UDC 619:616.993:616.995.4/.7

B. Stehnii, Academician of the NAAS, Doctor of Veterinary Sciences
A. Herilovych, Corresponding Member of NAAS, Doctor of Veterinary Sciences
A. Palii, Doctor of Veterinary Sciences
A. Mashkei, Candidate of Veterinary Sciences
N. Sumakova
National Scientific Center «Institute of Experimental and Clinical Veterinary Medicine»

ECTOPARASITES AS MECHANICAL AND TRANSMISSIVE TRANSMITTING AGENTS OF INFECTIOUS DISEASE

The purpose. To study possible role of the fixed and temporary parasites as mechanical and transmissive transmitting agents of causal organisms of contagious and invasion diseases of animals and auk, to develop up-to-date domestic means against them. **Methods.** Immunologic (RIF), ecological-and-entomological, laboratory. **Results.** Role of ectoparasites as transmitting agents of causal organisms of contagions of animals and auk is specified. In view of urgency of the problem series of domestic means against such ectoparasites is developed and offered to practical veterinary medicine. **Conclusions.** Basic characteristics are brought of the following preparations: Akarinotsid — against red chicken mite; Diptotsid — bait against flies; Ektotsid-plus — against Ixodidae mites on pastures.

Key words: ectoparasites, peritroids, Akarinotsid, Diptotsid, Ektotsid-plus, efficiency.

Formulation of the problem. Parasites are fairly widespread representatives of the wildlife. At present, about 1.3 million species of animals are described on our planet, of which 6% (tens of thousands of species) have adapted to the parasitic way of life. It is difficult to name the species of animals that do not have parasites or were not subjected to a temporary attack. Parasites are divided into groups depending on the time (period) of parasitism, localization and degree of their specificity in relation to the owners. By parasitic time, parasites are temporary and permanent.

Temporary parasites live freely in the environment and attack the hosts for food and meals only, they are females of the mosquito (Culicidae), females and

males (Tabanidae), red chicken mites (Dermanyssidae), ticks of the genus Ixodidae, and others.

Analysis of recent research and publications. There are more than 9,000 species of permanent ectoparasites (insects, mites) of terrestrial vertebrates. For regular ectoparasites typical meals are small meals, moderate or low fertility, short periods of development of one generation, small individual longevity, inability to prolong starvation. For these ectoparasites, the classic attributes of parasitism are most characteristic. They are characterized by one life form throughout the development cycle with a complex of morphological adaptations to parasitism [1].
In the epidemiological sense, the value of arthropods, as carriers of pathogens of infectious diseases of humans and animals, is incomparably greater than that of ectoparasites. They participate in the mechanism of transmission of about 25% of protozoan, rickettsia, viral and bacterial pathogens of all infectious diseases [2, 3].

Synanthropic and zoo flies inflict significant economic losses on livestock production in our country. In the period of intensive fly and flies attack, the milk and meat productivity of animals is reduced by (10 - 20)%. Flies negatively affect the sanitary quality of livestock products and feed, the working conditions of the staff and the general culture of production.

Red chicken mite (Dermanyssus gallinae) is a vector for the transmission of a number of pathogenic agents such as bird pox, cholera and bird Salmonella enteritidis (Zeeman et al. 1982, Waladde et al. 1993, Valente-Moro et al 2007, 2009). In addition, red chicken mite causes skin irritation, such as dermatitis and urticaria in poultry workers (Auger et al. 1979, Beck 1999). According to expert estimates, in Ukraine from 50% to 60% of poultry enterprises are invasive with red chicken mite, the damage of which is to reduce egg production on average from 2% to 15%, depending on the fascination of the poultry, the increase in the mortality of the poultry to 5%, and the decline in the egg quality By 5-10% (red spots on the surface of the eggs). Economic losses, according to European experts, range from 0.29 euros per chicken as a result of the decrease in egg and EUR 0.14 per chicken in the fight against red chicken mite [3, 4].

Blood insects are an integral part of the nest and are found in a variety of geographic landscapes, which are part of the relevant biocenoses. By way of life they are extremely diverse. In mass reproduction, these insects are a real disaster for livestock in some areas. In the territory of Ukraine, a large number of species inhabit the valleys of the Danube, the Dnieper, the Seversky Donets and other reservoirs, in which during the period of mass flying to cattle, up to 2000 or more specimens of blood-sucking insects can be attacked. In the event of the onset of a large number of cerebellar mosquitoes in the 80s of the 20th century, there were mass deaths of animals and somyelidotoxicosis in humans in the territory of the Kharkiv region. In addition, it is known that in the western regions of Ukraine, a neurotropic virus isolated from the Moore Culicoides pulicaris L. [5, 6].

The purpose of research - to identify the possible role of permanent and temporary parasites and transmissible as mechanical carriers of infectious and parasitic diseases of livestock and poultry and to develop modern domestic means to combat them.

