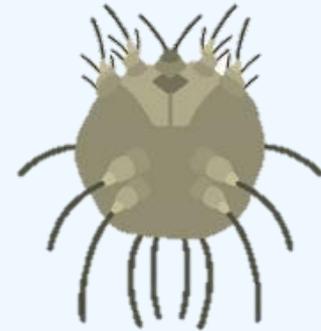
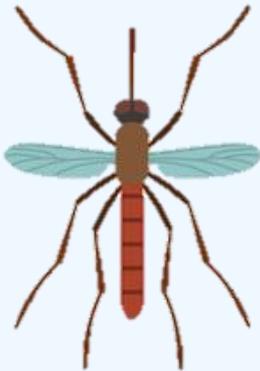
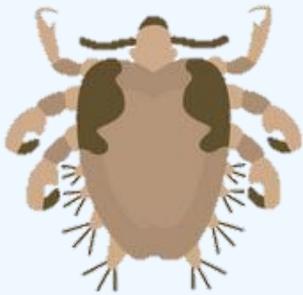


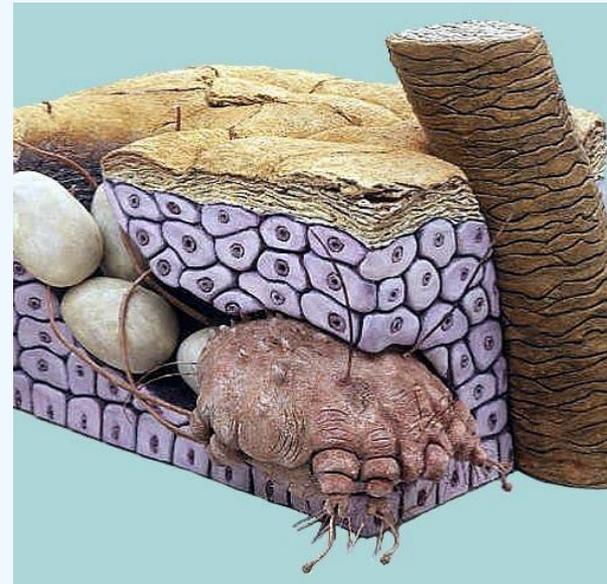
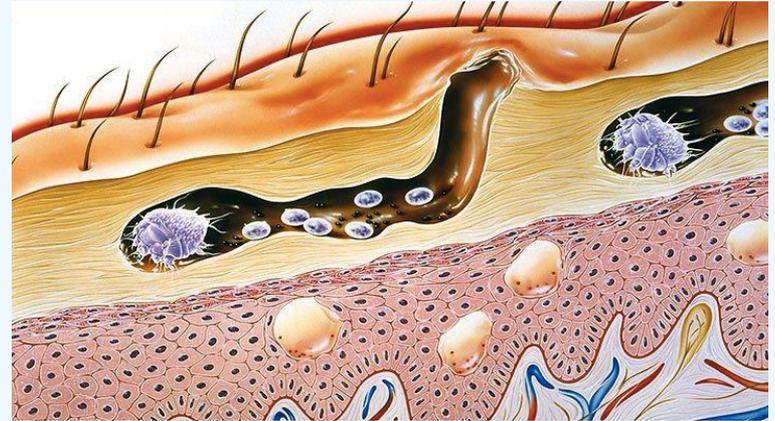
# PARASITIC SKIN DISEASES

