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MAPPING OF FASCIOLIASIS ON BALI CATTLE IN LOMBOK

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ABSTRACT

The objective of this study was to map the prevalence of fascioliasis on Bali cattle raised under village system in Lombok island of West Nusa Tenggara Province. The study was conducted between April and November 2011. Faecal samples from 950 heads of adult (2 – 10 years old) male and female cattle were collected from 53 subdistricts of the five districts in Lombok. Sedimentation technique was performed to detect eggs of liver fluke in the faeces. Results indicated that prevalence of liver fluke was 52.78% across Lombok and 2 out of 53 subdistricts have no liver fluke infection in sampled cattle. The highest prevalence of liver fluke recorded in Batu Kliang and Batu Kliang Utara subdistrict (94.4%) of Central Lombok district with the level of infection of 94.4%. On the other hand, no liver fluke infection was found at Bayan and Pemenang subdistricts of North Lombok district. Difference in level of liver fluke infection is very likely due to different agroecological zone. Subdistrict of Batu Kliang represents wetland area while Bayan subdistrict represents dryland area. Different sources of feed may determine the level of liver fluke infection.

Key words: Fascioliasis, Bali Cattle, Lombok, Prevalence

INTRODUCTION

The Fascioliasis is a helminth diseases caused by liver fluke (*Fasciola hepatica*) and *Fasciola gigantica*. Fasciolosis is categorised as plant-borne zoonosis as it can be transmitted to human and vice versa. The fascioliasis has been recognised by farmers and government around the globe as a factor causing significant loss in animal productivities (Mahato *et al.*, 2005). The helminth diseases, attributable to trematode in ruminants is characterised by reduction of weight gain or even weight loss, anaemia and condemnation of liver tissues (Kay, 2007; Walker *et al.*, 2008) all together orchestrated to cause economic loss in herbivores.

Liver fluke reside in the large biliary ducts (*ductus biliverus)* and release their eggs in biliary ducts. The migration from intestinal to the liver destroys the liver tissues as this type of worm has strong preference to eat liver tissue (Anonymous, 2010; Walker *et al.*, 2008). Liver fluke has been acknowledged to limit production in many tropical counties in particular. Manus *et al.* (2006) estimated that prevalence of liver fluke in Indonesia may reach 90%. Department of Animal Husbandry of West Nusa Tenggara Province (Dinas Peternakan dan Kesehatan Hewan NTB) affirmed the liver fluke prevalence status in 2007 indicated that 99% of cattle slaughtered in abattoir were infected by fascioliasis. Although the prevalence of liver fluke is high in Lombok information on level of liver fluke infection and liver fluke geographical distribution is considered limited. The objective of this study was to construct the geographical distribution and determine the prevalence of liver fluke on Bali cattle in Lombok.

There are two adventages that this study aimed to achieve. First of all was the increasing of farmer's awareness of fascioliosis. This effect will be usefull to prevent the spread of the deasease from animal to human and improve public health. Secondly, the information gethered and resulted from this research will be used as a recommendation for the government for further action in sustainable prevention of fascioliasis. This will be usefull to boost a live stock production.

MATERIALS AND METHODS

The study was conducted between April and November 2011 in 53 subdistricts of the five districts in Lombok comprised West

Lombok, Central Lombok, North Lombok, East Lombok and Mataram regency. From those subdistricts, it can be catagorized into 2 (two) typologies which are 26 subdistricts fall into wet land category and 27 subdistricts was dry land.

Representative village from each subdistrict were selected according to cattle population. Representative of collective or group penned/ housing as well as the individual cattle within group penned was randomly selected. Faecal sample of 950 head of male and female of Bali cattle with range 2 to 10 years old across 53 subdistricts were collected. The faeces were collected in the morning and added with 5% formalin for preservation and then labelled with specific code prior to analysis.

Eggs of liver fluke were detected by sedimentation technique at health laboratory of Dinas Peternakan of West Nusa Tenggara Province then the prevalence of liver fluke was calculated using the formula below (Stevenson, 2005):

$$\text{Prevalence (\%)} = \frac{\text{Number of existing case}}{\text{Size of population}} \times 100\%$$

Summary statistics were produced for each parameter and descriptive statistic was used to analyse the prevalence of liver fluke and the geographical distribution of liver fluke infection in Lombok.

RESULTS AND DISCUSSION

The study indicated that liver fluke infection was found in 96.23% of the village across 53 subdistricts of the five districts in Lombok with liver fluke prevalence level of 52.78%. The fascioliasis distribution based on districts indicated that level of occurrence from high to low was Central Lombok, Mataram, West Lombok, East Lombok and North Lombok, (Figure 1). This finding is in agreement with Dinas Peternakan of NTB released in 2007 that 99% of cattle slaughtered in abattoir infected by fascioliasis. Fascioliasis have been reported to cause significant economic loss in herbivores due to reduction of weight gain or even weight loss, anaemia and condemnation of liver tissues and sudden death (Mahato *et al.*, 2005; Kay, 2007; Walker *et al.*, 2008). Low productivities of Bali cattle in Lombok has been reported elsewhere which characterise by low growth rate and high calve mortality may caused by fascioliasis to some extent.

