

Identification of Gastrointestinal Endoparasites in Native Chickens (*Gallus Domesticus*) in Pattongko Village, Sinjai Tengah District, Sinjai Regency

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ABSTRACT

One of the livestock commodities in South Sulawesi is local chicken or native chicken (*Gallus domesticus*). Although this type of chicken has a high adaptability ability, native chickens can also experience illness and population reduction on farms that can be caused by worm-type endoparasites. This study was conducted from July to August 2023 in Pattongko Village, Central Sinjai District, Sinjai Regency with the aim of finding out what types of endoparasites are found in the gastrointestinal of native chickens in Pattongko Village. Sampling was carried out by random sampling method using 20 native chickens whose feces were taken as much as 5 grams per head. Sample preparation was carried out at the Zoology Laboratory FMIPA Hasanuddin University and sample examination and identification were carried out at the Parasitology Laboratory of the Maros Veterinary Center, which conducts 3 types of sample testing, namely the native method, the flotation method and the sedimentation method. The results of the study found 5 species of gastrointestinal endoparasites belonging to 2 classes, namely the nematode and cestode classes. Parasitic worms belonging to the nematode class are *Heterakis* spp., *Ascaridia* spp., *Syngamus* spp. and *Capillaria* spp. While parasitic worms belonging to the cestode class are *Hymenolepis* spp.

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1. INTRODUCTION

One of the livestock commodities in South Sulawesi is local chicken or native chicken (*Gallus domesticus*). This type of chicken is a native Indonesian poultry germ plasm that has high potential. Native chickens have the ability to adapt high to the environment so that it is suitable for development by the community, especially small and medium-scale chicken farmers [1]. Although this type of chicken has high adaptability, native chickens can also experience illness and population reduction on farms. The main factor causing a decrease in the number of native chicken livestock production is one of health problems. Health problems can usually be caused by bacteria, viruses, and parasites in the form of endoparasites [2]. Endoparasites are parasites that live in the host's body so that the diseases caused can be local or systemic and are generally worms, arthropods, bacteria, protozoa and viruses [3], [4]. Endoparasites can live in the internal organs of their host such as the liver, spleen, brain, digestive system, blood circulation, abdominal cavity, muscle and other body tissues

[5]. One of the livestock that is often infected by parasites is the poultry group (aves). Helminth parasites or worms are naturally found in various types of wild and domestic poultry. Endoparasites that often infect domestic poultry such as ducks, geese, birds and chickens are nematodes. Endoparasites can attack chickens of all ages. Chickens infected with endoparasites have symptoms such as lethargy, paleness, decreased body condition and even death. Endoparasites can inhibit growth in native chickens and result in decreased production [6]. Endoparasites can be transmitted through food, namely through food that is not clean enough so that it is easily infected with parasites. The eating habits of native chickens which are omnivorous are the cause of native chickens being attacked by parasitic diseases [7]. Possible food eaten by native chickens comes from food or feed that is not clean [8]. Meanwhile, maintenance of cages with good sanitation has a much lower parasite intensity compared to cages with poor sanitation [9]. Information on the detection of native chickens attacked by parasites and the identification of endoparasites in the digestive tract of native chickens is very necessary to maintain the health of native chickens and help the community choose healthy and parasite-free native chicken meat and prevent the emergence of zoonotic diseases. Research on endoparasites in the digestive tract of native chickens has been widely conducted before, but in Pattongko Village, Sinjai Tengah District, Sinjai Regency, South Sulawesi, it has never been studied. This study was conducted to determine the type of endoparasites that attack native chickens in the digestive tract.

2. METHOD

Feces were collected in the morning, by collecting them from the floor of the cage which had previously been given a plastic base to accommodate chicken droppings and minimize chicken droppings from being contaminated with other endoparasite eggs in the soil, approximately 5 grams for each native chicken [10]. The chicken feces samples tested in this study were taken from 20 chickens with an age range of 6-12 weeks or adult chickens (roasters) located in Pattongko Village, Sinjai Tengah District, Sinjai Regency. In free-range chickens, all age groups of chickens can be infected by endoparasitic worms. This is in accordance with Sudarjat's [11] research, namely the degree of infection of each worm in each age group of chickens is not different. Belo [12] also conducted a similar study and obtained the results of the study, namely the absence of a relationship between chicken age and the prevalence of gastrointestinal worm infections.

