No. HITRT/SF/T/170/2011

Date: 13/12/2011

To,

Lifeline Technologies
Plot No. A-387, Road No28, Ramnagar,
Wagle Estate, Thane 400 604
Telefax: +912225821587/88
Email: info@lifelinetechnologies.in
Website: www.lifelinetechnologies.in

Subject: EFFICACY TEST FOR “LDPE PLASTIC CHIPS” AGAINST SUBTERRANEAN TERMITES.

Reference: Your letter dated 30/09/2011
Attention: Mrs. Jayashree Jadhav

Dear Madam,

In this context, it is informed as under:

1. Our Institute had undertaken the study of your “LDPE PLASTIC CHIPS for testing its Efficacy against Subterranean Termites.

2. The sample was tested under standard laboratory conditions as per in-house validated methods.

3. Our report is issued with an explicit understanding that manufacturer and sponsor agree not to use HITRT’s name in any promotional literature, TV, Radio, web-based or other media, without the express written permission of HITRT management.

4. HITRT reserves the right to grant or deny this permission in its sole judgment based on the relation of the promotional text and images to the data generated by HITRT for the manufacturer and sponsor.

5. The Reports are enclosed herewith (25 pages including feedback form)


[Signature]

Director,
Haffkine Institute
REPORT

EFFICACY TEST FOR “LDPE PLASTIC CHIPS” AGAINST SUBTERRANEAN TERMITES

SPONSOR

LIFELINE TECHNOLOGIES
PLOT NO. A-387, ROAD NO28,
RAMNAGAR, WAGLE ESTATE,
THANE 400 604

PERFORMING LABORATORY

HAFFKINE INSTITUTE
DEPARTMENT OF SNAKE FARM
ACHARYA DONDE MARG,
PAREL, MUMBAI-12
INDIA

DECEMBER - 2011
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Haffkine Institute
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HI Study Number: HI/SF/RES-004/11

PERSONNEL INVOLVED IN THE STUDY

SIGNATURE

Principle Investigator
DR. ABHAY CHOWDHARY, M.D.

Co-Investigator
DR. MRUNAL GHAG SAWANT, M.V.Sc.

Statistical Analysis
DR. MRUNAL GHAG SAWANT, M.V.Sc.

Personnel
MRS. SWATI MUMBARKAR, B.SC, D.M.I.T.

(Experimental Room Procedures)
MR. SANJAY MANE,

REPORT APPROVAL

This study report is approved by:

[Signature]

Director,
Haffkine Institute

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LIST OF ABBREVIATIONS

Cm - Centimeter
Exp. - Experiment
F - Format
hrs - Hours
mL - milliliter
No. - Number
G - Group
HI - Haffkine Institute
N - Number of animals / observations
N° - Number
NA - Not Applicable
RES - Research
SD - Standard deviation
SF - Department of Snake Farm
Sec - Seconds

Director,
Haffkine Institute
This study was conducted to assess the efficacy of 3% LDPE chip against subterranean termites (Odontotermes obesus). The termite mounds were obtained from Premises of Sinhgad college of Science, Pune. Fourth in star stage of termite was used for the experiment. The entire intact mounds were allowed to acclimatize to the experimental laboratory conditions for a period of six days before exposure to the test substance. Experimental glass containers were used to house the subterranean termites during the experimental period. The cage containing termites were layered with soil and wood scrapings. The cages were kept in a stainless steel trey containing water to avoid the escape of termites from the cages. Termite mounds were randomly divided into two groups (G1 to G2). Each group consisted of approximately 100 termites and was exposed to control LDPE chips and 3% LDPE chips locally into the experimental glass cages for a period of thirty consecutive days.

Termite and termite mounds were observed for mortality and morbidity, all visible signs and symptoms such as changes in the activity, behavioral pattern, formation of fungal growth and other general changes. The test samples were removed after the specific exposure period of every one week for a month and carefully observed for any changes in the gross appearance. The surface of the test sample was clean and was evaluated visually under magnification for any feeding marks such as surface nibbling, scraping, pitting and perforation of termite bities. (Refer Appendix I)

Individual Test samples were weighed on the day of commencement of experiment and at weekly intervals thereafter till the termination of the study. The final weights of each of the samples was taken and compared with initial weights of the samples. Raw data was processed and analyzed between the controls and the treated groups using statistical software such as Graph Pad prism 5.0 Version.

