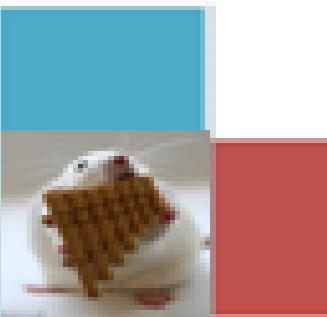


RODREPEL®TM



**Non Toxic
Animal & Bird
Repellent**



WHITE PAPER ON RODREPEL®TM

Rodents are aggressive, active, and adaptable; they have accompanied man throughout the world, travelling with them on ships, boats, deserts *et al.* These minute creatures have wreaked havoc in the functioning of human life. Considering the ugly rodents and the menace that they create, C Tech Corporation has come up with a unique and novel product **Rodrepel®TM**, a **non hazardous and non toxic animal and bird aversive**. The paper deals with why to use these products & how they actually work.

The Problem....

*Ring a ring a rosy, A pocket full of posies.
A-tishoo! A-tishoo! We all fall down.*

The origins of this well known nursery rhyme, sung by all of us in our childhood go back to the **Great Plague of London** perpetrated by the rodents. The numbers may be intriguing for us but it's true, **forty percent of mammal species found on earth are rodents**. On top of that, rats dwell where humans settle because they have learned through the ages that people can provide them with unlimited resources - whether we welcome them or not. The mess created by the rodents has aroused many problems and damages. The gravity of the situation varies from a one day solution to millions of losses.

- Trouble of starting the car in the morning as a rat or a vole has eaten through the cable is



one of the problems faced by every car owner. After spending thousands of dollars on the car it feels annoying to spend more on its maintenance which is not even covered by the insurance companies. Moreover, these dreadful rodents can chew on the engine wires to the tasty tune of **approximately \$1,500 in parts and labour.**



- Rodents are often the direct reason behind the **disruption of underground train services and metro rail services.** *Beijing Subway Once, because mice caused several power outages, the longest outage in a more than 40 minutes, resulting in tens of thousands of passengers trapped in tunnel.*

- *In 1982, Hunan Dongting Nitrogenous Fertilizer Plant, caused by rodents burning transformer short-circuit, resulting in disruption of production, a few days on the loss of millions of NT dollars.* The situation becomes more deadly when the gnawing may leads to fire explosions. *Shanghai Petrochemical Plant in the spring of 1980, a mouse jumped into the power plant due to high voltage switch positions, Deputy bus Knife cause a short circuit, causing lead to water, electricity, gas suddenly interrupted, causing loss of up to 17 million yuan.*
- Rodents significantly damage crop before and after with an estimated 20% of the world's food supply consumed or contaminated each year. **About 23 kilograms (50 pounds) of grain are required to support a rat for a year, but the total amount of grain loss (including spoilage) is about 70 kilograms (150 pounds) per rat per year.**
- World over heritage structures which are the symbol of pride for any country suffer the ignominy of being vandalized by birds who sit on



these heritage structures and make a mess with their pecking, food habits and droppings.

Such incidents which occur clearly disrupt the normal order of production and damage the machinery, and the resulting economic loss is immeasurable.

The Reason....

Going deep into the study of animal behaviour made us realize the bonding between the animals and the plastics. **The bright colours and texture of polymer, the aromatic odour of polymeric products and the plasticizers** used are all responsible for animals being attracted towards plastic goods. In addition, **Rodentia**, an order of mammals also known as rodents, is characterized by two continuously growing incisors in the upper and lower jaws which are kept short by gnawing. Thus to satisfy their own need, they hamper our living.

To come up with a non toxic product, we first explored the conventionally methods used by our ancestors for keeping the rodent away. We identified various types of predator urines which can evoke a fear response within the animal/rodent and we isolated the chemicals directly responsible for this. After extensive number of permutations and combinations followed by extensive trials we could combine them to give an effective concoction which was incorporated in Rodrepel® that has never failed to evoke the necessary fear response within the rodents and other



such common target animals thus keeping them away from the application area.

