



Booklice and Silverfish¹

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Booklice

Booklice (Figure 1) belong to a group of insects collectively called psocids. The psocids are small, soft-bodied insects, most of which are less than one-eighth of an inch long. They are both winged and wingless. Psocids have chewing mouthparts.



Figure 1. Booklouse. Credits: James Castner, University of Florida

The majority of psocids are outdoor species with well developed wings. They are most commonly

found on bark or on the foliage of trees and shrubs. These psocids are frequently called "barklice." Most of the species found in buildings are wingless. Because they are often found among books or papers, they are called booklice. The term "lice" in the names is somewhat misleading because none of these insects are parasites and few of them have a louselike appearance.

Psocids feed on molds, fungi, cereals, pollen, fragments of dead insects, or other similar materials. They cause little loss by actually eating foodstuffs since they do feed chiefly on mold. At times they may become extremely abundant and spread throughout an entire building. In such situations they may contaminate foods and materials to the point the goods must be discarded. Damage to books may be more direct. They eat the starch sizing in the bindings of books and along the edges of pages.

The eggs of psocids are laid singly or in clusters and are often covered with silken webs or debris. Most species pass through six nymphal stages. The entire life span from egg to adult is between thirty and sixty days.

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Control

Reduction of moisture to eliminate formation of mold is a very effective method for controlling booklice. Infested furniture, bedding, or other movable furnishings should be thoroughly cleaned and aired. Clean up spilled food products and keep all stored products tightly sealed.

If an insecticide is required, apply a spot treatment or crack and crevice treatment of products found in Table 2, according to label directions.

Precautions

All insecticides are poisons. Read the entire label, including the small print before opening the containers and heed all warnings and cautions. Store pesticides in their original labeled containers out of reach of children, irresponsible people, and pets, and preferably keep under lock and key. Dispose of leftover spray materials and empty containers promptly and safely.

Silverfish and Firebrats

Silverfish (Figure 2) and firebrats may cause damage in the home by eating foods or other materials that are high in protein, sugar, or starch. They eat cereals, moist wheat flour, paper on which there is glue or paste, sizing in paper and bookbindings, starch in clothing, and rayon fabrics.



Figure 2. Silverfish. Credits: James Castner, University of Florida

Silverfish and firebrats are common in homes. The silverfish lives and develops in damp, cool

places. Large numbers may be found in new buildings in which the newly plastered walls are still damp. The firebrat lives and develops in hot, dark places, such as around furnaces and fireplaces, and in insulations around hot water or steam pipes.

In apartment buildings the insects follow pipelines to rooms in search of food. They may be found in bookcases, around closet shelves, behind baseboards, windows or door frames.

Silverfish and firebrats are both slender, wingless insects and their bodies are covered with scales. Adults are about one-third to one-half inch long. Silverfish are shiny and silver or pearl-gray in color. Firebrats are mottled gray. The young insects look like adults except they are smaller.

Both insects have two long slender antennae attached to their heads and three long tail-like appendages at the hind end. Each appendage is almost as long as the body.

Silverfish and firebrats are active at night and hide during the day. When objects under which they hide are moved, they dart about seeking a new hiding place.

Biology

Under usual house conditions, silverfish and firebrats develop slowly and have few young. They are hardy and can live for several months without food.

Females lay eggs year round in secluded places, such as behind books or on closet shelves. Eggs are occasionally laid in the open. Silverfish lay only a few eggs at a time but may lay several batches over a period of weeks. The eggs are whitish, oval, and about 1/32 inch long. They hatch in two to eight weeks, the hatching time depending on temperature.

Firebrats lay about 50 eggs one at a time and will lay several batches. The eggs are soft, white and opaque, when laid. They will later have a yellowish tinge. Firebrat eggs hatch in about two weeks. Both insects reach maturity in 3 to 24 months. Their rate of growth depends on temperature and humidity.

