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EFFICIENCY OF MEDICINES AT VARROATOSIS OF BEES IN THE WEST KAZAKHSTAN REGION

Abstract

Varroatosis – the most widespread disease caused by *Varroa destructor* mite and proceeding all the year round. The mite causes extensive economic damage which consists of death of brood, adult working bees and loss of production. There are a large number of methods of fight against this disease. The most radical measure of fight against varroatosis of bees is application of chemotherapeutic medicines. Today, at the fight against varroatosis of bees there are applied chemical medicines incorporating the following active ingredients: fluvalinate, flumethrin, akrinatrín, formamines, coumaphos, organic acids, essential oils and medicinal herbs. Also, it is noted that the safest concerning activity of bees are phytogenesis medicines. The purpose of our researches - studying of dynamics of contamination of bees with varroatosis during the summer period and studying of acaricide medicines efficiency. Varroatosis is present throughout the beeyards of Zelenovsky area. Average invasion extensiveness was 10,08%. The greatest efficiency at varroatosis of bees was shown by Apidez medicine. Its extensity efficiency was 100%. All bee-families of the test group where this medicine has been applied are completely exempted from varroa tick. After application of medicines, no deviations in their clinical state were revealed at the test groups.

Keywords: *varroatosis, Apidez, Fumisan, West Kazakhstan region.*

Varroatosis – the most widespread disease caused by *Varroa destructor* mite and proceeding all the year round [1]. The mite causes extensive economic damage which consists of death of brood, adult working bees and loss of production. There are a large number of methods of fight against this disease.

According to Shishkanov D.V. [2], the most radical measure of fight against varroatosis of bees is application of chemotherapeutic medicines. Today, at the fight against varroatosis of bees there are applied chemical medicines incorporating the following active ingredients: fluvalinate, flumethrin, akrinatrín, formamines, coumaphos, organic acids, essential oils and medicinal herbs. Also, he notes that the safest ones concerning activity of bees are phytogenesis medicines.

Kotova A.A. [3] also claims that the most effective technology for fight against invasion is the combination of biological and chemical methods, at the same time, the leading place in the treatment of bees affected with varroatosis is occupied by chemotherapy as the biological method (systematic removal of brood, creation of brood-free nucleus, etc.) does not give 100% efficiency and is acceptable only for amateur beekeepers.

Widespread anti-varroatosis active ingredient is fluvalinate which contains aminoacid derivant - valine, as active agent. It belongs to pyrethroids of the third generation which have high efficiency at fight against mite-borne invasions and also lower toxicity for bees.

The purpose of our researches is studying of dynamics of contamination of bees with varroaosis during the summer period and studying the efficiency of acaricide medicines.

Materials and methods of research. Researches were conducted on the beeyards of «Zolotaya pchelka» IE, «Glumov I.V.» IE and «Zolotoy uley» farm in Zelenovsky area, West Kazakhstan region. These beeyards are located on the fields of «Matevosyan» farm.

When carrying out researches, the technique of bee-families survey (figure 1) in operating conditions of beeyards was used.

1. At the survey, attention was paid to the following signs:
2. Existence of mites on working bees, drones and bee breed (the color of mite is dark brown, oval form).
3. Emergence of bees with development defects (absence or deformation of wings and chelas) directly near a beehive.