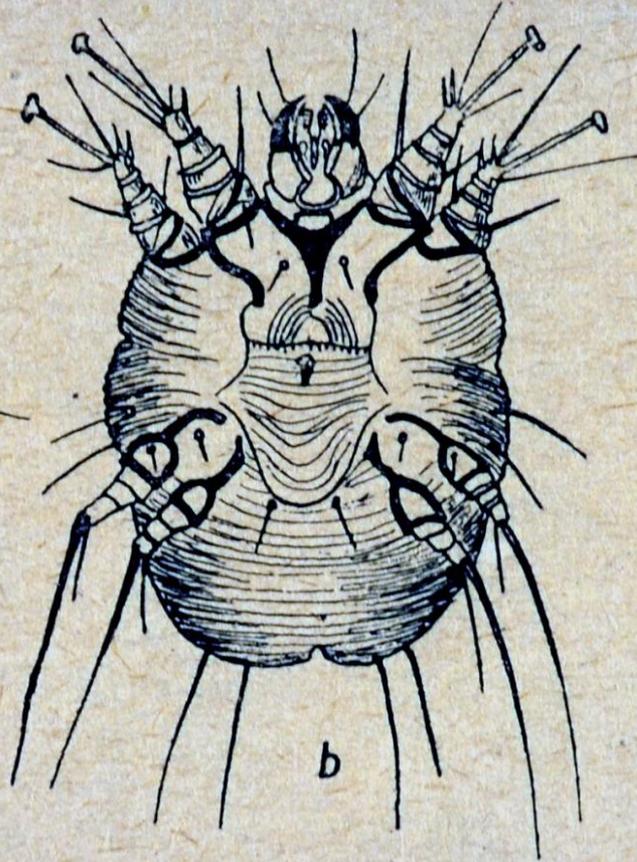
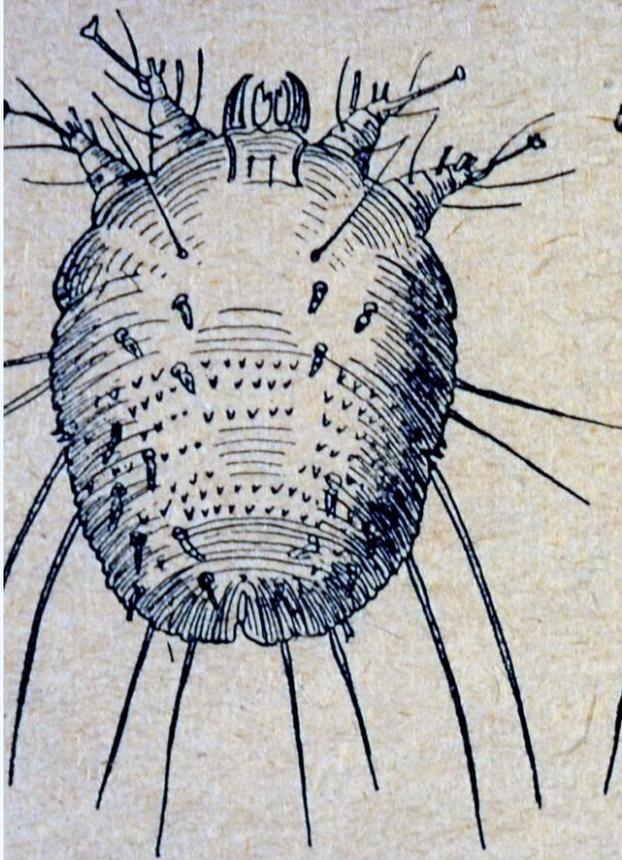


# SCABIES

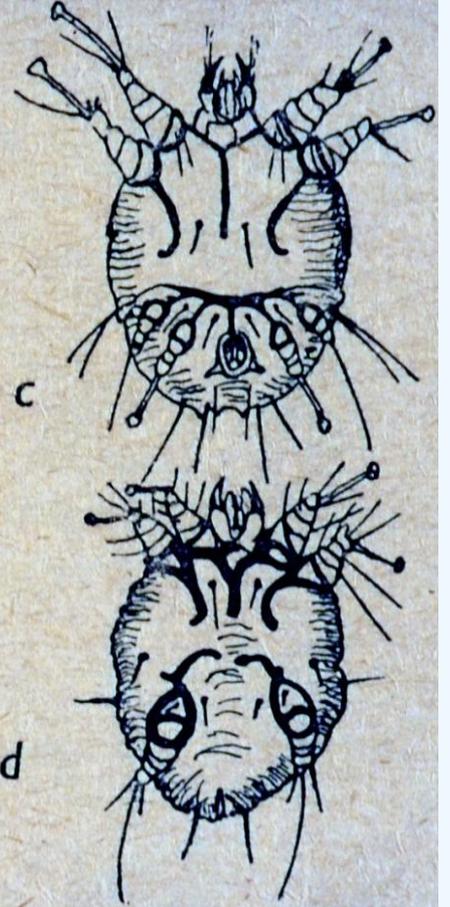
Scabies is an itchy dermatosis caused by the parasite **Sarcoptes scabiei**. The **female** parasite (about **0.3–0.4 mm** in size) **burrows in the stratum corneum** and lays 3 eggs a day, living for a total of 4-6 weeks. The male lives on the surface of the skin and dies within 48 hours after copulation. A single fertilized female is sufficient to infect a new host. Scabies is nearly always acquired by skin-to-skin contact, incubation period is 2-6 weeks. In absence of the host, it is very sensitive and dies at room temperature within 3 days, at exposure to 50 ° C within 10 minutes.

