# LABORATORY ASSESSMENT OF AN INSECTICIDE SPECIALITY INTENDED TO CONTROL INSECT AND MITES PESTS

**Product:**

**OXYPY**

SEPTEMBER 2011
Report n° 1457a1/0711R

**Sponsor:**

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I, hereby Bruno Serrano, T.E.C. Director certify that the trials presented in this issue were done according to the Good Experiment Practices (G.E.P.) – French Agriculture Ministry agreement 94-021.

Anglet, 8th September 2011

## GOOD EXPERIMENT PRACTICES

| | |
|---|---|
| STUDY TEC N° : | 1457a1/0711 |
| SPONSOR : | OXY'PHARM – 94500 Champigny-sur-Marne (France) |
| PRODUCT : | OXYPY |
| FACILITIES : | T.E.C. 1 rue jules Védrines 64600 Anglet (France) |
| TIMING : | Start 19th July 2011 |
| STUDY DIRECTOR : | Bruno Serrano / Agronomist engineer |
| STUDY ENGINEER : | Martine Falquier / Agronomist engineer |

QUALITY INSURANCE RESPONSIBLE : Bruno Serrano /Agronomist engineer

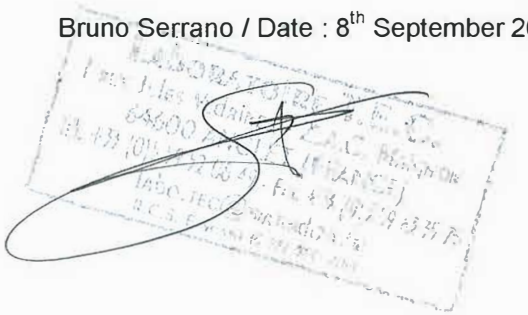
METHODOLOGY :

Adapted French registration standard methodology C.E.B. N°135 bis (1st edition: 1989 - Revised Mai 1996) in accordance with the E.P.P.O. Guideline n°135 (bulletin 18, 817-836 1988).
The trial is conducted in accordance with the procedures required to conduct Officially Recognized Trials (EOR), from the european directive 91/414/CE and according to the laboratory agreement by the french Ministry of Agriculture.

ARCHIVAGE : 10 years, papers and electronic files

There were no circumstances which can have affected the reliability of the data presented in this report.

Bruno Serrano / Date : 8th September 2011



# LABORATORY ASSESSMENT OF AN INSECTICIDE SPECIALITY INTENDED TO CONTROL INSECT AND MITES PESTS

## PURPOSE:

The purpose of this study is to assess the efficacy of an insecticide speciality applied as a residual spray onto surfaces and intended to control insect and mites pests.

The trial was conducted accroding to the french registration standard:

- Method C.E. B. 135 bis (First edition: april 1989 Revised: May 1996) : "Méthode d'étude de l'efficacité des préparations insecticides et/ou acaricides destinées aux traitements de surface des locaux de stockage, de transformation industrielle et de commercialisation des produits d'origine animale ou végétale"

The residual effect of the product is assessed until 4 weeks after treatment.

**This issue follows the standard method design and relates any deviations.**

# 1. EXPERIMENTAL CONDITIONS

## 1.1. Treatment chamber

The treatment is done in a closed 60 m3 chamber to be close to the reality of use.

The chamber represents the average conditions of a premise. There is no ventilation and it is separated form the storage room where the treated tiles are kept for ageing.
The treatment room allows to keep controlled temperatures between 20 and 25°C (±2°C).

## 1.2. Treated materials

### 1.2.1. Plates

A "plate" is defined as a plate of a material usually found in construction of food storage premises, which can be more or less sorbent and porous.

#### 1.2.1.1. Choice of the treated materials

The materials used for the trial have been checked as non effective against the pest species by a preliminary biological testing.

Two types of materials are treated in order to assess the efficacy of the product in relation with the physical properties of the materials found in the actual conditions of use (sorbent and unsorbent).

