Bug-Wise

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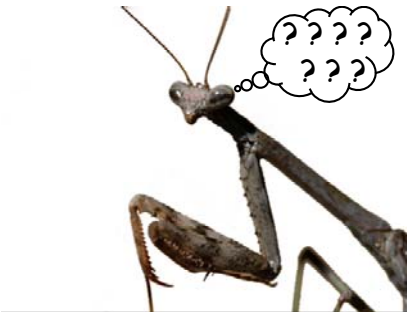

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Pyrethrum, Pyrethrins, Pyrethroids, Permethrin, What's the Difference?: There are many insecticide products available for homeowner use that contain pyrethrum, pyrethrins, permethrin, or some other pyrethroid. Given the similarity in names, it is easy to get these active ingredients confused, but there are important differences. Hopefully the following notes will help clarify the differences.

Pyrethrum: Pyrethrum is a botanical insecticide produced by grinding the flower heads of certain species of chrysanthemums, sometimes referred to as the pyrethrum daisies. Although there are a few other species that have insecticidal properties, *Chrysanthemum cinerariaefolium* is the most widely cultivated. The painted daisy, *C. coccineum,* also contains significant amounts of pyrethrum, but most of the ornamental chrysanthemums we grow here in the US do not have insecticidal properties. Pyrethrum is one of the first insecticides ever used. According to some reports it has been used since the first century AD. During the early 1800s it was known as Persian powder and was used for control of lice and fleas. Because of its low mammalian toxicity and botanical source, pyrethrum remains a popular organic insecticide today. The majority of the world's supply of pyrethrum is produced in Kenya where it is primarily grown as a cash crop on small farms. The majority of the world's pyrethrum production is sold to the US.

Pyrethrins: Pyrethrins are the actual insecticidal compounds found in pyrethrum. There are several active compounds: pyrethrin I, pyrethrin II, cinerin I, cinerin II, jasmolin I and jasmolin II. Collectively, these active compounds are referred to as 'pyrethrins'. Pyrethrins work as contact insecticides and act on the nervous system of most insects to provide quick 'knockdown', although some insects may eventually recover. The effectiveness of pyrtherins can be improved considerably by combining them with a synergist such as piperonyl butoxide (PBO). However, when an inorganic synergist is combined with pyrethrins, the resulting insecticide can no longer be considered to be "organic" and pyrethrins + PBO cannot be used in "certified organic production." There are relatively few commercial homeowner products that contain pyrethrins only, with no synergist, but there are many commercially available homeowner products that contain pyrethrins + PBO (or some other synergists). These are sold as aerosol sprays, total release aerosols, ready-to-use sprays, and in other formulations. One of the key disadvantages/advantages of pyrethrins is that they breakdown quickly when exposed to sun light, and thus provide very short residual activity.

Pyrethroids: Pyrethroids are 'pyrethrin-like' compounds that have been chemically synthesized based on the structure of pyrethrin molecules. Allethrin was one of the first synthetic pyrethroids to be commercially produced, but there are many others. Examples include resmethrin, tetramethrin, permethrin, cypermethrin, tralomethrin, deltamethrin, cyfluthrin, cyhalothrin, esfenvalerate, bifenthrin, and many others. Synthetic pyrethroids are not acceptable for organic production, but they do have some key advantages over natural pyrethrins. In particular, they provide higher levels of insect control and longer residual control.

Permethrin: Permethrin is just one of many different synthetic pyrethroid insecticides available today. It was the first pyrethroid to be widely used in commercial row crops and vegetables (as Pounce or Ambush) but in recent years it has been replaced in these markets by 'second' and 'third generation' pyrethroids, such as zetamethrin (Mustang Max), bifenthrin (Brigade) and others. Permethrin is one of the most widely labeled insecticides available for use in the homeowner market. It is sold under many

different brand names and in a number of different formulations. Depending on the formulation and label, permethrin is used for insect control in home vegetables, insect control in lawns and on ornamental plants, for control of fleas and other indoor pests, as a treatment for head lice, and many other uses.

Other Pyrethroids: In recent years, many of the second and third generation pyrethroids have been labeled for homeowner use, and this has given homeowners access to some very effective insecticides. Pyrethroids are highly effective against a wide range of insect pests, have relatively low toxicity to mammals, and provide relatively long-term residual control. This makes them ideal insecticides for many homeowner uses, both outdoors and indoors.

In outdoor settings pyrethroids are effective against a wide range of insect pests on vegetables and ornamental plants. Pyrethroids are the "shot guns" in the homeowner insecticide arsenal. However, there are some pests that pyrethroids will not control, and the pests they do not control, they usually make worse, or "flare." Pests that are easily flared by pyrethroid sprays include spider mites, whiteflies, and aphids, as well as certain caterpillars.

Many of the pyrethroids are also marketed as "ready-to-use" sprays for control of indoor pests. The following table lists a few of the more common ready-to-use pyrethroid products available for indoor pest control. Note that, unless the label indicates otherwise, pyrethroids labeled for indoor use should not be used on plants and products labeled for outdoor use on plants should not be used indoors. Even though two products may have the same active ingredient, they may have different carriers/inert ingredients that can damage plants, stain flooring, or cause other problems if used off label. Always follow label directions when using any pesticide.

Ready-to-use Indoor Pyrethroid Insecticides

Active Ingredient (Concentration)	**Brand Name (Example)**	**Kitchen Use ***
Bifenthrin (0.05%)	Ortho Home Defense Max	*Yes*
Cyfluthrin (0.05%)	Bayer Home Pest Control Indoor & Outdoor Insect Killer	*Yes*
Deltamethrin (0.02%)	Bonide Household Insect Control	Yes
Lambda-cyhalothrin (0.03%)	Spectracide Bug Stop Indoor Outdoor Insect Killer	Yes

* Can be used in kitchen areas if appropriate precautions are taken. Read product label before spraying.

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This information is for educational and preliminary planning purposes only. Brand names mentioned in this publication are used as examples only. No endorsement of these products is intended. Other appropriately labeled products containing similar active ingredients should provide similar levels of control. Always read and follow the insecticide label.