

Applying 25% of cypermethrine against ectoparasites

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Abstract. Recently, tangible results have been achieved in veterinary medicine in the use of biological methods for combating zoophilic insects and ectoparasites, and the use of microbiological and pyrethroid preparations with a plant base. Zoophilic insects and mites as ecto- and endoparasites parasitize on the body of animals and humans cause infestation, that is, parasitosis (entomoses and acarosis), as a result of which the milk productivity of cattle decreases to 30-40 percent, meat productivity annually decreases by 10-12 kilograms, and also negatively affect the growth and development of young animals and lead to death.

1 Introduction

Large-scale measures are being taken to reduce the level of infection of livestock by zoophilic insects and ectoparasites, to treat, prevent and control pests [1]. An active fight is underway against these insects, infecting livestock with various infectious and invasive diseases, causing a lag in their development, a decrease in productivity, and as a result of an acute disease - the forced slaughter and death of cattle and small ruminants [2, 3]. In livestock enterprises, modern methods and preparations with a pyrethroid base are used to combat the distributors of various invasive and infectious diseases by zoophilic insects and ectoparasites [3].

In various countries of the world, chemical agents are used in the fight against zoophilic insects, which negatively affect the resistance of the animal organism and the environment, at the same time, such agents have caused adaptation and, accordingly, the reproduction of pests that cause various diseases [4]. In this regard, it became necessary to develop a biological and integration system for the fight against zooparasites, to create and introduce biological, ecological and other optimal methods and means that are harmless to the environment, the body of people and animals, fauna and useful flora [4, 5].

In this direction, the widespread use of useful entomophages, the creation of new types of highly effective microbiological and pyrethroid preparations and their production in

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modern and improved preparative forms is relevant [6]. As a result of the research carried out by scientists from different countries of the world on the use of microbiological methods in animal husbandry, a number of scientific results have been obtained, in particular: the use of useful entomophages against zoophilic insects; the method of their industrial reproduction, the use of microbiological and phytopyrethroid medicines against ectoparasites (harmless to the ecology and nature); the development of the method of using the medicine bitoxibacillin against ticks that spread diseases among farm animals; the use of zoophilic insects in livestock farms; determination of the mechanism of action of bacterial preparations on insects and ticks; and the effectiveness of the scheme of aerosol use of pyrethroid medicines against insects [6-10].

Currently, scientific research is being carried out in the world on the use of useful entomophages in the fight against zoophilic insects and their industrial reproduction in the following priority areas: the use of useful entomophages in poultry and pig farms; ways of getting bacterial medicines into the body of arthropods, improving pyrethroid medicines to combat ectoparasites of farm animals [2, 11, 12].

Despite the results achieved, studies on the reproduction of useful entomophages in the fight against zoophilic insects, the use of microbiological and pyrethroid medicines in the fight against ectoparasites and animal estrosis have been conducted at an insufficient level in animal husbandry [13].

In the experiments carried out, the effectiveness of using a 25% local preparation of plant pyrethroid cypermethrin was studied to combat ectoparasites in cattle and sheep estrosis. Acceptable concentrations and doses of a 25% local preparation of plant pyrethroid cypermethrin have been determined for use against the control of zoophilic insects and ectoparasites of cattle and sheep, as well as disinsection of buildings and cattle corrals.

2 Materials and methods

The number of exterminators of zoophilic insects, their larvae and pupae was determined by ecological and entomological methods. Families, genera and species of zoophilic insects were determined by insect guides [1-5, 14]. The results of the study (biometric data) were calculated by the method of variation statistics [15]. The cultural and morphological properties of bacterial preparations were determined on the basis of biochemical, pathogenic features and microscopic studies of Voznyakovskaya and the use of other methods [16, 17].

In determining the insecticidal efficacy of 25% cypermethrin, materials of the World Health Organization and methodological manuals were used [18-20].

At present, the use of entomophages in animal husbandry to combat zoophilic insects requires the introduction of biomaterial production on an industrial basis. For the use of entomopathogenic bacteria of the *Bacillus thuringiensis* group in the fight against harmful insects in ticks, it is necessary to establish the production of bioinsecticide. To use the local medicine cypermethrin against widespread ectoparasites, it is necessary to increase production at the Navoi Electrochemical Plant and develop an arsenal of insecticides.

The object of the study was the laboratory of arachnoentomology of the Scientific Research Institute of Veterinary Medicine, the Boykozon farm of the Parkent district of the Tashkent region, the dairy farm of the joint-stock company of the Taylak district of the Samarkand region, the Ergash Zhumanbulbul farm of the Kushrabit district, the livestock farm of the Uzbekistan farm in the Saykhunabad region, the Syrdarya region Muso-ota and Beshbulok.

In these farms, the fauna of zoophilic insects and their entomophages (parasites), seasonal dynamics, ecology, distribution, level of infestation by entomophages, biology, morphology of entomophage reproduction, reproduction technology, efficiency of their use,

measures and methods of application in animal husbandry, microbiological preparations (foreign and local) and the topical preparation pyrethroid cypermethrin to combat ectoparasites and the disease of estrosis.

3 Results and discussion

Cypermethrin is a synthetic pyrethroid medicine, its active element is permethrin, naturally contained in Dalmatian chamomile (*Pyrethrum cinerariaefolium*) and Caucasian chamomile (*P. carneum*) [7, 10].

