ASCARIDIA COLUMBAE IN COLUMBIA LIVIA DOMESTICA

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Abstract:

Ascaridia columbae is the cause of ascariasis in pigeons. The object of this study carried out in Tirana and Lushnja was the presence of ascariasis, identification and parasite load in pigeons (*Columbia livia domestica*). 5 dead pigeons were examined, 8 others were sacrificed and fecal samples were examined repeatedly, taken from 2 coops with pigeons, 1 for each area out of a total of 192 poultry. *Ascaridia columbae* was frequently evidenced in the pigeons of our country. Its prevalence results relatively high and varies from 40-90 % of the pigeons. We think that the cause of high affection of *Ascaridia columbae* is due to the lack of dehelminth culture and prophylactic precautions in cages. Average parasite load resulted 124 v/g/f with significant variations in the values 60-180 v/g/f. Adult ascariasis was identified based on morphological characteristics and the number of the parasites grown within the intestines of the poultry were defined. The number of the adult parasites that colonize the intestines of the poultry resulted 4-8 parasites on average. But there were also sporadic cases which evidenced up to 24 patent ascribes grown in intestines. In these cases nervous phenomena were evidenced as well as problems of condition, nutrition, mal growth, which might be the cause of a compromising diagnosis with other diseases of the pigeons. The study identified *Ascaridia columbae* as the cause of ascaridiosis in pigeons and a prevalence and parasite load that makes the application of diagnostic precautions and dehelminth schemes indispensable, whose lack is the cause of such condition.

Key words: Ascaridia columbae, Columbia livia domestica, prevalence, parasite load.

1. Introduction

Ascaridia is a parasitic genus, and a lot of members of this genus are intestinal parasites in poultry. Some species result widely known and problematic. *A. columbae* in pigeons is among the most important and pathogenic. It is the cause of ascariasis, which could affect a wide range of poultry [1, 2, 8, 9]. Its symptomatology is grave and includes diarrhoea, considerable growth reduction or production as well as enteritis [11, 12, 13, 15]. The eggs of these nematodes are characterized by a thin, ellipsoidal membrane composed of three strata . The eggs resist sensitively to the environment and are directly infective. Infestation control with different ways as well as estimate and routine dehelminths are indispensable especially in young birds. The parasite is localized in the intestine and its life lasts up to almost 1 year. As in all ascarides the biological cycle is direct, with larvae development up to phase L_2 in the interior of the eggs in the outside environment [11, 12]. The biological cycle lasts in total 1,5-2 months, whereas the life of ascariasis in intestines is almost a year. The invasion of the disease in the Mediterranean varies in values from 2-53%, depending on the categories and kinds of poultry breeding conditions etc. It is rarely found in cold mountainous countries [4, 15, 19]. Ascaridiosis is a disease mainly found in cages of the type for breeding over land and without hygienic sanitary conditions. Source of the disease spreading are the host parasite poultry which distributing eggs in the environment of pigeons growth [9, 12,16].

2. Material and methods.

The study was carried out in Tirana and Lushnja during 2010. The diagnosis consisted in finding eggs within the faeces of the poultry or by finding grown ascarides within the intestines of the dead or sacrificed poultry. Depistation of the pigeons cages was carried out to search for the presence of eggs [1, 2, 5, 7, 11, 16]. In the sacrificed pigeons ascarides were evaluated within the intestine; they were identified and counted [17, 19]. Coproscopic samples were taken from the cages of the pigeons. In the cases when dead pigeons were gathered or when they were sacrificed, then fecal

