Skin lesions in rabbits caused by parasites and fungi

The number of house pet rabbits has increased the last years, especially amongst singles. These may get ectoparasites or dermatophytes infections by the contact with other rabbits.

**Ectoparasites:**

**Mites:**
The most important one is the rabbit fur mite (*Cheyletiella parasitivorax*). The direct transmission of this parasite is through body contact, but it may occur indirectly, by the use of one comb for several animals. This mite is not host specific; it can also affect humans or other pets causing skin irritation.

Infestation with this fur mite causes itching and scale production in the rabbit. The neck is the preferred site for this parasite. If the scales are removed with a comb, the mites can be visualized when placed over a dark surface.

For diagnosing this mite, it is recommended to take scales with tape and observe these under the microscope. Typical for these mites are the pedipalpes, which are curved to the inside and are used to hold on to the food (scales).

If a skin scraping is performed without immediate fixation, one may only find mite eggs, because the mites have migrated away. Besides treatment with anti-parasitic drugs, it is very important to control the environment (cleaning and disinfecting), even though these mites do not survive a long time away from the host.

The second most important mite is the rabbit ear mite (*Psoroptes cuniculi*). This mite is commonly not found in rabbits that live alone, but can be seen in larger populations (breeders/farms), where it can be seen locally. The affected ears show stratified accumulations. The infection occurs by direct body contact, but the indirect transfer is also possible (through combs and clothes). These parasites can survive in the surroundings for 2-3 weeks.

If the affected rabbits are in a horse stable, the horses should be checked as well. Humans can transmit the mites from rabbit to horse and back.

The diagnosis of mite infestation is quite easy macroscopically by looking at the typical ear lesions. It will be possible to see the mites without a microscope, by observing the scales. By microscope this mite can easily be recognised because of the typical stiletto form of its bucal pieces.

Besides treatment with anti-parasitic drugs, it is important to clean and disinfect the rooms where the rabbits are. All animals that live together have to be treated, even those that do not show any symptoms.

Also the mite *Leporacarus gibbus* can be seen in rabbits, but is considered to be less pathogen. This parasite lives in the fur and lays its eggs on top of the hairs. It can be the cause of local itching.
The sample should be taken from the border of the lesions, and sending in extraction of hairs and/or a swab is recommended. Hygienic measures have to be taken into consideration because of the zoonotic risk of Dermatophytes.

The scales or hairs are the best material for the microscopical examination. It has to be put on a slide with a cover and paraffin oil. The sample taken from a swab can be observed with caustic potash solution (10-20%) instead of paraffin oil as it helps to wipe out the scales and the spores that could be attached around the hairs. Although caustic potash solution makes the sample crystallize which make the microscopical evaluation difficult. The finding of groups of spores is indicative for the diagnose.

Other ectoparasites which are found more rarely on the rabbit are the rabbit flea and the rabbit louse.

![Figure 4: Rabbit flea (Spilopsyllus cuniculi)](image)

This flea behaviour is similar to other species, with a whole methamorphose (egg, larvae and pupal stadium) on the host until they reach the adult stadium. It is especially important in the rabbit as it is a myxomatose (leporipoxvirus) vector.

Besides treatment of the affected animals, it is necessary to treat the environment, by cleaning and disinfecting.

The rabbit louse (*Haemodipsus ventricosus*) is, like the other lice, host-specific. It produces itching and often a lack of appetite. Additionally to a specific treatment where the lice are killed, nits have to be considered. Therefore it is necessary to treat again later. Removing the nits is possible but difficult by longhaired rabbits, so it is sometimes easier to cut the hair.

With the therapy only the adult stages are killed. Therefore, re-treatment 8-10 days later is recommended to kill the following generation of parasites.

If the rabbits have access to an outside area, other parasites, like ticks and chigger (also called red bugs), and other non specific parasites, like fly maggots, are to be considered. The maggots can quickly appear after diarrhoea or over abscesses, so often the owners identify the problem very late. The treatment consists of collecting the maggots and their eggs, and treat the underlying cause.

**Fungi infection:**

Rabbits, similar to other rodents like guinea pig and chinchilla, often suffer from latent fungal infections without clinical signs. Round areas without hair and also wet scaly or hairless areas around the eyes, ears and nose are to be considered as suspicious for dermatophytes infection. These lesions rarely appear in other areas.

A bacteriological examination of the swab with several different culture media is very important. In our lab we routinely use a Sabouraud agar with gentamicine and chloramphenicol to inhibit the growth of bacteria, and also Sabouraud culture media with gentamicine and cycloheximide (Actidion) to inhibit the growth of moulds. The incubation takes up to 4 weeks at 28°C. The cultures are observed for the first time after 4 days. The examination of the cultures is done visually both from the upper and then the reverse side and finally microscopically.

![Figure 5: Spore structures around a hair](image)

![Figure 6: Trichophyton mentagrophytes upper and reverse side of the culture](image)
The suspected colonies are examined microscopically using a tape film and one drop of lactophenol cotton blue for the staining and with the x40 objective. The forms of microconidia, macroconidia and spiral hyphae are studied. 

*Microsporum gypseum* was found in 2.1% of the positive cultures. This fungus is a normal soil resident, but may colonise the skin and show the symptoms of dermatomycosis. If we consider all the yeast within the positive cultures, with *Candida* spp., *Candida albicans* and *Malassezia pachydermatis* and also the non pathogen yeast *Rhodotorula rubra*, this group reach around 28%. In a case of yeast infection, smearable seborrhoeic skin lesions are seen.

Moulds, usually considered a secondary contamination, we found *Scopulariopsis brevicaulis* in 27.2% of the cases. It is a ubiquitous fungus, usually non pathogenic that may be found in previously damaged skin. The relevance of the presence of this fungus needs to be evaluated together with the clinical signs. However, this fungus was often found in pure cultures.

The latent infected spore carriers have increased susceptibility of suffering a fungal disease. Stress conditions, like internal fights, dirtiness or an inadequate diet are cofactors that can onset clinical symptoms of a fungal infection.

**Therapy:**
A local therapy can be effective when only local lesions are present. In this case, it is important to control the success of the therapy at the borders of the lesions. The treatment must be applied consequently for 3-4 weeks.

If the lesions are generalised, a systemic treatment is necessary.

Please be aware that the skin of the rabbit is thicker than in the cat.

In the cases where yeast are found, other problems, like vitamin deficiencies, metabolic diseases, like diabetes mellitus, has to be considered and treated simultaneously to the yeast infection. Although the systemic medicaments reach good concentrations in the skin, one can face that spores situated in the hairs and on the skin are so many that environment disinfection and protection of other animals and owners is necessary.

**Disinfection and environment manage:**
In order to avoid the transmission to other animals or humans, it is necessary to treat the environment. Besides normal cleaning, for example vacuum cleaning, it is recommended to disinfect the room with bleach (5% natrium hypochlorit). This is easy to apply, kills the spores, but is highly irritant and therefore has to be used carefully. Enilkonazol (*Imaverol*®), with a 2% dilution, is another option for treating the environment.