

Final Report

BioGenius GmbH, Biology
TechnologiePark, Building 56
Friedrich-Ebert-Straße
51429 Bergisch Gladbach, Germany

Study no. : Mo3506
Report no. : BIO029/08
Date : 2008-04-04
Study Director : R. Jung

Biological Test Report

Repellent Effect of Mothproofer Products on Clothes moths

Repellent effect of Mothproofer Lavendel/Neem against *Tineola bisselliella*, up to 12 weeks after activation of product

Test Sample:

Mothproofer Lavendel/Neem

Author : R. Jung
Study Completion Date : 2008-04-04

Approval of the Biological Test Report

Signature of the Study Director:

Date

R. Jung

Signature of the Test Facility Management:

Date

Mike Bublitz

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1 Summary

Mothproofer Lavendel/Neem gave a sufficient repellent effect over a test period of 12 weeks against *Tineola bisselliella*.

3 replicates at each test point were done (control units: 2 replicates).

Mothproofer Lavendel/Neem showed a higher protection effect than 65 % in all cases, excepted at test point 0 day.

The explanation for the 0 day result is: Mothproofer and Clothes moths were placed at the same time into the test units. To get a sufficient repellent effect the product has to evaporate an adequate amount of active before first moths entering test boxes.

For all results see Figures 1 – 2 and Tables 1 – 2

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2 General Information

Sponsor: MRM Pharmtech Consulting
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3 Samples

3.1 Mothproofer Lavendel/Neem:

Lavendel/Neem
(Sylvagel/Sylvaclear)
47.25 %
3.5 ml gel
surface area: 13.5 cm² (3 cm x 4.5 cm)
Internal Product ID BioGenius GmbH: MRM010/0006#1#1

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4 Materials and Methods

4.1 Materials

Test insects: *Tineola bisselliella*, adults
mixed sex, 7 days old maximum; about 30/unit
(Breeding method see appendix)

4.2 Equipment

Clothes moths repellent units
Various: roll storage racks

4.3 Room Conditions

Temperature: 25 – 26°C
Rel. humidity: 55 - 62%
Light regime: daylight

4.4 Storage

Temperature: 24 – 26°C
Rel. humidity: 56 - 64%
Light regime: darkened windows

4.5 Number of Samples

1

4.6 Replicates

3 (control units 2)

4.7 Use of Product

The Mothproofer Lavendel/Neem were placed horizontally in the middle of the boxes.

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4.8 Test Points

0 days, 1 week, 6 weeks and 12 weeks after activation of Mothproofer Lavendel/Neem inside the test units.

4.9 Test Interval

24 hours after placing Clothes moths into the test unit.

4.10 Test Criteria

Distribution of Clothes moths within the repellent unit
Protection of wool in units with product in percent

4.11 Evaporation Rates

The evaporation rates of products were determined at each test interval.
Mothproofer were weighed before placing Clothes moths into the test units and directly after evaluating of distribution of Clothes moths 24 hours later.

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4.12 Execution of Method BioG B 307-01

Test of products for repellent effect on clothes moths

The method is suitable for testing the repellent effect of moth protection products based on a repellent.



picture 1



picture 2

The test set-up consists of two cardboard boxes (60 cm x 40 cm x 21 cm = 50 litres) which are connected by a gauze tunnel. The boxes are closed by a cling film and darkened with a lightproof cover (picture 1). Near one of the corners of the boxes a plastic tube (length 12 cm, diameter 5 cm), with a small opening at the box side (diameter 1.5 cm), is fixed (picture 2). The opposite end of the tube is not covered. Two of those prepared boxes are connected by a gauze tunnel (length 35 cm, diameter 5 cm).

In each of the boxes a black piece of woollen cloth, 20 x 20 cm, is placed near the small opening and in one of the cardboard boxes the test product is also hung or placed on a watch glass. 30 adult clothes moths (mixed sex) are then placed into the tunnel, so that the moths are able to approach the cloth in the boxes, with or without the product. After e.g. one, two and/or three days the evaluation is done by counting the alive and dead insects in the respective area (box with product, gauze tunnel and control box without product). The test room is illuminated only by daylight.

Modification: After evaluating Clothes moths and eggs laid on black woollen are taken out of test units. The black woollens are exchanged. The product remains in the units. The units will be stored in a separate room under similar climate conditions and later the insects are freshly introduced at the test points shown in the tables.

