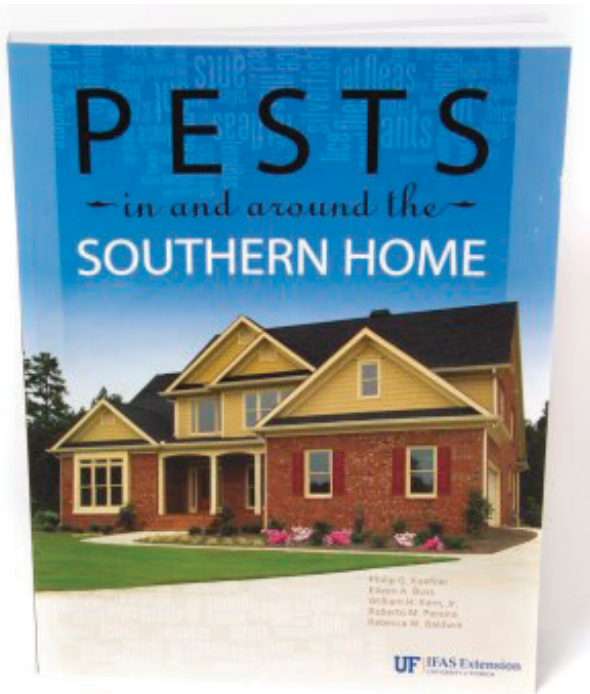


# Booklice and Silverfish<sup>1</sup>

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This fact sheet is excerpted from SP486: Pests in and around the Southern Home, which is available from the UF/IFAS Extension Bookstore. <http://ifasbooks.ifas.ufl.edu/p-1222-pests-in-and-around-the-southern-home.aspx>

## Booklice

Booklice (Figure 1) belong to a group of insects collectively called psocids (sō' sids). The psocids are small, soft-bodied insects, ranging in color from a translucent white to gray to light brown. They are usually less than 1/16 inch long (1.5 mm); however, outdoor species can be 1/4 inch (6 mm).

They are both winged and wingless, and they have long, filamentous antennae. Psocids have chewing mouthparts and a bulging clypeus—the front part of the head—between the eyes.



Figure 1. Booklouse.

Psocids' primary food sources are 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, where they prefer warm areas with high humidity. In such

1. This document is ENY-225, one of a series of the Department of Entomology and Nematology, UF/IFAS Extension. Original publication date April 1993. Revised May 1999, January 2003, and July 2011. Reviewed February 2017. Visit the EDIS website at <http://edis.ifas.ufl.edu>.
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situations they may contaminate foods and materials to the point the goods must be discarded. Damage to books may be more direct as they eat the starch sizing in the bindings of books and along the edges of pages.

The majority of psocids are outdoor species with well developed wings. They are also referred to as “barklice” because they are commonly found on bark or on the foliage of trees and shrubs. 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.

## Biology

During the warm summer months, the psocid female can lay 50 to 60 eggs. 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 30 and 60 days.

## Control

Reduction of moisture (humidity) to less than 50% can eliminate the formation of molds and is the most effective method for controlling booklice. Infested furniture, bedding, or other movable furnishings should be thoroughly cleaned and aired. Infested foodstuffs should be discarded. Clean up spilled food products and keep all stored products in tightly sealed containers.

Chemical control is not usually necessary once moisture has been reduced. However, if an insecticide is required, apply a spot treatment or crack-and-crevice treatment using a product labeled for crawling insects or booklice and apply it according to label directions. Mothballs containing naphthalene or 1,4-dichlorobenzene can be used in areas where it is not possible to reduce humidity, such as basements, closets, and storage areas. Always follow insecticide label instructions carefully.

## Silverfish and Firebrats

Silverfish (Figure 2) and firebrats (Figure 3) belong to a group of primitive insects called thysanura (thī'sə' nūr ə). They are wingless and have slender, carrot-shaped bodies that are covered with scales. 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. Adults are about 1/3 to 1/2 inch long

(8 to 13 mm). Silverfish are shiny and silver or pearl-gray. Firebrats are mottled gray or brown.



Figure 2. Silverfish.



Figure 3. Firebrat  
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Silverfish and firebrats are common in homes and can be found in places with high humidity and little airflow. They 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. Large numbers may be found in new buildings in which the newly plastered walls are still damp. Silverfish 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 book bindings, starch in clothing, and rayon fabrics. In apartment buildings, the insects follow pipelines to rooms in search of food. They may be found in bookcases, around closet shelves, behind baseboards, or around windows or door frames.

Silverfish live and develop in damp, cool places. Firebrats live and develop in hot, dark places, such as around furnaces and fireplaces and in insulation around hot water or steam pipes.

## Biology

Under normal house conditions, silverfish and firebrats develop slowly and have few young. Females lay eggs year-round in secluded places, such as behind books or on closet shelves; however, occasionally they lay eggs in the open.

Silverfish lay only a few eggs at a time but may lay several batches over a period of weeks. The adult female can live for two to five years depending on the species, and can lay up to 100 eggs. The eggs are whitish, oval and about 1/32 inch long (0.8 mm). They hatch in two to eight weeks.

Firebrats lay about 50 eggs, one at a time, and will lay several batches. The adult female can live for about two years and can lay thousands of eggs. The eggs are soft, white, and opaque when they are laid. They later have a yellowish tinge. Firebrat eggs hatch in about two weeks.

After hatching, the young silverfish and firebrats look like the adults except they are smaller. Both insects reach maturity in three to 24 months. Their rate of growth depends on temperature and humidity.

## Control

Sanitation can help prevent infestations but will not eliminate current infestations. Seal or remove hiding places. Sealing up cracks and crevices around plumbing, wall molding, and windowsills will help eliminate harborage (places for them to hide). Removing cardboard boxes and old newspapers eliminates food sources and harborage. Vacuuming can physically remove both silverfish and firebrats.

If insecticides are necessary, sprays should be applied to floors and wall moldings, behind drawers, under furniture, in 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. Dusts of

the recommended materials may be used for treating walls, voids, crawl spaces, and attics. Ten days to two weeks may be required to determine whether or not control has been achieved. Space sprays of pyrethrins are useful for controlling exposed insects.