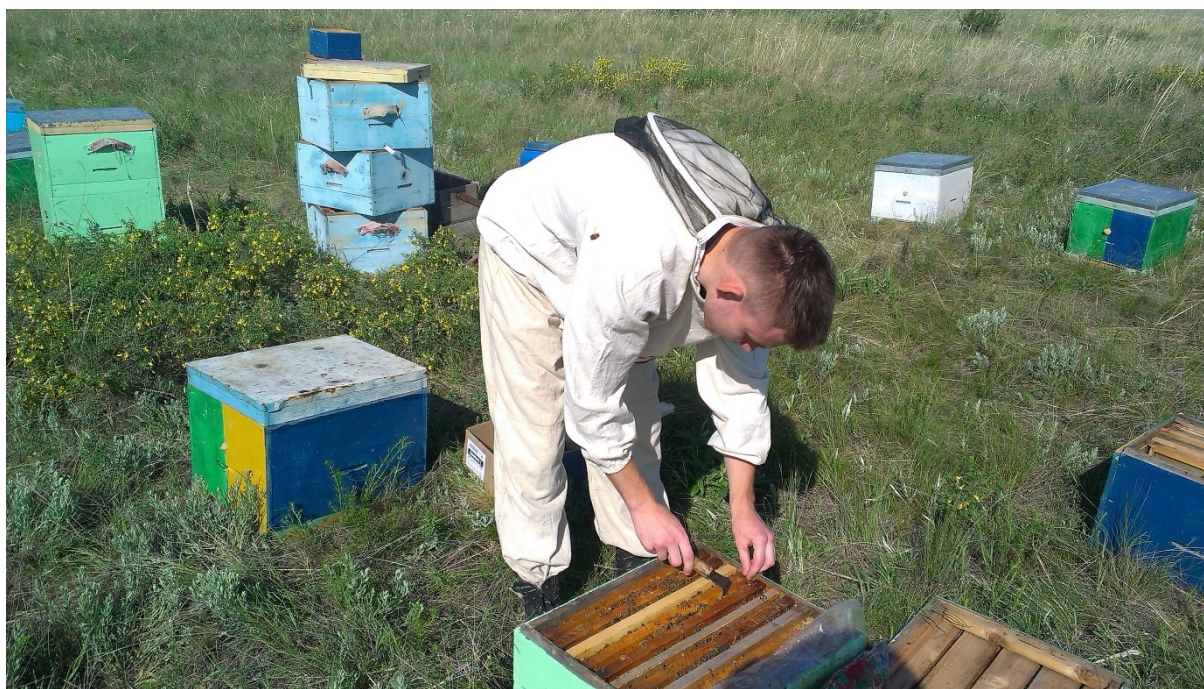


Figure 1 - Carrying out bee-families' survey in IE «Zolotaya pchelka»

For the assessment of anti-varroosis efficiency, we have applied the following medicines: solution of oxalic acid 2%, Apidez medicine (CJSC «Agrobioprom», Russia) and Fumisan (API-SAN, Russia).

Solution of oxalic acid is prepared at the rate of 20 g of powder per 1 l of distilled water. It is applied by spraying comb frames from sprinkler at the rate of 100-120 ml of solution per frame.

Apidez and Fumisan medicines represent the plates impregnated with acaricide substances. Fluvalinates are used as active ingredients in Fumisan medicine. Fluvalinates represents stable, non-volatile, viscous heavy oil, soluble in organic solvents and possessing high acaricide action. Active ingredients in Apidez medicine are origin vegetable oil - Timol (60 mg/plate) and Fir oil (80 mg/plate).

20 bee-families infested with varroa mite were used for determination of anti-parasitic efficiency of medicines. 4 groups by 8 beehives were created from all bee-families (3 test groups and 1 control).

The first group has received solution of oxalic acid in a dose of 100 ml/beehive by means of sprinkler. Frames with bees are sprayed at the angle in 45° from the distance of 30-40 cm.

The second group of bee-families has received 2 plates of Fumisan in each beehive carcass. The plates were placed between 3-4 and 7-8 comb frames, strictly vertically. Fixing of plates is carried out by attachment with office needles to the comb frame.

The third group has received 2 plates of Apidez in each beehive carcass (figure 2). The technology of application and fastening of plates is the same as at the application of Fumisan medicine.



Figure 2 – Use of Apidez medicine

Bee-families of the fourth group have not received medicines and served as control.

Assessment of medicines efficiency was defined by the survey of bee-families before treatment with anti-parasitic medicines and in 10 days after their application.

