Nano Repellent is a blend of encapsulated essential oils. It has a prolonged release, ensuring repellent full protection for up to 2 hours for the user with just one application. Blend encapsulation through the Nanovetores Technology allows the stabilization of sensitive components, complex of being formulated in their free format. The usage of the product promotes repellency of mosquitoes in general, and due to its natural characteristics and no toxicity or chemical aggression, it ensures daily protection and safety for users.

**Active ingredients:** Essential oils of citronella and rosemary.

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**Features**

- **Aspect:** Milky liquid from white to cream.
- **Usage Concentration:** 5 to 10%
- **pH stability:** 2.5 to 7.0
- **Solubility:** Water Dispersible
- **Particle:** Lipid
- **Release Trigger:** Enzyme

**Benefits**

- Mosquito repellent
- Moisturizer

**Usage**

- Creams and body sprays.
Nano Repellent is a blend of active ingredients encapsulated in lipid nanoparticles, with an enzymatic release trigger.

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Citronella (Cymbopogon winterianus) is a grass grown in tropical and subtropical regions, whose oil extracted from its leaves is used as an insect repellent with insecticide, fungicide and bactericide action. These properties are attributed to the presence of volatile substances in its leaves, such as citronellal, eugenol, geraniol and limonene, among others, generally known as monoterpenes. Studies conducted with the oil of this plant demonstrated its insecticide and repellent action against mosquitoes and flies (OLIVO et al. 2008). As it is highly volatile, citronella oil quickly loses its repellent activity - estimated action time between 1-2 hours (THORSELL et al., 1998; SRITABUTRA et al., 2011) significantly losing its properties after 30 minutes. To provide high protection levels, large citronella oil concentrations are required, e.g., at a concentration of 10% protection rate reaches 99%, but this protection lasts on average 20 minutes, no longer than 60 minutes (FRADIN; DAY 2002; BUENO; ANDRADE, 2010). Moreover, some components have caused irritation for skin and eyes (THORSELL et al., 1998). Encapsulation nullifies the potential harmful effects of citronella.

Rosemary (Rosmarinus officinalis) is a plant of the Lamiaceae family, native to the Mediterranean region. It is used worldwide as a condiment in numerous food and has several pharmaceutical indications. Its essential oil is rich in monoterpenes α and β-pinene, substances with great repellent potential for several species of insects (RIBEIRO et al., 2012; FÁVERO, 2014).

The repellent activity of the Nano Repellent works against mosquitoes in general. The encapsulation of these oils in particles promotes a sustained and controlled release effect of the active ingredients, increasing the product’s effectiveness and reducing the risk of irritation (NERIO et al., 2010; SENHORINI et al, 2012).

Effectiveness Test

Objective: Determine whether the test article presents repellent activity and its residual activity time

Aedes aegypti sting attempts (%) Hand after applying base cream

Unprotected hand

Time after product application

Conclusion: The formulation containing 10% Nano repellent is classified as a repellent, with residual activity greater than 120 minutes.

References

Regulatory Information

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<th>CAS NUMBER</th>
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Approved by International Regulations:

- Brazil - Anvisa
- China - IECIC
- Europe - EC Cosing
- USA - CIR
- Australia - AICS Inventor

Physical-Chemical Information

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<tr>
<td>COLOR</td>
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<td>SOLUBILITY</td>
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<tr>
<td>CHARACTERIZATION</td>
<td>BLEND</td>
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</tbody>
</table>

+ As it contains natural active ingredients, the product may change in color and odor.

Storage:
- KEEP AT ROOM TEMPERATURE, AROUND 25°C.

Incompatibility:
- ETHANOL AND OTHER ORGANIC SOLVENTS.

Compatibility:
- EMULSIONS O/W AND W/O TO 25%. IN ENAMELS UP TO 5%.

Nanovetores Encapsulation Technology

Monodispersity: that ensures control of the particle size, providing adequate permeation to its proposed action.

Enzymatic Specific Trigger Release, where enzymes present on the skin disintegrate particles, releasing the active ingredient specifically.

Secure particles larger than 200nm, biocompatible and biodegradable.

Active Ingredient Protection against oxidation resulted from interaction with external environment and other components of the cosmetic formulation.

Water Base. Active ingredients are manufactured without the use of organic solvents, ensuring safety for users and the environment.

Use Encapsulated Active Ingredients and Ensure:

- Stability Improvement
- Increased compatibility in the formulation
- Occlusion of odors
- Reduced dose
- Use of sensitive active ingredients (without refrigeration)
- Increased Solubility
- Prolonged release
- Increased effectiveness