material was individual and it was taken directly to the cloake for all the poultry [8, 13]. The quantity of the collective sample tended to be sufficient, to avoid mistakes related to expansion of eggs in the representative sample. This was realised by laying sheets of paper on the floor of the pigeons cages, leaving them there for 24 hours and the quantity of the fecal sample gathered by the poultry was 20-50 gr. In this way they resulted to be well mixed. Even the sample was well mixed before going through examinations, or the sample that would be analyzed was formed by taking a little material from different parts of the sample. In the case of the dead or sacrificed poultry together with the faeces, a part of the rectal mucosis content was analysed scratched by means of a cyrete, because the quantity of eggs there is a lot higher than in the faeces. Egg laying from the ascaride females during a day is done with variations, and their quantity is diverse in different days within the same individual. To avoid possible mistakes that derive from these variations we carried out 3 examinations which repeated during 10-15 days [11, 12] . The gathered material during 15 days, after mixture formed the sample that would be analysed. Fecal material was conserved in an appropriate condition so that it would not be damaged. Fecal conservation was carried out either in low temperatures (+2°C), or by mixing them to formalin solution 5 or 8 % in physiological solution, according to the recipe with market formalin 50 or 80 cc, sodium chlorur 8 gr and water 1000 cc [2, 13, 17].

Table 1. Data on samples.

Nr	*Area*	*Dead poultry*	*Sacrificed poultry*	*Collective samples*	*Number of poultry in cages*
1	Tiranë	2	3	1	42
2	Lushnjë	3	5	1	150
3	Shuma	5	8	2	192

The used techniques were the technique of rapid fecal expansion, the coproscopic Mc Master technique and the technique of scratching the mucosis of the intestines to evidence the eggs of the ascarides [2, 5, 8, 11, 12, 13, 17, 19].

2.1. The rapid method of fecal expansion and intestine scratching.

Fecal portion or the scratching from mucosis of the intestines as big as a grain of wheat was taken and put onto a slide. 2 drops of water were added and then the faeces and the water were mixed well by means of a scalpel or spatula. The big parts of the faeces were removed and the mixture was covered with a slide. The preparation should be as thick as to allow us to read the letters of normal writing behind the preparation. If the preparation is too thick then it should be diluted by adding a drop of water onto the slide, thus making the it to slide on the drop of water, and the preparation is diluted and made clearer by rotating the slide. These movements simultaneously eliminate the big particles from the preparation [2]. This technique resulted extremely efficient in this study and most of the egg photos were taken due to this method. The coproscopic Mc Master technique was applied for the evaluation of the parasite load. The technique requires to take 2 gr of faeces and mix them with 60 ml of hypertonic solution of the zinc chlorur (880 g in one litre of water) saturated in salt. The solution which we worked with has a density of 1.32. We filtrate the suspension in a sieve 280 - 500 μ, and by shaking the suspension through a pipette we take a little quantity with which we fill the cameras of the Mc Master slide, being careful in order not to form air bubbles. The Mc Master slide is put on the microscope table and it is left undisturbed for 2-3 minutes, then we count the eggs or the larvae found in the patterns of both cameras, their total is divided by 2 and multiplied with 200. This is the number of eggs or larvaes found in 1 gr faeces (if the slide has 3 cameras, then the eggs of the three cameras are counted and their total is divided by 3).

(The volume of one camera is 10 x 10 x 1.5 = 150 mm^3 = 0.15 ml, 1 gr faeces is diluted with 30 ml solution = the volume of 200 cameras because 30 ml = 30 x 1 000 mm^3=30 000 mm^3; 30 000 : 150 = 200) [13]. To be more precise in the number of the calculated parasite elements, some corrections should be done depending on the state of the analysed faeces. Because in the faeces that contain more water than usually, the quantity of the parasite elements for the same volume is lower, than in the faeces with normal consistency [8]. In addition to this the consistency of the faeces is a really important diagnosing element for which notes must be kept. The correcting coefficient was not applied, considering the fact that the faeces were dry and separate, especially the representative collective faeces from the cages.