**Factors leading to the spread:** poverty and overcrowding, institutional care, such as rest homes, hospitals, prisons, refugee camps, immune deficiency...





b



c

d

## Clinical features:

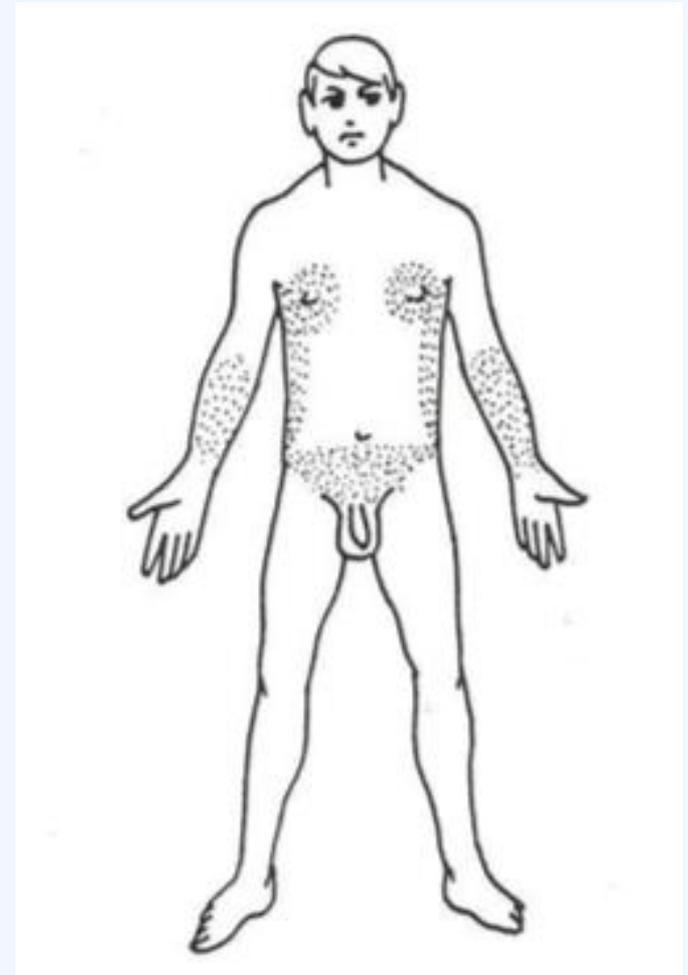
- severe **itchiness and papular rash, tiny burrows, two papules of light red color side by side**, one of which is larger (the place of entry of the mite into the skin), the other smaller (end of the scabies corridor)
- symptoms develop symptoms within two to four weeks, during a second infection within 24 hours
- **the itch is worse at night**
- scratching may cause skin breakdown and an additional bacterial infection in the skin
- **secondary lesions** are mainly an expression of **hypersensitivity reaction**, they represent **erythematous macules, papules, urticarial lesions, excoriation** from scratching, **crusts**, eczematization
- suspicion should be raised when other members of the household report itching as well





## Predilections areas:

- wrists, between fingers, along the waistline, genital area, areolas, axilla, inner thighs (places with warm, easy to penetrate, soft skin)
- **the head, palms and soles are usually not affected**, but can be in young children and immunosuppressed individuals



## Special forms of scabies:

### 1. Scabies of the “clean”

- patients with increased hygiene
- the diagnosis of pruritus is difficult, because there are usually **only a few isolated lesions**, especially papules
- the only major symptom is **severe nocturnal pruritus**

### 2. Scabies nodularis (picture)

- it is an expression of an **enhanced immune response**
- strongly **itchy red papules and nodules**, which sometimes recur after the scabies has healed



### 3. Crusted scabies - Norwegian scabies

- it was first described in Norway in patients with leprosy
- it is a more severe form of the disease, it typically only occurs **in those with a poor immune system** and people may have **millions of mites**, making them **much more contagious**
- it begins as **red patches that then develop into thick scaly plaques** between the fingers, under the nails, or diffusely over palms and soles, elbows and knees. Mites can also collect in nail beds, causing the nail plates to split.
- due to the reduced immune response in patients, **pruritus is mild or absent**
- **unlike normal scabies, it can also affect the head, neck, palms, soles** and mites can also accumulate in the **nail beds**, causing the nail plates to split