The findings from the present study were:

Control sample showed no changes during first and second week whereas at the end of third and fourth week of exposure there was remarkable damage observed on the surface of control LDPE chips such as surface nibbling and nest building. The rating for the damage observed on the surface of LDPE chips varies between 50-75 percent. In case of 3% LDPE chips no variation was observed during the entire experimental period of one month. The results of the visual assessment showed that 3% LDPE chips has termite repellant property as compared to control LDPE chips. The percent weight loss varies from 0.060 to 0.188. The results of the weight loss of sample showed that control LDPE chips have no termite repellant property as compared to 3% LDPE chips.

Based on the results of present study, it is concluded that the 3% LDPE chips has significant termite repellant property.

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HI Study Number: HI/SF/RES-004/11

1. INTRODUCTION

1.1 Study Objective
The objective of the study was to investigate the efficacy of treated LDPE Chips against Subterranean termite’s species for a period of thirty days. The study was conducted in compliance with In house standardized method of determining the bio efficacy anti termite compounds.

1.2 Study Guidelines
The present study was conducted as per in house standardized and validated method of anti termite activity against subterranean termites (HITRT/SF/SOP- 002).

1.3 Justification for Selection of the Test System
Subterranean termite (Odonotermes obesus) is selected as a test system because it is a readily available species of termite. It has been historically shown to be a suitable model for efficacy studies. The results of the study may be of value in predicting bio efficacy of test compound.

1.4 Performing Laboratory and Study Period
The study was performed at the Department of Snake Farm, Haffkine Institute, Parle, Mumbai - 400012, Maharashtra, India.

  Study Initiation : September 30, 2011
  Acclimatization Start : October 11, 2011
  Experiment Start : October 17, 2011
  Dates of Sacrifice : N.A.
  Experiment Termination : November 15, 2011
  Study Completion : December 13, 2011

1.5 Archives
All original raw data including any storage medium for electronically recorded data, documentation, the draft report, a copy of the final report, test substance and control substance will be retained in the Archives at Haffkine Institute for a period of five years. At the end of this period, the Sponsor’s instructions will be sought to either extend the archiving period or return the archived material to the Sponsor or for the material to be disposed off.

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HI Study Number: HI/SF/RES-004/11

2. EXPERIMENTAL PROCEDURE

2.1 Test Substance Name : 3% LDPE Chips
C.A. Name : N.A.
CAS No : N.A.
Product No : N.A.
Concentration / Purity : N.A.
Manufactured by : N.A.
Supplied by : Lifeline Technologies
Date of Manufacture : Not available
Date of Expiry : Not available
Appearance : White colored roughly squared chip
L = 5cm and W = 3.5 cm
Storage Condition (at HI) : As per the instruction received from the Sponsor on storage of the test substance, the test substance will be stored in its original container as supplied by the Sponsor at room temperature in the Department of Snake Farm (SF).

HI Test Substance Code : LF_LC_11_001_T

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2.1 Control Substance Name: Control LDPE Chips
C.A. Name: N.A.
CAS No: N.A.
Product No: N.A.
Concentration / Purity: N.A.
Manufactured by: N.A.-
Supplied by: Lifeline Technologies
Date of Manufacture: Not available
Date of Expiry: Not available
Appearance: White colored roughly squared chip
L= 5cm and W= 3.5 cm
Storage Condition (at HI): As per the instruction received from the Sponsor on
storage of the test substance, the test substance will be
stored in its original container as supplied by the Sponsor
at room temperature in the Department of Snake Farm
(SF).

HI Test Substance Code: LF_LC_11_001_C

2.2 Instruments and Equipment
Balance: KERN ABT-320-4M, Germany (Capacity – 0.1 mg to 320 g)
Glass cages: 45 X 22 cm

2.3 Solvents and Chemicals
Wood Scrapings: Local market
Sterilium (Disinfectant): Raman & Weil Pvt Ltd, Daman, India.
Phenyl: Devika Chemical Works, Kurla, Mumbai
Differ Liquid hand wash: Meetchem, Kurla Mumbai.

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2.4 Test System
Termite mounds of subterranean termites *Odontotermes obesus* were obtained from Premises of Sindhagad college of Science, Pune. Fourth in stars stages were used for the experiment.

2.5 Acclimatization
The entire intact two mounds were allowed to acclimatize to the experimental laboratory conditions for a period of six days before exposure to the test substance. During the acclimatization period, the termites and termite mounds were observed for signs of abnormality or fungal growth.

