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DYNAMICS OF BLOOD HEMATOLOGICAL PARAMETERS DURING TREATMENT EIMERIOSIS
(EIMERIA TENELLA) OF CHICKENS WITH ARTEMISIA ABSINTHIUM

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ელშად აჰმადოვი, ჯალა გასანოვა, ფარიდა მამადოვა, შაფიგა თოქჩიევა,
სევდა სამადოვა, ნურანა ნაჯიევა

სისხლის ჰემატოლოგიური პარამეტრების დინამიკა EIMERIOSIS (EIMERIA TENELLA)-ით
დაავადებული ქათმების ARTEMISIA ABSINTHIUM-ით მკურნალობის დროს
აზერბაიჯანის მეცნიერებათა ეროვნული აკადემიის ზოოლოგიის ინსტიტუტი, ბაქო.

რეზიუმე

ზოოლოგიის ინსტიტუტის ვივარიუმში 20 დღემდე გაზრდილი ადგილობრივი ჯიშის ქათმებს კვებადნენ სტანდარტული ფრინველის კომბინირებული საკვებით ბროილერებისთვის. სისხლში ჰემატოლოგიური პარამეტრების დინამიკის შესასწავლად ქათმები, რომლებიც ინფიცირებულნი იყვნენ *E.tenella*-ით და *Artemisia Absinthium*-ით მკურნალობდნენ, სამ ჯგუფად დაიყვნენ, თითოეულში 20 ფრინველი. პირველი ჯგუფის ქათმები ინფიცირებული არ იყვნენ (კონტროლი). მეორე და მესამე ჯგუფის ქათმები დააინფიცირეს *E.tenella*-თი (დოზა-20,000 სპორულირებული ოოციტი). ქათმების მეორე ჯგუფს არ მკურნალობდნენ (კონტროლი 2), ხოლო ქათმების მესამე ჯგუფს საკვებში უმატებდნენ *A. Absinthium* 1500 მგ თითო კვ საკვებზე, ინფიცირების შემდეგ, 10 დღის განმავლობაში. დაინფიცირებული ქათმების ერითროციტების, ეოზინოფილების, ფსევდო-ეოზინოფილების რაოდენობა, მცირდება და იზრდება მონოციტების რაოდენობა ($P<0,05$). სისხლის წითელი უჯრედების რაოდენობის შემცირება ამცირებს ჰემოგლობინის დონეს.

INTRODUCTION. Coccidiosis of chicken is an enteric parasitic disease caused by multiple species of the protozoan parasite genus *Eimeria* (Apicomplexa: Eucoccidia: Eimeriidae) and is one of the commonest and economically most important diseases of poultry worldwide [18]. Seven *Eimeria* species (*E.acervulina*, *E.brunette*, *E.maxima*, *E.mitis*, *E.necatrix*, *E.praecox* and *E.tenella*) are known to infect the intestinal tracts of chickens [1,2] and cause symptoms of coccidiosis, including weight loss, hemorrhagic diarrhea and death [13]. Although coccidiosis is a well-known disease, it still remains one of the most economically important parasitic diseases of the poultry industry worldwide [5,23,24]. Eimeriosis (*E.tenella*) is found in almost all farms with birds contained on the floor. The above-mentioned species have different location in the intestine, immunogenicity, reproductive are different antieymerioznm susceptibility to drugs, and the course of the disease.

The end of the 20-st the beginning of 21-st century has begun stage renunciation of the use of antibiotics for parasitic and infectious diseases of animals and birds. In EU countries became urgent search treatment and prevention of biologically active substances with antiparasitic actions, non-toxic that are foreign to the host organism, ecologically pure [22,20,2,26,27,12]. The medicinal herbs since time immemorial to this day used in treating various human diseases [7].

There are a variety the researches to identify the possibilities of using plants are alternative to antibiotics and chemical preparations for the treatment of coccidiosis around the world [25,10,4,19,9,21,8,1,3,14,11].

The aim of research was to determine the effect of *Artemisia absinthium* L. in the treatment of experimental eimeriosis of pock-marked local chickens on the dynamics of some hematological parameters in Azerbaijan.

MATERIALS AND METHODS. The experiments were carried out on chickens of local rocks breed, bred in the laboratory, "the biochemistry of host-parasite relationships" of the Institute of Zoology of the National Academy of Sciences of Azerbaijan. Per diem local breed chickens were grown in the vivarium of the Institute up to 20 days of age. Chickens were fed with standard bird combined feed for broilers.

For studying the dynamics of hematological parameters of blood of local pockmarked rocks chickens infected with *E.tenella* and treated of *Artemisia absinthium*, 20-day old chicks were divided into three groups of 20 birds each. Chickens of the first group were not infected (control). Chickens second and third groups were infected *E.tenella* with dose of 20,000 sporulated oocysts. The second group of chickens was not treated (control 2), and the third group of chicks was allowed *A. absinthium* 1500 mg per kg feed at the following day after the infection for 10 days.

Oocysts required for the infection of chickens were separated from the solution by centrifugation of potassium dichromate. The precipitate was suspended in water, collected in such an amount that the concentration was about 20,000 oocysts in 1 ml. Oocysts required for invasion by chickens, were separated from the solution by centrifugation of potassium dichromate. The precipitate was suspended in water; collected in such an amount that the concentration of oocysts was about 20,000 in 1ml. Counting oocysts were produced as follows: the oocyst suspension in distilled water thoroughly was shaken. With sterile micro pipette the graded micropipette 0.01ml of the suspension was applied to a glass slide and counted all oocysts.

