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Use of iodine-containing combinations during breeding entomophages

To study the efficiency of an iodine-containing compound during the ontogenesis of entomophages. Methods. Laboratory, contain optimization of power, viability, performance. Results The washing of eggs of nutrients with iodine-containing compound at a temperature of 20-25oC and their storage to 180 hours at a temperature of 2-4oC optimizes reproductive potential, survival, vitality P2, migration and search capacity, adaptability of entomophages to aboriginal phytophages. As a result, populations of entomophages with positive changes are formed. Conclusions The use of iodine-containing compounds during the reproduction of entomophages will contribute to the protection of the environment, the conformity of products to international standards.

Key words: iodine-containing compounds, entomophages, optimization, nutrition, vitality, productivity, physiological adaptability.

In order to obtain a qualitative final product, entomological technologies require constant innovations, based on which the rationalization and intensification of the technological process [2, 3, 5, 6]. With the use of entomological technologies, the population of useful insects lose contact with the source environment, and their existence depends on the established regulatory mechanisms [1, 4, 8, 9]. Conditions of cultivation of useful insects are not always ecologically the best and as a result - the negative reaction of the organism to any external action. The imbalance of interdependent substances in the stern, the disturbance of vital functions negatively affects the survival and productivity of useful insects. Because of this, in order to maintain high productivity and resistance of the organism, it is extremely important to provide it with a complete nutrition [10, 13]. It is established that iodine is the primary organizing link in all manifestations, affects the ethology of insects, participates in protein, lipid and hydrocarbon metabolism, and significantly improves the immunity of populations of useful insects [11]. The developed concept of the development of the program "Yodis" is significantly different from the traditional solution to the problem of iodine deficiency. The iodine compound (iodine concentrate) is produced by a special technology, which implements the original properties of water for the formation of associatives. It has been established that even in non-standard growing situations, the physiological response of beneficial insects to iodine concentrate is optimal. This safe immunomodulating agent has pronounced antibacterial and antimycotic properties [12]. The purpose of the research is to study the effectiveness of a biologically active iodine-containing compound (iodine concentrate) in the period of ontogenesis and the use of entomophages.

1. Effect of technological parameters of Eggs processing Autographa gamma L. as a feed on reproductive potential of females of zoofags. Reproductive daily potential of feline zoophagus, pc ./% to control. Indicator Macrolophus nubilis H.-S. Orius niger Wolff. Potential Average Daily Fertility Actual Fertility Potential Average Daily Fertility Actual Fertility Concentration of iodine-concentrate solution for washing eggs of the live host, mg / dm 3 20 40 2.8 / 140.0 2.9 / 145.0 1.7 / 212.5 1.8 / 225.0 6.2 / 140.9 6.6 / 150.0 2.8 / 175.0 3.3 / 206.3 Temperature of iodine-concentrate solution for washing the eggs of the carrier, + 20 25 2.9 / 145 , 0 3.0 / 150.0 1.8 / 225.0 1.9 / 237.5 6.3 / 143.2 6.6 / 150.0 3.0 / 187.5 3.1 / 193, 8 Control (Autographa gamma L. treated with H2O) 2.0 / 100.0 0.8 / 100.0 4.4 / 100.0 1.6 / 100.0 Note. In the numerator - the zoos of the individuals to control. Zags, pcs., In the pronoun - the ratio of the number of individuals

Research methodology. The effectiveness of iodine-containing compounds studied in laboratory lines Macrolophus nubilis H.-S., Anthocoris netorum L., Dicyphus errans Wolff., Orius niger Wolff. In experiments, oviposition of families of entomophages was used, the mass of which at the beginning of the larvae's regeneration was 10 - 15% higher than the average value. Food for entomophages eggs were species - Scotia

exlamationis L., Autographa gamma L., Helicoverpa armigera Hbn., Heliothis viriplaca Hfn., Scotia segetum Schiff., After laying females are washed at 20 - 25oS aqueous Jodis-concentrate (20 - 40 mg / dm3) and were fed to the feed at a temperature of 2 - 4 ° C to 180 hours. In experimental insektariyi where placed entomophages experimental and control options 100 copies in 6 replications maintain optimum parameters abiotic factors origin - 25oS temperature, relative humidity - 75-85% and the duration of daylight - 14 - 16 hours of lighting power 8 - 9 thousand luxury. The larvae and imago control variants were diluted in similar technological conditions to the experimental individuals on eggs of the Sitotroga cerealella Oliv corn molybdenum. For the breeding of experimental and control individuals entomophagous recommendations were taken into account regarding the peculiarities of biology, ethology and technology of zooophagous breeding [7]. The results of studies indicate the effectiveness of iodine-containing compounds in the period of cultivation and use of entomophages as promising biological means of plant protection (Table 1). It was established as a result of washing at 20 - 25oS aqueous Jodis-concentrate (20 - 40 mg / dm3) after egg-laying females zhyvytelya Autographa gamma L. provided the best performance of female reproductive potential Macrolophus nubilis H.-S. And Orius niger Wolff. So, after washing eggs zhyvytelya aqueous Jodis-concentrate (20 - 40 mg / dm3) the potential and actual average fertility of female Macrolophus nubilis H.-S. And Orius niger Wolff. In the indicated variants was 2.8-2.9 units respectively. And 1,7 - 1,8 and 6,2 - 6,6 and 2,8 - 3,3 units, which by 40 - 45% and 112,5 - 125% and 40,9-50 and 75- 106 , 3% more compared to control. The research results of technological parameters of egg storage Scotia exlamationis L. before use as feed for reproductive potential of females entomophages shown in Table. 2. The analysis confirms that the best indications for the potential fertility of Macrolophus nubilis H.-S., Anthocoris netorum L. and Orius niger Wolff females. Were observed in variants where eggs of the Scotia exlamationis L. nutrient prior to use as feed were stored at a temperature of 2-4 ° C to 180 hours. In these variants, the potential fertility of the experimental females from the position of the technological process was the best. It should be noted that the further storage of eggs of the live feed as a feed (up to 240 h) reduced the possible fecundity of feline zoofag compared with the options up to 180 h of storage.