2.6 Environmental Conditions
Termite mounds were maintained in Experimental Laboratory No. 1 (EL - 1). The experimental room temperature and humidity were recorded daily. The mean maximum and minimum temperatures (°C) during study period (October 2011 to November, 2011) were 28.4 ± 0.65 and 29.33 ± 0.49 respectively. The mean relative humidity (%) during this period was 67.36 ± 3.71 and 63.80 ± 4.60. In the experimental room, 12 hours of artificial fluorescent lighting and 12 hours darkness were maintained. The approximate light intensity (Lux) during study period was 350 Lux (October to November 2011). The experimental room was cleaned and mopped daily with liquid disinfectant.

2.7 Housing
Experimental glass containers were used to house the subterranean termites in experimental room 1 of Department of Snake Farm, Haffkine Institute. The cage containing termites were layered with soil and wood scrapings. The cages were kept in a stainless steel trey containing water to avoid the escape of termites from the cages.

2.8 Diet and Water
The termites were provided wood scrapings *ad libitum* and cotton wool soaked in water were placed in corners of the cage to provide the moist environment. Fresh wood scrapings were supplied at least once a week.

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2.9 Grouping
The termite mounds were allocated in two groups viz. control (G1) and test (G2) randomly. Each group were comprised of approximately 100 termites per group.

2.10 Identification
Groups were identified with colored cage label showing Study No., Test Substance Code, Group No., Dose, Study Code and Cage No.

2.11 Experimental Outline

<table>
<thead>
<tr>
<th>Group No.</th>
<th>Group</th>
<th>Test substance</th>
<th>Dose (No. of chips per mound)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>Control</td>
<td>LDPE Chip</td>
<td>5</td>
</tr>
<tr>
<td>G2</td>
<td>Test</td>
<td>Treated LDPE Chip</td>
<td>5</td>
</tr>
</tbody>
</table>

2.12 Route of Exposure
Termites were exposed to the test compounds viz. control LDPE chips and 3% LDPE chips locally into the mound.

2.13 Duration and Frequency of Exposure
The test compounds were applied into the termite charged experimental glass cages for a period of thirty consecutive days. This test thus is performed by covering the test samples with approx. 1.5 kg mud along with the termites for a period of a month or the time as specified by the sponsor.

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2.14 Observations

2.14.1 Clinical Signs

Termite and termite mounds were observed for mortality and morbidity twice daily. All visible signs and symptoms such as changes in the activity, behavioral pattern, formation of fungal growth and other general changes were observed recorded once daily.

2.14.2 Visual Assessment of Damage

The test samples were removed after the specific exposure period of every one week for a month, for careful observation of nest and changes in the gross appearance. The surface of the test sample was clean by removing mud and debris and was evaluated visually under magnification for any feeding marks such as surface nibbling, scraping, pitting and perforation of termite bites. (Refer Appendix I)

2.14.3 Weight of the sample

The sample was washed with tap water to remove the adhered sand particles and kept in the room temperature till they are dried. Individual Test samples were weighed on the day of commencement of treatment and at weekly intervals thereafter till the termination of the study. The final weights of each of the samples was taken and compared with initial weights of the samples.

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HITRT/SF/22-00
2.15 Statistical Evaluation of Results

Raw data was processed and analyzed for reporting group means, standard deviations and standard error with significance between the controls and the treated groups using statistical software such as Graph Pad prism 5.0 Version (Online Free Trial version). The parameter such as weight of the samples were subjected to Analysis of Variance (ANOVA) and Dunnet’s t-test. Significance was calculated at 1% as well as 5% level and indicated in the summary tables as follows:

* ↑* - Significantly higher than control \((p \leq 0.05)\)
* ↓* - Significantly lower than control \((p \leq 0.05)\)
* ↑↑* - Significantly higher than control \((p \leq 0.01)\)
* ↓↓* - Significantly lower than control \((p \leq 0.01)\)

The mean values of all the parameters are rounded based on the accuracy of the individual values and given in the summary tables.
3.0 RESULTS AND DISCUSSION

3.1 Clinical Signs

No mortality and morbidity was observed during the entire experimental period.

