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A Product of the Integrated Pest Management Working Group

## Book Lice or Psocids

*Liposcelis sp.*



### GENERAL INFORMATION

Psocids are known as booklice because of their affinity for damp, moldy books. They are not truly lice and pose no threat to humans or pets. There are 4,408 species on all continents, including Antarctica with about 260 species in the United States and Canada. Psocids are small, and they need high humidity or moisture to live. They are an indicator species, implying past or present dampness in an environment. The different species have different environmental parameters under which they thrive or die. As of 2018, there are no published studies on one of the common species known as a booklouse, *Liposcelis corrodens*. Typically, the lower the relative humidity (RH), the less chance this insect will survive. Populations of the species *Liposcelis entophilus* will die in 6 days in an environment of 43% RH while populations of *Liposcelis paeta* will die in 16 days in an environment of 50% RH. Generally speaking, most species of psocids do not survive in RH environments below 50%, while population increases of psocids occur in environments with RH readings of 65% and above. Environmental temperatures greater than 37°C are usually high enough to kill most psocid species with the exception of *L. paeta* that tends to be more heat resistant. These insects start to become active at temperatures as low as 10° C and will increase in their feeding and activity up to 32° C.

Common places for psocid populations to thrive include window sills, under building siding, tree trunks, shrubs, flowers, around garden hoses, under bricks and rocks, around light fixtures and under boxes. Outdoor populations of barklice (in the same family: Psocoptera) can occasionally come inside and be mistaken for booklice. Barklice generally have wings where booklice do not.



### DIAGNOSTIC MORPHOLOGY

#### Adults:

- Less than 4 mm in length (usually 1 -2 mm)
- Soft bodied insects, with long, slender antennae and chewing mouthparts
- Hind femora are characteristically enlarged and flattened
- Common species are wingless
- Outdoor related species of barklice often have wings



#### Immature Stage:

- Incomplete metamorphosis (egg-nymph- adult)
- Nymphs are similar in appearance to adults but smaller
- Young nymphs are paler and sometimes patterned

### SIGNS OF INFESTATION

Booklice are slow eaters. This means that damage from local populations is usually minor unless populations go unchecked for long periods of time. Booklice may be spotted in the folds of food packets and in books and magazines. Gently tapping boxes or paper suspected of having psocids onto a dark surface will reveal the small and lightly colored insects.

### FOOD SOURCES

The primary food for booklice is microscopic molds and other fungi found on food, wheat starch paste and paper. Certain species are known to feed on dead insects. They will eat a wide variety of materials and are able to change their diet as food availability changes.

### LIFE CYCLE

Studies of certain booklouse species report that no males occur and that females reproduce parthenogenetically (reproduction without fertilization). These insects undergo simple metamorphosis to develop to maturity. Their white oval eggs may be covered with a crusty material, silk, or debris of various kinds and will hatch ~ three weeks after being laid. Eggs are laid in warm, humid areas other than where the adults are feeding. The nymphs will shed their skins several times as they grow. Booklice may lay anywhere from 20 - 50 eggs depending on the time of year. Their total life span is from 24 to 110 days. Some species produce only one generation while others may have as many as eight per year, with a single generation completed in as little as 25 days under ideal conditions.

### CONTROL & TREATMENT

The most effective method for controlling booklice is to reduce moisture and environments conducive to mold growth. Good air circulation, de-humidification to a relative humidity below 50%, repair of any moisture problems and storage of materials above floor level will help to minimize dampness. Existing psocid populations will prosper unless the conditions which caused their population growth are changed.

Most species are susceptible to heat treatment with temperatures >55° C with the exception of *L. paeta*.

Freezing to temperatures below - 18° C generally works well to kill this pest with the exception of the species *L. bostrychophila*

Diatomaceous earth has not been found to be effective against psocid species. There is also evidence of resistance in psocids to the fumigant gas, phosphine.



*Liposcelis corrodens*

## **Fact Sheet: Book Lice or Psocids**

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