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Research Article

FASCIOLOSIS IN BALI CATTLE (BOS SONDAICUS / BOS JAVANICUS) IN RICE FIELDS WITH DIFFERENT RAINFALLS

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A B S T R A C T

The purpose of this research was to determine the infestation of cattle suffering from Fasciolosis in rice fields in rainfall level. This research consisted of evaluating the water depth of rice fields with snail populations as intermediate hosts of Fasciolosis and egg per gram (EPG) examination on changes in rainfall. Twenty Bali cattle were examined EPG every month by sedimentation test for four consecutive months with changes in rainfall. Rainfall data is obtained from BMKG West Lombok. The results showed that water depth is 0-10 cm, 10-20 cm, 20-30 cm with the number of snails 2.3±0.49 tails/m2, 5±1.15 tails/m2, 6±1.73 tails/m2 respectively are positively correlated (R=0.93),Y=1.86x+0.17. Precipitationfrom September to December was 19.5 cm, 24.3 cm, 50.4 cm, 32.3 cm. Stool examination results (EPG±sd) in December to March were 10.50±10.22 EPG, 14.75±9.65 EPG, 21.80±19.95* EPG and 5.35±6.71* EPG and a noticeable difference in EPG ($P<0.05$) in February and March. It was concluded that the increase of Fasciolosis occurs due to an increase in the volume of rainfall as a medium for swimming mirasidium and cercaria to breed in snails (Lymnaea sp.), then when rainfall decreases followed by rapid drops of Fasciolosis.

INTRODUCTION

Fasciolosis is a disease caused by infection of *Fasciola hepatica* and *Fasciola gigantica*. Ruminants live in field and humid area is easily infected with *Fasciola* spp. (Astiti *et al*., 2015). Fasciolosis infestation is divided into three stages, that are, accute, moderate, and chronic infection which is usually asymptomatic (Adrien *et al*., 2013). More than 400 eggs in one gram of feces is obtained in accute infection of fasciolosis, in moderate infection is 101-400 egg/gram, and 1-100 eggs per one gram of feces is obtained in mild infection (Balen *et al*., 2007).

Prevalence of Fasciolosis in Lombok island, Indonesia reached 96.2%, however the number of egg per gram feces (EPG) was low (1-8 EPG or 5 EPG) in average, based on sedimentation test (Astiti and Panjaitan, 2012). High prevalence and low infestation were usually asymptomatic, so that the farmer did not notice for better management and treatment. Fasciolosis was based on the rainfall, climate, irrigation, and the presence of snails (*Lymnaea* sp.) as the intermediate host (Ardo *et al*., 2013). This research was to get information about snail population, irrigation depth, and EPG.

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MATERIALS AND METHODS

Population of snail (*Lymnaea* sp.) as the intermediate host of fasciolosis was counted with quadrant method in the different water depth or ricefield such as 0-10 cm, 10-20 cm, and 20-30 cm. the formula of counting was D= N/S (D= density of population, N= individual number or species, S= the habitat). The result was then analyzed by statistic method to identify the correlation between water depth and the amount of snail (*Lymnaea* sp.) (Adrien *et al*., 2013).Twenty Bali cattle were counted monthly, the presence of *Fasciola* sp. with sedimentation method (Parfitt and Bank, 1977) during four months. This method could detect infection of *Fasciola* sp. After prepatent period for 10-14 weeks (Ardo *et al*., 2013). Result of egg per gram feces was analyzed by statistic, and evaluated with the rainfall during previous three months as prepatent period.

RESULTS AND DISCUSSION

Snail (*Lymnaea* sp.) population in the water depth of 20-30 cm was the most abundant. The water depth was correlated positive to snail population, $y= 1.86x + 0.71$ ($R^2=0.93$) in the water depth of 0-10 cm, 10-20 cm, 20-30 cm, getting snail (*Lymnaea* sp.) number of 2.3±0.49, 5±1.15 snail/m^2, 6±1.73 snail/m^2 (Fig 1).