Results of researches and discussion. The results of research have shown that varroatosis is present throughout the beeyards of Zelenovsky area. In total, we have surveyed 383 bee-families from which infested ones were 35 (table 1, figure 3).

Table 1 - Invasion of bees with mite *V. destructor* in beekeeping farms of Zelenovsky area, West Kazakhstan region

№	Name of farm	Quantity of bee-families	Invasion of bee-families	Extensiveness of invasion, %
1	«Zolotaya pchelka» IE	212	18	8,49
2	«Glumov I.V.» IE	58	8	13,79
3	«Zolotoy uley» farm	113	9	7,96
	Total	383	35	
	Average			10,08

In «Zolotaya pchelka» IE, 212 bee-families were surveyed. 18 bee-families among them there were infested with *V. destructor* mite. Extensity efficiency of bee-families on average was 7,3%.

In «Glumov I.V.» IE, 8 bee-families among 58 were infested with *V. destructor* mite. Extensity efficiency of bee-families on average was 13,79%.

In «Zolotoy uley» farm, 113 bee-families were surveyed, and 9 bee-families were infested with *V. destructor* mite. Extensity efficiency of bee-families on average was 7,96%.

Thus, invasion extensiveness of bees with varroatosis on the beeyards of Zelenovsky area, West Kazakhstan region during the summer period averages 10,08%.

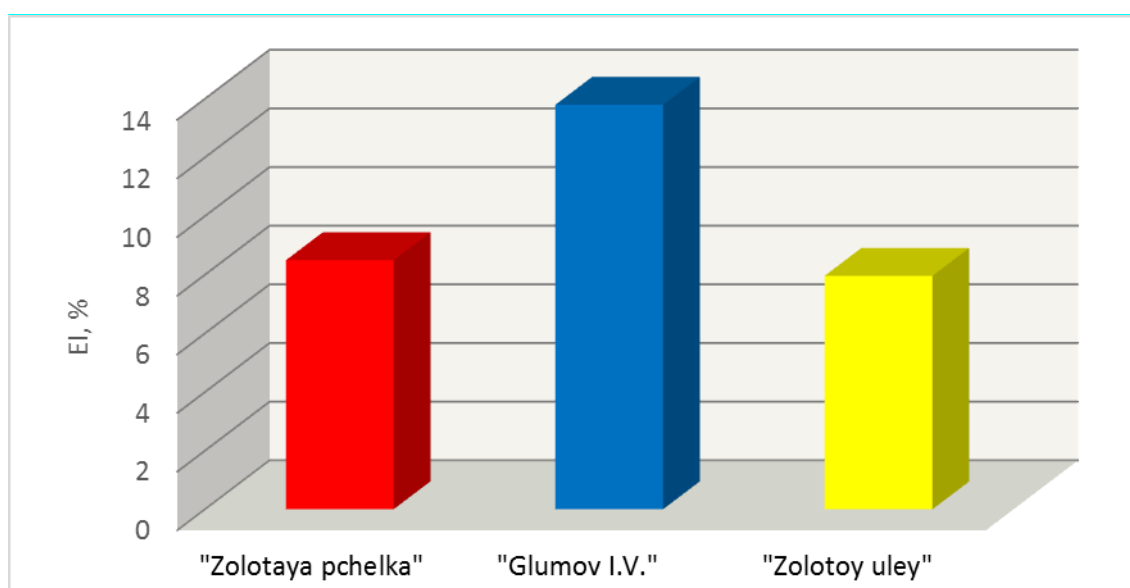


Figure 3 - Invasion bees with V. Destructor mite in beekeeping farms of Zelenovsky area, West Kazakhstan region

Further, we have studied efficiency of medicines against varroatosis of bees (table 2, figure 4).