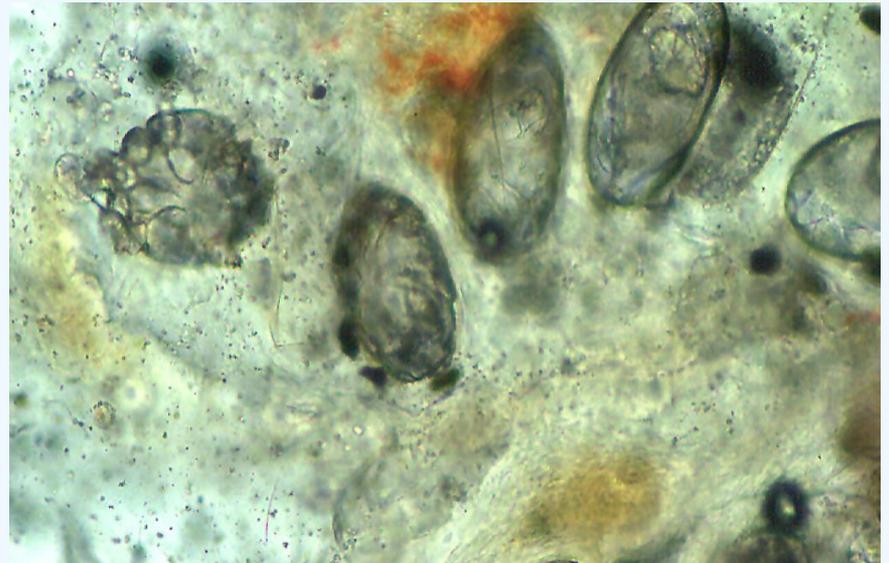
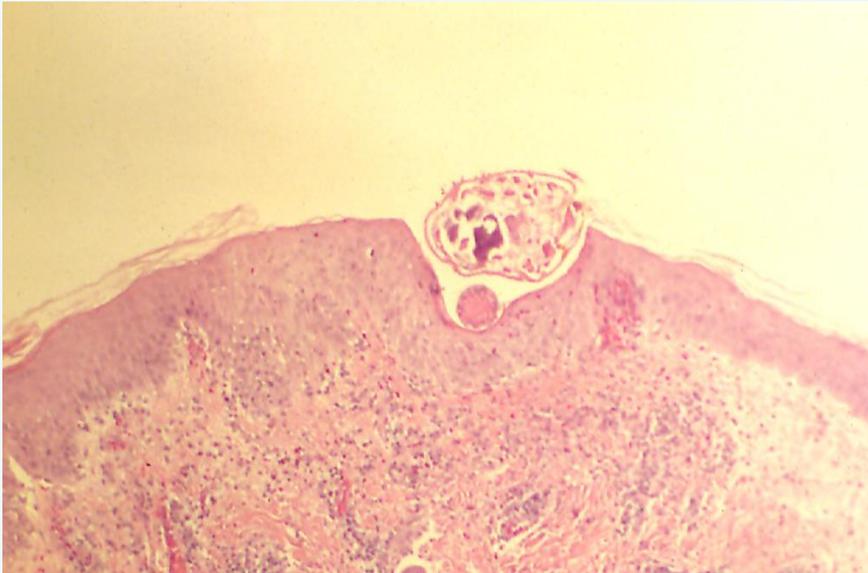






## Diagnosis:

- is usually made **clinically**, based on the typical signs and symptoms
- if in doubt **microscopic examination** can help identify the mites or their eggs and feces
- **skin biopsy** is rarely necessary



## Treatment:

- **5% permethrin** cream for 8 hours or **20% sulphur ointment** for 5 days
- even application after a bath onto dry skin, from the chin to the fingertips, in young children, crusted scabies and in case of repeated reinfestations also treat the head
- **antihistamines** to relieve itching and **local steroids** to cure eczematization can be used as additional treatment
- family members should also be screened and treated accordingly to prevent reinfection
- living areas should be thoroughly cleaned, **clothes washed at 60 °C minimum**
- **items that cannot be washed**, should be kept sealed in **plastic bags for a week** or left in a freezing environment for 48 hours
- scabies is an infectious disease and there is **an obligation to report it!**