2.2. Post-mortum examination.

The technique was used in the case of dead pigeons and for 7 poultry that were sacrificed. Abdominal cavity was opened in these poultry. In this cavity the attention was paid by eye examination for the presence of ascarides, especially in the dead pigeons [2, 13]. Ascarides in dead poultry are able to perforate the intestine and to go freely in the abdominal cavity, in the case of the sacrificed pigeons ascarides are found in the interior part of the intestines. Intestines are linked at both ends and are separated from the other part of the intestines the soonest possible after scarify of the poultry. The material which is not frozen and fixed in formalin 4-10 % is examined at the moment because parasite worms lose their normal indices within 24 hours [1, 2, 5, 9, 16]. The formalin does not harm the parasites, but their eggs. The fresh intestines are separated into several parts and put in physiological solution at 37°C before examination. The worms fixed within the mucosis wall might be identified and counted with the eyes, because they are relatively obvious or through a magnifying lens that is kept in the hand [13]. For a careful counting the unfrozen intestines are separated in 4 or 6 parts, they are opened and left in physiological solution at 37 °C during 30 minutes to separate the worms. The content of the intestine is rinsed in another container for detailed examination, whereas the mucosis is scratched with a spatula. The whole material (the content and the scratches of the mucosis) is filtered and rinsed in a sieve to eliminate the excessive parts. Afterwards the content is poured into a black basin. The worms are identified and counted through a magnifying lens [9].

3. Results and discussion

A considerable number of pigeons resulted positive for *Ascaridia columbae* despite the parasitoligical manner of diagnosing used.

Table 2. Results of parasitological examinations of the pigeons in Tirana.

Nr	*Technique*	*Dead poultry*	*Positive*	*Sacrificed poultry*	*Positive*	*Collective samples*	*Number of poultry in cages*	*Positive*
1	Rapid expansion	2	0	3	2	1	42	+
2	Mc Master n/e/g/f	2	0	3	60	1	42	88

Table 3. Results of necropsy examinations of the pigeons in Tirana.

Nr	*Technique*	*Dead poultry*	*Positive*	*Sacrificed poultry*	*Positive*
1	Necropsy	2	0	3	2
2	Parasite/ poultry	2	0	3	2-8

Figure 1. *Ascaridia columbae* (Laboratory of Parasitology, FVM 2010). Original photo.

Table 4. Results of parasitological examinations of the pigeons in Lushnja.

Nr	*Technique*	*Dead poultry*	*Positive*	*Sacrificed poultry*	*Positive*	*Collective samples*	*Number of poultry in cages*	*Positive*
1	Rapid expansion	3	2	5	5	1	150	1
2	Mc Master n/e/g/f	3	124	5	180	1	150	126

Table 5. Results of necropsy examinations of the pigeons in Lushnja.

Nr	*Technique*	*Dead poultry*	*Positive*	*Sacrificed poultry*	*Positive*
1	Necropsy	3	2	5	5
2	Parasite/ poultry	2	4-8	5	8-24

In the area of Tirana out of 2 dead pigeons none of them resulted positive for *Ascaridia columbae*. From the sacrificed pigeons 2 resulted positive, where 2 grown ascarides were counted in one of them and 8 in the other. Average parasite load resulted 60 v/g/f. Whereas for the collective sample taken from a cage of 42 pigeons average parasite load resulted 88 v/g/f. In the area of Tirana infestation prevalence went up to 40 % and parasite load about 70 v/g/f.

In the area of Tirana out of 3 dead pigeons 2 of them resulted positive for *Ascaridia columbae*. Parasite load resulted relatively high 124 v/g/f and approximately 2.5 times higher than the examined analogues in the area of Tirana. From the sacrificed pigeons all resulted positive and a high number of parasites was counted. In 1 sample 20 adult ascarides were counted, while in another one 24. Average parasite load resulted 180 v/g/f or 3 times higher than the analogues in the area of Tirana. Whereas for the collective sample taken from the cage with 150 pigeons average parasite load resulted 126 v/g/f. In the area of Lushnja the prevalence of the noticed infestation was 40 % and average parasite load of about 120 v/g/f. The causes of this condition are related to the specific conditions of raising the examined pigeons in this area [10, 19]. The pigeons resulted to have no veterinary control, lack of information for the diagnosis and dehelminth. Even in cases when dehelminth was applied it resulted to have been wrong. Within the cages according to the anamnesis frequent deaths and nervous phenomena were evidenced [11, 12].