3.2 Visual Assessment of Damage

The test samples were removed every week for a month to observe the damage caused by the termites. Control sample showed no changes during first and second week of the exposure the surface of samples were found smooth and without any physical damage whereas at the end of third and fourth week of exposure there was remarkable damage observed on the surface of control LDPE chips such as surface nibbling and nest building. The rating for the damage observed on the surface of LDPE chips varies between 50-75 percent. In case of 3% LDPE chips no variation was observed during the entire experimental period of one month. (Refer Appendix I). The results of the visual assessment showed that 3% LDPE chips has termite repellent property as compared to control LDPE chips.

3.3 Weight of the sample

Test samples were weighed on the day of commencement of treatment and at weekly intervals thereafter till the termination of the study. Mean weight loss during the exposure period was compared for control and experimental sample. It was observed that there was statistically significant weight loss observed in control LDPE chips when compared to the initial weight of the sample before exposure to the charged termite’s container whereas no statistical significance was observed in 3% LDPE chips. The results of the weight loss of sample showed that control LDPE chips have no termite repellent property as compared to 3% LDPE chips.
4.0 CONCLUSION

Based on the results of present study, it is concluded that the 3% LDPE chips has significant termite repellent property as compared to control LDPE chip.
5.0 REFERENCES


5.4 GB 1986: GB 2951.38-86 guidelines for anti-termite testing

5.5 Su, Nan-Yao; Tabashiro, Minoru; Yates, Julian R.; Haverty, Michael L., 1982, "Effect of Behavior on the Evaluation of Insecticides for Prevention of or Remedial Control of the Formosan Subterranean Termite", Journal of Economic Entomology, Volume 75, Number 2


5.7 Lyman Ott, Michael Longnecker, Rev. 2008, An introduction to statistical methods and data analysis

Director,
Haffkine Institute
EFFICACY TEST FOR "LDPE PLASTIC CHIPS" AGAINST TERMITE SUBTERRANEAN

TABLE 1: MEAN VISUAL ASSESSMENT OF SAMPLE

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>IO</th>
<th>MEAN OBSERVATION</th>
<th>DOD</th>
<th>Rating</th>
<th>DOD</th>
<th>Rating</th>
<th>DOD</th>
<th>Rating</th>
<th>DOD</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1st week</td>
<td></td>
<td>2nd week</td>
<td></td>
<td>3rd week</td>
<td></td>
<td>4th week</td>
<td></td>
</tr>
<tr>
<td>Control LDPE Chip</td>
<td>Ok</td>
<td>Surface Nibbling and Nest building</td>
<td>50-75</td>
<td></td>
<td></td>
<td>Surface Nibbling and Nest building</td>
<td>50-75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3% LDPE Chip</td>
<td>Ok</td>
<td></td>
<td>100</td>
<td>Ok</td>
<td>100</td>
<td>Ok</td>
<td>100</td>
<td>Ok</td>
<td>100</td>
<td>Ok</td>
</tr>
</tbody>
</table>

Key: DOD: Degree of damage, IO: Initial Observation,

TABLE 2: MEAN WEIGHT ASSESSMENT OF SAMPLE

<table>
<thead>
<tr>
<th>WEEK</th>
<th>CONTROL LDPE CHIPS</th>
<th>3% LDPE CHIPS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Initial Observation</td>
<td>3.04</td>
<td>0.02</td>
</tr>
<tr>
<td>First Week</td>
<td>3.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Second Week</td>
<td>3.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Third Week</td>
<td>3.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Fourth Week</td>
<td>2.95↓↓</td>
<td>0.06</td>
</tr>
</tbody>
</table>

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**EFFICACY TEST FOR “LDPE PLASTIC CHIPS” AGAINST TERMITE SUBTERRANEAN**

**TABLE 3: EVALUATION REPORT**

<table>
<thead>
<tr>
<th>Sample Name</th>
<th>Before Exposure to Termites</th>
<th>After Exposure to Termites</th>
<th>Rating</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONTROL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>3.038</td>
<td>2.850</td>
<td>0.188</td>
</tr>
<tr>
<td>2</td>
<td>3.060</td>
<td>2.989</td>
<td>0.162</td>
</tr>
<tr>
<td>3</td>
<td>3.005</td>
<td>2.900</td>
<td>0.105</td>
</tr>
<tr>
<td>4</td>
<td>3.049</td>
<td>2.989</td>
<td>0.060</td>
</tr>
<tr>
<td>5</td>
<td>3.056</td>
<td>2.995</td>
<td>0.061</td>
</tr>
<tr>
<td>TEST</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>3.067</td>
<td>3.067</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>3.041</td>
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<td>0.00</td>
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<tr>
<td>3</td>
<td>3.058</td>
<td>3.058</td>
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<td>4</td>
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</tr>
<tr>
<td>5</td>
<td>3.055</td>
<td>3.055</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**LABORATORY EXPERIMENTS**

