PREVALENCE RATE OF TREMATODE INFECTION IN POULTRY REARED IN RICE GROWING ENVIRONMENT IN VILLAGES IN TWO DISTRICTS OF SUKABUMI AND SERANG, WEST JAVA

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ABSTRACT

There has been examined for the presence of trematode infection of 309 heads of birds (83 chicken, 152 ducks and 74 muscovy ducks) from two districts of Sukabumi and Serang, province of West Java. The infection rate of trematode was slightly higher in chicken from Sukabumi than that from Serang. However, there was no different between ducks from both districts, and it was about 95%. The infection rate of trematode in muscovy duck was higher in Serang than in Sukabumi. In this study was identified 13 genera of digenean trematodes from these birds. Fluke schistosomes were found in both ducks and muscovy ducks, but was not in chicken. It was concluded that amongst these birds, the infection with trematode was very common.

Key words: Village chicken, ducks, muscovy ducks, prevalence of trematode, genus of trematode

INTRODUCTION

Information on the prevalence of trematode infection in domestic birds in Indonesia is very scanty. It was reported that chicken and duck harbor several trematode parasites (ADIWINATA, 1955; MUCHLIS, 1971). The economic importance of such parasites is also unknown. From a previous study (SUHARDONO, 1998) was reported that ducks is very good for controlling fasciolosis but causes cercarial dermatitis to farmers. Therefore, identifying other birds which are naturally infected with digenean trematode but refractory to schistosomal infection need to be done.

Helminth parasites from the order of 
Digenea
to complete its life cycle has to go through one, or two intermediate hosts, in which one of the intermediate host must be a snail (LAPAGE, 1959; BORAY, 1982) before enters a definitive host. Many species of worm from this order use one type of snail as intermediate host, for example snail Lymnaea sp. is also a common intermediate host for Fasciola sp. and for other digenean trematodes (BELJAKOVA-BUTENKO, 1971; ADAM and LEWIS, 1993; CHAO et al., 1993; SUHARDONO and COPEMAN, 2000). There is a competition process between larvae of trematodes to live within the snail intermediate host (ESCH and FERNANDEZ, 1994). For control purpose, the competition process of two or more larvae from different species of trematodes can be use to control hazardous parasite, such as against F. gigantica (KWÓ et al., 1970) or Schistosoma spindale (LIT, et al., 1970) in the snail.

This study, is part of serial studies to find out possible methods for fasciolosis control using infected birds with trematodes, is to determine the rate of natural infection with trematode in chicken (Gallus domesticus), ducks (Anas boschas) and muscovy ducks (Cairina moschata) reared semi-intensive or extensively in rice crop environment in villages of West Java.

METHODOLOGY

Location of study

Two districts of Sukabumi and Serang, province of West Java were chosen as locations for study. District of Sukabumi is a low- and hilly land and was known as high Fasciola infection in ruminants livestock. Village poultry (i.e.: chicken, ducks, and muscovy ducks) raised semi-intensively or extensively with minimum feed supplementation. Cropping system in this district is mainly dry-land crop with commonly one to two rice crops per year. Irrigation scheme is very poor. The district of Serang, however, is a low laying and flat area with almost no fasciolosis and high population of ducks reared intensively or semi-intensively. Cropping system is mainly rice (2-3 rice crops per year) with a good irrigation scheme.

Study of infection with trematode in poultry

Chicken, ducks and muscovy ducks that raised semi intensively or extensively in the two districts were sampled five of each every two months for 12 months. These birds were collected from farmers who live in adjacent to rice field (fringes of kampongs) and further examined for the presence of trematode worm in their respiratory and digestive organs by dissecting the birds and collected the worms. The worms were further identified their genera according to YAMAGUTI (1958) and/or MCDONALD (1981).
RESULT AND DISCUSSION