- ceramic tiles (non porous),
- carpet tiles (porous/sorbent).

#### 1.2.1.2. Dimension and preparation of the plates

The plates are squares of 15 cm x 15 cm in order to be covered by a Petri box adapted to the species (e.g. 14 cm for cockroaches and 5,5 cm for the other species).

#### 1.2.1.3. Storage of the treated plates

The treated plates are stored at a temperature of 25 °C +/- 2 °C and a relative humidity of 70 +/- 5 %, in darkness and without contact between each other to avoid any transfert of product.

## 1.3. Target insect species

Target organisms:

*Blattella germanica* (German cockroach)
*Musca domestica* (house fly)
*Aedes aegypti* (mosquito)
*Sarcoptes scabiei* (scabies mite)
*Dermatophagoides pteronyssinus* (house dust mite)

The insects ae from laboratory colony breedings from french official specialized institutes (INRA for the mites and TEC for the others – strain from Wellcome + WHO + INA Paris-Grignon).
The strain are susceptible strains (checked yearly towards main insecticide families).

AGE AND INSTAR OF THE TARGET SPECIES

| Scientific name | Common name | Instar | Age |
|---|---|---|---|
| *Blattella germanica* | german cockroach | adult, male | 1 to 3 weeks |
| *Musca domestica* | fly | adult | 4 to 6 days |
| *Aedes aegypti* | mosquito | adult | 2 to 4 days |
| *Saroptes scabiei* | scabies mite | adult | 4 to 6 days |
| *D.pteronyssinus* | dust mite | adult+nymph | all instar |

For each dose and modality, 25 insects are exposed, except for *Dermatophagoides pteronyssinus*: 200+/-20 all instar mites.

**Untreated control:**

Some batches of insects are placed onto the same materials treated with water and handled in the same conditions than the materials treated with the product.

# 2. TREATMENTS

## 2.1. Product and dosage

The experimental product is provided by OXYPHARM :

**OXYPY** – ready to use – Lot 230611 EXP 06/2013 REF 4200.001

Dose: 50 ml /m²

## 2.3. Application of the treatments

The treatments are done by using a pressurized hand-held sprayer provided with the product.

The droplets are thin enough to wet the surfaces without leaking and without excessive vapourization in the air.

Rate of application of the mixture product: 50 ml par m².

The materials are treated falt and the actual treated area is 10 times the area of the materials.
The treated plates are randomly assigned among the total treated area and not handled before complete drying.

The untreated materials are treated with water.

4 replicates are conducted by factor. A factor is a combination of the date of persistence, the insect species and the type of material.

# 3. Assessments

## 3.1. Principle

The day of the treatment (after drying), the pests are placed onto the plates during 4 hours.

The residual activity is assessed after 28 days.

The experimenter records the mortality at regular time intervals.

After the 4 hours exposure time, the pests are withdrawn from the plates by gentle succion and placed onto untreated plates with food and water sources, in breeding climatic conditions.

## 3.2. Mortality assessments

### 3.2.1. Knockdown and mortality

The observations are recording two phenomenons:

- knockdown (KD),
- mortality, lethal effect.

Main insecticides are acting on the nervous system and give successive effects: excitation, uncoordination of moves, paralysis (knock down) and lethargy conducting to death.

The paralysis phase depends on the active ingredient and the dosis, some recoveries can occur after a knockdown effect lasting more or less longer.

### 3.2.2. Assessments

- knockdown effect: during the 4 hours exposure time. A compulsory assessment is done after 4 hours.

- Lethal effect: after 24 hours of exposure. An insect unable to move (fly) properly is classified as dead.

### 3.3. Dates of assessments

#### 3.3.1. Instant effect

Until 24 hours after exposure.

#### 3.3.2. Residual activity

The residual actvity is assessed by exposing the insects on the plates treated 28 days before.

## 4. RESULTS

### 4.1. PRESENTATION

The synthesis of data is given in Table I.

The raw data by species/date/replicate/materials are given in APPENDIX.

