AN INSECTICIDE CHEMICAL SPRAY COMPRISED OF ETHANOL AND NEEM TREE (*Azadirachta indica*) LEAVES

Technical Field of the Utility Model

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 neem tree (*Azadirachta indica*) leaves.

Background of the Utility Model

The neem tree (*Azadirachta indica*) is native to Southeast Asia where it is a fast growing ornamental shade tree. For thousands of years, farmers have been aware of the insecticidal properties of the neem tree (*Azadirachta indica*). Its branches were hung in granaries to protect stored grain from insect attack. Historically, neem (*Azadirachta indica*) has also been used for both cosmetic and medicinal purposes. Since the 1970s, scientists in Europe and the United States became interested in neem (*Azadirachta indica*) because of its insecticidal properties plus its low toxicity to mammals (Conklin, 2011).

Azadirachtin is a chemical found in neem tree (*Azadirachta indica*) which acts as a feeding deterrent to insects and is found in all parts of the neem tree (*Azadirachta indica*). More than 60 insect pests may be affected by azadirachtin including aphids, beetles, caterpillars, lace bugs, leafhoppers, leafminers, mealybugs, psyllids, thrips and whiteflies. Azaderichtin also disrupts molting and reproductive processes. Since azadirachtin has a number of different modes of action. It is less likely that insects or pathogens will develop resistance to neem (*Azadirachta indica*) products compared to materials with a single mode of action. (Conklin, 2011).

The prior art with a patent number CN102986743A by Ma Jianju, Huang Geng, Ding Chengfeng, Liu Yan, Zhang Yong, Zhu Xincheng of Chengdu Green Gold High-Tech Co Ltd of China discloses an invention of neem (*Azadirachta indica*) insecticide for controlling root-knot nematodes. The said insecticide is composed of the following components in percentage by weight: 0.1-3% of azadirachtin, 3-10% of neem (*Azadirachta indica*) oil, 0.5-8%

of abamectin, 10-15% of nonyl phenol polyoxyethylene ether, 3-10% of methanol and 60-80% of rosin based plant oil.

With the bases in the prior art, it utilizes neem (*Azadirachta indica*) and methanol and rosin oil. Methanol however is more expensive than ethanol and is better to be used as extracting medium since it has the ability to dissolve both polar and non-polar compounds.

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 neem tree (*Azadirachta indica*) leaves.

More particularly, the product utilizes ethanol which is safer than methanol since ethanol 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 in food products.

Summary of the Utility Model

The present utility model discloses a chemical insecticide spray produced by extracting dried neem (*Azadirachta indica*) tree leaves using ethanol. The ethanol functions both as an extraction medium and as a carrier solvent for application.

The neem (*Azadirachta indica*) leaves are dried, pulverized, and soaked in ethanol for a predetermined period to extract insecticidal compounds such as azadirachtin. The resulting solution is filtered to produce a ready-to-use sprayable insecticide.

Compared to prior art, the utility model: eliminates methanol and synthetic additives; utilizes ethanol, a safer and GRAS-listed solvent; employs neem (*Azadirachta indica*) leaves alone, avoiding the need for purified azadirachtin or neem (*Azadirachta indica*) oil; provides a straightforward preparation process, suitable for local production.

Detailed Description

The preparation of an insecticide chemical spray comprised of ethanol and neem tree *(Azadirachta indica)* leaves includes the following materials:

components	quantity
neem tree *(Azadirachta indica)* leaves	100 grams
ethanol	400 grams

The composition is needed for the following steps of producing an insecticide chemical spray comprised of ethanol and neem tree *(Azadirachta indica)* leaves:

a. dry the neem tree *(Azadirachta indica)* leaves using a vacuum dryer for 24 hours at a temperature of $50^{O}C$;
b. ground the dried leaves into powder form using an electric powered grinder or blender;
c. using a graduated cylinder, measure 400 grams ethanol and keep separately in a beaker;
d. mix 100 grams ground neem tree (*Azadirachta indica*) leaves into 400 grams ethanol;
e. keep the mixture for 24 hours at a shaker;
f. filter the solution using a four layered cheese cloth producing the extract ready for application; and
g. keep the extracted solution in a glass container and is ready to be used.