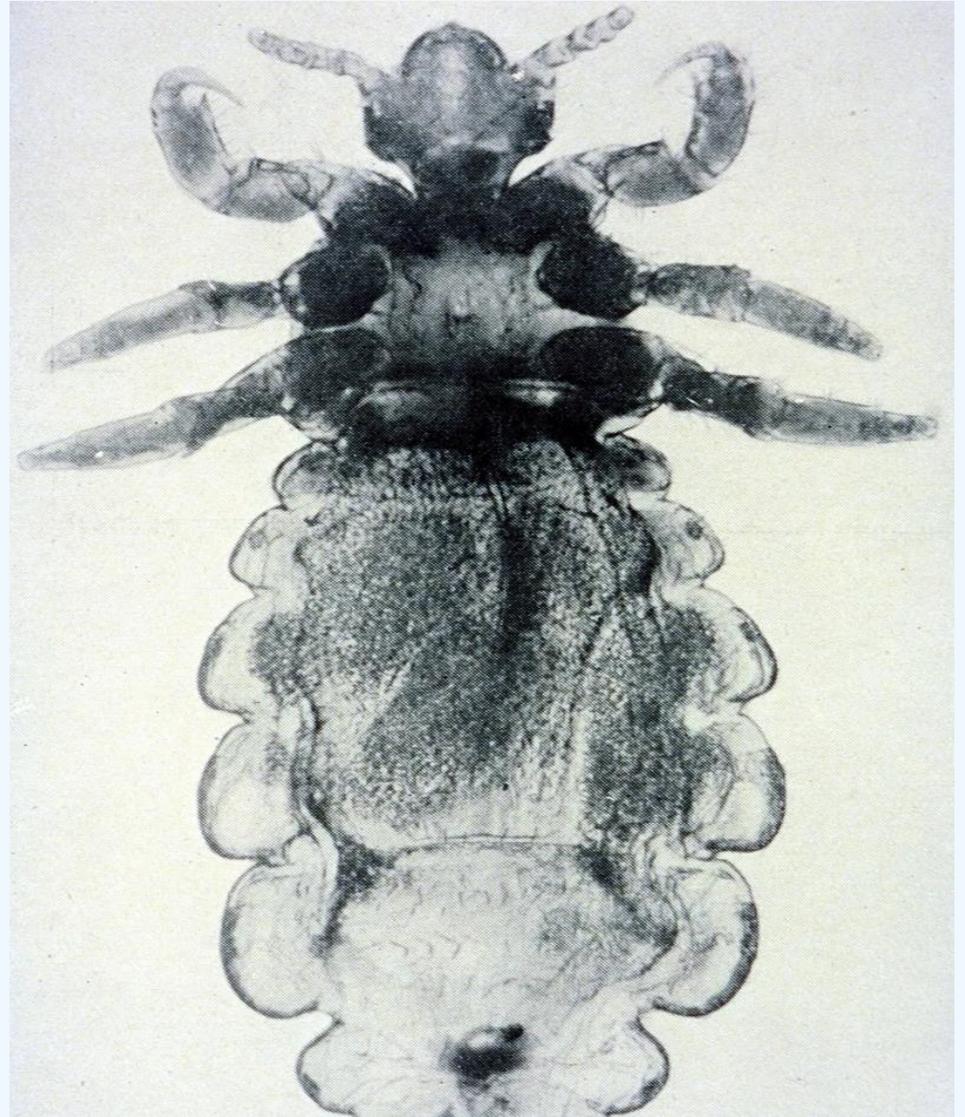
# PEDICULOSIS – LOUSE INFESTATION

Lice are small insects that live on human hair and clothing and can just be seen with the naked eye. Lice are well camouflaged and reflect the color of the surroundings. They are wingless and have six legs on which are attached strong claws that they use to **grasp on tightly to hair shafts or clothing fibers**. With their piercing mouthparts they puncture the skin to **feed on human blood**. They also inject a saliva which causes itching. Lice can survive for up to 10 days without feeding if they become detached from their human host. Clinically they cause **strongly itchy red maculopapules**, which appear hours to days after the bite. **Secondary lesions** include **excoriations, crusts**, thickening of the skin surface. Lice can be **carriers of various diseases** (eg: typhoid fever, recurrent fever, etc.).



## 1. Pediculus capitis (head louse)

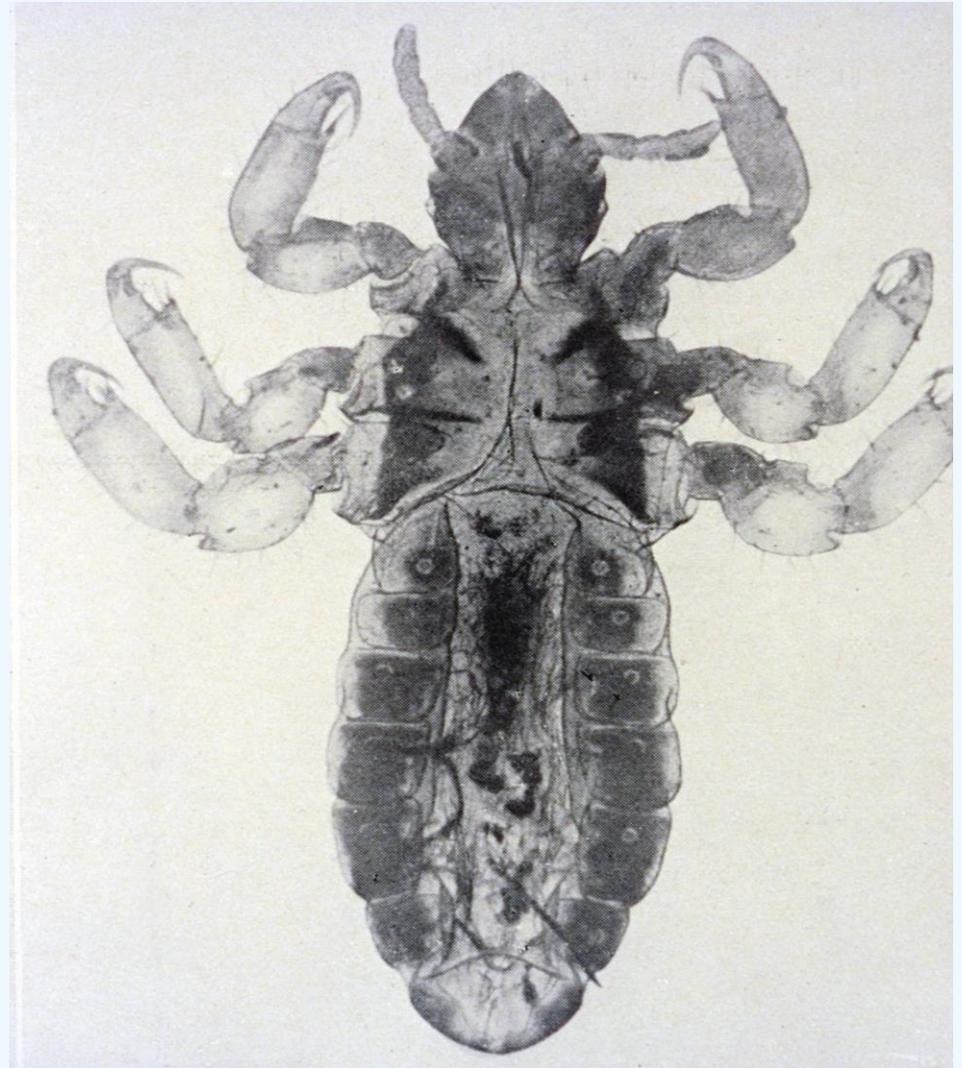
- colloquially known as **cooties**, sucks several times a day, its nits are firmly attached to hair (easy to see, adherent white grains on the hair shaft)
- lice favor the nape of the neck and the skin behind the ears
- clinically there is itch and irritation in the scalp, **visible nits, red-brown spots on the skin due to excreted digested blood**
- when hair grows out, the nits move away from the surface of the skin, so you can determine the age of the infestation (distance of 1 cm corresponds to about 1 month)

