

Natural and chemical control of varroa destructor and *Tropilaelaps mercedesae* in Afghanistan

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Introduction

The Varroa destructor Anderson and Trueman mite is considered as the causal agent of the most severe parasitosis of the honeybee. During its expansion throughout the whole world, it appeared in Afghanistan in the 80s. It is known that this mite is characterized by its special reproductive cycle, linked to the different evolutionary phases of the bee colony.

The parasitic mite Varroa destructor is well known to beekeepers because in many countries it is the most common cause of death of *Apis mellifera* colonies. Methods of controlling the mite have been investigated and several products are now approved for use. A recent difficulty in Afghanistan as well as in other countries has been the development of resistance in varroa to pyrethroids. This has led to a high mortality of colonies worldwide, and we have therefore investigated various new control products on sale.

Tropilaelapidoses is due to a haemophagous ectoparasitic mite tropilaelaps clareae. After a short phoretic period on the adult bee, it enters the brood cell just before capping, where it reproduces. It causes a rapid decline of *Apis mellifera* colonies. The re-classification of the genus Tropilaelaps is based on genetic and morphological variation of the parasite ,new name is Tropilaelaps mercedesae Anderson and Morgan 2007. During its expansion throughout the whole world, it appeared in Afghanistan in the 80s.The mite was first described on *Apis mellifera* in the Philippines by Delfinado and Baker 1961.Later,it was described on the other species of genus *Apis* (Table1).



The beekeepers of Rustaq Depat Takhar (Afghanistan)

Table 1. Distribution of *Tropilaelaps clareae* (mercedaesae) on its known *Apis* hosts (Aggarwal, 1988)

Host	<i>A.dorsata</i>	<i>A.mellifera</i>	<i>A.cerana</i>	<i>A.florea</i>
Stage & cast	Ad,drB,Wb	Ad,drB,wB	Ad,drB	Ad
Infested countries	India Philippines Nepal Burma	India Philippines Burma Malaya Vietnam Thailand China Taiwan Pakistan Afghanistan Iran(2000)	India Burma Malaya Java Pakistan PapuaN.G Afghanistan	India

AD=adult bees; drB=drone brood; wB=worker brood

In India, the mite was responsible for the loss of 50% of the brood in *A. mellifera* colonies, introduced six years earlier (Atwal and Goyal, 1971).

The same situation was observed in the Philippines (Laigio and Morse, 1968). In other countries, Thailand and Afghanistan, where *A.mellifera* is native, *Tropilaelaps mercedesae* is considered a serious pest, making control treatments necessary.

The objective of this experiment was to study the efficacy of natural and chemical control of Varroa destructor, *Tropilaelaps mercedesae* with ApiLifeVar® and Apivar® and Bayvarol®.



The beekeepers of Rustaq (Afghanistan)

Materials and Methods

The trial site was the apiary of the Takhar department in Afghanistan. The study lasted from June 7th 2008 to July 19th 2008. Twenty colonies with a normal brood pattern (eggs, larvae and pupae) were used. At the start of the trial the colonies occupied 10 frames. Bee colonies were naturally infested with *V. destructor* & *T. mercedesae*. Bee colonies were randomly allocated to 4 treatment groups of 5 colonies each. Groups were treated with three medicaments. The first group was treated by ApiLifeVar[®]. ApiLifeVar was registered in Italy. 100 g of the product containing thymol crystal 74.08g, 16% eucaliptus Oil, 16 g menthol crystal, 3.7g camphor crystals). One tablet per colony, it is more effective to place the tablet on top of the brood combs and to replace it with another one 7 to 10 days later. Under optimum conditions of application, the efficacy of treatment was greater. The diurnal temperature must be over 25°C. The second group treated by Apivar[®], Apivar was registered in France. It has 500 mg amitraz. Two strips were placed between frames close to the brood nest area for 6 weeks.

The third group was treated by-Bayvarol[®], Bayvarol was registered in Germany. It has 4 mg flumethrin, four strips were placed between frames close to the brood nest area for 6 weeks.

The fourth group remained untreated. The hives were arranged in groups. Within each group the hives were standing side by side. Between the groups there was a minimum distance of six metres. At the start of the study all the colonies were naturally infested with *V.destructor* & *T.mercedesae*.



Training in the Rustaq (Afghanistan) from 6th up to June 24th 2008

1) Treatment with ApiLifeVar®:

Tab.1-A) taken before treatment on the 7th June 2008

Nº.hive	Department	Take bees	NºVarroa & Tropilaelaps	%Infestation
1 to 5	Takhar	655	37+24 = 61	9.31%

Tab.1-B) taken after treatment on the 19th July 2008

Nº.hive	Department	Take bees	NºVarroa & Tropilaelaps	%Infestation
1 to 5	Takhar	573	2+1 = 3	0.52%

2) Treatment with Apivar®

Tab.2-A) before treatment on the 7th June 2008

Nº.hive	Department	Take bees	NºVarroa & Tropilaelaps	%Infestation
6 to 10	Takhar	601	38+22 = 60	9.98%

Tab.2-B) taken after treatment on the 19th July 2008

N° hives	Department	Take bees	N°Varroa & Tropilaelaps	%Infestation
6 to 10	Takhar	603	1+1 = 2	0.33%

3)Treatment with Bayvarol ®

Tab.3-A) taken before treatment on 7th June 2008

N° hives	Department	Take bees	N°Varroa & Tropilaelaps	%Infestation
10 to 15	Takhar	604	32+29 = 62	%10.26

Tab.3-B) taken after treatment on the 19th July 2008

N° hives	Department	Take bees	N°Varroa & Tropilaelaps	%Infestation
10 to 15	Takhar	617	1	%0.16

4) non treatment

Tab.4-A) taken before treatment on the 7th June 2008

N° hives	Department	Take bees	N°Varroa & Tropilaelaps	%Infestation
15 to 20	Takhar	610	33+26= 59	%9.67

Tab.4-b) taken after treatment on the 19th July 2008

N° hives	Department	Take bees	N°Varroa & Tropilaelaps	%Infestation
10 to 15	Takhar	623	49+38 = 87	%13.96

Conclusion

The tests we have carried out in Afghanistan against Varroa destructor and Tropilaelaps mercedesae show a good effectiveness, of 98.45% for Bayvarol®, for Apivar® 96.7%, for ApiLifeVar® 94.42%.

With Bayvarol® strips, a single treatment seems to be sufficient to reduce significantly the impact of varroa and tropilaelaps on the colonies for a year. Varroa destructor and tropilaelaps mercedesae are serious illnesses. It is necessary to learn how to live with them. By preserving only strong colonies in the apiaries. By systematically changing the

queens every two years, by developing queens selected for resistance to the diseases, one manages to control the serious problem of varroa and tropilaelaps. When the hives are strong and well populated, Varroa destructor and Tropilaelaps mercedesae does not make them perish.

Although we are in the 21st Century, varroa destructor and tropilaelaps mercedesae will undoubtedly remain for several years one of the principal agents of the weakening of apiarian livestock.



The beekeepers of Takhar Department in Afghanistan

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