Research methods. Studying the role of ambient flies as mechanical carriers of infectious rhinotracheitis (IBR) and viral diarrhea (ID) conducted using immunofluorescence (RIF). Research mosquitoes (Anophele maculipens Mg) and mosquito-Piskun or common mosquito (Culex pipiens L) was performed according to conventional methods used in environmental and entomological studies (Fasulaty, 1971; Hylyarov, 1966 Mishchenko, 1975; J. Masha, 1997 , Beletskaya, Lozinsky, 2005). The intensity of the red chicken mite infestation was determined by counting the number of ticks in 1 g substrate in sight under the microscope and estimated ticks on the construction plane 10 cm2 (VN Speranskaya, 1969).

Research results. For the purpose of the preliminary diagnosis of viral diseases in the Kharkiv, Zhytomyr and Zaporizhia regions were clinically examined calves 1-1.5 months of age (550 goals) and adult animals (400 heads) for IBR and VD.

In the survey found that calves severely depleted, coughing, shortness of breath and diarrhea observed in adult animals - redness of the mucous membrane of the vagina, bubble and lumpy rash.

During the examination of the premises, a large cluster of indoor fly (M. domestica) was detected. With the flies index (MI) it is estimated that at each animal there were at least 150-200 individuals of flies.

Results of the study biological material of cattle and flies in the FTA led to the conclusion that the housefly (Musca domestica) is a mechanical carrier IRT and VD conditions with large concentrations of it in pastoral areas and in contact with animals suffering from viral infection [7, 8, 9]. Room flies occupy all the main biotopes - pastures, squads and animal husbandry facilities, which account for 38.4% of the main composition of zoo flies.

Continuing Studies in several years in April and May monitor complex midges pastures and fees Diptera in areas of grazing animals in Dergachi, Kharkiv and Zmiiv district showed a significant number of blood-sucking insects - mosquitoes, midges and horse-fly. In pastures where cows graze and around livestock buildings on keeping cattle in the morning (7-8 hours) and night (18-20 hours) at the optimal temperature (17-19 ° C), the most active were the mosquitoes (Culicidae). The simuliidae and the Tabanidae were active at the time of day. Goji for the bloodstream especially chose hot sunny days.

More than 1,500 mosquito females of different species were found in the bivalves. In the study of malaria mosquitoes (Anophele maculipens Mg) and mosquitoes, or mosquitoes (Culex pipiens L) in females in the salivary glands microfilariae were detected. The results of ovarian studies showed that females had 3 ovipositors. That is, each female consumes at least 3 times the blood. The A. maculipens mosquito is not only a vector of the pathogen of malaria, but also nematodes of the genus Dirofilaria.

In the survey of premises of poultry farms (the maintenance of hens in cells), as well as in the private sector (keeping on the floor), red chicken mite (Dermanyssus gallinae) was found, its population in poultry houses was on average

60-75%. The number of chicken mites varies depending on the season, so in April, it averaged from 2 to 3 thousand in 1 gram substrate, in June, due to the increase in temperature, the number increased to 7-8 thousand individuals in 1 g substrate.

The red chicken mite is a temporary parasite, for food it attacks the bird mostly only at night, but with a large number it can be observed, both on constructions during the daytime, and on the chicken.

In the external examination of chickens it is established: comb and earrings are anemic, skin is thickened forever, a skin covering with signs of dermatitis accompanied by redness and the presence of blistering rashes and scabies. Parasites, especially massively under the wings, around the cloaca and around the neck, were found throughout the plumage. In addition, there were mites in the nostrils, gullet and trachea. Due to the high number of red chicken mites from blood loss, intoxication and in the development of pathogenic microflorum, the death of poultry occurs.

At the attending staff (nurseries) there were allergic manifestations, fever, due to tick bites.

In the general the presence of ticks from 60 to 70%, the average death of poultry in standard poultry was 20% of the total number, with egg production decreased by 10-15%.

Taking into account the above, in the National Research Center "Institute of Experimental and Clinical Veterinary Medicine" there were developed means and a bait for the fight against ectoparasites of animals and poultry. The purpose of the development of tools and charms was to reduce the amount of peritroids, due to the introduction of two active substances, a repellent, a synthetic analogue of sex pheromone and food attractant to make them more dangerous.

Means "Acarinocid" for the control of red chicken mite were tested and used in 25 poultry farms of Ukraine. The efficiency of the treatment was from 87 to 89%. The duration of the remedy for three one-time processing is up to 6 months. The advantage of the remedy is that it is an oily emulsion containing

insectoacaricide with two active substances, which makes acarinocide more effective and environmentally safe [10].