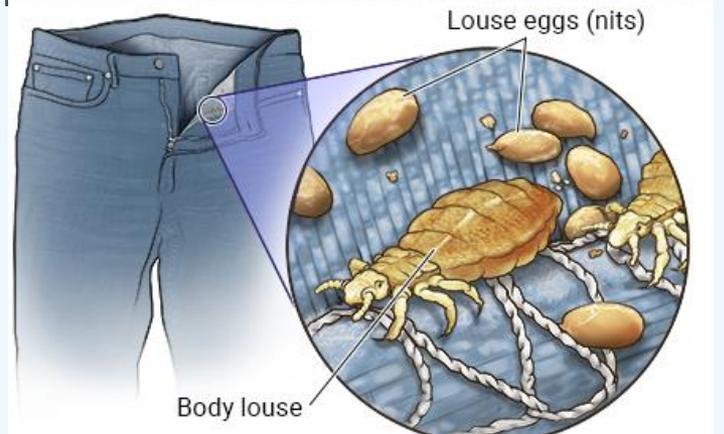




## 2. *Pediculus corporis* (body louse)

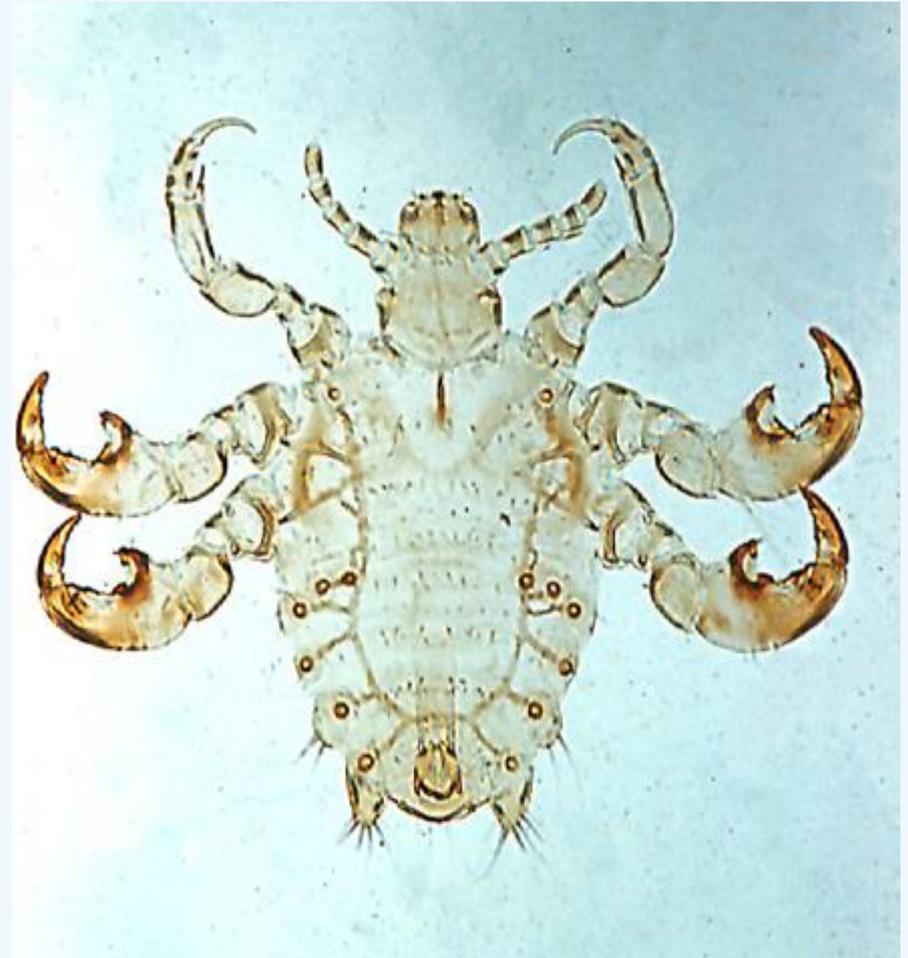
- tends to infest **people in extreme states of poverty or personal neglect**, particularly when unwashed and wearing the same clothing for weeks-on-end
- they **live in the folds of clothing** and **crawl on the skin only for feeding**, they **lay eggs in seams** of clothing
- bite manifest as small red macula with a small puncture hole.