Control

The sprays should be applied to floors and wall moldings, behind drawers, under furniture, cracks and crevices, and the floor and ceiling of attics. Outside, treat eaves, mulched flower beds, and storage sheds. Control may not be immediate because hiding insects must come out and contact spray residue. Ten days to two weeks may be required to determine whether or not control has been achieved.

Dusts of the recommended materials may be used for treating walls, voids, crawl spaces, and attics. Space sprays of pyrethrins are useful for controlling exposed insects. See Table 1 and Table 2.

Table 1. Insecticides labeled for Homeowner Use.

Formulation	Common Name	Trade Name	Signal Word	Pest
Crack and Crevice				
Aerosol	Prallethrin (0.03%), Esfenvalerate (0.05%), MGK-264 synergist (0.3%)	Ortho Roach, Ant & Spider Killer	Warning	silverfish
Aerosol	Pyrethrins, MGK-264, Permethrin	Ortho Ant-B-Gon	Caution	silverfish
Emulsifiable Concentrate	Beta-Cyfluthrin	Bayer Power Force Carpenter Ant & Termite Killer Plus	Caution	silverfish
Ready-to-Use	Cyfluthrin	Bayer Advanced Home, Home Pest Control Indoor & Outdoor Insect Killer	Caution	silverfish
Indoor Surface Treatment				
Aerosol	Prallethrin (0.03%), Esfenvalerate (0.05%), MGK-264 synergist (0.3%)	Ortho Roach, Ant & Spider Killer	Warning	silverfish
Aerosol	Pyrethrins, MGK-264, Permethrin	Ortho Ant-B-Gon	Caution	silverfish
Ready-to-Use	Cyfluthrin	Bayer Advanced Home, Home Pest Control Indoor & Outdoor Insect Killer	Caution	silverfish
Outdoor Barrier				
Aerosol	Prallethrin (0.03%), Esfenvalerate (0.05%), MGK-264 synergist (0.3%)	Ortho Roach, Ant & Spider Killer	Warning	silverfish

Table 1. Insecticides labeled for Homeowner Use.

Formulation	Common Name	Trade Name	Signal Word	Pest
Emulsifiable Concentrate	Beta-Cyfluthrin	Bayer Power Force Carpenter Ant & Termite Killer Plus	Caution	silverfish
Emulsifiable Concentrate	Bifenthrin	Ortho Termite & Carpenter Ant Killer	Caution	silverfish
Emulsifiable Concentrate	Malathion	Ortho Malathion 50 Plus Insect Spray	Warning	silverfish
Granule	Carbaryl	Ortho Bug-B-Gon Multipurpose Insect Killer Ready-to-Use Granules	Caution	silverfish
Ready-to-Use	Cyfluthrin	Bayer Advanced Home, Home Pest Control Indoor & Outdoor Insect Killer	Caution	silverfish
Outdoor Broadcast				
Emulsifiable Concentrate	Beta-Cyfluthrin	Bayer Power Force Carpenter Ant & Termite Killer Plus	Caution	silverfish
Emulsifiable Concentrate	Malathion	Ortho Malathion 50 Plus Insect Spray	Warning	silverfish
Ready-to-Use	Cyfluthrin	Bayer Advanced Home, Home Pest Control Indoor & Outdoor Insect Killer	Caution	silverfish

Table 2. Insecticides labeled for Commercial Use on booklice (Psocids).