Table I: synthesis of data in KT100 (time of exposure to kill or knockdown 100% of the pests):

| | | DAY0 | | DAY0 + 4 weeks | |
|---|---|---|---|---|---|
| | | Ceramic tile | Carpet tile | Ceramic tile | Carpet tile |
| OXYPY | *B.g* | < 1h | < 1h | < 2h | < 2h |
| | *M.d* | < 1h | < 1h | < 1h | < 1h |
| | *A.a* | < 1h | < 1h | < 1h | < 1h |
| | *S.s* | < 1h | < 1h | < 1h | < 2h |
| | *D.p* | < 1h | < 1h | < 1h | < 2h |

B.g = *Blattella germanica* M.d = *Musca domestica*
A.a= *Aedes aegypti* *S.s* = *Sarcoptes scabiei* *D.p* = *Dermatophagoides pteronyssinus*

### 4.2. COMMENTS

During all the trial, the death rates of the Untreated control batches of insects are lower than 5%, the trial is then validated.

The treatment gave a complete and definitive mortality (no recoveries after 24 hours).

The efficacy remains effective until 28 days after application.

# 5. CONCLUSION

*In the conditions of this trial, with the product sample provided, the pests strains and methodology used:*

The product **OXYPY**, applied as a surface treatment at a rate of 50 ml per m², has proved:

- A fast and definitive insecticide efficacy against flying and crawling insects, and against mites as the mite responsible of scabies (trials done against representative organisms),

- A residual activity of at least 28 days after treatment in laboratory conditions.

# APPENDIX

Raw data

Note: the standards CEB can not be reproduced, but it can be purchased from the AFPP website: http://www.afpp.net/

## TRIAL ON Blattella germanica / TRIAL AT DAY0 (after drying)

| Treatment | Material | Mean of replicates in % knockdown/ mortality | | | | Mortality |
|---|---|---|---|---|---|---|
| | | 1 h | 2 h | 3 h | 4 h | After 24 h |
| OXYPY | Ceramic tile | 100 | 100 | 100 | 100 | 100 |
| | Carpet tile | 100 | 100 | 100 | 100 | 100 |
| Untreated Control | carrelage | 0 | 0 | 0 | 0 | 0 |
| | moquette | 0 | 0 | 0 | 0 | 0 |

## TRIAL ON SUR Musca domestica / TRIAL AT DAY0 (after drying)

| Treatment | Material | Mean of replicates in % knockdown/ mortality | | | | Mortality |
|---|---|---|---|---|---|---|
| | | 1 h | 2 h | 3 h | 4 h | After 24 h |
| OXYPY | Ceramic tile | 100 | 100 | 100 | 100 | 100 |
| | Carpet tile | 100 | 100 | 100 | 100 | 100 |
| Untreated Control | carrelage | 0 | 0 | 0 | 0 | 0 |
| | moquette | 0 | 0 | 0 | 0 | 0 |

## TRIAL ON Aedes aegypti
## TRIAL AT DAY0 (after drying)

| Treatment | Material | Mean of replicates in % knockdown/ mortality | | | | Mortality |
|---|---|---|---|---|---|---|
| | | 1 h | 2 h | 3 h | 4 h | After 24 h |
| OXYPY | Ceramic tile | 100 | 100 | 100 | 100 | 100 |
| | Carpet tile | 100 | 100 | 100 | 100 | 100 |
| Untreated Control | carrelage | 0 | 0 | 0 | 0 | 0 |
| | moquette | 0 | 0 | 0 | 0 | 0 |

## TRIAL ON Sarcoptes scabiei
## TRIAL AT DAY0 (after drying)

| Treatment | Material | Mean of replicates in % knockdown/ mortality | | | | Mortality |
|---|---|---|---|---|---|---|
| | | 1 h | 2 h | 3 h | 4 h | After 24 h |
| OXYPY | Ceramic tile | 100 | 100 | 100 | 100 | 100 |
| | Carpet tile | 100 | 100 | 100 | 100 | 100 |
| Untreated Control | carrelage | 0 | 0 | 0 | 0 | 0 |
| | moquette | 0 | 0 | 0 | 0 | 0 |

