Flea & Tick Active Ingredients

Drs. Foster & Smith Educational Staff

There are more flea and tick products available today than ever before. Provided below is a brief description of the various categories of active ingredients found in today's flea and tick preventives. Also see our Flea & Tick Product Comparison Chart, which provides a more detailed overview of products containing these ingredients.

Pyrethrins -

Pyrethrins, made from extracts of chrysanthemum flowers, have been in use for over 100 years and are one of the most common ingredients in flea and tick control products. Pyrethrins affect the nervous system of insects by influencing the flow of sodium out of nerve cells. This results in repeated nerve firing, and the insect dies. Pyrethrins are used to control ticks, fleas, lice, and mosquitoes.

Pyrethroids (permethrin, phenothrin, etofenprox, fenvalorate) -

Pyrethroids are synthetic relatives of natural pyrethrins. They are made in a laboratory and have a longer-lasting effect than pyrethrins. Examples of pyrethroids include permethrin (found in Bio Spot® ACTIVE CARE SPOT ON® for Dogs and K9 Advantix®) and etofenprox (found in Bio Spot® ACTIVE CARE SPOT ON® for Cats). Pyrethroids are often used in the environment to kill and repel ticks, fleas, lice, and mosquitoes. Many pyrethroids cannot be used on cats, so be sure to check the label for safety. Etofenprox (Bio Spot® ACTIVE CARE SPOT ON® for Cats) is a pyrethroid that is labeled safe to use on cats.

Fipronil -

Fipronil (found in FiproGuard™ for Dogs and Frontline® Plus) is the most commonly used ingredient in a relatively new group of synthetic insecticides called arylheterocycles. These compounds block the passage of chlorine through cells in the insect's nervous system, causing paralysis. In FiproGuard™ for Dogs and Frontline® Plus, fipronil is mixed with an oil carrier, and collects in the sebaceous (oil) glands of the skin, then is slowly released. Because of this, it is water-resistant. Fipronil gives excellent protection against ticks, and adult fleas, but does not prevent flea eggs and larvae from developing. For protection against

*Unauthorized use of any images, thumbnails, illustrations, descriptions, article content, or registered trademarks of **Foster & Smith, Inc.** is strictly prohibited under copyright law. Site content, including photography, descriptions, pricing, promotions, and availability are subject to change without notice. These restrictions are necessary in order to protect not only our copyrighted intellectual property, but also the health of pets, since articles or images that are altered or edited after download could result in misinformation that may harm companion animals, aquatic life, or native species.*

all stages of the flea life cycle, we recommend Frontline® Plus, which contains fipronil plus the Insect Growth Regulator methoprene, described below.

Insect Growth Regulators (methoprene, pyriproxyfen (Nylar™), fenoxycarb) -

Insect Growth Regulators (IGR's) differ from traditional flea product ingredients because their main activity is against the immature forms of the flea, not the adults. IGR's mimic juvenile growth hormone, a substance that keeps the flea from developing. Normally, juvenile growth hormone decreases over time and the flea eggs and larvae mature. IGR's keep this development from occurring and the immature fleas fail to molt and they die. Insect growth regulators are found in products such as Frontline® Plus, Bio Spot® ACTIVE CARE SPOT ON® for Dogs, and Bio Spot® ACTIVE CARE SPOT ON® for Cats. Because IGR's do not kill adult fleas, it is important to make sure that the product you are using also contains an adulticide.

Methylcarbamate -

Carbamate insecticides function by inhibiting acetylcholinesterase, an enzyme necessary for normal nerve function. The insect's nerves continue to fire repeatedly, and it dies.

Imidacloprid -

Imidacloprid (found in Advantage® II and K9 Advantix®) interferes with the nerve conduction system of insects, by blocking the insects' nerve receptors. It kills fleas but does not have activity against ticks. Therefore, the dog product K9 Advantix® also contains an ingredient (permethrin) that works against ticks. Advantage may be used on cats or dogs, but K9 Advantix should **NOT** be used on cats.

Amitraz -

Amitraz is an ingredient that is used as a dip to treat demodectic mange. It has also been shown to be highly effective as an ingredient in canine tick collars, such as Preventic collars. Most ticks are killed by Amitraz before they attach or if they do attach, they are killed in less than 24 hours, thus preventing the transfer of Lyme disease. Do NOT use Amitraz on cats.

Selamectin -

Selamectin is the active ingredient in the prescription product Revolution®. Selamectin kills parasites by blocking nerve signal transmission. Revolution is absorbed through the skin and enters the bloodstream, where it protects against heartworm disease. It passes into the gastrointestinal tract where it kills certain parasites, and passes onto the hair and skin providing protection against fleas, flea eggs and certain types of mites and ticks.

Nitenpyram -

*Unauthorized use of any images, thumbnails, illustrations, descriptions, article content, or registered trademarks of **Foster & Smith, Inc.** is strictly prohibited under copyright law. Site content, including photography, descriptions, pricing, promotions, and availability are subject to change without notice. These restrictions are necessary in order to protect not only our copyrighted intellectual property, but also the health of pets, since articles or images that are altered or edited after download could result in misinformation that may harm companion animals, aquatic life, or native species.*

Nitenpyram is the active ingredient in Capstar®, an oral flea control product. Capstar starts killing adult fleas on your pet within 30 minutes. It can be used on pregnant or nursing dogs and cats, and is safe for puppies and kittens 4 weeks and older. It can be very useful in situations such as prior to surgery, boarding or grooming or after a trip to the park. However, it will not work for ongoing control as the medication is out of the animal's system within 24 hours. Therefore, we recommend following up a day later with an application of Frontline® Plus for Dogs or Frontline® Plus for Cats.

Citrus Extracts (Linalool, d-limonene) -

Citrus extracts are derived from the fresh peels of citrus fruits, and have an effect on the nervous system of insects.

Synergists (piperonyl butoxide, N-octyl bicycloheptene dicarboximide (MGK 264)) -

Synergists are compounds that help to increase the effectiveness of another active ingredient in a product. For example, piperonyl butoxide helps slow degradation of pyrethrins by the insect's metabolism. Both piperonyl butoxide and N-octyl bicycloheptene dicarboximide are used to enhance the effectiveness of pyrethrins.

Sodium lauryl sulfate (Natural Flea Control) -

Detergent-like nontoxic flea and tick control.

Spinosad (Rx Comfortis) -

Derived from a naturally-occurring bacterium in the soil. When the flea is exposed to this fast acting insecticide, it over-stimulates the insect's nervous system, causing death. Effective against fleas.

*Unauthorized use of any images, thumbnails, illustrations, descriptions, article content, or registered trademarks of **Foster & Smith, Inc.** is strictly prohibited under copyright law. Site content, including photography, descriptions, pricing, promotions, and availability are subject to change without notice. These restrictions are necessary in order to protect not only our copyrighted intellectual property, but also the health of pets, since articles or images that are altered or edited after download could result in misinformation that may harm companion animals, aquatic life, or native species.*