Formulation	Common Name	Trade Name	Signal Word	Pests
Crack and Crevice				
Aerosol	Acephate	PT Orthene Crack & Crevice Pressurized Residual (Whitmire Micro-gen)	Caution	booklice, silverfish
Aerosol	Cyfluthrin	PT Cy-Kick Crack & Crevice Pressurized Residual (Whitmire Micro-gen)	Caution	booklice, silverfish
Aerosol	Cyfluthrin	PT Cy-Kick CS Pressurized Crack & Crevice Residual (Whitmire Micro-gen)	Caution	booklice, silverfish
Aerosol	Lambda-Cyhalothrin	PT 221L (Whitmire Micro-gen)	Caution	booklice, silverfish
Aerosol	Pyrethrins and Others	PT 565 Plus XLO (Whitmire Micro-gen)	Caution	booklice, silverfish
Aerosol	Pyrethrins and Others	PT Microcare Pressurized Pyrethrum Capsule Suspension (Whitmire Micro-gen)	Caution	booklice, silverfish
Aerosol	Pyrethrins (0.5%), PBO (4.0%)	PT P. I. Contact Insecticide (Whitmire Micro-gen)	Caution	booklice, silverfish

Table 2. Insecticides labeled for Commercial Use on booklice (Psocids).

Formulation	Common Name	Trade Name	Signal Word	Pests
Bait	Hydramethylnon	Eclipse (Zoecon)	Caution	silverfish
Bait	Hydramethylnon	MaxForce Fine Granule Insect Bait	Caution	silverfish
Bait	Hydramethylnon	MaxForce Granular Insect Bait (6 lb)	Caution	silverfish
Bait	Hydramethylnon	MaxForce Granular Insect Bait (25 lb)	Caution	silverfish
Bait	Orthoboric Acid	Niban FG	Caution	silverfish
Bait	Orthoboric Acid	Niban Granular Bait	Caution	silverfish
Bait	Orthoboric Acid	Snuffer (Nisus)	Caution	silverfish
Dust	Boric Acid	PT Perma Dust Pressurized Boric Acid Dust (Whitmire Micro-gen)	Caution	booklice, silverfish
Dust	Deltamethrin	DeltaDust (Aventis)	Caution	silverfish
Dust	Disodium Octaborate Tetrahydrate	NIBoR-D (Nisus)	Caution	silverfish
Dust	Pyrethrins	PT Tri-Die Silica & Pyrethrum Dust (Whitmire Micro-gen)	Caution	booklice, silverfish
Dust	Pyrethrins and Others	PT Tri-Die Pressurized Silica & Pyrethrin Dust (Whitmire Micro-gen)	Warning	booklice, silverfish
Dust	Pyrethrins, PBO, Silica Gel	Drione (Aventis)	Caution	silverfish
Emulsifiable Concentrate	Bifenthrin	Talstar F Insecticide/Miticide (FMC)	Caution	silverfish
Emulsifiable Concentrate	Bifenthrin	Talstar Insecticide/Miticide (FMC)	Caution	silverfish
Emulsifiable Concentrate	Cyfluthrin	PT Cy-Kick CS Controlled Release Cyfluthrin (Whitmire Micro-gen)	Caution	booklice, silverfish
Emulsifiable Concentrate	Cypermethrin	Cynoff EC (FMC)	Caution	silverfish
Emulsifiable Concentrate	Cypermethrin	Cynoff Power Spray Insecticide (FMC)	Warning	silverfish
Emulsifiable Concentrate	Cypermethrin	Cynoff WP (FMC)	Warning	silverfish
Emulsifiable Concentrate	Cypermethrin	Cynoff WSB (FMC)	Warning	silverfish
Emulsifiable Concentrate	Cypermethrin	Prevail FT Termiticide (FMC)	Caution	silverfish

Table 2. Insecticides labeled for Commercial Use on booklice (Psocids).

