

Pseudoparasites

Classification

Various; includes pollen, plant cells, psocid insects, and grain mites. As the name implies, these are things that are sometimes mistaken for parasites of laboratory animals.

Affected species

All

Frequency

Relatively common depending on time of year and other factors.

Transmission

Not applicable

Clinical Signs and Lesions

None

Diagnosis

Animals may be diagnosed with pseudoparasites after routine health monitoring reveals unidentifiable objects or parasites on the fur or in the feces. Common pseudoparasites include pollen, plant cells, grain mites, and psocids (book lice).

Pollen may be found in feces and can resemble protozoal cysts or even helminth eggs, although pollen is usually several-fold smaller than even the smallest of helminth eggs. Pollen is usually ingested with feed. Since the outer structures of pollen are quite resistant to the environment, pollen may be incorporated into feed and pass intact through the animal.

Plant cells and plant hairs are also sometimes seen in feces. These are less commonly seen than pollen, as laboratory rodents and rabbits have digestive tracts that are able to digest the cellulose in plant walls. Plant cells are usually regular in shape (square or rectangular) and may be found in sheets, which are anisotropic, i.e., are birefringent when viewed with polarized light. Plant hairs are large structures from the roots of plants. It would be uncommon to find plant hairs in laboratory rodent or rabbit feces.

Grain mites (*Acarus siro*) are arthropods that live and feed in grains and flours. They prefer high environmental moisture levels, and may be found in conjunction with environmental molds. Since they are food pests, they are usually found contaminating laboratory animal feed, or as transients on the fur of an animal, having fallen from the feeder on to the animal. They are also sometimes ingested by animals and found whole in feces. These mites may cause a mild allergic reaction if a person is sensitized to them. They also emit a minty odor if crushed. Typically, as would be expected for free-living mites, grain mites can move much more rapidly than fur (parasitic) mites, and they are also larger than most parasites.

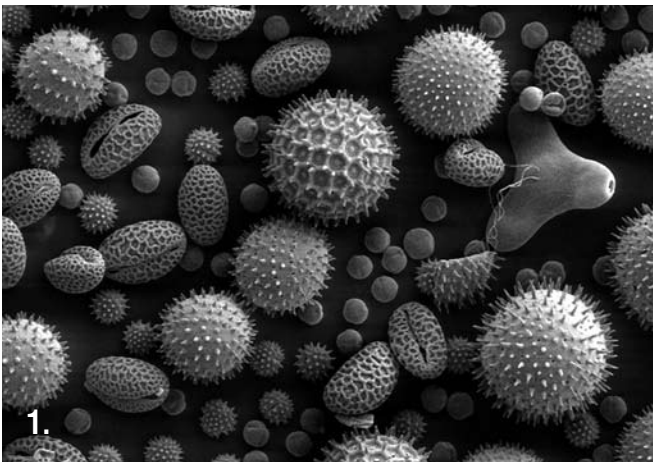
Psocids, also known as “book lice,” are insects that feed on grain or floury products. Most insects identified as psocids are in the genus *Liposcelis*. They prefer similar environmental conditions as grain mites. Psocids usually find their way into laboratory animal facilities on paper products, such as the exterior packaging of feed bags. They may be resistant to common insecticides in use. Yeasts are often commensal flora in the gut of laboratory animals. As with other pseudoparasites, their chief significance is that they may be mistaken for true parasites, such as cryptosporidium or other protozoa. *Saccharomyces* yeasts, in particular, are often abundant in rabbit feces.