Table 2 - Efficiency of antiparasitic medicines at varroatosis of bees

№	Group	Quantity of bee-families	Medicine	Dosage	Application method	Quantity of infested bee-families		EE, %
						Before processing	After processing	
1	Test	8	Oxalic acid	100ml/bee hive (10 ml per frame)	Spraying by means of sprinkler	8	3	62,5
2	Test	8	Fumisan	2 plates per carcass	Placement of medicine plates in beehives	8	1	87,5
3	Test	8	Apidez	2 plates per carcass	The same	8	0	100
4	Control	8	X	X	X	8	8	X

Oxalic acid in the first group of bee-families was ineffective. 5 bee-families exempted from the mite, extensity efficiency was equal to 62,5%.

7 bee-families in the second group which has received 2 plates of Fumisan medicine exempted from varroa mite, extensity efficiency was 87,5%.

In the third group of bee-families where Apidez medicine plates were applied, all bees were completely exempted from the mite. Extensity efficiency of the medicine was 100%.

In the fourth group everything remained without changes.

After application of medicines, the bees of test groups had no deviations in their clinical state.

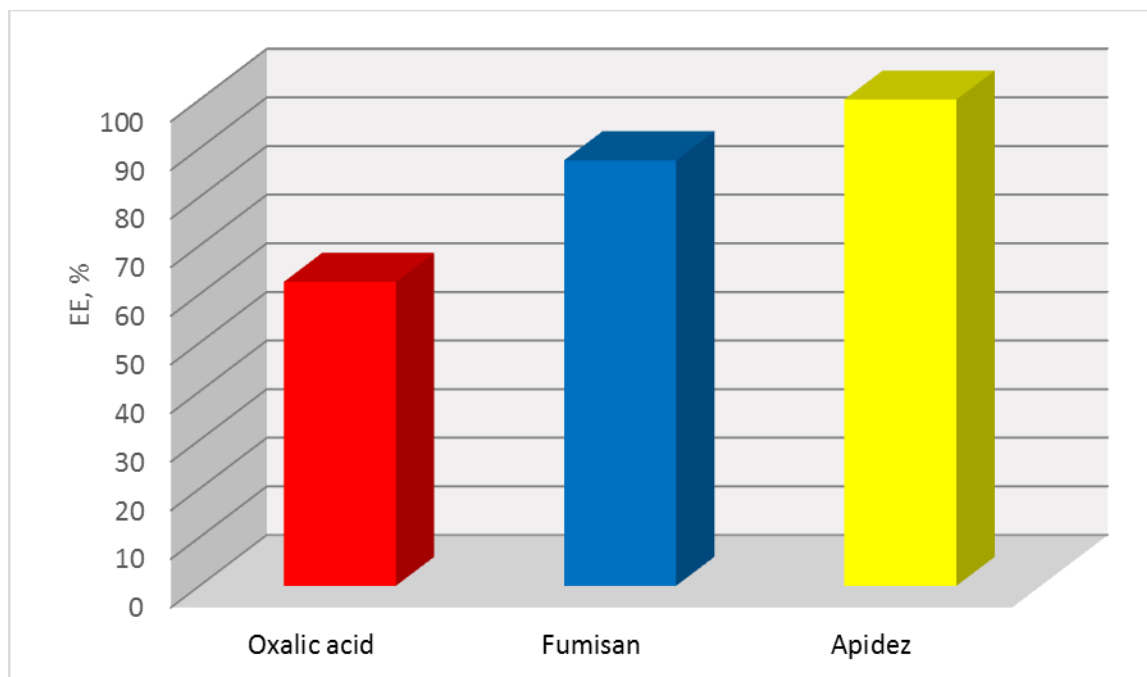


Figure 4 - Efficiency of antiparasitic medicines at varroaosis of bees

Conclusions.

1. Varroaosis is observed everywhere on the beeyard of Zelenovsky area, West Kazakhstan region.
2. Average invasion extensiveness was 10,08%.
3. The greatest efficiency at varroaosis of bees was shown by Apidez medicine. Its extensity efficiency was 100%. All bee-families of the test group where this medicine has been applied are completely exempted from varroa mite.
4. After application of medicines, no deviations in their clinical state were revealed at the test groups.