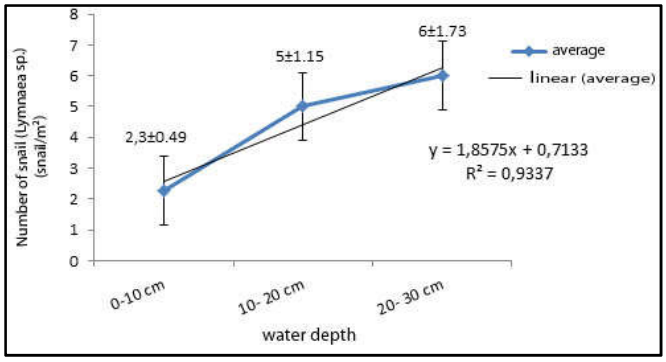

Figure 1 The correlation of water depth and snail number

Infestation of *Fasciola* sp. needs a good environment for their life cycles such as: irrigation, rainfalls, the presence of snail (*Lymnaea* sp.) as the intermediate host (Mc Kay, 2007; Ardo *et al*., 2013).

Snail (Lymnaea sp.) entered the mud until 30 cm depth, they got their food from their fat deposit. Until 6 weeks then they came back to the surface area to shed the eggs, 1000-1200 eggs/month or 200-300 eggs/week (Rudy, 2010). The number of EPG of 20 cattle per month during four months was positively correlated to the rainfall Y = 0.32x + 2.96 (R^2 = 0.39) (Fig 2).

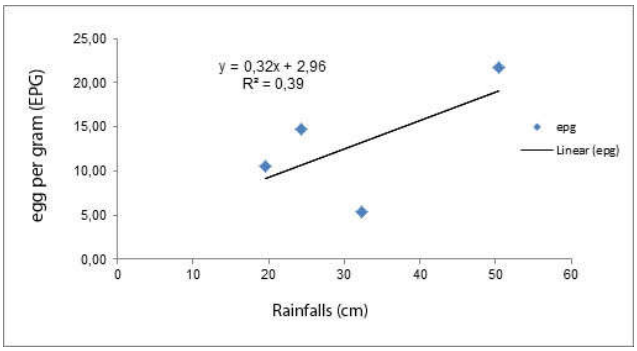

Figure 2 Correlation between the infestation of *Fasciola* sp. and the rainfall

The number of EPG from December- February showed that the average egg per gram (EPG) examination continued to increase from 10.50 ±10.22 EPG, 14.75 ±9.65 EPG and 21.80 ±19.95 EPG. This was caused by September- November as the prepatent period with increasing rainfall from 19.5 cm, 24.3 cm and 50.4 cm respectively based on BMKG West Lombok, Indonesia, 2016. Furthermore in December there was a significant decrease in rainfall (P <0.05) from 50.4 cm to 32.3 cm and caused a decrease in EPG number in February to March from 21.80 ±19.95 EPG to 5.35 ±6.71 EPG which was analyzed by statistical analysis of single factors (Fig3)

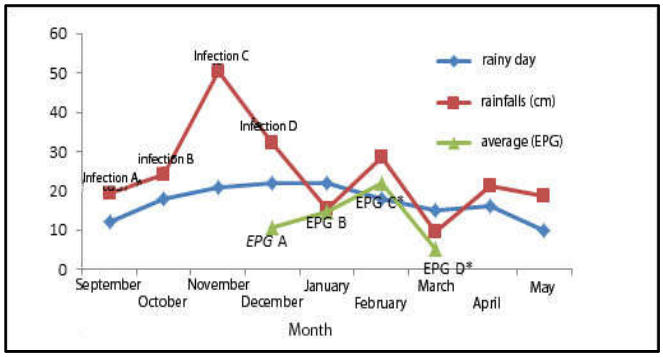

Figure 3 Infestation of *Fasciola* sp.(EPG) and rainfalls

The percentage of positive cases of Fasciolosis tends to be higher in the rainy season than in the dry season (Kusumamiharja, 2005). Myracidium could easily reach the snail (Lymnaea sp.), and cercariae attached the grass and other vegetation to become metacercaria (Wymann, 2005). When metacercaria are swallowed by cattle while eating grass, metacercaria become young heart worms, penetrate the intestine, follow blood circulation and eventually reach the liver and destroy liver tissue (Kahn and Line, 2010). Metacercariae caused fibrosis (Marcos *et al*, 2007) and become adult in the bile duct and can block the duct (Wymann, 2005).

CONCLUSION

The increase of rainfall was positively correlated to the increase of Fasciolosis on Bali cattle in Lombok Island, Indonesia.

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