Fresh feces were put into a sample plastic then 2 cc of 10% formalin solution was added. The addition of formalin is intended so that the eggs do not hatch during storage. Each sample plastic is labeled containing the sample code and other information that can be used as a marker the sample. After that, the sample is put into a coolbox containing ice cubes, the sample put into the coolbox is stored until it is examined in the laboratory. For the native method, a little chicken feces that has been dissolved in a little water is taken and then smeared on the object glass. To clarify the worm eggs, 1 drop of 0.1% methylene blue solution can be added, adding 0.1% methylene blue, to the feces sample to more clearly distinguish the worm eggs from the surrounding dirt. After adding 0.1% methylene blue solution, the object glass is covered using a cover glass slowly until evenly distributed and ensuring that there are no air bubbles in the sample. The sample is then examined under a microscope at 10X magnification and to clarify the morphology of the eggs, 20X and 40X magnifications are added [13]. For the floating method, a 2 gram feces sample was taken, 30 ml of physiological saline solution was added and stirred until homogeneous. Furthermore, filtration was carried out to separate the feces dregs. The filtered results were put into a centrifuge tube up to the height of the tube limit. Attach the cover glass to the surface of the tube and leave it for 5 minutes. After that, the cover glass was placed on the object glass and examined under a microscope with a magnification of 10X and to clarify the egg morphology, 20X and 40X magnification were added. Meanwhile, the sedimentation method is carried out by taking 2 grams of feces, then putting it into a plastic pot glass and adding 30 ml of physiological salt, and homogenizing it with the help of a mortar. The liquid that has been homogenized is filtered using a sieve to filter out large feces. The centrifuge tube is balanced and then centrifuged at a speed of 1,500 rpm for 5 minutes. If the centrifuge cannot be used, let the mixture stand for 20 – 30 minutes. The centrifuge tube is removed from the centrifugator, the supernatant is discarded by pouring it out and leaving the sediment (sediment) at the bottom of the tube. The sediment is taken using a pasteur pipette and placed on a glass object. The sample is dripped with 0.1% methylene blue solution and stirred until homogeneous. Then a preparation is made like a native examination and examined using a light microscope with a 10X objective magnification and to clarify the morphology of the eggs, a 20X and 40X magnification is added.

Data analysis was carried out descriptively after an examination at laboratory and found the types of gastrointestinal parasites found in the sample was then identified using the Helminths, Arthropods and Protozoa of Domesticated Animals 7th Edition book by E.J.L Soulsby [14]. The result of the subsequent examination are presented in the form of tables and pictures of the observation results are included.

3. RESULTS AND DISCUSSION

Based on the feces examination conducted on 20 samples of native chickens, 5 types of parasitic worms were found from 2 classes, namely the nematode and cestoda classes. Parasitic worms from the nematode class are *Heterakis* spp., *Ascaridia* spp., *Syngamus* spp. and *Capillaria* spp. While parasitic worms from the cestoda class are *Hymenolepis* spp.

Table 1. Results of Observations of Worm Eggs in Free-Range Chicken Feces Samples

	Native Method	Flotating Method	Sedimentation Method
<i>Heterakis</i> spp.	1	5	-
<i>Ascaridia</i> spp.	2	5	-
<i>Syngamus</i> spp.	2	6	-
<i>Capillaria</i> spp.	7	12	-
<i>Hymenolepis</i> spp.	-	-	2

The test results using the native method found 4 types of gastrointestinal endoparasites, namely *Heterakis* spp., *Ascaridia* spp., *Syngamus* spp., and *Capillaria* spp. with the results being 1 sample found *Heterakis* spp., 2 samples found *Ascaridia* spp., 2 samples found *Syngamus* spp., and 7 samples found *Capillaria* spp. The test results using this floating method found 4 types gastrointestinal endoparasites namely *Heterakis* spp., *Ascaridia* spp., *Syngamus* spp., and *Capillaria* spp. with the results that 5 samples found *Heterakis* spp., 5 samples found *Ascaridia* spp., 6 samples found *Syngamus* spp., and 12 samples found *Capillaria* spp. The results of testing using the sedimentation method only found 2 endoparasites namely *Hymenolepis* spp.

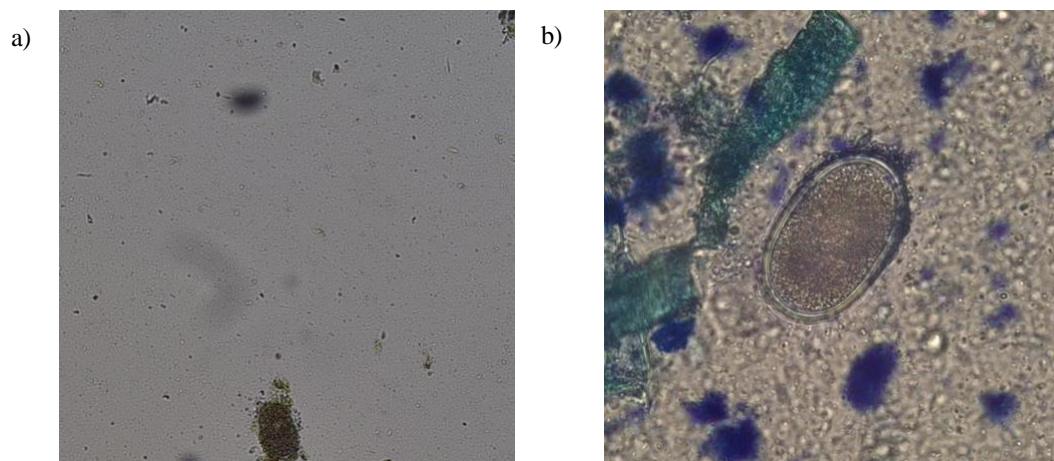


Figure 1. Morphology of the worms egg (a), *Heterakis* spp. (b), *Ascaridia* spp.

