. The main vectors of *B. bigemina* and *B. bovis* are 1-host *Rhipicephalus (Boophilus*) spp ticks, in which transmission occurs transovarially. In endemic areas such as Malaysia, three features are important in determining the risk of clinical disease: (1) calves have a degree of immunity (related both to colostral-derived antibodies and to age-specific factors) that persists for approximately 6 months, (2) animals that recover from Babesia infections are generally immune for their commercial life (4-yr), and (3) the susceptibility of cattle breeds to ticks and Babesia infections varies; e.g. *Bos indicus* cattle tend to be more resistant to ticks and the effects of *B. bovis* and *B. bigemina* infection than *Bos taurus* derived breeds. At high levels of tick transmission, virtually all calves become infected with Babesia by 6 months of age, show few if any clinical signs, and subsequently become immune. This situation can be upset by either a natural (e.g. climatic) or artificial (e.g., acaricide treatment or changing breed composition of herd) reduction in tick numbers to levels such that tick transmission of Babesia to calves is insufficient to ensure all are infected during this critical early period (http://www.msdvetmanual.com/circulatory-system/blood-parasites/babesiosis).

On the other hand trypanosomiasis is caused by *Trypanosoma evansi* in Malaysia and has been reported by Cheah *et al*., 1999 as well as Wahab *et al*.,2002 in smallholder and commercial cattle. Work on theileriosis in Malaysia has shown the presence of *T. orientalis* in local cattle (Shinichiro Kawazu *et al*., 1991). Thus, in view of the protozoan diseases diagnosed over the past 20 years, it was deemed important that follow-up analyses was conducted to view the current state of the diseases.

The data retrieved from diagnostic cases from ruminants submitted at the Central Regional Veterinary Laboratory at Sepang was analysed to elucidate the common blood protozoans. This information is vital so that strategic control measures can be put in place to prevent future outbreaks and disease patterns. It also gives an indication as to the types of vectors which may be present and methods to control it.

Cattle, buffalo, goat and sheep blood samples were sent from commercial, smallholder and government farms through the auspices of the Herd Health Programme conducted regularly by the state veterinary office in Central Region area of Malaysia which comprises of the states of Negeri Sembilan, Malacca, Selangor and Kuala Lumpur Federal Territories. This activity includes blood screening of ruminants for blood protozoa twice a year. The blood samples are sent to the Central Region Veterinary Laboratory located at Salak Tinggi, Sepang, Selangor for screening by stained thin blood smears according

to methods by Ministry of Agriculture, Fisheries and Food (1986).

A drop of blood sample was placed on a clean glass slide and then spread, one-cell layer thick across the slide. After drying, the thin smears were fixed and stained with MGG Quick Staining. The stained smear is then observed under a light microscope at a magnification of 1000×. If the blood contains the parasite, it can be observed as intracellular (*Babesia, Anaplasma* and *Theileria*) or extracellular organisms (trypanosomes). All the results were documented and made known to the farmer or attending veterinarian for further treatment.

The data for diagnosis of blood protozoa was generated from the Central Region Veterinary Laboratory Data Bank in Salak Tinggi, Sepang, Selangor for the period of 2011 to 2015. The data was thoroughly checked for accuracy in entry, coding and typing error. Repeated entry of the farm was removed to ensure that a herd or farm was not over represented in a given year of study. The information

Table 1. Total blood samples from ruminants tested for blood protozoans

Protozoan spp identified from blood smears	Positive samples/ Total no. of samples tested	Host
Theileria	1074/1946 318/824 112/167 15/17	Cattle Goat Sheep Buffalo
Anaplasma	46/1946 1/824 1/167	Cattle Goat Sheep
Babesia	18/1946 2/824 4/167	Cattle Goat Sheep
Trypanosome	5/1946	Cattle