Fig. 1. Influence of feed on the migratory and searchability of larvaeMasrolophus pybiyi ^ n. ^.

Fig. 2. Effect of feed on the physiological adaptability of entomophagous organisms to aboriginal hosts - harmful phytophages: sig: - O / syr / iiv iggapv; And-and-DpgLosog / into peyogit; And - * - - Masogioriiv ptsNN; - Ogiev ran

Fig. 3. Physiological adaptability of entomophagous organisms to aboriginal hosts - harmful phytophages: i = and - Masogioriiv ptsNN; C: .1: - DpLosogk pejogite; O / Sour / Iiv Eggalv; Orius cookies

2. Influence of technological parameters egg storage Scotia exlamationis L. as feed for reproductive potential of females entomophages

Potential Indicator female fertility, pieces ./% to control Masrolophus nubilis Anthocoris peshit Orius niger temperature during egg storage, +2 +4 0 ° C + 10 127 6 ± 2,4 144,2 ± 2,8 149,5 ± 3,4 123,5 ± 2,7 163,7 + 2,1 193,5 ± 2,6 191,2 + 2,1 124 6 + 2.3 120.0 127.6 + 2.0 + 2.2 + 2.1 128.0 102.5 + 1.8 Shelf eggs zhyvytelya before use as feed h 144 180 240 148,6 ± 2,8 147,5 ± 2,9 111,2 ± 2,7 193,5 + 2,6 193,0 + 2,2 107,2 + 1,7 128,4 + 2,1 128,3 + 2 , 3 105.6 + 1.8

Effect of feed on the migration and searchability of Macrolophus nubilis H.-S. Shown in fig. 1. The obtained results indicate that the highest rates of migration and search capacity of larvae of Macrolophus nubilis H.-S. - in experimental variants where the fodder were scrounged scotia eggs Scotia exlamationis L., Autographa gamma L., Helicoverpa armigera Hbn., Heliothis viriplaca Hfn., Scotia segetum Schiff. For example, the average number of found and destroyed larvae of greenhouse white whiskey was 768, respectively; 777; 764; 751 and 744 copies, which is 36.41; 38.01; 35.70; 33.39 and 32.15% more compared to the control version. For use in feed of eggs of Scotia exlamationis L., Autographa gamma L., Helicoverpa armigera Hbn., Heliothis viriplaca Hfn., Scotia segetum Schiff. It has been experimentally proved that the best indices of the physiological adaptability of microorganisms of entomophages to aboriginal hosts - harmful phytophages - are also observed in experimental variants (Fig. 2). Due to the best nutritional qualities, processing, storage technology for eggs of lobsters as feed in these variants, a high percentage of survivors' survivors (F2) was observed, which, depending on the eggs as feed, was respectively in Macrolophus nubilis H.-S. 48; 41; 39; 42; 39%, which is 18; 11; 9; 12; 9% more compared to control; At Dicyphus errans Wolff. - 63; 56; 53; 55; 51%, which is 25; 18; 15; 17; 13% more than control; In Anthocoris net- rum L. - 54; 50; 47; 46; 44%,

which is 14; 10; 7; 6; 4% more compared to control; At Orius niger Wolff. - 68; 66; 63; 65; 63%, which is 25; 23; 20; 22; 20% more control. Experimentally proved (Fig. 3), that even under adverse environmental conditions, which lead to the maximum relaxation of the organism, the greatest viability of the second generation of entomophagous individuals in experimental variants is observed. Thanks to the use of eggs as feeds for feedstocks and their storage technologies prior to feeding to larvae and imago of useful insects, an increase in the percentage of viability of second generation individuals, in particular Macrolophus nubilis H.-S. - 28; 27; 26; 24; 26%, which is 11; 10; 9; 7; 9% more compared to control; At Dicyphus errans Wolff. - 29; 27; 28; 27; 26th at 9; 7; 8; 7; 6% more compared to control; In Anthocoris netorum L. - 29; 30; 29; 28; 29%, which is 8; 9; 8; 7; 8% more control; At Orius niger Wolff. - 39; 34; 31; 35; 32%, which is 21; 16; 13; 17; 14% more compared to control. Under conditions of ecological pessimism it is possible to fix and preserve in entomophages the morphological and physiological processes that contribute to the emergence of new properties necessary for the progressive development of an artificial population of useful insects. This is evidenced by the preservation of a significant percentage of the viability of the second generation individuals in experimental variants.

Conclusions

The average daily and actual fertility of Maslophus nubilis H.-S. females is improved as a feed for entomophages treated with an aqueous solution of iodine concentrations of lobsters eggs and optimized storage technology prior to feeding. And Orius niger Wolff. Respectively 40-45 and 112.5-125% and 40.9-50 and 75-106.3% respectively. Optimization of the migration and search capacity of larvae of the entomophage Maslophus nubilis H.-S. The average number of found and destroyed larvae of the harmful phytophagus of greenhouse white whiskey per day is increased by 32-38%. Using iodine-containing compounds, processes of the physiological adaptation of entomophages to aboriginal hosts - harmful phytophages are observed, which leads to an increase in the survival of the descendants and the viability of the second generation of individuals of Masrolophus nubshs N. ^. By 24-28%. The research has established that the use of iodine-containing compounds for laboratory and industrial fertilization of beneficial insects will reduce the material costs and increase the qualitative and quantitative indices of the total yield of entomophages.

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