*Director,*

Haffkine Institute
Efficacy Test for "LDPE Plastic Chips" Against Termite Subterranean

**Figure 1: Assessment of Damage of Control LDPE Chips**

- **Legend:**
  - SD
  - Mean

<table>
<thead>
<tr>
<th>WEEKS</th>
<th>2.85</th>
<th>2.90</th>
<th>2.95</th>
<th>3.00</th>
<th>3.05</th>
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<td>4</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

**Figure 2: Assessment of Damage of 3% LDPE Chips**

- **Legend:**
  - SD
  - Mean

<table>
<thead>
<tr>
<th>WEEKS</th>
<th>3.03</th>
<th>3.04</th>
<th>3.05</th>
<th>3.06</th>
<th>3.07</th>
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<tr>
<td>4</td>
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</table>

Director,
Haffkine Institute
EFFICACY TEST FOR “LDPE PLASTIC CHIPS” AGAINST TERMITE SUBTERRANEAN

FIGURE 3: LABORATORY SETUP FOR ANTI TERMITE

FIGURE 4: LABORATORY SETUP FOR SAMPLE EXPOSURE

HITRT/SF/22-00
## EFFICACY TEST FOR “LDPE PLASTIC CHIPS” AGAINST SUBTERRANEAN TERMITES

### TABLE 1: INDIVIDUAL READING OF VISUAL ASSESSMENT OF CONTROL LDPE CHIP

<table>
<thead>
<tr>
<th>SAMPLE No.</th>
<th>IO</th>
<th>OBSERVATION</th>
<th>DOD</th>
<th>Rating</th>
<th>DOD</th>
<th>Rating</th>
<th>DOD</th>
<th>Rating</th>
<th>DOD</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Ok</td>
<td>Ok 100</td>
<td>Ok</td>
<td>100</td>
<td>Ok</td>
<td>100</td>
<td>1st</td>
<td>week</td>
<td>2nd</td>
<td>week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surface nibbling</td>
<td>50</td>
<td>Surface nibbling</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>2</td>
<td>Ok</td>
<td>Ok 100</td>
<td>Ok</td>
<td>100</td>
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<td>100</td>
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<td>week</td>
<td>2nd</td>
<td>week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nest building</td>
<td>75</td>
<td>Nest building</td>
<td>75</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Ok</td>
<td>Ok 100</td>
<td>Ok</td>
<td>100</td>
<td>Ok</td>
<td>100</td>
<td>1st</td>
<td>week</td>
<td>2nd</td>
<td>week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surface nibbling</td>
<td>50</td>
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<td></td>
</tr>
<tr>
<td>4</td>
<td>Ok</td>
<td>Ok 100</td>
<td>Ok</td>
<td>100</td>
<td>Ok</td>
<td>100</td>
<td>1st</td>
<td>week</td>
<td>2nd</td>
<td>week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nest building</td>
<td>75</td>
<td>Nest building</td>
<td>75</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>5</td>
<td>Ok</td>
<td>Ok 100</td>
<td>Ok</td>
<td>100</td>
<td>Ok</td>
<td>100</td>
<td>1st</td>
<td>week</td>
<td>2nd</td>
<td>week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nest building</td>
<td>75</td>
<td>Nest building</td>
<td>75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Key: DOD: Degree of damage, IO: Initial Observation,
Efficacy Test for “LDPE Plastic Chips” Against Subterranean Termites

Table 2: Individual Reading of Visual Assessment of 3% LDPE Chip

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Initial Observation</th>
<th>Observation 1st Week</th>
<th>Observation 2nd Week</th>
<th>Observation 3rd Week</th>
<th>Observation 4th Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>Ok 100</td>
<td>Ok 100</td>
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<td>Ok 100</td>
</tr>
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<td>Ok 100</td>
<td>Ok 100</td>
</tr>
<tr>
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<td>Ok</td>
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<td>Ok 100</td>
<td>Ok 100</td>
<td>Ok 100</td>
</tr>
<tr>
<td>4</td>
<td>Ok</td>
<td>Ok 100</td>
<td>Ok 100</td>
<td>Ok 100</td>
<td>Ok 100</td>
</tr>
<tr>
<td>5</td>
<td>Ok</td>
<td>Ok 100</td>
<td>Ok 100</td>
<td>Ok 100</td>
<td>Ok 100</td>
</tr>
</tbody>
</table>
### EFFICACY TEST FOR “LDPE PLASTIC CHIPS” AGAINST SUBTERRANEAN TERMITES