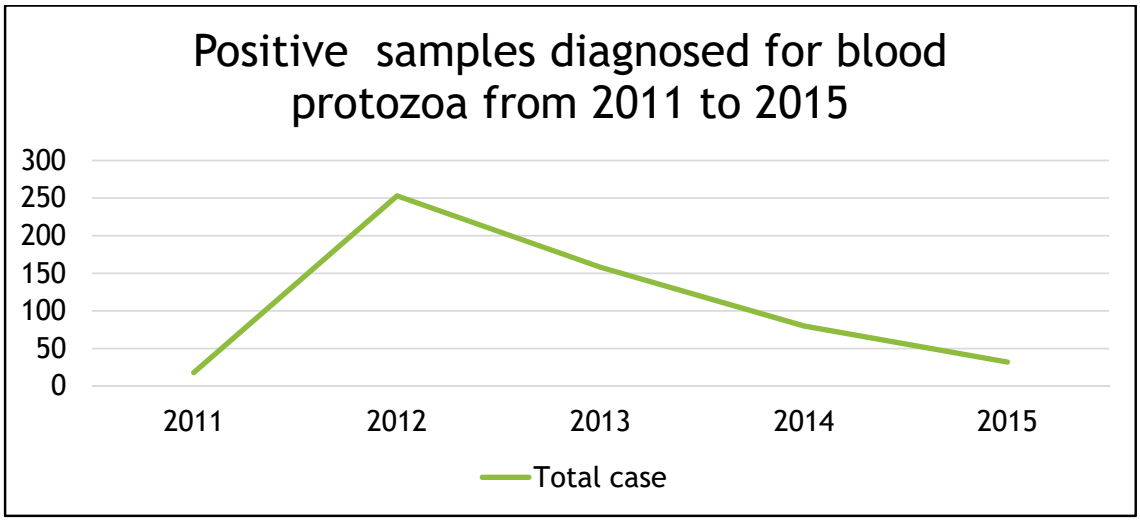

Figure 1. Total positive samples from ruminants diagnosed each year from 2011 to 2015

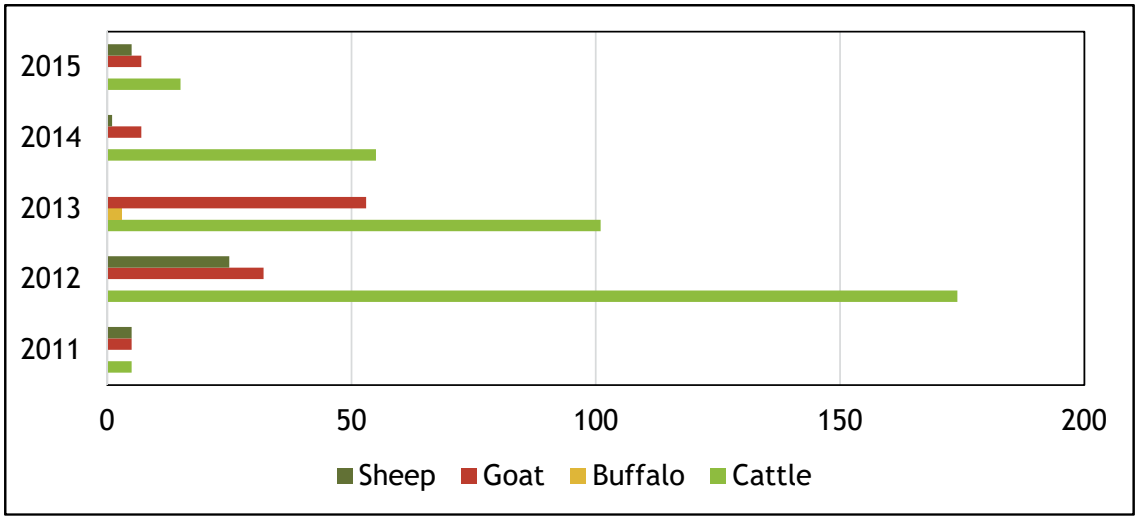

Figure 2. Total positive samples from various species of ruminants diagnosed with blood protozoa from 2011 to 2015

from the data includes farm name and address, date of sampling, species, location and state, breed, age range and number of animals tested. The data was managed and stored in a Microsoft Excel (Microsoft Corporation) spreedsheet, and frequency tables were used to calculate prevalence bases on each species and disease.

From Table 1 and Figures 1 and 2, a total of 1,946 cattle, 824 goats, 167 sheep and 17 buffaloes were tested over the 5-year period. The results indicate that theileriosis is the most common protozoan parasite diagnosed, followed by anaplasmosis, babesiosis and trypanosomiasis. The cattle showed the highest number of positive diagnosis for blood protozoa (Figure 2). In the year 2012, there was the highest number of diagnoses for blood protozoa. As these results are analyses from retrospective data, further work needs to be done to collate information pertaining to the various animal species as well as to elucidate the reason for the high number of positive protozoa cases in 2012. The main information gathered here, which shows that blood protozoans are prevalent in ruminants, indicates the need for concerted efforts to treat and control the diseases which can cause mortality and low productivity thereby reducing farmer's profits. According to several workers (Chandrawathani *et al.,* 1994; Cheah *et al.,* 2002) blood protozoans infections can be successfully controlled by prophylactic treatments, breeding resistant breeds with a susbstantial *Bos indicus* line as well as vector control. Furthermore, nutrition and stresses due to weather, may also play a role in causing outbreaks thus it is vital for farmers to be proactive in their management of the animals.

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