Using standard methods have been defined number of red blood cells and white blood cells, hemoglobin, WBC [28,29].

For statistical processing the results used the statistical program IBM SPSS Statistics 20. Data obtained from analytical tests and in vivo experiments were expressed as mean \pm Sd from at least thirty experiments. The mean value for each group was analyzed and compared with other groups using Student's t-test. P-Values less than $P \leq 0.05$ were considered statistically significant.

RESULTS AND DISCUSSION. Hematologic parameters are very sensitive to the effects of changing in endogenous and exogenous factors, including those caused by the nature of the supply. The content of hemoglobin, red blood cells and white blood cells, as well as the ratio of blood cells is largely characterize the state of the blood system and informatively reflect the state of hematopoiesis.

During parasitic diseases including protozoan are observed changes in hematological parameters of blood. In the blood of chicks infected with *Eimeria tenella*, *Eimeria maxima* and *Eimeria acervulina* are observed reduction in the number of hemoglobin and erythrocytes compared with controls. On day 6 of infection increases the number of red blood cells, and on 10 day decreases [30]. The study of hematological blood parameters of broiler chickens of Lowman breed, infected with *Eimeria tenella* and treated with probiotics showed that these probiotics reduce the number of erythrocytes, hemoglobin and hematocrit, and increase the number of leukocytes [15,6].

Changes in peripheral blood leukocytes from chickens affected by *E. tenella* were detected only in primary infections in a study conducted by Natt [16], where severe bleeding was detected. Rose et al. (1979) observed that first infection with *E. maxima* in the chicken leads to an increase in the circulating leukocytes number (heterophils, lymphocytes, and monocytes) in two phases, one lymphocytosis before and another after the peak production of oocysts [17].

It was established that statistically significant changes in the amount of hemoglobin and of leukocytes does not occur at the 3rd day of invasion compared with the control group. The number of erythrocytes reduced, leading to a reduction in the amount of hemoglobin in the blood. The number of eosinophils and pseudo-eosinophils decreases, and the number of monocytes, in contrast, increased ($P < 0.05$) in that day invasion. There were no statistically significant changes in the number of erythrocytes and hemoglobin, and in the number of leukocytes were observed statistically significant changes on the 5th day of invasion. On this day of invasion, the number of leukocytes is reduced to $22,07 \pm 0,099 \times 10^9 / L$ (control group to $22,16 \pm 0,007 \times 10^9 / L$, and in the infected group to $22,29 \pm 0,007 \times 10^9 / L$). On the 7th day of invasion reduction in the number of erythrocytes and leukocytes was not statistically significant, and decrease in hemoglobin ($0,84g / L$) was statistically significant ($P < 0.01$). In the blood of treated chickens the number of leukocytes, erythrocytes and hemoglobin on the 10th day of invasion has been at the level of physiological norm. Statistically significant increase in the number pseudo-eosinophils of blood chickens treated with *Artemisia absinthium* were observed on the 3rd and 10th days of invasion ($P < 0.01$ and $P < 0.001$, respectively).

The statistically significant changes in the number pseudo-eosinophils were not observed at 5th and 7th days of invasion ($P > 0.05$). On the third day of treatment, the difference in the number of eosinophils in comparison with the control uninfected group was small (0.05%), but more than in the infected untreated group by 0.21%. In both cases, the changes were statistically significant ($P < 0.05$ and $P < 0.01$). The number of lymphocytes compared with indicators infected group decreases up to the level of indicators of the uninfected control group (0.87%) ($P < 0.05$) (in control group - 41.03%, in the treated group -41.04%). In comparison with indicators of the infected untreated group the number of lymphocytes was decreased ($P < 0.05$). On the 5th day of treatment, changes in the numbers of eosinophils and monocytes in the blood of chicks does not occur, and the number of basophils as compared with the infected untreated group decreased ($P < 0.01$), the number of lymphocytes compared to the uninfected group is reduced and compared with indicators of infected untreated group increased ($P < 0.05$). Thus, it was found that treatment eimeriosis of pockmarked chicks with *Artemisia absinthium* has a positive effect on the stabilization of hematological parameters of blood.

CONCLUSIONS. In the blood of chicks infected with *Eimeria tenella* number of erythrocytes, eosinophils, pseudo-eosinophils decreases and the number of monocytes increases ($P < 0,05$). Decrease in the number red blood cells reduces the amount of hemoglobin.

The number of red blood cells and white blood cells, the amount of hemoglobin in the blood of local pockmarked chickens infected with *Eimeria tenella* and treated *A.absinthium* restored to the physiological norm by the end of the invasion.

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SUMMARY

The chickens of local rocks breed were grown in the vivarium of the Institute of Zoology up to 20 days of age. Chickens were fed with standard bird combined feed for broilers. For studying the dynamics of hematological parameters of blood of local pockmarked rocks chickens infected with *E.tenella* and treated of *Artemisia absinthium* were divided into three groups of 20 birds each. Chickens of the first group were not infected (control). Chickens second and third groups were infected *E.tenella* with dose of 20,000 sporulated oocysts. The second group of chickens was not treated (control 2), and the third group of chicks was allowed *A. absinthium* 1500 mg per kg feed at the following day after the infection for 10 days. In the blood of chicks infected with *Eimeria tenella* number of erythrocytes, eosinophils, pseudo-eosinophils decreases and the number of monocytes increases ($P < 0,05$). Decrease in the number red blood cells reduces the amount of hemoglobin.

Keywords: *Eimeria tenella*, coccidiosis, chicken, *Artemisia absinthium*, erythrocytes, oocysts