

Section 1. Biology

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SPECIES COMPOSITION OF ECTOPARASITES OF CHICKENS IN CONDITIONS OF THE SOUTHERN REGIONS OF UZBEKISTAN

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Abstract

The article presents the results of research conducted on the spread of chicken ectoparasites (footflies and hamazoid mites) in poultry farms and private households in the southern regions of Uzbekistan. During the research, samples of 380 bed-eaters and 590 gamozoid mites were collected and identified from more than 800 chickens suspected of mallaphagosis and dermanissiosis. The composition of ectoparasite species of chickens distributed in the region was determined. Among them, *Dermanyssus gallinae* from gamazoid mites, and *Menopon gallinae* species were found from mealybugs. The level of infection of chickens with ectoparasites (invasion extent and intensity of infestation) was determined by *Dermanyssus gallinae* mites (100% and 300–400), *Menopon gallinae* (90% and 150–250), respectively. Ectoparasites of chickens in this area, in warm climates, bioecological research and development of modern innovative control measures to fight against them.

Keywords: *Chickens, ectoparasite, Dermanyssus gallinae, Menopon gallinae, infestation, dermanysiosis, mallophagosis, extent of invasion, intensity of invasion*

Introduction

Poultry is the most important and economically productive sector of animal husbandry, or it cannot be said that “Poultry is one of the seven treasures”. The development of intensive poultry farming provides an opportunity to grow a lot and quality poultry meat in a short period of time. Egg production in the world is about 707 billion per year. is forming a unit. This would require approximately 2.8 billion egg-laying hens. Main egg producing coun-

tries: Asia 61.2% (China 47.5%, Japan 6.1%, India 4.2%), North America 15.6% (United States 11.0%, Mexico 3.8%), South America 2.8% (mostly in Brazil 1.8%), European Union 11.7% (France 2.3%, Germany 2.0%, Italy 1.7%, United Kingdom 1.5%, Netherlands 1.4%, Spain 1.4%), Eastern Europe 1.6%, Russia and Ukraine 5.7% and Middle East (mainly Turkey) 1.3% (Yaroshchuk, A.I., 2019). Today, 91935 000 chickens are raised in Uzbekistan and 7788 417,000 eggs are produced (Infor-

mation of the State Statistics Committee of the Republic of Uzbekistan, 2021). Recently, due to the increase in the average daily temperature in the world, it is related to the wide distribution of the parasitic mites (Mallophaga) and Gamasina (Gamasina) (Lyakhova, O.M., 2010). Mealybugs and gamozoid mites are a serious problem for poultry. They act on the body of chickens, causing discomfort and itching. As a result, chickens lay eggs less, when the invasion is at a high level, i.e., at the pathological-anatomical stage, signs of acute bleeding are observed, and some of them die (Akbaev, R.M., 2013).

The purpose of our research. Study of chicken ectoparasites of mealybugs (Mallophaga) and gamozoid (Gamasina) mites species composition and levels of infection of chickens with them.

Material collection and methods

In 2021–2022, the research was carried out mainly in the spring and autumn seasons in the poultry farms and households of the Kashkadarya region. We selected 10 to 50 chickens suspected of mallophagosis and dermanissiosis from each farm and subjected them to acarological examination. Collection of ectoparasites was performed using generally accepted methods. We pre-treated the isolated chickens with a talc preparation from the group of synthetic perethroids (neostomazan) to temporarily kill ectoparasites. The chickens were collected by combing the feathers on white paper, mites, and then placed in test tubes with 70% ethyl alcohol. In addition, samples were taken from the floor, walls, ceiling, feeding bowls, mangroves and other places of buildings where chickens are kept to collect ectoparasites of chickens. For difficult to sample areas (wall and floor cracks, etc.) we used cotton swabs with a cotton tip. We determined the species composition and amount of ectoparasites (ex/m²) in laboratory conditions using detectors.

Results and discussion

In the world, ectoparasites of agricultural poultry have been studied by scientists and researchers of many countries. Ectoparasites of birds can include insects and mites that parasitize them directly. These are feather and feather eaters, mites, lice, cockroaches, living

and feeding together with birds in poultry houses. Many dipterans, wasps, and beetles are carriers of bird diseases (Romashenko, P.V., Egorov, S.V., Malunov, S.N., 2015; Zakhvatkin, Yu.A., 2012; Safronov, F.M., 2017). In March–December 2021–2022, research was carried out in about 30 poultry farms in Karshi, Nishon Kasbi and Mirishkor districts of Kashkadarya region. Chickens of different ages and sexes were involved in the research. The main attention was focused on chickens with obvious clinical signs of molyphagous and drug-free. The shoulder, abdomen, head and cloaca area of the chickens were examined (Figures 1–2). Ectoparasites were collected from chickens by conventional methods and studied in the laboratory. We collected ticks from chickens by combing them on white paper, and we collected mites using cotton sticks dipped in ethyl alcohol. We analyzed the collected mealybugs and mites microscopically to identify the species. According to the microscopic examination, the following results were obtained. During the research, more than 800 chickens were identified and samples were collected from 380 menoponidae and 590 gamozoid mites. *Menopon gallinae* species belonging to the Menoponidae family and the *Dermanissus gallinae* species from Gamazoid (Gamasina) mites were found. In our research, the most common ectoparasite of chickens (Menoponidae) species *Menopon gallinae* was found to be a permanent parasitizer.