Various level of egg number of liver fluke on faeses observed across districts as indicated in Table 1.

Subdistrict with typology predominantly paddy field tends to have high level of prevalence of fascioliasis *e.g.* prevalence of liver fluke was high in Batu Kliang, Batu Kliang Utara, Jonggat, Kopang and Praya subdistricts in central Lombok, Gerung and Lingsar subdistricts in West Lombok and Masbagik subdistrict in East Lombok. Wetland with intensive rice crop may have been a favourable area for a vector such as snail to breed and favourable for the life cycle of liver fluke. Suhardono *et al.* (2006a) reported that metacercaria survive to more than five weeks in lowland with irrigated rice field. This may explain the high level of prevalence in some wet area in Lombok.

Feeding management may play an important role to liver fluke infection. Cattle were kept in their stalls full time in group penned except in some part in North Lombok where cattle been tethered at day time fed under a cut-and carry system with forage sourced from rice banks, creek banks, and irrigation channel bank. These sites consider a favourable area for liver fluke to breed and thus high possibility to cattle raised in this area infected by liver fluke. Manus *et al*. (2006) estimated that the prevalence of internal parasite disease could reach 90% in area with irrigated rice field in several regions of Indonesia. Keyyu *et al.* (2006); Yildirim *et al*. (2008) reported that the highest prevalence was found in adult animals (58.5 – 70.7%) and 36.5% in young animal. Under small scale dairy farms the prevalence of 37.2% has been reported (Yildirim *et al*., 2008).

Utilisation of rice straw as feed source to cattle may also possible to cause high prevalence of liver fluke. Suhardono *et al.* (2006b) reported that the use of rice straw as cattle feed and utilisation of raw manure as fertilizer contributed to the cycle of liver fluke infection. Poor management also reported to cause high liver fluke infection (76.5%) in cattle under traditional system (Yildirim *et al*., 2008; Anonymous, 2010).

Table 1. Level of egg number of liver fluke on faeces in 53 subdistrict of five districts in Lombok

District	Number of Bali cattle	Sub district	Egg per gram*	Categories
West Lombok	18	Batu Layar	1	Light
	18	Gerung	13	High
	18	Gunung Sari	1	Light
	18	Kediri	4	Light
	18	Kuripan	3	Light
	18	Labu Api	4	Light
	18	Lembar	5	Light
	18	Lingsar	4	Light
	18	Narmada	2	Light
	18	Sekotong	1	Light
Central Lombok	18	Batukliang	10	Medium
	18	Batukliang Utara	5	Light
	18	Janapria	2	Light
	18	Jonggat	7	Medium
	18	Kopang	7	Medium
	18	Praya	9	Medium
	18	Praya Barat	5	Light
	18	Praya Barat Daya	4	Light
	18	Praya Tengah	3	Light
	18	Praya Timur	1	Light
	18	Pringgarata	5	Light
	18	Pujut	3	Light
East Lombok	18	Aikmel	1	Light
	18	Jero Waru	1	Light
	18	Keruak	1	Light
	18	Labuhan Haji	7	Medium
	18	Masbagik	2	Light
	18	Montong Gading	3	Light
	18	Pinggasela	1	Light
	18	Pringgabaya	1	Light
	18	Sakra	1	Light
	18	Sakra Barat	1	Light
	18	Sakra Timur	1	Light
	18	Sambelia	1	Light
	18	Selong	2	Light
	18	Sembalun	3	Light
	18	Sikur	1	Light
	18	Suela	1	Light
	18	Sukamulia	1	Light
	18	Suralaga	1	Light

District	Number of Bali cattle	Sub district	Egg per gram*	Categories
	18	Terara	1	Light
	18	Wanasaba	1	Light
North Lombok	18	Bayan	0	Negatif
	18	Gangga	1	Light
	18	Kayangan	1	Light
	18	Pemenang	0	Negatif
	18	Tanjung	1	Light
Mataram City	18	Sandubaya	1	Light
	18	Cakranegara	7	Medium
	18	Selaparang	1	Light
	18	Mataram	2	Light
	18	Sekarbela	3	Light
	18	Ampenan	1	Light

*Light: 1 – 5 Eggs Per Gram Faeses (EPG); Medium: 6 – 10 EPG and High: 11 – 15 EPG