### 3. *Pediculus pubis* (pubic louse)

- very uncommon in developed countries since shaving of pubic hair has become popular
- **eyelashes can also be infested**
- they are smaller than the other two species, and have a **short body resembling a crab** — hence the common name for pubic lice, '**crabs**'
- hind legs are attached to a hair, the front pair of legs and the suction apparatus is immersed in the follicle
- bites manifest on the as skin blue spots, (**maculae coeruleae**) and there is intense itching





## Treatment:

- 1) **Suffocating agents** (Pedicul Hermal Shampoo) – **4% dimethicone** blocks the respiratory airways of lice and nits and effectively kills them.
- 2) **Topical insecticides** - resistance has been reported, dimethicone is better
- 3) **Physical methods: Nit combs** used in wet hair are the most effective way of physically removing the lice and nits. Shaving the head or cutting the hair very short is effective, but rarely necessary.

**Laundering of clothing and bed linens** using hot washes is essential to killing body lice and their eggs on clothing.



# FLEAS – PULLICOSIS

## **Pulex irritans – Human flea**

- they survive from **sucking blood** on their hosts – several times a day - breakfast, lunch, dinner, which usually manifests on the skin as 3 **hemorrhagic dots, most commonly in places covered with clothes**
- the main symptom of a flea bite is intense itching, the bite may also be painful
- scratching can lead to secondary infection
- some individuals experience bigger immune response (allergy) to flea saliva leading to papular urticaria
- species that primarily infest cats and dogs may bite humans if they have been starved since their last blood meal
- **pets carry about 5% of the total flea population** and are the main reservoir of adult fleas
- source of human Yersinia pestis infection

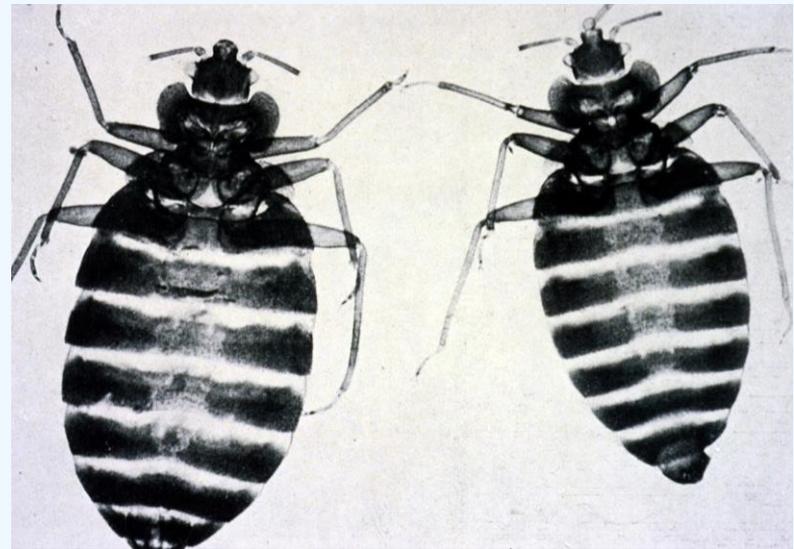


**Treatment:** flea eradication, local steroids, oral antihistamines

# BED BUGS – CIMICOSIS

## **Cimex lectularius**

Bedbugs feed primarily on human blood. They have a **brown to reddish flat body**, size 4-5 mm. Nymphs and adults **hide in human dwellings** during the day (furniture, walls and floors, mattresses, bed frames) and **suck blood during the night** – they find their hosts by thermal sensors located on their heads. They stab mainly the **uncovered parts of the body**; usually not under the duvet or under the clothes. The bedbug injects an anesthetic so that **the bite does not hurt**. It feeds for 3-10 minutes, **once a week, but can last without food for several weeks** up to one year, that is why it is so **difficult to get rid of them**.



