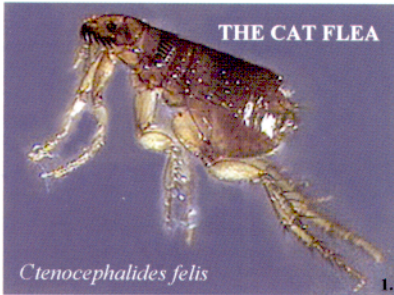


Fleas and the PCO

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Introduction All the fleas found on dogs are actually cat fleas, the same species found on raccoons, opossums, skunks, and other small mammals that wander through our backyards at night. Thus, no matter how successful we are in controlling fleas on our pets, there is always potential for re-infestation from fleas dropped off by passing wildlife. Approximately 2,200 flea species infest birds and mammals worldwide, but in the U.S. both dogs and cats typically encounter only cat fleas (*Ctenocephalides felis*).

Feeding adult fleas insert their mouthparts into the skin and suck blood. Backward-projecting spines catch on fur (like a cocklebur), preventing fleas from being easily extracted from the hair coat.



Fleas are in the order Siphonaptera; this name comes from "siphon" (sucking mouthparts) "a" (without) "ptera" (wings), referring to their wingless and blood-sucking characteristics. All adult fleas, both males and females, feed only on blood so must have a warm-blooded host (mammal or bird) to survive. Adult fleas cannot drink water, so they will desiccate unless they find a host.

Cat Flea Development

Eggs Flea eggs are pearly white ovals measuring 1/50 inch (0.5 mm) in length. Female fleas lay their eggs (about one per

hour) on the host. Because the eggs are smooth, not sticky, they readily sift through the host's hair and fall to the ground. Accumulations of flea eggs are thus highest in areas where hosts spend the most time. Cat flea eggs typically hatch in a day or two, depending on temperature and humidity.

Larvae spin silk cocoons to which adheres debris such as soil or carpet fibers (note the sand grains), camouflaging the cocoon as a dirt clod or lint ball. If opened soon after pupation, the larvae can be seen coiled up inside



Larvae Larval fleas are slender, white, legless, eyeless, maggot-like larvae, sparsely covered with hairs. Newly hatched larvae are about the size of the egg, while fully grown larvae are about 1/8 inch (3 mm) long. Larvae are free-living, feeding on adult flea feces in their environment.



Within the cocoon, the larva undergoes metamorphosis, changing into an adult flea. When the cocoon is opened, the fully formed adult flea can be seen inside.

The larval stage usually lasts five to 11 days, but may be extended up to three weeks, depending upon food availability and climatic conditions. Flea larvae are extremely vulnerable to desiccation. Due to their susceptibility to heat and drying, flea larvae do not survive outdoors in sun-exposed areas. Because hosts prefer shaded areas, flea eggs are more likely to be deposited in shade; and flea larvae develop in crawl spaces and under porches, where the ground is shaded and humidity is highest.



Flea larvae are legless and eyeless, but each body segment has stiff hairs encircling it.

Pupae When the larva has matured, it secretes silk and spins a cocoon within which it pupates. The silk is sticky, so debris from the environment adheres to it, camouflaging the cocoon as a lint ball or dirt clod. The cocoon is ovoid, ca. 1/8 inch (3 mm) long. Within its cocoon the larva molts to a pupa, and the pupa then molts to an adult. This within-cocoon stage has the most variable duration. Under good conditions, an adult flea may emerge five days after the cocoon is formed, while adverse environmental conditions or absence of a host may delay emergence for many months.

Adult The pre-emerged adult, waiting in its cocoon, is stimulated to emerge by movement, heat, or carbon dioxide, all clues indicating presence of a warm-blooded host. When the flea perceives one of these stimuli, it immediately exits the cocoon and orients toward moving objects. It flings itself toward any warm-bodied creature, latching onto the hair coat with its grappling-hook claws. Once an adult cat flea acquires a host, it typically remains on that animal for the duration of its life, with host grooming being the most common mortality factor. Female fleas must suck blood every hour to produce eggs.