In terms of the level and effectiveness of use, the medicine cypermethrin is in first place in the group of insectoacaricides. Even the use of minimal doses (10-100 g/ha, 0.006-0.4 ml per 1 head of cattle) gives a high parasicidal result. In particular, the working emulsion of cypermethrin, in comparison with organophosphorus chlorophos (standard), even at a 70-fold minimum dose can give a parasicidal result. It is less harmless to humans and the environment than phosphorus-chlorine-carbamate and other organic insectoacaricides; under the influence of biotic and abiotic environmental factors, it rapidly degrades (decomposes, is rendered harmless).

Based on the results of studies carried out in cooperation with the staff of the laboratory of arachnoentomology, it was recommended to use the medicine cypermethrin on a national scale to combat 12 types of parasitic (entomotic) and acarous diseases of farm animals (approved by the Main State Veterinary Directorate of the Republic of Uzbekistan, 2001, 2008).

The medicine is recommended for the treatment of parasitic (entomosis and acarosis) diseases that can spread in the field of animal husbandry (therapy, disinsection and deacarization), as well as for the elimination of natural infectious foci and use to combat blood-sucking bugs and insects that spread vector-borne diseases.

Cypermethrin gives a high therapeutic result in the treatment of the following animal diseases indicated in Table 1.

Table 1. Animal diseases

#	Animal diseases	Description
1	Acarosis	boophilosis, hyalommatosis of cattle, dermacentorosis of cattle and sheep, ripicephalosis of cattle, sheep and other cattle, ixodeosis, hemaphysaliosis, alveonasis of sheep, psoroptosis of cattle, sheep and other cattle, demioptosis, chorioptosis sheep and goats, argazidosis of birds, scabies of camels and horses
2	Entomoses	hypodermatosis of cattle, estrosis and melophagosis of sheep, kryvelliasis of goats, ligninosis of cattle and sheep, hematopinosis of cattle and equid-hoofed animals, lipeyrosis, trichodectosis and ctenocephalidosis of cats and dogs
3	Fever	has a strong acaricidal and entomocidal effect (paralyzes the nervous system of parasites) of specific pathogens of vector-borne diseases in humans and animals - Central Asian (Crimean) and Tomdinskaya hemorrhagic fever, tick-borne encephalitis, tularemia, relapsing fever, malaria, leishmaniasis, typhus typhus, tick-borne fever, theileriosis, piroplasmidosis (in general, more than 100 types of diseases), as well as on ixodid, gamasid, argasic ticks (more than 50 species), blood-sucking insects (flies, mosquitoes, midges, horseflies, fleas, lice, mallophagous, zoophilic and synanthropic muscoids and etc)

The pyrethroid medicine cypermethrin has a selective effect coefficient: when administered orally for warm-blooded animals - average toxicity (for rats LD 50 - 242-542 mg/kg), for insects - high toxicity (for laboratory population of domestic mosquitoes - LD50 - 0.313 µg/g, for the field population - 0.383 µg/g), for ecto- and endoparasites - stronger than organophosphorus and carbamate compounds (more than 631.8-1415.1 times).

Application of the medicine. Cypermethrin is recommended for disinsection and deacarization of cattle, sheep, goats, horses, donkeys, camels, poultry and other animals, protection of livestock facilities from harmful insects and ticks, the medicine was tested in livestock farms, its highly effective concentrations and doses were determined.

It is allowed to use animal products (milk, meat, etc.) treated with cypermethrin in the form of dust, a weakly concentrated aqueous emulsion (0.0125-0.015% 1.5-4 liters per 1 head of cattle), small volume (0.5-1.0% 40-80-100 ml per 1 head of cattle). In the fight against ectoparasites, a 0.25-0.125% aqueous solution of the medicine is 5-10 times more effective.

In structures and pens for livestock, mainly in the morning, after the withdrawal of livestock, with open doors and windows, a 0.015% aqueous solution of the medicine in the calculation of 50-75 ml/m² was sprayed with non-absorbent surfaces (windows, cabinets, painted boards), calculated 100-200 ml/m² - moisture-absorbing surfaces (brick, walls, etc). Pest control was carried out in the structures and pens, taking into account the level of infection of livestock with ectoparasites. This treatment was carried out once every 3-4 weeks.

When treating sheep and goats against ectoparasites by the bath method (bathing) with an aqueous 0.0125-0.025-0.03 percent solution of cypermethrin, cattle with water 0.015-0.025 percent emulsions and 0.05-0.1 dusts gives positive effects.

As a result of experimental studies, the scope of application of a 25% local preparation cypermethrin (against zoophilic insects, animal ectoparasites) has been expanded;

- the insecticidal activity of a 25% local preparation cypermethrin in the fight against animal ectoparasites was determined;
- determined the effective doses and concentrations of a 25% local preparation of cypermethrin for the treatment of cattle and sheep, as well as disinsection of premises and corrals against various types of ectoparasites.

4 Conclusion

It has been established that the local phyto-based pyrethroid cypermethrin is the most effective medicine in the fight against ectoparasites, in contrast to chlorophos, it has a 39-56 times stronger effect on them.

It is recommended that when spraying sheep against ectoparasites, a positive result is obtained by using a 0.015% aqueous solution of a 25% cypermethrin preparation at the rate of 50-100 ml per 1 head of cattle, while disinfecting structures - spraying wooden and brick surfaces at a rate of 50-100 ml/m², plaster surfaces - at the rate of 150-200 ml/m².

The local medicine cypermethrin does not have inhalation, embryotoxic, teratogenic, mutagenic, carcinogenic effects on humans and animals, does not reduce the activity of the cholinesterase enzyme.

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