Menopon gallinae is a small, wingless insect, white-yellow in color, body length up to 2.5 mm. The body of the insect is divided into segments, and the seams between the segments are clearly visible. It has three pairs of jointed legs and a pair of antennae that are wider than the head.

The oral apparatus is rodent type. Aphids develop with incomplete metamorphosis, the larvae that hatch from the eggs turn into imago in 4–20 days or several weeks (Figure 3). As a result of microscopic examination of the obtained samples in the laboratory, the Ticks feed on skin secretions, feathers and feathers, as well as on the blood and lymph epidermis that has flowed out as a result of the skin and structure of feathers and feathers growing due to scratches and itching. In the process of inspection of chickens, most of the eggs are leaking at the base of the feathers,

the adult stages of the parasite are found on the skin and feathers of birds, mostly under the wings and around the cloaca and on the

head. In the process of parasitism, the affected birds are observed to shrivel, itch and scratch their bodies.

Figure 1, 2. *Infection of chickens with mallophagosis and dermanissiosis (original)*



Dermanissus gallinae is an ectoparasite, a blood-sucking gamazoid mite, the body is somewhat long oval, the back is wide, and there are many hairs. Khartoum and long legs. The chelicera is like a thin long needle, adapted to pierce the skin and absorb the mine. Red-brown, with white spots on the

back (shoulder). Female body length 0.75–0.84 mm (width 0.4 mm), male body length (0.3 mm width). Eggs are bubble-shaped, up to 0.3 mm in size, protonymph – transparent (0.4 mm), pale deutonymph length – 0.6 mm, widespread throughout the world (Yaroshchuk, A.I., 2019).

Figure 3. *External structure of Menopon gallinae (original)*



It mainly attacks wild birds and domestic birds in bird nests, cages, poultry houses at night, and hides during the day. Dermatitis and itching are observed when they bite people working in poultry houses. It is a carrier of many infectious diseases (especially chicken encephalitis). In chickens, insufficient blood (anemia) is observed, live weight gain and egg production are reduced (Omonova, N. R.,

Bobonazarov, G'.Yo., 2022). Larvae emerge from eggs laid by female mites 50–120 hours later, and less mobile larvae develop into protonymphs after 24–30 hours. Protonymphs suck the host's blood, move actively and turn into deutonymph, mature imago (male and female). A female mite lays 3–20 eggs. The number of eggs depends on how much blood they suck (Figure 4).

Figure 4. External structure of *Dermanissus gallinae* (original)



Due to frequent attacks and blood sucking of these mites, chickens lose weight, lay few eggs, and in some cases may die. During the study, more than 800 chickens, which were examined acarologically, were observed to be infected with mealybugs or red chicken mites in all (100%). The intensity and extent of infestation of chickens by *Dermanissus*

gallinae and *Menopon gallinae* are presented in the table above. The level of infection of chickens with ectoparasites (invasion extent and intensity of infestation) was determined by *Dermanyssus gallinae* mites (100% and 300–400), *Menopon gallinae* (90% and 150–250 mites), respectively (Table 1).

Table 1. Infection of chickens with *Dermanissus gallinae* and *Menopon gallinae* in the conditions of the southern regions of Uzbekistan

Types	Intensity of infestation. Average number per head	Invasion Extent (%)
<i>Dermanissus gallinae</i>	300–400	100
<i>Menopon gallinae</i>	150–250	90

Summary

As a result of the analysis of the species composition of ectoparasites of chickens (foot-eaters and gamazoid mites) distributed in poultry farms and private households in the conditions of the southern regions of Uzbekistan, the extent of infection of chickens with the red chicken mite *Dermanissus gallinae* is 100%, the intensity of invasion is on average 300–400 per head of chicken, *Menopon gallinae* with 90%, the infesta-

tion intensity corresponds to an average of 150–250 chickens per head. In this region, i.e. in hot climate, it is necessary to study the bioecological characteristics of chicken ectoparasites and to develop and implement modern innovative control measures against them.

Conflict of interest statement

The authors declared that they have no conflict of interest.

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