**TABLE 3: INDIVIDUAL READING OF WEIGHING ASSESSMENT OF CONTROL LDPE CHIPS**

<table>
<thead>
<tr>
<th>SAMPLE NO</th>
<th>INITIAL WEIGHT</th>
<th>1ST WEEK</th>
<th>2ND WEEK</th>
<th>3RD WEEK</th>
<th>4TH WEEK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>3.056</td>
<td>3.056</td>
<td>3.012</td>
<td>2.995</td>
</tr>
</tbody>
</table>

Director,
Haffkine Institute
# EFFICACY TEST FOR “LDPE PLASTIC CHIPS” AGAINST SUBTERRANEAN TERMITES

**TABLE 4: INDIVIDUAL READING OF WEIGHING ASSESSMENT OF 3% LDPE CHIPS**

<table>
<thead>
<tr>
<th>SAMPLE NO</th>
<th>INITIAL WEIGHT</th>
<th>1ST WEEK</th>
<th>2ND WEEK</th>
<th>3RD WEEK</th>
<th>4TH WEEK</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

Director,
Haffkine Institute
APPENDIX V

EFFICACY TEST FOR “LDPE PLASTIC CHIPS” AGAINST SUBTERRANEAN TERMITES

**TABLE 5: MAIN CHARACTERISTICS OF SCALE OF DAMAGE**

<table>
<thead>
<tr>
<th>Degree of damage</th>
<th>Characteristics of damage</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ok</td>
<td>Undamaged*</td>
<td>100</td>
</tr>
<tr>
<td>Nest Building</td>
<td>Formation of nest building on the surface of the test samples.</td>
<td>75</td>
</tr>
<tr>
<td>Surface Nibbling</td>
<td>Surface roughened by the termites but not pitted</td>
<td>50</td>
</tr>
<tr>
<td>Slight Attack</td>
<td>Surface with shallow pits and only in a few, restricted regions</td>
<td>25</td>
</tr>
<tr>
<td>Attack</td>
<td>Surface deeply pitted, shallowly pitted over extensive areas.</td>
<td>10</td>
</tr>
<tr>
<td>Destroyed</td>
<td>Sample perforated</td>
<td>0</td>
</tr>
</tbody>
</table>

* Rating of – 100 – Shall Indicate That the Sample has Successfully Passed the Termite Resistance Test
APPENDIX VI

Efficacy Test for “LDPE Plastic Chips” Against Subterranean Termites

Table 6: Monthly Mean Temperature and Relative Humidity During Study Period

<table>
<thead>
<tr>
<th>Month &amp; Year</th>
<th>Temperature (°C)</th>
<th>Relative Humidity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>October 2011</td>
<td>28.43</td>
<td>0.65</td>
</tr>
<tr>
<td>November 2011</td>
<td>29.33</td>
<td>0.49</td>
</tr>
</tbody>
</table>
EFFICACY TEST FOR "LDPE PLASTIC CHIPS" AGAINST SUBTERRANEAN TERMITES

NOTE

This report (H/SF/RES-004/11) is considered by the Principle investigator as "final report". The Sponsor is requested to review this document and return the same on or before December xx, 2011 with approval and comments, if any, to the investigator failing which the final report will be issued.

Please note:

Any changes to the final report after the date of issue will be in the form of a separate amendment to the report.

Feedback on the Quality of Report

Kindly provide your valuable Feedback to serve you better in future.

Rating on a scale of 1 to 5, with excellent starting from 1

1. Report Presentation
   Language : [ ]
   Clarity : [ ]
   Level of errors : [ ]
   Tabulation : [ ]
   Graphics : [ ]

2. Quality of Scientific inputs and interpretations : [ ]

3. Comments on overall business process with JRF : [ ]

December 05, 2011

SIGN:

\Sponsor:

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HITRT/SF/ Feedback

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