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Sales dept.
Product ref: PYRETHRUMNAT/V2
Date: 28/05/11

Name: PYRETHRUM EXTRACT NATURAL

1.Type: Natural extract from Pyrethrum (Chrysanthemum cinerariaefolium, Family Asteraceae)



2.Technical data:

Typical analysis
Pyrethrin content 50.17 + - 1.24 %
Pyrethrin I: 29.45 + - 0.74 %
Pyrethrin II: 20.72 + - 0.51 %
Ratio PYI / PYII : 1.42
Flash point: > 61 °C (ASTM D3278-96)

3. Description

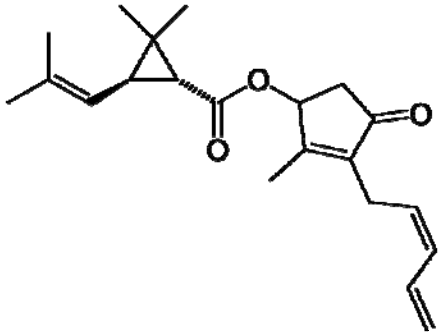
Pyrethrum was used for centuries as an insecticide, and as a lice remedy in the Middle East (Persian powder, also known as "Persian pellitory"). It was sold worldwide under the brand Zacherlin by Austrian industrialist J. Zacherl.

The flowers should be dried and then crushed and mixed with water. It should be noted that though the pesticide is organic, it can still be harmful to humans.

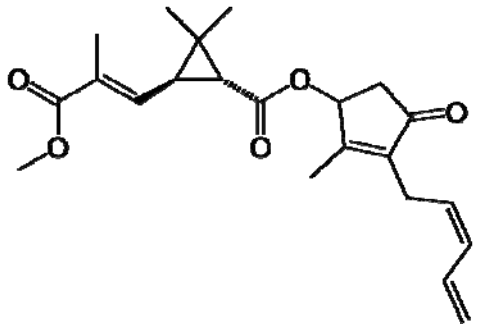
- Pyrethroids are synthetic insecticides based on natural pyrethrum (pyrethrins); one common example is permethrin. A common formulation of pyrethrin is in preparations containing the synthetic chemical piperonyl butoxide: this has the effect of enhancing the toxicity to insects and speeding the effects when compared with pyrethrins used alone. These formulations are known as *synergized pyrethrins*.

- Because of the natural insecticidal properties of the pyrethrums, they are used as companion plants, to repel pest insects from nearby crops and ornamental plants. They are thought to repel aphids, bed bugs (cimex lectularius), leafhoppers, spider mites, harlequin bugs, ticks, pickleworms and imported cabbage worms, among others that are in gardens and farms. For example, they are planted among broccoli plants for protection from several common insect pests.

4. Chemical formula:



Pyrethrin I



Pyrethrin II

The **pyrethrins** are a pair of natural organic compounds that have potent insecticidal activity. Pyrethrin I and pyrethrin II are structurally related esters with a cyclopropane core, (+)-*trans*-chrysanthemic acid in the case of pyrethrin I. They differ by the oxidation state of one carbon. They are viscous liquids that oxidize to become inactivated. They are non-persistent, being biodegradable, and break down on exposure to light or oxygen. The chemical structure of pyrethrins is the basis for a variety of synthetic insecticides called pyrethroids such as bifenthrin, permethrin, and cypermethrin.

The pyrethrins are contained in the seed cases of the perennial plant pyrethrum (*Chrysanthemum cinerariaefolium*), which is grown commercially to supply the insecticide. Although extracts of the plant were already used as insecticide, the structure was first published by Hermann Staudinger and Lavoslav Ružička in 1924.Pyrethrins are neurotoxins that attack the nervous systems of all insects. When present in amounts not fatal to insects, they still appear to have an insect repellent effect. Pyrethrins are gradually replacing organophosphates and organochlorides as the pesticide of first choice.

5. Toxicity:

The United States Department of Agriculture has stated that synergized pyrethrum " is probably the safest of all insecticides for use in food plants " and that " a pyrethrum formulation is approved for use around foodstuffs." All pyrethrins are easily hydrolyzed and degraded by stomach acids in mammals, so toxicity following ingestion by pets is very low. However, pyrethrins are dangerous for fish. Toxicity is usually associated with applying much more of the product than directed. Care should be taken to observe direction labels when using this substance around humans and animals. Overdose and toxicity can result in a variety of symptoms, especially in pets, including drooling, lethargy, muscle tremors, vomiting, seizures and death.Toxicity symptoms in humans include asthmatic breathing, sneezing, nasal stuffiness, headache, nausea, incoordination, tremors, convulsions, facial flushing and swelling, and burning and itching sensation. Permethrin and other pyrethroids are synthetic versions of pyrethrin which have much greater potential for causing toxicity. The latest information regarding toxicity of piperonyl butoxide has determined that it can pose a distinct health risk when it becomes airborne and pregnant women are exposed during the third trimester. This leads to delayed mental development in young children. A 2011 study found a significant association between piperonyl butoxide (PBO), a common additive in pyrethroid formulations, measured in personal air collected during the third trimester of pregnancy, and delayed mental development at 36 months. Children who were more highly exposed in personal air samples (≥4.34 ng/m3) scored 3.9 points lower on the Mental Developmental Index than those with lower exposures. The lead researcher stated, "This drop in IQ points is similar to that observed in lead exposure. While perhaps not impacting an individual's overall function, it is educationally meaningful and could shift the distribution of children in the society who would be in need of early intervention services."

6. Stability:

Stability: Unstable in the light which increases the oxidation in the presence of air
Quickly hydrolysed in alkaline pH

7. Analytical method:

- Analytical reference method :GLC (AOAC 1995)
- Extracts determination: titrimetry (AOAC 1995).