## TRIAL ON Dermatophagoides pteronyssinus
## TRIAL AT DAY0 (after drying)

| Treatment | Material | Mean of replicates in % knockdown/ mortality | | | | Mortality |
|---|---|---|---|---|---|---|
| | | 1 h | 2 h | 3 h | 4 h | After 24 h |
| OXYPY | Ceramic tile | 100 | 100 | 100 | 100 | 100 |
| | Carpet tile | 100 | 100 | 100 | 100 | 100 |
| Untreated Control | carrelage | 0 | 0 | 0 | 0 | 0 |
| | moquette | 0 | 0 | 0 | 0 | 0 |

## TRIAL ON Blattella germanica / TRIAL AT DAY0 + 4 weeks

| Treatment | Material | Mean of replicates in % knockdown/ mortality | | | | Mortality |
|---|---|---|---|---|---|---|
| | | 1 h | 2 h | 3 h | 4 h | After 24 h |
| OXYPY | Ceramic tile | 46 | 100 | 100 | 100 | 100 |
| | Carpet tile | 11 | 100 | 100 | 100 | 100 |
| Untreated Control | carrelage | 0 | 0 | 0 | 0 | 0 |
| | moquette | 0 | 0 | 0 | 0 | 0 |

## TRIAL ON SUR Musca domestica / TRIAL AT DAY0 + 4 weeks

| Treatment | Material | Mean of replicates in % knockdown/ mortality | | | | Mortality |
|---|---|---|---|---|---|---|
| | | 1 h | 2 h | 3 h | 4 h | After 24 h |
| OXYPY | Ceramic tile | 100 | 100 | 100 | 100 | 100 |
| | Carpet tile | 100 | 100 | 100 | 100 | 100 |
| Untreated Control | carrelage | 0 | 0 | 0 | 0 | 0 |
| | moquette | 0 | 0 | 0 | 0 | 0 |

## TRIAL ON Aedes aegypti
## TRIAL AT DAY0 + 4 WEEKS

| Treatment | Material | Mean of replicates in % knockdown/ mortality | | | | Mortality |
|---|---|---|---|---|---|---|
| | | 1 h | 2 h | 3 h | 4 h | After 24 h |
| OXYPY | Ceramic tile | 100 | 100 | 100 | 100 | 100 |
| | Carpet tile | 100 | 100 | 100 | 100 | 100 |
| Untreated Control | carrelage | 0 | 0 | 0 | 0 | 0 |
| | moquette | 0 | 0 | 0 | 0 | 0 |

## TRIAL ON Sarcoptes scabiei
## TRIAL AT DAY0 + 4 WEEKS

| Treatment | Material | Mean of replicates in % knockdown/ mortality | | | | Mortality |
|---|---|---|---|---|---|---|
| | | 1 h | 2 h | 3 h | 4 h | After 24 h |
| OXYPY | Ceramic tile | 100 | 100 | 100 | 100 | 100 |
| | Carpet tile | 75 | 100 | 100 | 100 | 100 |
| Untreated Control | carrelage | 0 | 0 | 0 | 0 | 2 |
| | moquette | 0 | 0 | 0 | 0 | 4 |

## TRIAL ON Dermatophagoides pteronyssinus
## TRIAL AT DAY0 + 4 WEEKS

| Treatment | Material | Mean of replicates in % knockdown/ mortality | | | | Mortality |
|---|---|---|---|---|---|---|
| | | 1 h | 2 h | 3 h | 4 h | After 24 h |
| OXYPY | Ceramic tile | 100 | 100 | 100 | 100 | 100 |
| | Carpet tile | 81 | 100 | 100 | 100 | 100 |
| Untreated Control | carrelage | 0 | 0 | 0 | 0 | 3 |
| | moquette | 0 | 0 | 0 | 0 | 1 |