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ТҮЙІН

Варроатоз - *Varroa destructor* кене тудыратын және жыл бойы өтетін ең көп таралған ауру. Бұл аурумен күресудің көптеген әдістері бар. Ара варроатозына қарсы күресуде ең тиімді күресу шарасы химиотерапевтік препараттарды қолдану. Қазіргі таңда ара варроатозына қарсы құрамында келесі әрекет етуші заттары бар химиялық препараттар қолданылады: флувалинат, флуметрин, акринатрин, формафин, кумафос, органикалық қышқылдар, эфирлық майлар және дәрілік шөптер. Сонымен қатар, араның өміріне ең қауіпсіз, бұл өсімдіктестес препараттар.

Біздің зерттеу жұмысымыздың мақсаты – жазғы уақытта ара варроатозын жұқтыру динамикасын зерттеу және акарацидтік препараттарының тиімділігін анықтау.

Батыс Қазақстан облысы, Зеленов ауданының шаруашылықтарында варроатоз ауруы кең тараған. Бал ара варроатозының орташа инвазиялық экстенсивтілігі 10,08 % - ды құрайды. Бал ара варроатозына кезіндегі жоғары тиімділікті апидез көрсетті. Оның экстенсивтілігі 100%. Препаратты қолданудан кейін барлық ара ұяларындағы тәжірибелік топтарда клиникалық жағдайда ауытқулар болмады.

РЕЗЮМЕ

Варроатоз – наиболее распространенное заболевание, вызываемое клещом *Varroa destructor* и протекающее круглогодично. Клещ наносит большой экономический ущерб, который складывается из гибели расплода, взрослых рабочих пчел и потери продукции. Существует большое количество методов борьбы с данным заболеванием. Наиболее радикальной мерой борьбы против варроатоза пчел является применение химиотерапевтических препаратов. На сегодняшний день при борьбе с варроатозом пчел применяют химические препараты, имеющие в своем составе следующие действующие вещества: флувалинат, флуметрин, акринатрин, формамины, кумафос, органические кислоты, эфирные масла и лекарственные растения. Так же он отмечает, что, наиболее безопасными в отношении жизнедеятельности пчел являются препараты растительного происхождения. Цель наших исследований - изучение динамики зараженности пчел варроатозом в летний период и изучение эффективности акарицидных препаратов. Варроатоз на пасеках Зеленовского района, Западно-Казахстанской области наблюдается повсеместно. Средняя экстенсивность инвазии составила 10,08 %. Наибольшую эффективность при варроатозе пчел показал препарат Апидез. Его экстенсивность составила 100%. Все пчелосемьи подопытной группы, где был применен данный препарат, полностью освобождены от клеща варроа. После применения препаратов на пчелосемьи у пчел подопытных групп никаких отклонений в их клиническом состоянии не выявлено.

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ANALYSIS OF RESULTS OF DNA ISOLATION FROM BIOLOGICAL SAMPLES

Abstract

To date, researchers have a fairly large set of methods for extracting and purifying DNA, and these methods continue to be improved and modified with reference to new research objects. In connection with the variety of living objects, there are no universal methods of DNA isolation. The use of this or that method of DNA isolation is dictated, firstly, by the specificity of the material being studied, and secondly, by what purpose is pursued: the production of total, nuclear, chloroplast DNA or other of its preparations. The DNA isolation method should be relatively simple, well reproducible and allow for the rapid production of sufficient quantities of satisfactorily purified DNA preparations. The yield of DNA depends on the nature of the starting material and is due to the content of DNA in this tissue, as well as the presence and nature of impurities that interfere with DNA purification.

In the article, based on literature sources and own research, the results of studies on the selection of the optimal method for isolation of *Pasteurella multocida* DNA from biological material are presented.

As a result of the selection of the optimal methods for isolation of *Pasteurella multocida* DNA from biological material, it was determined that all methods of DNA extraction used in the work are