Formulation	Common Name	Trade Name	Signal Word	Pests
Emulsifiable Concentrate	Permethrin	Dragnet SFR Termiticide/Insecticide (FMC)	Caution	silverfish
Emulsifiable Concentrate	Prallethrin	PT ULD SPy-300 (Whitmire Micro-gen)	Caution	silverfish
Emulsifiable Concentrate	Propetamphos	Catalyst (Zoecon)	Warning	silverfish
Emulsifiable Concentrate	Pyrethrins	PT ULD BP-300 (Whitmire Micro-gen)	Caution	booklice
Emulsifiable Concentrate	Pyrethrins and Others	PT Microcare CS Controlled Release Pyrethrum (Whitmire Micro-gen)	Caution	booklice, silverfish
Emulsifiable Concentrate	Pyrethrins and Others	PT ULD BP-100 (Whitmire Micro-gen)	Caution	booklice, silverfish
Emulsifiable Concentrate	Pyrethrins (0.5%), PBO (5.0%)	PT ULD BP-50 (Whitmire Micro-gen)	Caution	silverfish
Emulsifiable Concentrate	Pyrethrins (0.5%), PCO (5.0%)	Pyrenone 50 (Aventis)	Caution	silverfish
Emulsifiable Concentrate	Pyrethrins (2.5%), PBO (12.5%)	Synerol Insecticide (Aventis)	Caution	silverfish
Wettable/ Soluble Powder	Cyfluthrin	Tempo 20 WP (Bayer)	Caution	silverfish
Wettable/ Soluble Powder	Tralomethrin	Saga WP Insecticide (Aventis)	Warning	silverfish
Indoor Space Treatment				
Aerosol	Pyrethrins and Others	PT 565 Plus XLO (Whitmire Micro-gen)	Caution	booklice, silverfish
Aerosol	Pyrethrins and Others	PT Pro-Control (Whitmire Micro-gen)	Caution	silverfish
Aerosol	Pyrethrins and Others	PT Pro-Control Plus (Whitmire Micro-gen)	Caution	silverfish
Aerosol	Pyrethrins (0.5%), PBO (4.0%)	PT P. I. Contact Insecticide (Whitmire Micro-gen)	Caution	booklice, silverfish
Emulsifiable Concentrate	Prallethrin	PT ULD SPy-300 (Whitmire Micro-gen)	Caution	silverfish
Emulsifiable Concentrate	Pyrethrins	PT ULD BP-300 (Whitmire Micro-gen)	Caution	booklice
Emulsifiable Concentrate	Pyrethrins and Others	PT ULD BP-100 (Whitmire Micro-gen)	Caution	booklice, silverfish

Table 2. Insecticides labeled for Commercial Use on booklice (Psocids).

Formulation	Common Name	Trade Name	Signal Word	Pests
Emulsifiable Concentrate	Pyrethrins (0.5%), PBO (5.0%)	PT ULD BP-50 (Whitmire Micro-gen)	Caution	silverfish
Emulsifiable Concentrate	Pyrethrins (0.5%), PCO (5.0%)	Pyrenone 50 (Aventis)	Caution	silverfish
Emulsifiable Concentrate	Pyrethrins (1.0%), PBO (5.0%)	Pyrenone 100 (Aventis)	Caution	silverfish
Emulsifiable Concentrate	Pyrethrins (2.5%), PBO (12.5%)	Synerol Insecticide (Aventis)	Caution	silverfish
Indoor Surface Treatment				
Aerosol	Acephate	PT Orthene Crack & Crevice Pressurized Residual (Whitmire Micro-gen)	Caution	booklice, silverfish
Aerosol	Cyfluthrin	PT Cy-Kick CS Pressurized Crack & Crevice Residual (Whitmire Micro-gen)	Caution	silverfish
Aerosol	Pyrethrins and Others	PT Microcare Pressurized Pyrethrum Capsule Suspension (Whitmire Micro-gen)	Caution	booklice, silverfish
Dust	Pyrethrins	PT Tri-Die Silica & Pyrethrum Dust (Whitmire Micro-gen)	Caution	booklice, silverfish
Emulsifiable Concentrate	Bifenthrin	Talstar F Insecticide/Miticide (FMC)	Caution	silverfish
Emulsifiable Concentrate	Bifenthrin	Talstar Insecticide/Miticide (FMC)	Caution	silverfish
Emulsifiable Concentrate	Cyfluthrin	PT Cy-Kick CS Controlled Release Cyfluthrin	Caution	booklice, silverfish
Emulsifiable Concentrate	Cypermethrin	Cynoff EC (FMC)	Caution	silverfish
Emulsifiable Concentrate	Cypermethrin	Cynoff Power Spray Insecticide (FMC)	Warning	silverfish
Emulsifiable Concentrate	Cypermethrin	Cynoff WP (FMC)	Warning	silverfish
Emulsifiable Concentrate	Cypermethrin	Cynoff WSB (FMC)	Warning	silverfish
Emulsifiable Concentrate	Cypermethrin	Prevail FT Termiticide (FMC)	Caution	silverfish
Emulsifiable Concentrate	Deltamethrin	Suspend SC Insecticide (Aventis)	Caution	silverfish
Emulsifiable Concentrate	Permethrin	Dragnet SFR Termiticide/Insecticide (FMC)	Caution	silverfish