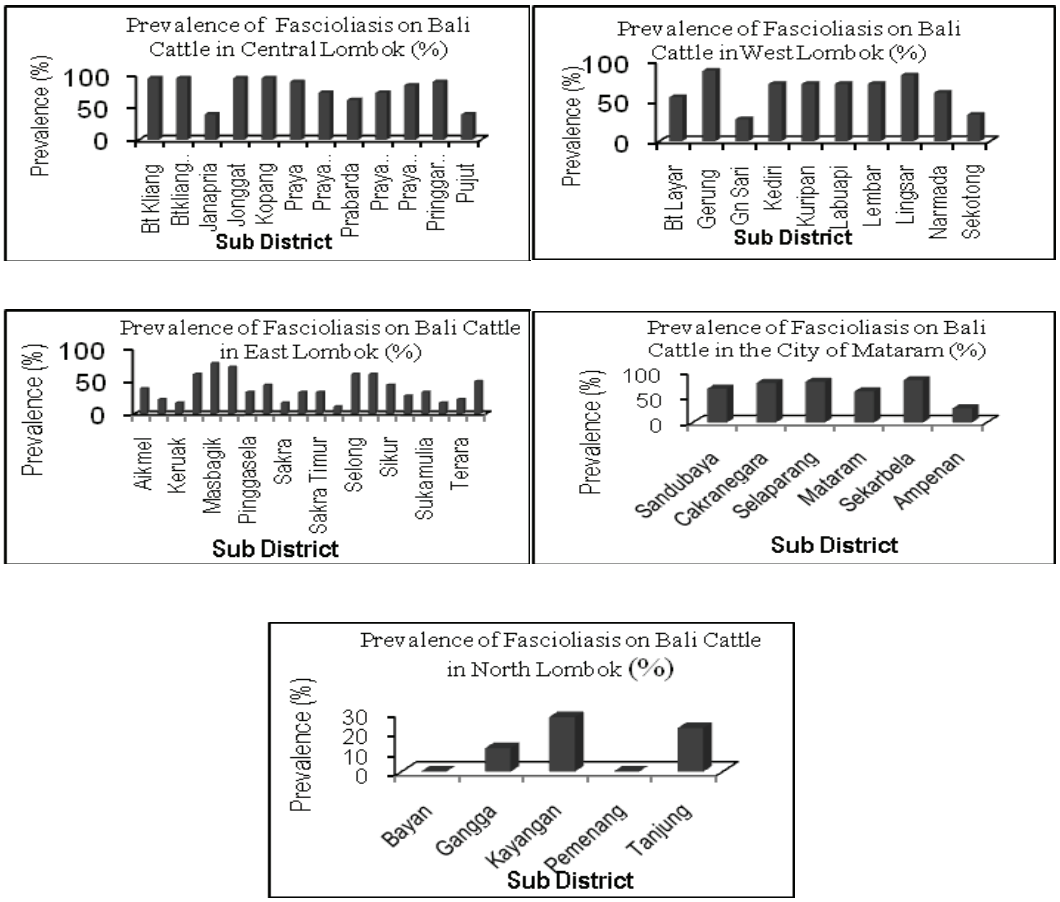

Figure 1. Prevalence (%) of fascioliasis disease on Bali cattle in Lombok

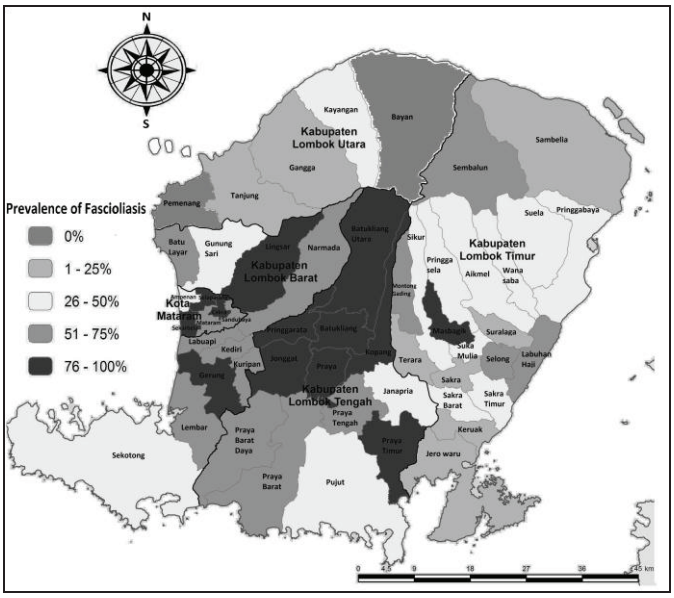

Figure 2. Geografical distribution of fascioliasis disease on Bali cattle in Lombok

It is commonly accepted that snail and cercaria are sensitive to light exposure thus better forage cutting/harvesting management may retain the cycle of infection. Drying procedure or adding small amount of urea in pile of rice straw kill the egg of internal parasite. This simple strategy may be apply to interrupt the cycle of liver fluke infection.

CONCLUSION

Although level of liver fluke infection cross Lombok Island was low, however the prevalence relatively high and the distribution almost cover all subdistrict of five districts in Lombok. This phenomenon is potentially hazard to Lombok cattle industry and surrounding area in the future as this internal parasite would cause low growth rate and high mortality.

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