Interference with Research

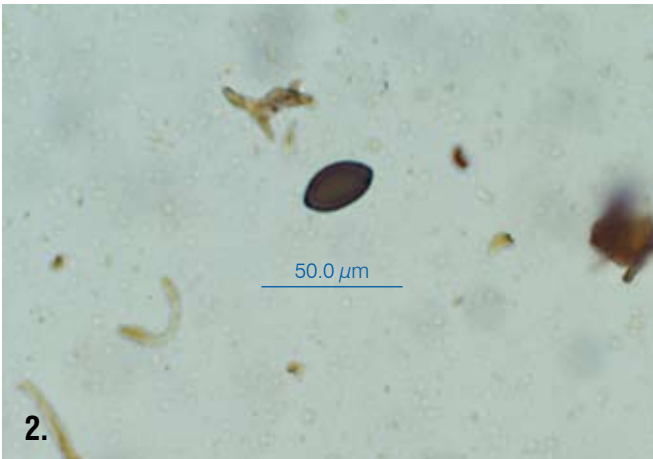
None, if correctly identified as a matter of no concern. Speculatively, it is possible that arthropod pseudoparasites may be fomites of other animal diseases. Psocids and grain mites may cause mild allergic reactions in sensitized humans. If incorrectly identified as true parasitism, further diagnostic tests may be undertaken, the animals may be treated or culled, and rooms recycled unnecessarily. Treatment plans developed based on pseudoparasites have the potential to affect animal welfare and result in economic and research losses.

Prevention and Treatment

No treatment of animals for pseudoparasites is necessary. Correct identification of some pseudoparasites may lead to treatment of the environment to remove the source of the problem.



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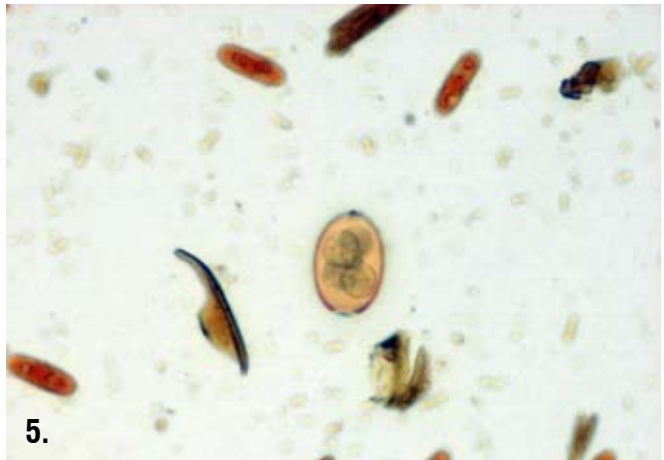
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1. Plant pollen (electron micrograph). Pollen from a variety of common plants: sunflower (*Helianthus annuus*), morning glory (*Ipomoea purpurea*), hollyhock (*Sidalcea malviflora*), lily (*Lilium auratum*), primrose (*Oenothera fruticosa*), and castor bean (*Ricinus communis*). The image is magnified some 500x, so the bean-shaped grain in the bottom left corner is about 50 μm long. Photo credit: Dartmouth Electron Microscope Facility, Dartmouth College from http://commons.wikimedia.org/wiki/Image:Misc_pollen.jpg.

2. An acospore of the coprophilous fungal species *Sordaria*. This particular specimen is from rabbit feces. (Previously described as a pollen grain; correct identification provided courtesy of Dr. James Scott, Univ. Toronto.) Photo courtesy of Charles River Research Animal Diagnostic Services Laboratory.



4.



5.

3. Grain mite (*Acarus silo*). Photo taken at 100x magnification. Photo credit: Joel Mills from: http://commons.wikimedia.org/wiki/Image:Grain_mite_1.JPG.

4. Psocid mite, *Liposcelis* spp. Photo shows approximate real-life size of book lice. Note the type in the right bottom of the photo for comparative size. Inset photo shows a close-up of a book louse. Main photo: unknown, inset photo: Dr. Cory Brayton, John Hopkins University.

5. In the center of the photo is a pathogenic protozoan of rabbits, *Eimeria media*. The brown elongated oval structures (circled) are yeasts of the genus *Saccharomyces*, commonly found in rabbit feces. Photo courtesy of Charles River Research Animal Diagnostic Services Laboratory.