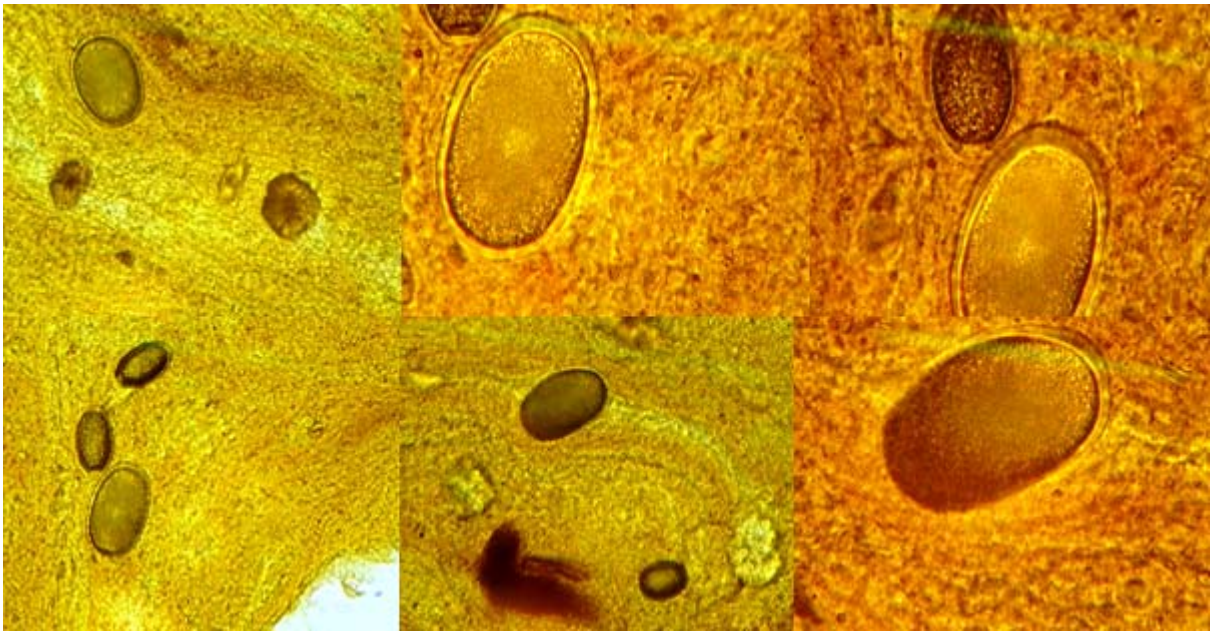

Figure 2. *Ascaridia columbae* eggs (Laboratory of Parasitology FVM 2010). Original photo.

4. Conclusions

Ascaridia columbae resulted to be frequent in our country. *Ascaridia columbae* which was the most prevalent nematode was recovered in *Columbia livia domestica.*of the year 2010. For the first time we refer accurately its presence and parasite load in Albania.

Out of five dead pigeons 2 or 40 % of them resulted positive for *Ascaridia columbae.* Parasite load resulted 124 v/g/f and the number of parasites grown within the intestine from 4-8.

Out of 8 sacrificed pigeons 7 (5 in Lushnja and 2 in Tirana) or 89 % resulted positive. Parasite load resulted from 60-180 v/g/f and the number of parasites grown within the intestine up to 24 patent ascarides.

The high degree of parasitism often causes nervous phenomena which could become the cause of a compromising diagnosis with other diseases of pigeons.

Lack of veterinary culture from the stockbreeders, non application of diagnosing precautions and lack of dehelminth schemes are the causes of this condition.

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