Storagemites

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Mites are one of the most common triggers for allergic disease. The main groups are house-dust mites (*Dermatophagoides farinae* and *D. pteronyssinus*; family *Pyroglyphidae*) and the storage mites (family *Glycyphagidae* with *Glycyphagus domesticus* and *Lepidoglyphus destructor* and family *Acaridae* with *Acarus siro* and *Tyrophagus putrescentiae).*

The life cycle of the storage mites takes three weeks at 25°C and includes 5 stages (egg, larva, protonymphe, tritonymphe, adult). The optimal relative humidity is 70-90%; under 65% humidity the mites desiccate. Infested foods smell minty, and a brownish mite dust can be seen.

Acarus siro belongs to the flour mites and also lives in food, grain and on cheese. The average size is 300-600µm, the lifespan up to 100 days, and they lay up to 1000 eggs. The mites tolerate very low temperatures down to 5°C; under optimal conditions (90% humiditiy and 25°C) the development takes 9-11 days; at 10-15°C 28 days. A characteristics of these mites is the development at the second nymphe stage of a hypopus stage, which is very resistant and can survive in flour up to 7 months.

Tyrophagus putrescentiae likes all climates where fungi can grow. They can be found on cheese, in flour, grain, straw, furniture, etc. The average size of this mite is 300-400µm and the lifespan 30-40 days. Below 10°C this mite is not viable. At a temperature of 22°C and a humidity of 87% the cycle needs 15-18 days, however they also survive above 30°C. They do not develop a hypopus stage.

The prevalence of positive reactions to storagemites in the intradermal-skintest and blood tests

In Europe allergies to house-dust and storagemites play an important role and are more significant than are the pollens. Positive reactions to *Acarus* are seen in between 45-95% of atopic dogs, to *Typrophagus* in 60-89% and to *D. farinae* in 70-90%, depending on the literature source.

Occurence of storage mites

They are found not only in grain and food, but also in stables, hay, straw and house dust. In 0,1g of dust 640 house dust mites and 120 storage mites have been found (Zejda, 1993). Not only the mites, but also the faeces of the mites are allergenic. The faecal pellets break up into many small pieces, combine with dust particles and form the allergenic dust.

In 1994 a study found storage mites in urine or faeces of 8% of humans examined (Li et al., 2003). Thind et al. (2001) found storage mites in 21% of 571 cereal based food samples. Hallas and Gudmundsson (1987) found in one kilogramm hay 50.000 living mites.

Avoidance strategies

In Veterinary medicine the recommendation to freeze dry food is often made. Thus a study was performed to evaluate first how often dry foods are infested with mites and the effects of freezing (Wagner, 2005).

Samples from 20 different dog and cat foods of various brands, 10 samples of different human dry foods, and 2 samples of farm animal food were examined for storage mite

contamination. Mites were found in 15,6% of samples (3 in dog/cat food, 1 in human food and 1 in farm animal food). On the third day in the freezer none of the mites moved. All of the positive samples came from expired foodstuffs and were from both open or original packaging. The study confirmed contamination of foodstuffs with storage mites, and expired food seems particularly at risk. Freezing dry food helps to stop the reproduction of the mites, although existing allergens will not be affected.

Recommendation

The final recommendation of this study is:

Animals allergic to storage mites should

- generelly only eat dry food from good manufacturer
- not eat expired food
- be fed from smaller packages to prevent lengthy storage of open of big packages
- the opened packages should be stored in dry rooms in closed containers

Prevention of reproduction of any mites can be achieved by buying only small bags, storing them in the freezer and feeding directly from the freezer (after allowing the food to reach room temperature).