The results of morphological observations of *Heterakis* spp. worm eggs can be described as having medium-sized eggs with a length of 63–75 μm , a width of 36–48 μm , an elliptical shape with smooth, thick side walls and a smooth shell, non-segmented content, different from *Ascaridia* spp. eggs which are larger in size and have a wall shape the sides are somewhat like tubes [10]. The results of morphological observations of *Ascaridia* spp. worm eggs can be described as having oval-shaped characteristics, having a layer on the outside of the shell, smooth and soft egg shells, a solid core filling the egg and having a length ranging from 73 - 92 μm and a width of 45 - 57 μm [15].

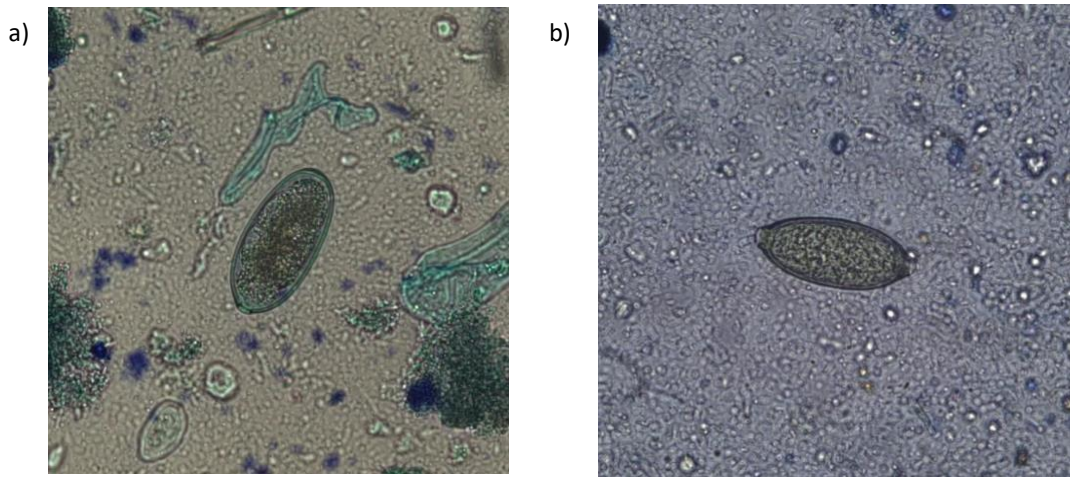


Figure 2. Morphology of the worms egg (a), *Syngamus* spp. (b), *Capillaria* spp.

The results of morphological observations of *Syngamus* spp. worm eggs can be described as having an oval shape, having a thick overculum at the end of the egg and a thick egg shell wall (shell). *Syngamus* spp. eggs have an egg length of 46-52 μm and a width of 24-27 μm [15]. The results of morphological observations of *Capillaria* spp. worm eggs can be described as measuring around 43.3 \times 20.5 μm , having thick walls, eggs containing embryos and at both ends there are bipolar plugs (having 2 plugs at the poles and striated walls) [16]. [8]. The prepatent period of *Capillaria* spp. worms is about 3 weeks.



Figure 3. Morphology of *Hymenolepis* spp. Egg

The results of morphological observations of *Hymenolepis* spp. worm eggs can be described as having characteristics, namely having a size of 30-55 \times 44-62 μm , round in shape and inside the egg there is a hexacanth embryo formation [14].

From the examination of chicken feces samples, it was found that the most dominant type of endoparasite that attacks local chickens is *Capillaria* spp. This can be caused because the hosts of the *Capillaria* spp. worms, namely the earthworms *Eisenia foetida*, *Allolobophora caliginosa*, and several types of *Lumbricus* and *Dendrobaena*, could be found in Pattongko Village. Eggs come out with the feces and are then eaten by earthworms, and poultry are infected because they eat the earthworms [14]. In addition, seasonal factors also affect the fluctuation of the worm population which is increasing, namely in the rainy season [8]. This can happen because Sampling was carried out in July, which is the rainy season.

4. CONCLUSION

The conclusion of the research that has been conducted can be concluded that in Pattongko Village, Sinjai Tengah District, Sinjai Regency, 5 species of gastrointestinal endoparasites were found from 2 classes, namely the nematode and cestoda classes. Parasitic worms from the nematode class are *Heterakis* spp., *Ascaridia* spp., *Syngamus* spp. and *Capillaria* spp. While parasitic worms from the cestoda class are *Hymenolepis* spp.

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