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APPLICATION OF AGAINST MEALYBUG CRYPTOLAEMUS MONTROUZIERI MULS IN UZBEKISTAN MEALYBUG

Nafasov Zafar Nurmaxmadovich
Plant Protection and Quarantine Scientific Research Institute (Tashkent), Uzbekistan

Xalilov Qarshiboy
Plant Protection and Quarantine Scientific Research Institute (Tashkent), Uzbekistan

Allayarov Nodirjon Jo'raevich
Plant Protection and Quarantine Scientific Research Institute (Tashkent), Uzbekistan

Аннотация
В статье приведены способы применения энтомофага криптолемус (Cryptolaemus montrouzieri Muls., Coleoptera, Coccinellidae) в борьбе против мучнистого червеца (Planococcus vovae Nas., Homoptera, Pseudococcidae) в условиях Республики Узбекистан, а также представлены сведения о результатах проведенных опытов.

Ключевые слова: можжевельник, мучнистый червец, криптолемус, энтомофаг, кокциодофаг, кокциниеллид.

Abstract
The article presents the ways of using Mealybug Cryptolaemus montrouzieri Muls., to control mealybug under the conditions of the Republic of Uzbekistan. The results of conducted tests are considered as well.

Keywords: juniper, mealybug, Cryptolaemus montrouzieri Muls., entomophage, cocciodophage, Coccinellidae.

Introduction

It is known that mealybugs damage junipers, sucking the liquid out of the needles and branches, which leads to tree mortality.

The bioecological properties of mealybug have not been studied under the conditions of Uzbekistan. Thus, there is an issue of controlling this invader. Until now, chemical method of control, harmful for humans and warm-blooded animals, was used.

One of the environmentally safe methods of mealybug control is using its

entomophage, reproducing under the laboratory conditions. Its natural entomophage at biological control is Mealybug Ladybird (Crytalaemus montrouzieri Muls.), considered an effective cocciodophage. More than 120 years ago, this insect was implemented and used as a biological agent in Australia and California. Nowadays Mealybug Ladybird is used as cocciodophage in more than 20 countries, including Russia, USA, France, Portugal, Turkey etc [1,8,9].

Mealybug Ladybird as a tropical species can live the whole year without winter holdover. In Russia, it is bred in special laboratories and used for mealybug control at vineyards, tea plantations, botanical gardens and on tropical plants.

Mealybug Ladybird's grub can neutralize 8000-16000 eggs, 300-800 grubs and 40-60 adult mealybugs during its whole life, which is observed in warm rooms [3, 6, 7].

At Coccinellidae dispersal the ratio of invaders and entomophage should be 1:10; 1:60 respectively [2,5].

In Russia, at Lazarevskoye Experimental Station Mealybug Ladybird was implemented twice on 100 ha tea plantation, contaminated by mealybugs: first time during laying eggs by invader (the second decade of May); secondly, during grub hatch (the second decade of June). The efficiency reached 33-100 % [4].

Due to complexity of handheld dispersal at the plantation, higher efficiency was reached using aircraft to implement bugs and nymphs at the height of 20 m with the speed of 30-40 m/s (0.5-1.5 pcs per 1 m^2) [1].

In 2013-2014, promising results on mealybug control were received at breeding and implementing Mealybug Ladybird entomophage on pumpkins and potatoes in the laboratory of Scientific Research Institute of Plant Protection in Uzbekistan. For dispersal of Coccinellidae bred under the laboratory conditions, the mealybug areas (Tashkent area, needle-leaved trees in Tashkent) were studied in 2013.

Mealybug Ladybird was used variously for mealybug control in Tashkent botanical garden in the second decade of May.

Table 1 The biological efficiency of Mealybug Cryptolaemus montrouzieri Muls against mealybug on juniper

Options	Dispersal date	Invaders population per 1 m of branch before entomophage dispersal (pcs)	Invaders population per 1 m of branch on 21st day after entomophage dispersal (pcs)	Biological efficiency, %
Dustlik biolaboratory, Upper Chirchik district, Tashkent region, 2013				
1: 15	5.05	45,6 ± 1,0	37,0 ± 1,3	85,3 ± 1,25

1:15 (twice)	5.05 17.05	53,8 ± 0,9	38,0 ± 1,3	95,3 ± 0,75
1:20 (twice)	5.05	59,3 ± 0,8	36,3 ± 1,4	76,5 ± 0,91
1: 20 (twice)	5.05 17.05	56,1 ± 0,5	20,6 ± 0,8	60,9 ± 1,2
1: 25	5.05	50,4 ± 1,1	11,6 ± 0,7	48,2 ± 1,65
1: 25 (twice)	5.05 17.05	57,5 ± 0,6	4,2 ± 1,8	54,9 ± 1,47
Control (without processing)	-	54,7 ± 0,45	85,8 ± 0,9	-
Mirzo Ulugbek district of Tashkent, 2014				
1:10	1. 06	3,5 ± 1,38	86,9 ± 2,1	80.4 ± 0,45
1: 15	1. 06	2,5 ± 1,26	66,2 ± 1,9	69,6 ± 1,28
1: 20	1. 06	5,9 ± 0,3	78,5 ± 0,86	58,4 ± 0,19
1: 25	1. 06	4,0 ± 0,9	82,6 ± 0,98	45,6 ± 1,31
Control (without processing)	-	-	54,1 ± 1,25	-

This laboratory hosted the work on breeding and dispersal of Mealybug Ladybird. It was fed by mealybug, bred on pumpkins and potatoes. The dispersal of grubs and bugs of Mealybug Ladybird, bred under the laboratory conditions, on contaminated plants was considered. Junipers vary by age and size in Tashkent region. Mealybug Ladybird was implemented according to sizes and age of the trees and 89.1 % of mealybugs were neutralized.

The research on breeding Mealybug Ladybird in Dustlik biolaboratory in Upper Chirchik district of Tashkent region was conducted.

Mealybug Ladybird dispersal of 25 pcs twice per one tree has shown the biological efficiency of 54.9 %, while the dispersal efficiency of 20 pcs once was 60.9 %. The biological efficiency was 76.5 % at double dispersal of Mealybug Ladybird. Single dispersal of 15 pcs has shown the efficiency of 85.3 %, while double dispersal – 95.3 %.

In 2014, Coccinellidae bred in biolaboratory were dispersed on junipers in Mirzo Ulugbek district of Tashkent in the ratio of 1:10; 1:15; 1:20 and 1:25. The experiment results are presented in table 2. At dispersal ratio of 1:10, the efficiency was 80.4 %, while at 1:15 – 69.6%, at 1:20 – 58.4 % and at 1:25 – 46.5 %. (table 1).

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