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Role of entomophagous in struggle against harmful insects

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Abstract
The improvement of livestock efficiency particularly increasing of milk yield and meat productivity plays the important role in livestock development. At the same time, prevention of animals against infection from various diseases (of infectious, invasion, noninfectious character) is particularly important for solving the above tasks.
Thus, proceeding from the mentioned above data in integrated methods system of struggle with zoo filed flies on cattle-breeding farms, it is possible to apply successfully the following entomophagous: *S. nigroaenea*, *S. cameroni* and M. raptor, and also bugs of Aleochara sort (seasonal colonization).

Keywords: *S. nigroaenea*, *S. cameroni* and M. raptor, bugs of Aleochara sort (seasonal colonization)

1. Introduction
There are more than thousand kinds of dangerous insects (a biting insects and others) both acarus (ticks) – an ecto and endoparasities, causal organisms entomoses and an acaroses on the territories of stock-rearing farms and in their rooms, and also on pastures of Uzbekistan. Many of these arthropods have medical and veterinary value as specific and mechanical carries of causal organisms dangerous zymotic and invasions (a plague, a tularaemia, a tick encephalitis, a hemorrhagic fever, a malaria, a tongs typhinia, a spotted fever and relapsing fever, a smallpox, a glanders, an anthrax, a brucellosis, a tuberculosis, trypanosomiasises, a leushmaniosis, a psittacosis, pathogenic fungi, a foot-and-mouth disease and many other) diseases of the person and animals.
The improvement of livestock efficiency particularly increasing of milk yield and meat productivity plays the important role in livestock development. At the same time, prevention of animals against infection from various diseases (of infectious, invasion, noninfectious character) is particularly important for solving the above tasks.
In the spread of animal's disease the special role is played by insects, which are more than 1,5 million kinds. From them in cattle-breeding farms basically dominate zoo filed flies. And among them the zoophilous flies mainly dominate in livestock farms.
Zoophilous flies are mechanical, and some kinds are specific carriers of pathogens of infectious and invasive diseases of humans and animals. They cause considerable economic damage to livestock development, composed of the reduced productivity (milk, meat, wool), young animals lagging in growth and development.
The insecticides are mainly used in the struggle against these insects, which have a number of advantages (speed of action, and others.), but could negatively affect the environment. It is observed the environmental pollution while unsystematic use of poison chemicals, that leads to a poisoning of human and warm-blooded animals, destruction of useful entomofauna (it's biological barrier constrains the mass development of harmful insects).
In the integrated system of insect pest control and entomology, biological methods become important that allow dramatically reduce the use of pesticides.
For the development of this direction it is necessary a careful study of biological regulators, the number of harmful insects - entomophags (parasites and predators), their fauna, phenology, ecology, biology of development, cultivation methods and techniques of practical application.
Hence, biological methods and means of pest-control with zooparasites and parasitic diseases in stock-breeding are now developed. In the researches conducted by us on cattle and pig

farms, have shown, that in zoobiogenozes of the republic there are 9 kinds of parasites of zoophilousflies. 3 kinds of them (Brachimeria minuta, Eucoila trichopsila, Aphaereta minuta) infects the hosts in a larval stage, and 6 kinds (Spalangia nigroaenea, Spalangia cameroni, Spalangia subpunctata, Muscidifurax raptor, Aleochara bipustulata, Aleochara spp.) in a pupal stage. In the first case there are mainly infected flies of Sarcophagidae family, in the second flies of Muscidae, Sarcophagidae families. Maximum level of host's spontaneous invasiverness is marked among Brachimeria minuta larvae (66, 5%) and Eucoila trichopsila larvae (24, 2%), and Spalangia nigroaenea (49, 1%), Muscidifurax raptor (25, 6%) and Spalangia cameroni (13, 6%) are dominated among dolls.

The larvae of zoophilousflies parasites in nature from the middle of May (inwarm winter, from the beginning of May), and reaching the maximum number from the end of June (owners' contamination by B. minuta is 75%) till October (in spring and autumn activity of owners' contamination by other kinds is accordingly 36 and 22, 5%).

Pupals of zoophilousflies entomophagous on cattle-breeding farms are met from March (2, 5-4%) till the beginning of December (1, 8-2%). The activity of Spalangia kinds are observed from the end of May, and the maximum number is observed in August-October. At this time of the year about 26-28% of zoophilousflies covered by pupa, are infected by entomophagous.

In nature M. raptor appears in April, and disappears in the middle of November with the maximum number in September. At the same infestation of flies is 14, 1%.

Bugs of Aleochara family are found in layers of animal's manure in all seasons of the year, the maximum number is reached from August till November (3-3, 3%).

The fly of etmofagues begins with a sun rise at the air temperature above 13*C. In warm season they give some generations, and they can breed year round in the closed heated places. However many larvae of zoophilousflies, who are considered as owners of entomophagous, perish from strong heat (especially in manure of pig-breeding farms).

