

Research Article

Parasites Prevalence of Dairy Cattle in Argopuro Area, Krucil District, Probolinggo Regency, Indonesia

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Abstract: This study aimed to identify endoparasitic species and their prevalence in dairy cows in the Probolinggo, Indonesia. This survey was conducted in the Cooperation of Argopuro, in the hill side of Krucil district, Probolinggo regency, during rainy season from March until July 2020. Faecal samples were collected (n=100), and three fecal examinations were performed for parasite identification: native, sedimentation, and flotation techniques. Results showed that the prevalence of endoparasitosis was 56%; 29% was due to helminthiasis and the other 37% was of *Balantidium coli*. *Fasciola sp.*, *Oesophagostomum sp.*, *Gaigeria pachyscelis*, *Toxocara vitulorum*, *Mecistocirrus digitatus*, *Chabertia sp.* were among the helminths detected. The Lucient Brump test indicated that among samples infected with helminths (n=29), 89.7% were mild, 6.9% were moderate and 3.4% were severely infected. Further, the study estimated that the level of burden with *Balantidium coli* was identified to be mild in 62.2%, moderate in 32.4%, and severe in 5.4% of the positive samples, respectively (n=37). This study indicates that during the commencement of the rainy season, the campaign of effective endoparasitic control could be advisable in the study area.

Keywords: faecal, infection, parasites, prevalence, worm egg

INTRODUCTION

The Indonesian dairy cattle population resides only in the Java Island, with the East Java province having the vast majority of the dairy population in the country at 265,002 cows (East Java BPS, 2018). Despite decades of efforts to boost production, national milk production remains insufficient to meet domestic demand in Indonesia (Agustina, 2016). Among potential factors contributing to the low productivity of dairy cattle in the country may be endoparasitic burdens. Direct losses from endoparasitoses in dairy cows may be due to weight loss, decreased milk production, retarded growth of a calf (Paramitha et al., 2017). The most common clinical signs of endoparasitoses are inappetence, while severe infection may result in anaemia, diarrhoea, and stunting in calves (Kusnoto et al., 2011; Pandit, 2009).

The Probolinggo Regency is among the areas in East Java which has large population of dairy cows, at 6,052 cows (East Java BPS, 2018). The dairy cow husbandry in the region was traditional with low input on sanitation, suspecting the high prevalence and abundance of parasitic burden in the population. However, the prevalence of endoparasitosis in dairy cows in this region was lacking.

This research was conducted to obtain basic data regarding the species and the prevalence of endoparasites infecting dairy cows in the Cooperation Argopuro dairy cattle population. The research

provided data to help the local government develop effective parasitic disease control programs in the future.

MATERIALS AND METHODS

The research was conducted during rainy season from March to July 2020 in the area of the Cooperation Argopuro, on the hillside of Krucil District, Probolinggo Regency. Samples (n=100) were freshly excreted faeces of dairy cows, collected randomly. The number of samples was calculated based on the Slovin formula (2002), considering a 10% inaccuracy. The faecal materials were divided into a few 5 Gram portions, and each portion was stored in 10% formalin. The identification was conducted in the Laboratory of Parasitology, Universitas Airlangga, using the native, simple sedimentation, fecal floatation, and Lucient Brumpt counting methods for parasitic egg count per gram of faeces (egg per Gram, EPG). The degree of infections with helminths were categories into three ordinal scale i.e. mild infection (1-500 EPG), moderate infection (500-1000 EPG), and severe infection (more than 1000 EPG) (Scala et al., 2020). Further, protozoa infection was grouped into categories of low (50 – 1000 EPG), medium (1001 – 5000 EPG) and high (>5000 EPG) (Lassen & Jarvis, 2009). Data was analyzed descriptively in prevalences.

RESULT AND DISCUSSION

The prevalence of endoparasitoses was 56% (n=100). Six helminth eggs from the nematodes were identified: *Oesophagostomum* sp., *Gaigeria pachyscelis*, *Toxocara vitulorum*, *Mecistocirrus digiatus*, *Chabertia* sp., *Cooperia* sp., two trematodes detected were *Fasciola* sp., and *Schistosoma* sp. while the protozoa of *Balantidium coli* was also identified.

Helminth Prevalence in Dairy Cow

Faecal examinations indicated that the prevalence of helminth burdens was 29%. The prevalence of each parasite was 11% for *Oesophagostomum* sp., eight percent for *Fasciola* sp., three percent for *Chabertia* sp. and *Gaigeria pachyscelis* respectively, and one percent for *Toxocara vitulorum*, *Mecistocirrus digiatus*, *Cooperia* sp. and *Schistosoma bovis*, respectively. The results are shown in **Table 1**. Among infections (n=29), 89.7% were mild, 6.9% were moderate and 3.4% were severe.

Table 1. Helminth Eggs identified in the faeces of dairy cows in the Cooperation Argopuro, Krucil District, Probolinggo Regency, Indonesia (n=100)

Genus/Species	Total (%)	Genus/Species	Total (%)
<i>Oesophagostomum</i> sp.	11	<i>Toxocara vitulorum</i>	1
<i>Fasciola</i> sp.	8	<i>Mecistocirrus digiatus</i>	1
<i>Chabertia</i> sp.	3	<i>Cooperia</i> sp.	1
<i>Gaigeria pachyscelis</i>	3	<i>Schistosoma bovis</i>	1

Parasitic infections in dairy cattle may be related to climate conditions, micro-environmental conditions, as well as health and feed management. Humid condition during the rainy season and suitable temperature in tropical area may have facilitated parasitic eggs to hatch and develop into infective larvae in the study area. Purwanta et al. (2009) indicated that a humid environment facilitates suitable conditions for parasites to grow and complete their life cycle.