Flea Infestation Management

Developing an integrated flea control program necessitates understanding flea biology, population assessment techniques, mechanical control systems, biological control, insect growth regulators, and traditional insecticide treatments. Source reduction, sanitation, and exclusion are flea pest management critical elements.

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Identification While rodent or bird flea infestations are uncommon, it is possible that flea species other than *C. felis* can be the problem. For this reason, it is always important to identify the pest before initiating a control program. Due to their small size, microscopic examination is required for accurate flea identification. As with any pest situation, pest identification is the first priority because developing a control strategy for cat fleas, for instance, is vastly different than dealing with discovery of a chigoe flea. Most flea control calls to pest control firms will be from residences, not businesses. An occasional infestation may occur in a warehouse or other structure where rodents, wildlife, or feral animals are residing. Flea suppression in and around man-made structures lends itself well to the Urban Integrated Pest Management concept.

Exclusion Environmental modification to exclude wildlife and feral animals from the area is crucial to prevent flea re-infestation. Pet food removal at night avoids luring raccoons and opossums into the area. Openings to crawl spaces should be closed, to exclude animals from making dens beneath structures.

Frequently customers call complaining of fleas, even though they have no pets. Typically these are situations where wild animals have left their fleas in the crawlspace. After the host abandons its nest, fleas continue to emerge and attempt to locate a host, climbing up through holes in sub-flooring (pipe chases, wiring penetrations, other crevices), enter the living space, and annoy human occupants. Chemical applications indoors are ineffectual; control involves removing nest material from the crawlspace and treating surrounding areas with a residual insecticide.

Source Reduction When people complain about fleas in the workplace, typically there are two explanations. If no actual fleas are seen, such individuals may be experiencing delusory parasitosis. If valid specimens are presented, the explanation may be that workers are acquiring fleas on their way to work, but not discovering them until they enter the facility. Fleas may be hopping on them as they leave home, or as they walk through flea-infested areas surrounding the building. Again, the infestation source should be identified. Are wild animals denning in surrounding shrubs or outbuildings? Are workers feeding wildlife or feral dogs or cats? Pesticide applications will not solve the problem if such practices are continued.

Sanitation Regular vacuuming of carpet, furnishings, and floors will reduce both flea eggs and larval food. Because eggs can hatch within 24 hours, daily vacuuming is essential when flea infestations are severe.

Flea Control on the Pet Pest control has gone the way of baits in the last few years; we use baits for most pests, including cockroaches, ants – even termites. Because fleas can be lured only to a warm-blooded host, we use the pet as the attractant, treating it with a toxicant so that when fleas attach to get their blood meal, they acquire a lethal pesticide dose.

In the last decade, flea control has become primarily a veterinary market, with products killing virtually 100% of on-host populations and providing sustained residual efficacy (for a month or more with one treatment) as well as ease of use. While prices of veterinary-supplied products are higher than their OTC competitors, their success rate reduces time and effort required to achieve acceptable flea suppression. Application ease makes using these host-targeted products consumer-friendly, minimizing need for environmental treatments, and switching flea control from the PCO market. As consumers learned to use such products proactively to prevent flea populations from building in the spring, season-long flea control became a reality.

However, because many pet-owners fail to treat their animals to prevent flea infestations, PCOs still receive calls about flea problems. Once a flea population has built up, yielding large numbers of fleas in the environment, on-host treatments are inadequate to deal with the situation. Environmental applications may be necessary to reduce flea numbers in the home, to prevent fleas attacking human occupants.

While Georgia PCOs may not be doing as many flea jobs as a decade ago, they can rest assured that flea suppression will continue to be a segment of their business for years to come. Fleas will not go away – and customers are not going to accept sharing their homes with these pests.