Despite this there is always a possibility that rodents try and come in contact with the applied area. In such a case incorporated within the Rodrepel®TM chemistry are another set of chemicals which cause severe distress to the mucosa of the rodent and deter the animal from taking the next step forward and gnawing into the area. However the above two steps while extremely effective in keeping away majority of the rodents there are always some experimental rodents who would still sink their teeth into the application. Even in such a case the taste of the compound ends up creating such an unpleasant experience for the rodent that in almost all cases the rodent is automatically kept away from biting into the application again.

However at each point, **we were careful not to include any poisonous products** for animals as in the wild; we could be dealing with endangered species or special animals & birds.

The Solution...

Employing novel techniques and focusing on environmental issues and safety norms are the need for the day and polymer-specific masterbatch for effective rodent aversion is now possible. Rodrepel®TM, a patented non-toxic & non-hazardous product by C-Tech Corporation, has been successful in keeping the rodents away by keeping them away instead of killing them. Rodrepel®TM is available in the form of **universal masterbatches with a recommended addition level of 1-5%** depending on end application.

Rodrepel®TM alters the attractiveness by working on the following 5 principles:

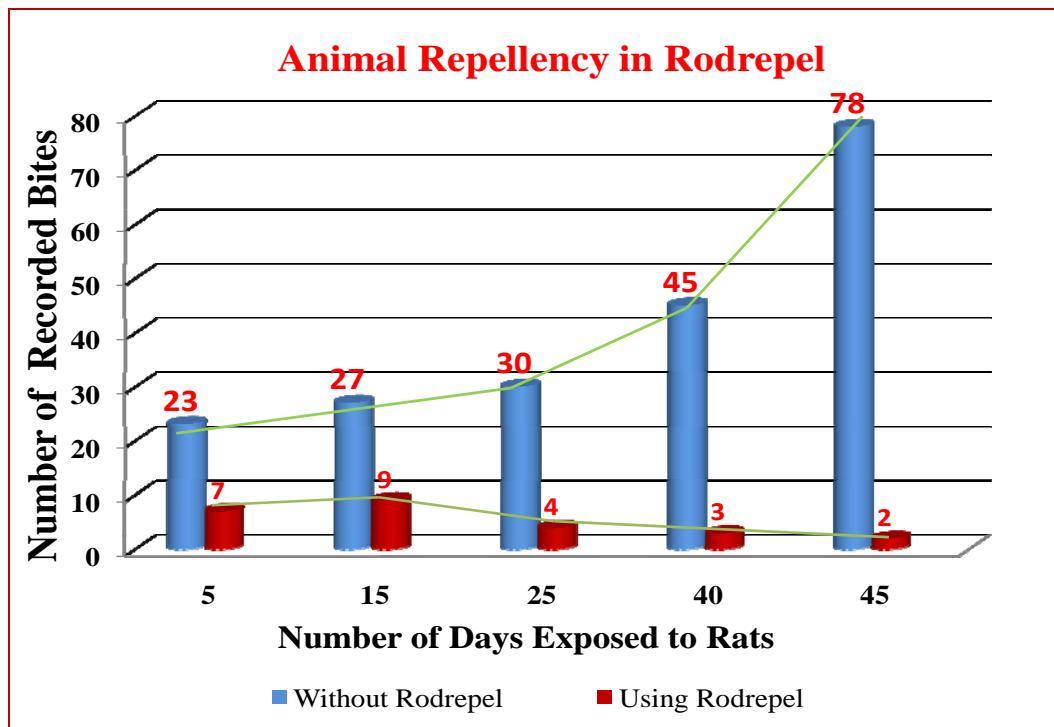
Aversion – By making the cable sheath or plastic component foul in taste.

Discomfort – By causing severe distress to the mucosa of the animal.