Table 2. Insecticides labeled for Commercial Use on booklice (Psocids).

Formulation	Common Name	Trade Name	Signal Word	Pests
Emulsifiable Concentrate	Pyrethrins and Others	PT Microcare CS Controlled Release Pyrethrum (Whitmire Micro-gen)	Caution	booklice, silverfish
Emulsifiable Concentrate	Pyrethrins (0.5%), PCO (5.0%)	Pyrenone 50 (Aventis)	Caution	silverfish
Emulsifiable Concentrate	Pyrethrins (1.0%), PBO (5.0%)	Pyrenone 100 (Aventis)	Caution	silverfish
Emulsifiable Concentrate	Pyrethrins (2.5%), PBO (12.5%)	Synerol Insecticide (Aventis)	Caution	silverfish
Wettable/ Soluble Powder	Cyfluthrin	Tempo 20 WP (Bayer)	Caution	silverfish
Wettable/ Soluble Powder	Tralomethrin	Saga WP Insecticide (Aventis)	Warning	silverfish
Outdoor Barrier				
Aerosol	Acephate	PT Orthene Crack & Crevice Pressurized Residual (Whitmire Micro-gen)	Caution	silverfish
Aerosol	Cyfluthrin	PT Cy-Kick Crack & Crevice Pressurized Residual (Whitmire Micro-gen)	Caution	booklice, silverfish
Aerosol	Cyfluthrin	PT Cy-Kick CS Pressurized Crack & Crevice Residual (Whitmire Micro-gen)	Caution	silverfish
Aerosol	Lambda-Cyhalothrin	PT 221L (Whitmire Micro-gen)	Caution	booklice, silverfish
Bait	Hydramethylnon	Eclipse (Zoecon)	Caution	silverfish
Bait	Orthoboric Acid	Niban FG	Caution	silverfish
Bait	Orthoboric Acid	Niban Granular Bait	Caution	silverfish
Dust	Deltamethrin	DeltaDust (Aventis)	Caution	silverfish
Emulsifiable Concentrate	Bifenthrin	Talstar F Insecticide/Miticide (FMC)	Caution	silverfish
Emulsifiable Concentrate	Bifenthrin	Talstar Insecticide/Miticide (FMC)	Caution	silverfish
Emulsifiable Concentrate	Cyfluthrin	PT Cy-Kick CS Controlled Release Cyfluthrin	Caution	silverfish
Emulsifiable Concentrate	Cyfluthrin	Tempo SC Ultra (Bayer)	Danger	silverfish