The "Diptocid" bait for flies was tested and used in pig farms, livestock and poultry farms in 12 oblasts of Ukraine, in particular Donetsk, Kharkiv, Poltava, Kirovograd, Zaporozhye, Dnipropetrovsk, Kyiv, Lugansk, Sumy, Kherson, Cherkasy, and Sumy. The efficiency of bait processing in pig breeding farms is from 97 to 99%, in livestock farms - from 94 to 98%, and during summer-camp keeping of animals - from 88 to 96%. Longevity is 18-21 days. The effective protection of animals from flies also allows for additional 100-200 kg milk from each cow, 15-20 kg of beef and 10 kg of pork per replenished animal during the year. The advantage of the bait is that its composition, in addition to food attractants, includes a synthetic analogue of sex pheromone of a room flies, which makes the bait "Diptocid" more effective and environmentally safe. Also, the lure "Diptocid" was tested in private farms for growing mushrooms against mushroom mosquitoes, treating lawns against mosquitoes and other blood-sucking two-winged ones [11].

"Ektocyd-plus" - a means to combat mosquitoes (horse-fly, autumn zhalytsya, gnats, mosquitoes, mokretsi) and Ixodes ticks on pasture. Due to the introduction of the repellent and insectoacaricide, the device provides a high degree of protection of animals from insects in the pastures. The repellent scares away, and acaricide kills ectoparasites. The expiration date is 21 days. The measure was tested on pastures in the Kharkiv region.

In addition, the cost of funds "Akarynocyd" "Ektocyd- plus" and attractions "Diptocyd" is much lower compared with existing drugs, analogues of domestic and foreign production.

Conclusions. A number of domestic import-substituting agents for the fight against ectoparasites have been developed and proposed for practical veterinary medicine: the "Acarinocid" remedy for the fight against red chicken mite, the "Diptocid" bait for flies, the "Ectocid-plus" agent for combating gnus (goji, autumn rope , Mosquitoes, mosquitoes, moccasins) and Ixodine mites in pastures.

The prospect of further research is to improve the existing schemes of veterinary and sanitary measures at livestock enterprises, taking into account modern domestic developments.

Bibliography

1. *Parazitologia* i invazionnie bolezni jivotnix / M.W. Akbaev[i dr.]. – M.: Kolos, 1998. – 743 s.

2. *Maloizvestnie* zaraznie bolezni jivotnix / F.M. Orlov [i dr.]. – Izd. 2-e pererob. i dopoln. – M.: Kolos, 1983. – S .19–20.

3. *Carn V.M.* The role of dipterous insects in the mechanical transmission of animal viruses / V.M. Carn // Br. Vet. J. – 1996. – Vol. 152, № 4. – P. 377–393.

4. *Krovososnie* chlenistonogie – perenoschiki vozbuditeley transmesivnix infekciy / B.T. Stegniy [i dr.] // Vet. Med. Вет.: mejved. temat. nauk. sbor. – 2012. – Vup. 96. – S. 198–199.

5. *Prudkina N.S.* Vidovoye raznoobraziye krovososushchikh mokretsov (Diptera: Ceratopogonidae) v zhivotnovodcheskikh khozyaystvakh Khar'kovskoy obl. / N.S. Prudkina, A.A. Mishchenko, A.N. Mashkey // Aktual'nyye problemy veterinarnoy patologii i morfologii zhivotnykh. – Voronezh, 2008. – S. 358–362.

6. *Formirovaniye* fauny mokretsov (Diptera: Ceratopogonidae) v vodoyomakh razlichnogo tipa Khar'kovskoy oblasti / N. S. Prudkina [i dr.] // Annali Mechnikívs'kogo ínstitutu. – 2006. – № 3. – S. 70–73.

7. *Tan S.W.* Mechanical transport of rotavirus by the legs and wings of *Musca domestica* (Diptera: Muscidae) [Text] / S.W. Tan, K.L. Yap, H. L. Lee // J. Med. Entomol. – 1997. – Vol. 34, № 5. – P. 527–531.

8. *Gunn H.M.* Role of fomites and flies in the transmission of bovine viral diarrhoea virus [Text] / H.M. Gunn // Vet. Rec. – 1993. – Vol. 132, № 23. – P. 584–585.

9. *Mashkey A.N.* Komnatnaya mukha (Musca domestica) kak vozmozhnyy mekhanicheskiy perenoschik gerpes- i pestivirusov [Tekst] // A.N.

Mashkey, N.P. Chechetkina, A.A. Mishchenko // Vet. meditsina : mízhvíd. temat. nauk. zb. – Kharkív, 2010. – Vip. 94. – S. 282–283.

10. *Rasprostraneniye* i lokalizatsiya kurinogo kleshcha (Dermanyssus gallinae) i sredstvo bor'by s nim [Tekst] / A.A. Mishchenko [i dr.] // Vet. meditsina : mízhvíd. temat. nauk. zb. – Kharkív, 2010. – Vip. 94. – S. 284–285.

11. *Primanka* «Diptotsid» – effektivnoye sredstvo dlya bor'by s zoofil'nymi dvukrylymi [Tekst] / A.N. Mashkey [i dr.] // Vet. meditsina : mízhvíd. temat. nauk. zb. – Kharkív, 2011. – Vyp. 95. – S. 373–375.