Parasites, as well as their owners, are unequally distributed on various substrates. Some kinds prefer dry, and some damp substrata. In particular, kinds of Spalangia sort prefer more damp substrata with rather low temperature, and M. raptor, opposite, prefers drier substrata.

At studying of biological features, it was noticed, that emergedfrom the owner's pupa, male of all three kinds finds and fertilizesa female. The impregnated female infects pupa of flies. Female for infection (for eggs delivery) choose basically fresh one-day pupa of flies (in rare instances two-day) in which viable parasites are developed.

In research, it has been noticed, that one female postpones on a body of one owner from 1to 7 eggs, however, only one high-grade parasite develops from them. At M. raptor parasite was registered the development of two high-grade individuals. Fertility of females in laboratory conditions more low, than in nature.

It was found, that entomophagous destroy their hosts not only infecting a pupa (as endo parasites), at the same time laying eggs, and eating his hemolymph (as endo parasite). Parasites live during a winter inside of owner's pupa in (basically third) stage of larvae, settle down in deep layers of manure (10-12 sm), under hay of laying, and also in crevices of cattle-breeding premises walls. In winter life duration of imago in the conditions of laboratory thermostat at temperature 25 ^{0}C (at feeding by honey, by sugar syrup, etc.) is 16-17 days, postpone on the average of 3, 8-4 eggs; in summer at temperature 24-26 ^{0}C accordingly 19-20 days, from 14-28 (Spalangia) to 153 (M. raptor) eggs.

At entomofague *S. cameroni* in comparison with other kinds of a sort (Spalangia) and M. raptor are well developed search abilities. They find and destroy the owners in layers of manure with depth to 9-10sm (more effectively on depth of 5-6 sm).

This and other mentioned above biological features of fly parasites raise their efficiency in entomofague quality. It's recommended also the seasonal colonization including laboratory cultivation and their release at the beginning of host's development, for the purpose of number suppression during a season.

It was done a cultivation of sort Spalangia entomophagous in laboratory conditions. For this purpose there was prepared womb population of parasites in laboratory insectarium at temperature 24-26 ^{0}C and humidity of 65-70%. They were placed in 0,5liter glass bottle by 100 copies of everyone, on bottom of which was filled by manure and black sand of humidity of 65-70%. Once a day entomophagous were given fresh one-day pupa of house flies (by 200 and 300 copies) larvae, insection. entomophagous were fed with honey, sugar syrup and water by means of moistened tampon. Flies, which were in touch with pupa parasites, were incubated separately in special test tubes and they were observed till an exit of insects.

2. Practical application

Application in conditions of stock-rearing farms implements by seasonal colonization of entomophagous (May-October) in seasons of a mass attack on animal endophilous kinds muscoidal flies (preimaginales which phases, develop in a dung animal and other organic sewage disposals).

For this purpose quantity of the flies parasitizing on animal, and also quantity of flies 1 m^2 of a room at the beginning is determined. The settlement density of a puparium in places of their development (a dun- pit, manure heaps and other biotopes) is taken into account.

Then entomophagous is let out.

On 100 m^2 contaminated puparium (flies) of biotopes let out *S. cameroni*-more than 10 thousand individuals of the parasite.

The greatest efficiency in depressing number of flies is reached at use of parasites in a vernal season, i.e. against a first generation of flies. The further colonization is carried out on entomological indications.

Operational effectiveness of entomophagous is determined on a level of suppression of number of houseflies or autumnal stable-flies by calculation of their quantity on animal and on 1 m^2 of a surface of a room (in places of a congestion of insects). The percent of infection rate puparium flies (in 0, 5-1,0 kg of substrate) is calculated by parasites that is determined by availability waste of entomophagous outlets also.

Most favorable for let out of entomophagous temperature is 18-20 ^{0}C.

Transportation of entomophagous is made in 0,5-1,0 liter glass wares placed at special boxes.

The storage of a foundation stock implements in a phase of a pupa (in puparium flies) in a household electric refrigerator at the temperature +4-5 ^{0}C.

The qualified application of entomophagous can supply drop of number of zoophilous flies on stock-rearing farm up to 60-70 percents that promotes ecological optimization zoobiocenoses.

Having extended the stated, it is possible to conclude, that parasites – entomophagous can be in the long term efficiently used in biological depressing zoophilous and synanthropic flies (having medico veterinary value), by their seasonal colonization in zoobiocenoses. Besides entomophagous can be used and in federated system of extirpation with flies.

In animal husbandry of the republic of Uzbekistan, experience of extirpation with parasitic insects, with the use of entomophagous is missed.

As to true activity it the first scientific generalization dedicated entomophagous of zoophilous insects in Uzbekistan, and consequently a separate to shortcomings are not excluded.

During field experiences the average temperature of air in manure storehouse was 28-35 ^{0}C, humidity-60-65%.

3. Conclusion

Thus, proceeding from the mentioned above data in integrated methods system of struggle with zoo filed flies on cattle-breeding farms, it is possible to apply successfully the following entomophagous: *S. nigroaenea*, *S. cameroni* and M. raptor, and also bugs of Aleochara sort (seasonal colonization).

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