

## **AN INSECTICIDE CHEMICAL SPRAY COMPRISED OF ETHANOL AND TURMERIC (*Curcuma longa*) RHIZOME**

### **Technical Field of the Utility Model**

5           The present utility model relates generally to a chemical spray but more particularly to a composition of an insecticide chemical spray comprised of ethanol and turmeric (*Curcuma longa*) rhizome.

### **Background of the Utility Model**

10           Turmeric (*Curcuma longa*) is rhizomatous perennial herb of Zingiberaceae found mainly in South East Asia. It is used for its flavoring properties as a spice food preservative and food coloring agent. Turmeric (*Curcuma longa*) has a well-known therapeutic history in home remedies and in Indian traditional medicine system due to variety of important beneficial  
15           properties. Natural products from turmeric (*Curcuma longa*) have been reported for analgesic, antibacterial, antifungal, anti-inflammatory, antioxidant, and digestive properties. However, turmeric (*Curcuma longa*) is also well reported for its insecticidal properties against certain pests of agricultural and household insect pest. It shows potential repellent effect against noxious  
20           mosquito species. Study shows turmeric (*Curcuma longa*) products as natural environment friendly economical alternative to chemical pesticides (Kumar *et al.* 2017).

            Turmeric (*Curcuma longa*) has medicinal properties such as anti-inflammatory, spasmolytic, antiparasitic, antibacterial, antiarthritic, carminative,  
25           Laxative, Tonic, Diuretic etc (Pawar, 2013). He even concluded in his experiment that turmeric (*Curcuma longa*) has to be further investigated for developing an ecofriendly insect control pesticides which can used in Integrated Pest Management.

The prior art with a patent number AU2011375107B2 by Indra Baruah, Pronobesh Chattopadhyay, Anurag Pandey, and Lokendra Singh of Australia discloses an invention anti-termite biological formulation and a process for the preparation thereof, a biological formulation comprising: 10 to 60% of an aqueous seed extract of *cuminum cyminum*, 5-30% of essential oil of *curcuma aromatica* and 10-45% of secondary metabolites isolated from *Pseudomonas aeruginosa* along with not more than 12% of an inert carrier.

With the bases in the prior art. It utilizes aqueous seed extract of cumin, essential oil extract of *curcuma aromatica* and metabolites from *Pseudomonas aeruginosa*. However, the presented prior art utilizes Cumin which is not available locally. *Curcuma aromatica* on the other hand is an endangered species and the rate of rhizome production is slow. Hence, the present utility model replaced *Curcuma aromatica* with *Curcuma longa* which is abundantly growing in the local condition. Moreover, there is a year round production of *Curcuma longa* which can sustain the production throughout the year.

It is therefore the main object of the present utility model is to provide a composition of an insecticide chemical spray comprised of ethanol and turmeric (*Curcuma longa*).

More particularly, the product utilizes ethanol which is commonly found in beauty products. Furthermore, ethanol represents one of the safest methods for extraction of essential oils from plant and biomass. Ethanol is labeled by the FDA as a Generally Recognized as Safe (GRAS) substance, which means that a panel of qualified experts determined that ethanol is safe to use even in food products.

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### **Summary of the Utility Model**

The present utility model provides a composition for preparing an insecticide chemical spray comprising ethanol and turmeric (*Curcuma longa*) rhizome extract. The technical solution addresses the limitations of prior-art formulations by utilizing *Curcuma longa*, which is locally abundant and renewable, and ethanol, which is a safe and effective extraction solvent.

The advantages of the utility model include: (a) use of plant-based, biodegradable ingredients; (b) reduced reliance on synthetic chemical pesticides; (c) utilization of locally available raw materials; (d) simplicity of preparation without the need for complex chemical processes; and (e) suitability for household and small-scale agricultural insect control applications. These features make the utility model environmentally friendly, economical, and easy to adopt.

### Detailed Description

The preparation of an insecticide chemical spray comprised of ethanol and turmeric (*Curcuma longa*) includes the following materials:

<u>components</u>	<u>quantity</u>
turmeric ( <i>Curcuma longa</i> ) rhizome	100 grams
ethanol	400 grams

The composition is needed for the following steps of producing an insecticide chemical spray comprised of ethanol and turmeric (*Curcuma longa*) rhizome:

- a. wash the turmeric (*Curcuma longa*) rhizome to remove any lingering soil debris and clinging dirt;
- b. peel the turmeric (*Curcuma longa*) rhizome and thinly slice the peeled rhizome;
- c. dry the sliced turmeric (*Curcuma longa*) using a vacuum dryer for 24 hours at a temperature of 50°C;
- d. ground the dried turmeric (*Curcuma longa*) into powder form using an electric powered grinder or blender;
- e. using a graduated cylinder, individually measure 400 grams ethanol and keep separately in a beaker;
- f. mix 100 grams ground turmeric (*Curcuma longa*) rhizome into 400 grams ethanol;
- g. keep the mixture for 24 hours at a shaker;

h. filter the mixture using a four layered cheese cloth producing the extract ready for application; and

i. keep the extracted solution in a glass container and is ready to be used.

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