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Formulation	Common Name	Trade Name	Signal Word	Pests
Emulsifiable Concentrate	Cypermethrin	Cynoff EC (FMC)	Caution	silverfish
Emulsifiable Concentrate	Cypermethrin	Cynoff Power Spray Insecticide (FMC)	Warning	silverfish
Emulsifiable Concentrate	Cypermethrin	Cynoff WP (FMC)	Warning	silverfish
Emulsifiable Concentrate	Cypermethrin	Cynoff WSB (FMC)	Warning	silverfish
Emulsifiable Concentrate	Cypermethrin	Prevail FT Termiticide (FMC)	Caution	silverfish
Emulsifiable Concentrate	Deltamethrin	Suspend SC Insecticide (Aventis)	Caution	silverfish
Emulsifiable Concentrate	Permethrin	Astro Insecticide (FMC)	Caution	silverfish
Emulsifiable Concentrate	Permethrin	Dragnet SFR Termiticide/Insecticide (FMC)	Caution	silverfish
Emulsifiable Concentrate	Pyrethrins	Kicker (Aventis)	Caution	silverfish
Emulsifiable Concentrate	Pyrethrins and Others	PT Microcare CS Controlled Release Pyrethrum (Whitmire Micro-gen)	Caution	booklice, silverfish
Granule	Deltamethrin	DeltaGard G (Aventis)	Caution	silverfish
Wettable/ Soluble Powder	Cyfluthrin	Tempo 20 WP (Bayer)	Caution	silverfish
Outdoor Broadcast				
Bait	Hydramethylnon	Eclipse (Zoecon)	Caution	silverfish
Bait	Hydramethylnon	MaxForce Fine Granule Insect Bait	Caution	silverfish
Bait	Hydramethylnon	MaxForce Granular Insect Bait (6 lb)	Caution	silverfish
Bait	Hydramethylnon	MaxForce Granular Insect Bait (25 lb)	Caution	silverfish
Bait	Orthoboric Acid	Niban Granular Bait	Caution	silverfish
Emulsifiable Concentrate	Bifenthrin	Talstar F Insecticide/Miticide (FMC)	Caution	silverfish
Emulsifiable Concentrate	Bifenthrin	Talstar Insecticide/Miticide (FMC)	Caution	silverfish
Emulsifiable Concentrate	Cyfluthrin	Tempo SC Ultra (Bayer)	Danger	silverfish
Granule	Deltamethrin	DeltaGard G (Aventis)	Caution	silverfish

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Formulation	Common Name	Trade Name	Signal Word	Pests
Wettable/ Soluble Powder	Cyfluthrin	Tempo 20 WP (Bayer)	Caution	silverfish
Voids/Attics				
Aerosol	Acephate	PT Orthene Crack & Crevice Pressurized Residual (Whitmire Micro-gen)	Caution	booklice, silverfish
Aerosol	Pyrethrins and Others	PT 565 Plus XLO (Whitmire Micro-gen)	Caution	silverfish
Aerosol	Pyrethrins (0.5%), PBO (4.0%)	PT P. I. Contact Insecticide (Whitmire Micro-gen)	Caution	booklice, silverfish
Bait	Hydramethylnon	Eclipse (Zoecon)	Caution	silverfish
Bait	Hydramethylnon	MaxForce Fine Granule Insect Bait	Caution	silverfish
Bait	Hydramethylnon	MaxForce Granular Insect Bait (6 lb)	Caution	silverfish
Bait	Hydramethylnon	MaxForce Granular Insect Bait (25 lb)	Caution	silverfish
Bait	Orthoboric Acid	Niban FG	Caution	silverfish
Bait	Orthoboric Acid	Niban Granular Bait	Caution	silverfish
Bait	Orthoboric Acid	Snuffer (Nisus)	Caution	silverfish
Dust	DeltaDust (Aventis)	DeltaDust (Aventis)	Caution	silverfish
Dust	Disodium Octaborate Tetrahydrate	NIBoR-D (Nisus)	Caution	silverfish
Dust	Pyrethrins	PT Tri-Die Silica & Pyrethrum Dust (Whitmire Micro-gen)	Caution	booklice, silverfish
Dust	Pyrethrins and Others	PT Tri-Die Pressurized Silica & Pyrethrin Dust (Whitmire Micro-gen)	Warning	booklice, silverfish
Dust	Pyrethrins, PBO, Silica Gel	Drione (Aventis)	Caution	silverfish