



## INTRODUCTION

The Anti moth patch consists of a small cushion plaster (patch) containing a blend of 4 essential oils (Red-cedar, Citronella, Camphor, Clove).

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Moths have perfectly adapted to anthropozied environments, thriving by evolution in many different species.

They have developed a very peculiar physiological mechanism concerning protein digestion. Proteins are the main components of animal and vegetal fibers along with cellulosa.

### MOTH REPELLENT SUBSTANCES

For a while it was thought to solve the problem of moths through synthetic products (chlorinated, phosphorated or arsenicated compounds, naphthalene etc.).

The increasing development of an ecological consciousness however is more and more against the use of those products because of their toxicity (for man and environment) in favour of the use of natural substances.



## ROLE OF ESSENTIAL OILS

The essential oils of some plants help to keep insect away from our houses, clothes and even our body with the great advantage of being completely natural and harmless.

A particular sensitivity of insects is shown as regards some terpenes, especially sesquiterpenes, and some alcohols like citronellol and geraniol.

These substances are the main components of the essential oils of Citronella, Camphor, Clove and Red Cedar which are described here under.

### 1. CITRONELLA ESSENTIAL OIL

The essential oil of Citronella originates from a plant, *Cymbopogon nardus*, which grows in South Asia.

A greenish-yellow essential oil with a strong citrus smell is extracted from leaves by distillation. The plant is named Citronella because of its particular aroma, which is very close to lemon.

The earliest studies on citronella as an insect repellent were developed by J.B. STUTH in 1901.

A good insect repellent substance seems to act directly on the chemosensitive system of insects causing different reactions such as escaping, confusion, no localization of a food source, which is hidden by the repellent substance aroma.



## 2. CAMPHOR ESSENTIAL OIL

Camphor essential oil is derived from trunk and leaves of *Laurus camphor* L. (cinnamomum camphor), of the Lauraceae family. It is extracted by distillation.

Camphor oil components are very efficient against moths of both families.

If exposed to camphor, Dermestidae become drowsy and don't recover until they die even though the exposition ceases.

Camphor is probably efficient also against insects which had become resistant to DDT, p-dichloro-benzene and other chemical insecticides.

In the case of Tineidae, the use of this essence is recommended as a very efficient preventive to the arrival and settlement of insects in the clothes avoiding eggs lay, which the larvae are originated from.

## 3. RED CEDAR ESSENTIAL OIL

Red cedar oil is obtained from the wood of many species belonging to the Cupressaceae family. It is extracted by distillation.

Red Cedar essential oil contains mainly pinipicrine, terpene carbides, tannin and alcohols (citronellol, geraniol, terpineoln, sabinol).

These compounds are very efficient against Tineidae and Dermestidae. Sesquiterpenes act very efficiently as moth repellents; some of them have shown a strong efficacy as antifeedants for many Dermestidae larvae.

Some adult insects have shown to escape substances containing sesquiterpenes. Red cedar oil, inhibits the reproductive and development cycle of many insects. Moths are among them.



#### 4. CLOVE ESSENTIAL OIL

Clove essential oil is obtained by distillation from the dried fruits of the homonymous tree (*Eugenia caryophyllata* thumb. *Syrygium aromaticum*) which belongs to the Myrtaceae family.

The oil is employed because of its aroma. It was used as a spice in China since 3rd century B.C. and was introduced into Europe in the Middle Age.

Clove essential oil main components are Eugene and caryophillene whose amounts are about 85%.

These hydrocarbides are chemically sesquiterpenes and have a strong efficacy as insect repellent.

Many studies are in fact reported in literature which show the efficacy of terpenes against many Dermestidae species and *Tineola bisselliella*.

Clove is commonly used in our food as a spice.

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