Samples were firstly collected in the mid wet season in which time water was still abundance and harvesting of irrigated rice was still underway. Infection of trematode amongst domestic birds reared in villages in rice growing environment is common occurrence and relatively high prevalence (68% to 100%), although fluctuated from time to time of collection. Trematode infection in chicken was relatively higher in Sukabumi (85%) than in Serang (68%). The same infection in muscovy ducks, however, was higher in Serang (100%) than in Sukabumi (83%). Infection rate of trematode in ducks was similar between the two districts was about 95% (see Table 1). During the study was identified at least 13 genera of trematode, these were: Apatemon sp., Catatropis sp., Cotylurus sp., Echinostoma sp., Hypoderaeum sp., Notocotylus sp., Opistorchis sp., Paramonostomum sp., Philophthalmus sp., Prosthoconus sp., Psilochasmus sp., Dendritobilharzia sp., and Trichobilharzia sp. The last two identified flukes were found in both ducks and muscovy ducks but not in chicken. The genus Trichobilharzia sp. and Dendritobilharzia sp. are flukes under family of Schistosomatidae in which their larval infective enters final host through either the skin or mouth instead of forming cyst (Lapage, 1959; McDonald, 1981). From the all collected birds, average worm burden tend to be higher in chicken (103 flukes) than in ducks (34 flukes). The worm burdens fluctuated substantially from time to time of collection, even though the prevalence of trematode infection in poultry relatively constant. In general the worm burdens in poultry from Sukabumi was higher than those from Serang, except in ducks was the same.

The relatively higher number of trematode in chicken than in ducks in Sukabumi it was unexpected since chicken is not a water bird. To explain this finding it may involve environment where the chicken was reared and type of crops during the time period. During the collection time of 1, 2, 5 and 6 (Table 1) the average number of trematode in chicken was higher than in other time of collection (3 and 4). These time was a period when harvesting of rice was underway. One to two weeks prior to harvest of rice, rice fields were dried out. Since chicken was reared extensively to get food, they were forced into rice fields where feed was abundance. Chicken is also a scavenger animal, they will also eat everything includes snails in rice field. All of these were also supported by the fact that all identified worms were digenean trematodes that use fresh water snail as intermediate host (McDonald, 1981; Boray, 1982). The different number of trematode in birds between two districts may associate with the abundance of water in the field crops. The availability of water in the field crops was much higher in Serang than in Sukabumi. This means that much wider habitat of snails in Serang than in Sukabumi which in turn spread snails in wider area. In Sukabumi, however, such snails will be more concentrated in certain area. These situations will influence the chance of birds such as chicken to contact with snails. Therefore, the trematode infection in the birds was also depended on the chance of the birds feed on snails and/or enter snail habitat. The average number of trematode worm found in both ducks and muscovy ducks was relatively constant because these ducks are truly water birds. Therefore, they will be exposed throughout the time by snails because snails and ducks use same habitat, watery environment. Since ducks are also scavenger animals, then they feed on snails. Murtisari and Evans (1982) reported that ducks reared extensively more than 30% of their food was snails.

Table 1. The rate of trematode infection in poultry (chicken, muscovy duck, and duck) reared extensively in the subdistrict of Sukabumi and Serang, province of West Java. Samples were taken every two months for one year

<table>
<thead>
<tr>
<th>Location</th>
<th>Time of Collection</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Sukabumi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicken</td>
<td>% (n)</td>
<td>100(9)</td>
</tr>
<tr>
<td>No. worms</td>
<td></td>
<td>436</td>
</tr>
<tr>
<td>Muscovy</td>
<td>% (n)</td>
<td>67(6)</td>
</tr>
<tr>
<td>No. worms</td>
<td></td>
<td>32</td>
</tr>
<tr>
<td>Duck</td>
<td>% (n)</td>
<td>100(4)</td>
</tr>
<tr>
<td>No. worms</td>
<td></td>
<td>36</td>
</tr>
<tr>
<td>Serang</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicken</td>
<td>% (n)</td>
<td>86(7)</td>
</tr>
<tr>
<td>No. worms</td>
<td></td>
<td>56</td>
</tr>
<tr>
<td>Muscovy</td>
<td>% (n)</td>
<td>100(8)</td>
</tr>
<tr>
<td>No. worms</td>
<td></td>
<td>19</td>
</tr>
<tr>
<td>Duck</td>
<td>% (n)</td>
<td>100(8)</td>
</tr>
<tr>
<td>No. worms</td>
<td></td>
<td>19</td>
</tr>
</tbody>
</table>

* Prevalence of trematodes infection (number of samples)
** Statistical analysis on the prevalence of trematode infection between chicken and duck in Sukabumi P>0.05, and Serang P<0.001
Based on its prevalence and worm burden, theoretically, both muscovy ducks and village chicken can be used as biological agent for controlling fasciolosis to replace ducks, but chicken is better because from this study was also found no chicken was infected with schistosomes.

REFERENCES