Cattle manure as a source of parasitic infection may have been collected by farmers in the study at some point time periodically and dumped away but, the effectiveness of the practice to control

helminth burdens in a farm remains unknown. In traditional dairy farms in Indonesia, deworming is conducted at a random time and population coverage and the efficacy of anthelmintic use has not been effectively evaluated. Nonetheless, the current study indicated that 10% of the helminth infections were moderate to severe. This suggests the need for prompt action to alleviate the impact of helminthiasis in the region. A deworming program in the early rainy season using effective dewormer agents prioritizing *Oesophagostomiasis* dan *Fasciolosis* is advisable.

Protozoa in Dairy Cow

A 37% prevalence rate of protozoan infection was indicated from the survey, with the only species identified was *Balantidium coli*. Protozoa *Balantidium coli* was found through either native or floatation with saturated sugar examination. Protozoa *Balantidium coli* was found in trophozoite and cyst stages. The trophozoites is indicated by sac-like characteristics and a thin gray color, with $87.37 \mu\text{m} \times 51.07 \mu\text{m}$ size, with cilia arranged longitudinally and spirally which enables the parasite to make a circular movement. The *Balantidium coli* cyst had a size of $52.45 \mu\text{m} \times 52.71 \mu\text{m}$ with round characteristics like a ball, shown in **Figure 1 (I-J)**. The level of burden was identified to be mild in 62.2%, moderate in 32.4%, and severe in 5.4% of positive samples, respectively (n=37).

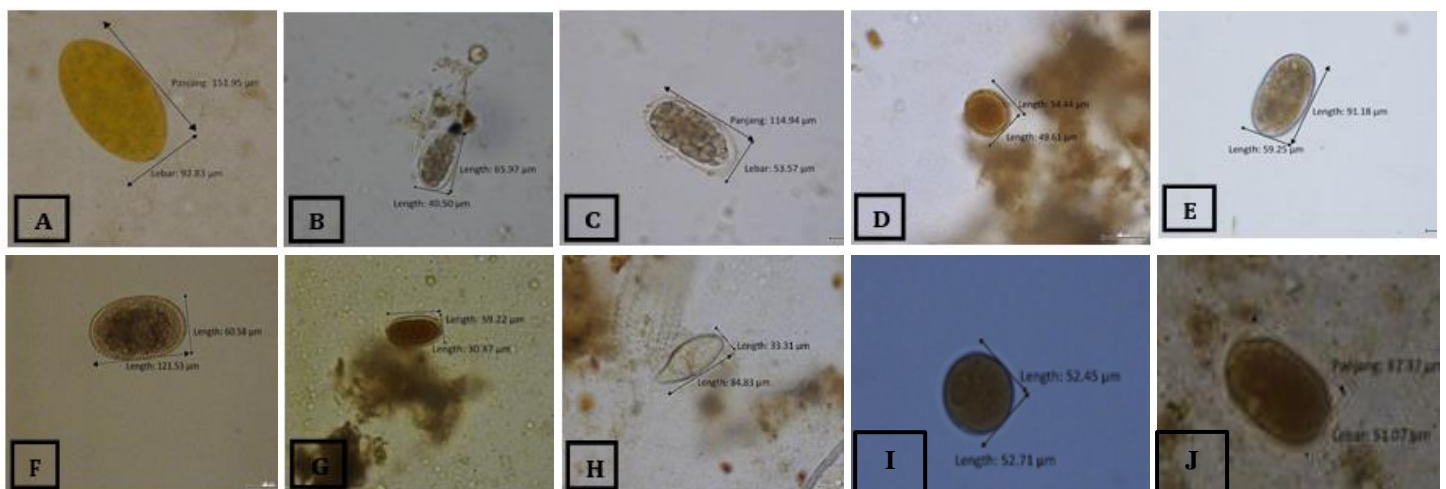


Figure 1. (A-H) Helminth eggs and (I-J) *Balantidium coli* identified in the faeces of dairy cows in the Cooperation Argopuro, Krucil District, Probolinggo Regency, Indonesia; (A) *Fasciola* sp. egg, (B) *Oesophagostomum* sp. egg, (C) *Gaeigeria pachycelis* eggs, (D) *Toxocara vitulorum* egg, (E) *Chabertia* sp. egg, (F) *Mecistocirrus digiatus* eggs, (G) *Cooperia* sp., (H) *Schistosoma bovis* eggs, (I) cyst; (J) trophozoite (400x).

The high prevalence of *Balantidium coli* might be related to the location of Krucil District in the mountainside area, and the fact that the survey was conducted during a wet season. Wisesa et al. (2015), reported that cattle from the highland compared to the lowland, an area with higher rainfall, male sex, and free-range pasture were risk factors of infection with *Balantidium coli* in Bali cattle. The finding of this study that, more than one-third of the infected animals were in moderate to high infection levels indicated that the control of the infection is needed. Antiprotozoan treatment might be needed to lower the impact of the infection with *Balantidium coli* during rainy season. Further, indoor farming might be needed especially during the wet season to reduce the risk of contracting the infection. Further investigation is needed to confirm whether these practices are useful in controlling the impact of balantidiasis in dairy farms in the study area.

CONCLUSION

The prevalence of parasitoses in dairy cows in the study was 56% with a 29% prevalence of helminthiasis and 37% balantidiasis. Parasite species found in the study area included *Fasciola* sp., *Oesophagostomum* sp., *Gaigeria pachyscelis*, *Toxocara vitulorum*, *Chabertia* sp., *Mecistocirrus digiatus*, *Cooperia* sp., *Schistosoma* sp. and *Balantidium coli*. A significant number of cattle were infected with moderate to severe levels of infections, urging a control action to be put in place.

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