TEST REPORT

CLIENT: **GRUPO AC MARCA**

PETITIONER: **PILAR MARTINEZ**

ADDRESS: **Av. Carrilet 293-299**
08907 L'HOSPITALET DE LLOBREGAT (Barcelona)

TESTED MATERIAL: **MOTHBALLS**

TESTS REQUESTED: **EFFICACY ASSAYS**

DATE OF RECEIPT:	**03.12.2007**
TEST STARTING DATE:	**04.12.2007**
TEST END DATE:	**29.01.2008**
REPORT EMISIÓN DATE:	**04.06.2009**

Results included in this report can only be applied to the products received and tested in this Research Center on the indicated dates.

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Technician BIOTEK-Wood Department

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Head of BIOTEK-Wood Department

SAMPLES CHARACTERISTICS

On the 3th of December 2.007, CIDEMCO received from **GRUPO AC MARCA** samples of insecticidal balls referenced as **ORION MOTHBALLS**

Fig. 1 – *Product presentation*

TEST REQUESTED

The test requested by the client is the following:

1. *Determination of the insecticidal efficacy against colthes moths (Tineola bisselliella) in drawers according to an in-house method to measure the percentage mortality.*

TEST CARRIED OUT

1. Toxic values against *Tineola bisselliella*

1.1. *Standard Test*

As a consequence of the inexistence of a standard assay for this type of insecticide, a modification of the method described by the University of Southampton has been employed to measure the efficacy of these kinds of products used on drawers.

1.2. *Biological material*

Groups of 10 adults of *Tineola bisselliella* have been used for the test.

1.3. *Description of the product*

ORION MOTHBALLS is a sphere of 1,75 cm of diameter approximately, displayed in a microperforated bag to facilitate the emission of the insecticide, with a mean weight per unity (*ball and plastic*) of 1.4974 g at the opening moment. The commercial presentation is a pack of three balls, because the recommended dose is three balls per drawer.

1.4. *Conditioning of the product*

When the products were received, they were placed in a stabilization chamber, at 20 ± 2° C and 65 ± 5% RH for one day.

1.5. *Quantity tested*

As recommended by the manufacturer, three balls were placed in each drawer. The drawers employed were 48 x 40 x 12 cm, making up a volume of 0.23 m^3.

To know de amount of product released, the balls must be weighed before being exposed (*initial weight, just at the opening of the pack*) and at the end of the assay (*final weight*), being the difference the amount of product released to the environment. In this case, for the product **ORION MOTHBALLS** the lost mass was 4,6942 g/m^3. All the drawers employed have the same dimensions, and have been made with the same material (*agglomerated pineboard with white melamine coating*), and have no openings after being closed. The balls were laid at one corner of the drawer.

1.6. *Moth exposure*

24 hours after the mothballs were introduced in the drawers, groups of 10 adult moths were introduced in 5cm of diameter and 5 cm high tubes, closing the open ends by a fine metallic mesh to avoid escapes. This tube was introduced vertically into each assay drawer, at the opposite corner to the mothballs. All the tests took place at controlled temperature of 22 ± 2° C and 55 ± 10 % of relative humidity.

The moths were maintained for 24 hours in the treatment drawer. After this period, the moths were transferred to another container without insecticide to observe their recovery.

Fig.2: *Moths container*

1.7. *Value recording*

The value recording was done after 24 hour recovery period, observing the treatment moth survival. Killed moths were counted, considering a moth as dead if it doesn't move upon touching. The values were noted on a laboratory sheet.

1.8. *Assay repetitions*

Three repetitions were made for each product. Three repetitions without insecticide were also made as a control in no treated drawers.

1.9. *Ageing*

The test was done at the initial moment (*package opening*) and after the first week, second week, third week and after eight weeks of package opening. During the whole period, the mothballs were maintained inside the drawers at the same assay climatic conditions.

1.10. *Final Test*

Once finished all repetitions, the final test is conducted on February 4Th of 2008. The percentage *(%)* mortality induced by the mothballs was assessed. Data will take into account the mortality obtained in the assays without insecticide according to the following formula:

% mortality = ((Assay moths dead at 24 hours - (Control moths exposed – Control moths dead))/ Assay moths exposed) X 100

The products are weighed after eight weeks of ageing to measure the mass loss.