Fear - By exploiting the olfactory fear response of the animal.

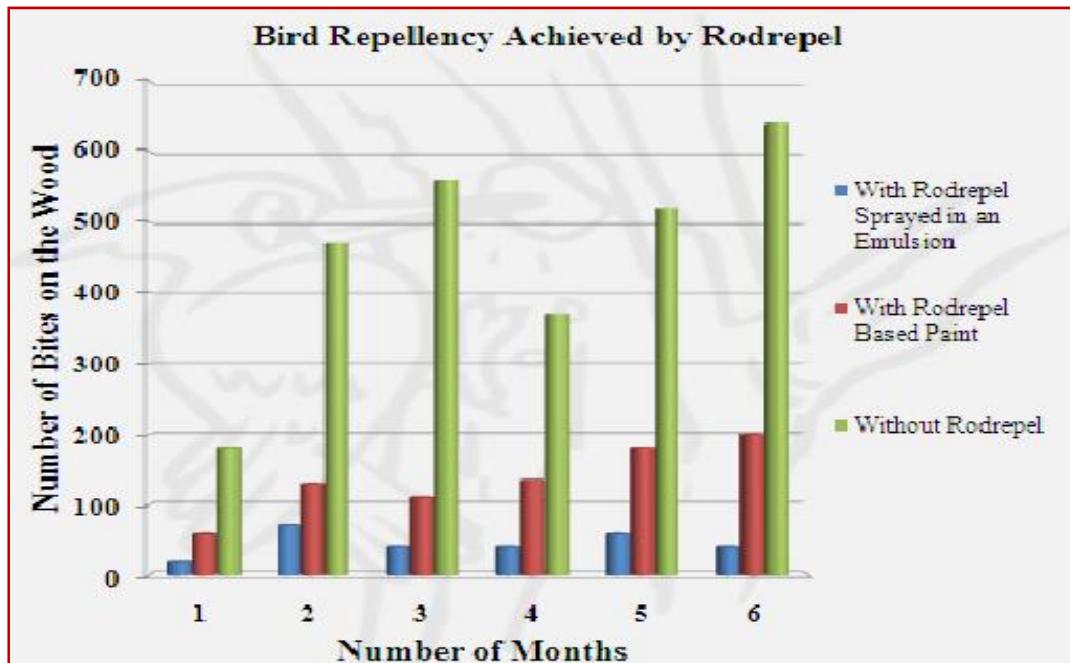
Training – the unpleasant experience leads to behaviour modification and the animal avoids products made with Rodrepel®TM in the future.

Association and Conditioning – The fear response and unpleasant reaction is communicated to other animals in the vicinity.



The graph proves the validity of above principles. The Rodrepel®TM treated cables are less chewed as compared to the untreated cables. Rodrepel®TM is not only effective for rodents but for birds also. The testing was done by

applying Rodrepel®™ on woods by various techniques like coating and spray. The results have shown that Rodrepel®™ is non toxic bird aversive.



The Environment...

Our approach is not to poison the animal or add hazardous chemicals. The term "aversion" means to drive back, ward off, or keep away. We have been working with are completely non other animals. Since **keep the rodents** kill the rodents or doesn't harm any in any way. It is **insecticides, heavy metals** or products such as copper or lead naphthenates, lindane etc or chemicals found dangerous or harmful to several bio actives which toxic to humans as well as **Rodrepel®™ is designed to away effectively and not any other animal; it target or non target species completely free of**



humans or animals. **It does not migrate or leach out from the polymer** to contaminate ground water resources like the conventional rodenticides.

The Gist...

The issue of protection of polymeric goods from recurring attacks by rodents causing huge damages and economic losses; is global. Current rodenticides come along with their set of drawbacks including human health hazards and environmental hostility. Thus rodent aversion options based on natural extracts like, **Rodrepel™® form better, safer and cost effective alternatives for rodent protection.**

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