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5 Results

Fig. 1

Repellent effect of MRM Pharmtech Consulting Mothproofer Lavendel/Neem on Clothes moth *Tineola bisselliella*

Trial: Mo3506 (V2008-01-11)
 Method no.: BioG B307-01

mean of 3 trials

temperature: 25 - 26°C
 rel. humidity: 55 - 62%

**Product: Mothproofer Lavendel/Neem
 (Sylvagel/Sylvaclear)
 47.25%
 3.5 ml**

Use of Mothproofer Lavendel/Neem gel within the study:

1 Mothproofer (vertical position) per test unit

product	Test point after activation of product	Distribution of clothes moth in percent (24 hours after placing them into the tunnel)			Protection of wool in percent	Evaporation rate in mg / day	mean of evaporation rate in mg / day
		Product	Gauze Tunnel	Untreated			
1 Mothproofer Lavendel/Neem Amount of gel: 3.5 ml Evaporation area: 13.5 cm ²	0 days	40.3%	8.3%	51.3%	59.7%	12.8-16.5	15.2
	1 week	29.7%	7.7%	62.7%	70.3%	14.1-17.6	16.2
	6 weeks	23.7%	8.3%	68.0%	76.3%	10.2-10.9	10.6
	12 weeks	32.3%	4.3%	63.3%	67.6%	4.5 – 5.6	5.2

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Fig.2

**Repellent effect of MRM Pharmtech Consulting Mothproofer Lavendel/Neem
 on Clothes moth *Tineola bisselliella***

Trial: Mo3506 (V2008-01-11)
 Method no.: BioG B307-01

mean of 2 trials

temperature: 25 - 26°C
 rel. humidity: 55 - 62%

Product: Control units without product

product	Test point after activation of product	Distribution of clothes moth in percent (24 hours after placing them into the tunnel)			Protection of wool in percent	Evaporation rate in mg / day	mean of evaporation rate in mg / day
		Product	Gauze Tunnel	Untreated			
Control Units (both boxes without product)	0 days	44.0%	5.0%	51.0%	---	---	---
	1 week	44.5%	8.0%	47.5%	---	---	---
	6 weeks	44.0%	9.5%	46.5%	---	---	---
	12 weeks	41.5%	6.5%	52.0%	---	---	---

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Table 1

Repellent effect of MRM Pharmtech Consulting Mothproofer Lavendel/Neem
on Clothes moth *Tineola bisselliella*

Trial: Mo3506 (V2008-01-11)
 Method no.: BioG B307-01

mean of 3 trials

temperature: 25 - 26°C
 rel. humidity: 55 - 62%

Distribution of clothes moth (24 hours after placing them into the tunnel)					Evaporation rate in mg / day
Number of clothes moth					
Box	% of moth	Gauze tunnel	% of moth	Box without Product	
1 Mothproofer					
Product	40	9	51	Untreated	16.3
0 days	47	6	47		16.5
	34	10	56		12.8
Distribution in %	40.3	8.3	51.3		15.2
Product	30	8	62	Untreated	17.6
1 week	21	12	67		17.0
	38	3	59		14.1
Distribution in %	29.7	7.7	62.7		16.2
Product	27	7	66	Untreated	10.6
6 weeks	26	6	68		10.9
	18	12	70		10.2
Distribution in %	23.7	8.3	68.0		10.6
Product	20	3	77	Untreated	5.6
12 weeks	34	3	63		5.5
	43	7	50		4.5
Distribution in %	32.3%	4.3%	63.3%		5.2

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Table 2

Repellent effect of MRM Pharmtech Consulting Mothproofer Lavendel/Neem
on Clothes moth *Tineola bisselliella*

Trial: Mo3506 (V2008-01-11)
 Method no.: BioG B307-01

mean of 2 trials

temperature: 25 - 26°C
 rel. humidity: 55 - 62%

Distribution of clothes moth (24 hours after placing them into the tunnel)					Evaporation rate in mg / day
Number of clothes moth					
Box without Product	% of moth	Gauze tunnel % of moth	Box without Product		
Untreated	43	3	54	Untreated	---
0 days	45	7	48		---
Distribution in %	44.0	5.0	51.0		
Untreated	50	5	45	Untreated	---
1 week	39	11	50		---
Distribution in %	44.5	8.0	47.5		
Untreated	39	8	53	Untreated	---
6 weeks	49	11	40		---
Distribution in %	44.0	9.5	46.5		
Untreated	15	3	56	Untreated	---
12 weeks	13	10	48		---
Distribution in %	41.5	6.5	52.0		

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6 Appendix

Breeding method *Tineola bisselliella*

About five hundred adult insects are given into plastic cylinders (20 cm high, 9.5 cm diameter), closed by perforated lids. The cylinders are filled with a layer of two cm of horn shreds and covered with wool three quarters of the cylinder's height.

The wool is treated before as follows: Two litres of warm tap water are mixed with 20 g of yeast. The volume of about 10 litres of wool is soaked in that mixture. The wool is removed, squeezed out and dried at 40°C for two days.

Once or twice a week the amount of wool eaten by the hatched larvae is replaced. About two month later the first adult moths have developed.

The cylinders are kept under 12 hours : 12 hours light : dark regime at 27°C \pm 2°C and 60% \pm 10% relative humidity.