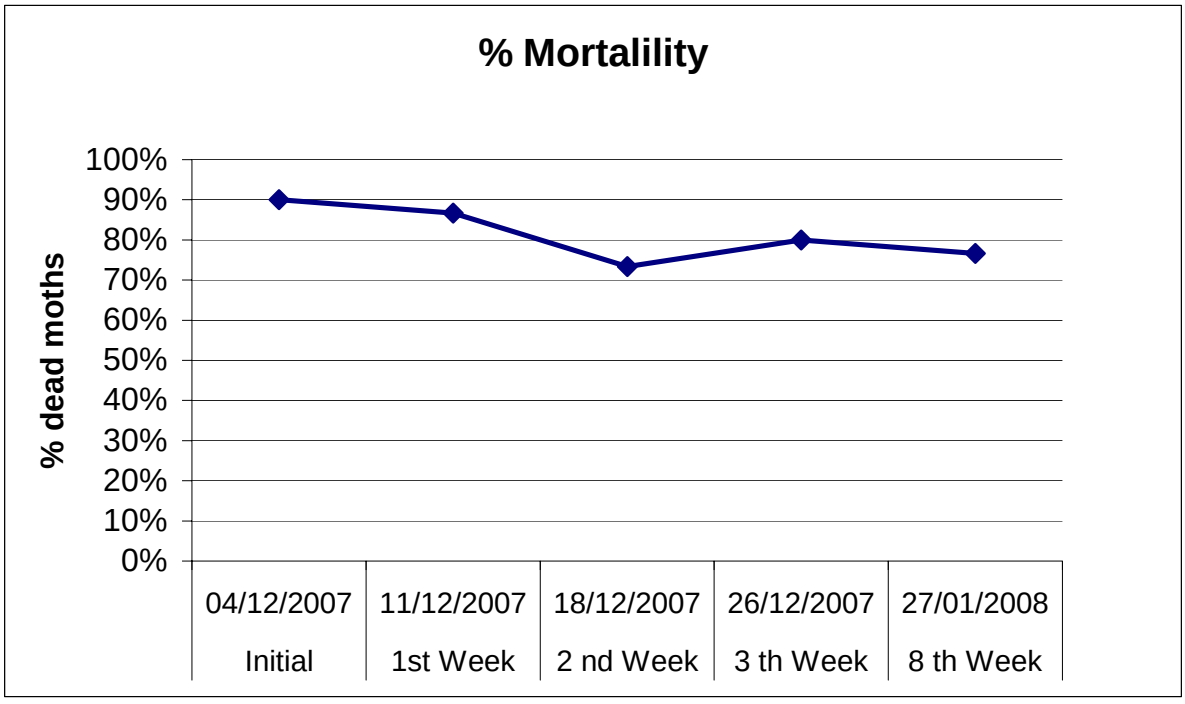
RESULTS

VALUES:

	Repet.	Initial Mean Weight (g.)	% Mortality					Final Mean Weight (g.)	% Mass Loss
			Initial	1st Week	2 nd Week	3 th Week	8 th Week		
Balls	1	1,4258	90%	80%	90%	100%	100%	1,0460	26,64
	2	1,4842	100%	100%	50%	70%	70%	1,1207	24,49
	3	1,5824	80%	80%	80%	70%	60%	1,1521	27,19
	Mean	**1,4975**	**90%**	**86%**	**73%**	**80%**	76%	1,10627	26,10
Control	1	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0
	Mean	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table 1 - *Values of moth mortality percentage and product weights*

GRAPHICS



Graphic 1 - *Evolution of the mothballs efficacy*

DISCUSSION

- To be able to assess the results, it has to be taken into account that we do not know the type of active substances or the concentrations employed to formulate this product.

CONCLUSIONS

- After eight weeks of opening the package, the product **ORION MOTHBALLS** show a mortality of 76 %, indicating a considerable efficacy.

NOTE

"The interpretation of this report and the practical conclusions which may be drawn from it require a profound knowledge of the problems regarding the domestic insecticides; for this reason, they cannot in themselves constitute a certificate of authorization for the insecticide studied".