- most patients do not experience a reaction to a bed bug bite, when a reaction occurs, the lesions are most commonly **red, urticarial lesions with a hemorrhagic dot**, saliva penetration into the subcutaneous tissue causes **intense itching and burning**
- if not scratched, the lesions **usually resolve in a week** or so, treatment is not generally required, **symptoms can be alleviated by antihistamines or local corticosteroids**
- **the important thing is eradication**, which can be difficult and requires chemical and non-chemical control strategies, **it is best to hire a professional** pesticide applicator with experience in treating bed bugs.



**NOTE:** If travelling, watch out, check every hotel room or dormitory for bed bugs. Keep your bags off the floor. When you get home, hotwash your clothes, and thoroughly vacuum your bags. Seal the vacuum bag before destruction.



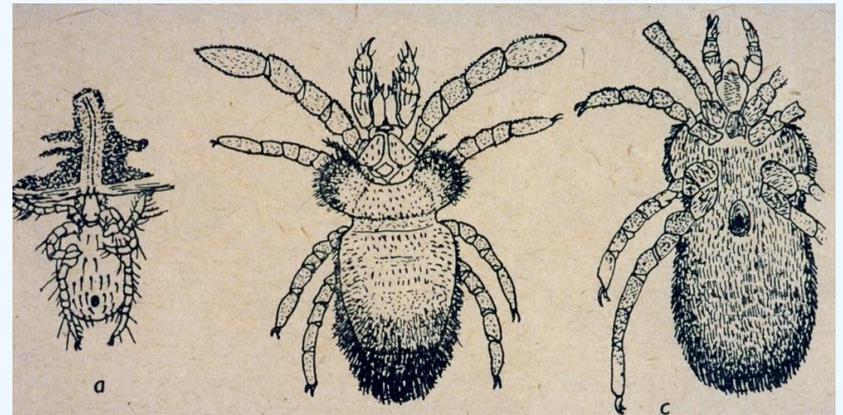
# TROMBIDIASIS

## **Trombicula autumnalis - harvest mite**

Trombiculas are orange or **red in color**. They lay eggs in damp soil. After hatching, **their larvae climb on grass and wait for a potential host - warm-blooded mammals**, including humans. With their "blade-like chelicerae" they attach themselves to the hosts and **feed on their tissues**. After sucking for several days, they fall off and develop into adult mites. The bite causes a relatively **violent allergic reaction, severe itching and red papules, similar to mosquito bites**. Heat increases the effects of the bite, bites are often found

**The symptoms disappear spontaneously after 10-14 days**. Therapy is symptomatic.

**The manifestation is related to staying in nature, especially on warm days from July to September.**





# TICKS - IXODAE

## **Ixodes ricinus - castor bean tick**

Is a European species of hard-bodied tick, size 2-3mm, larva 1.5 mm. These ticks live **in the vicinity of forest roads** and paths, they usually **hang by hind legs from low bushes and other vegetation**, patiently waiting for a passing person or an animal. As soon as a person touches the tick, it **reflexively attaches and anchors in the skin** by a toothed hypostome and **sucks blood**.



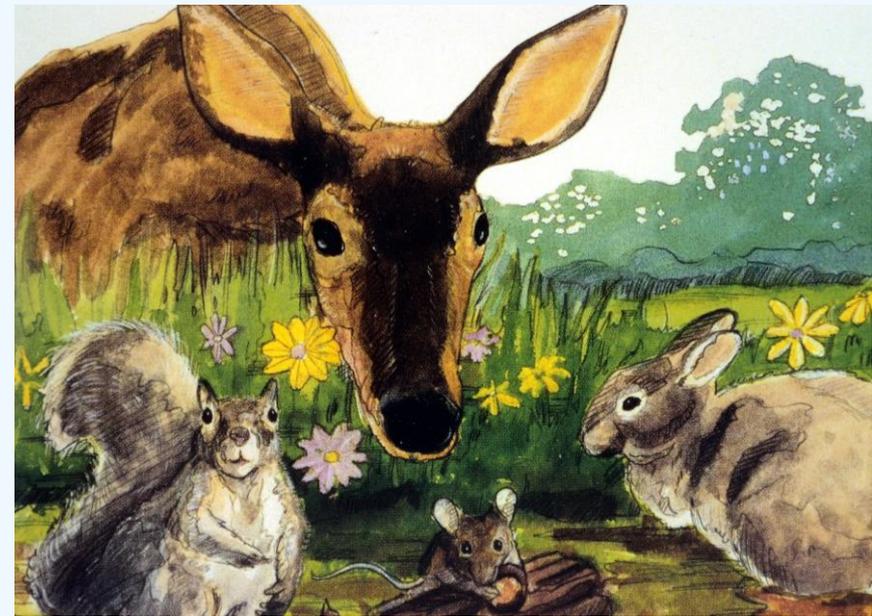
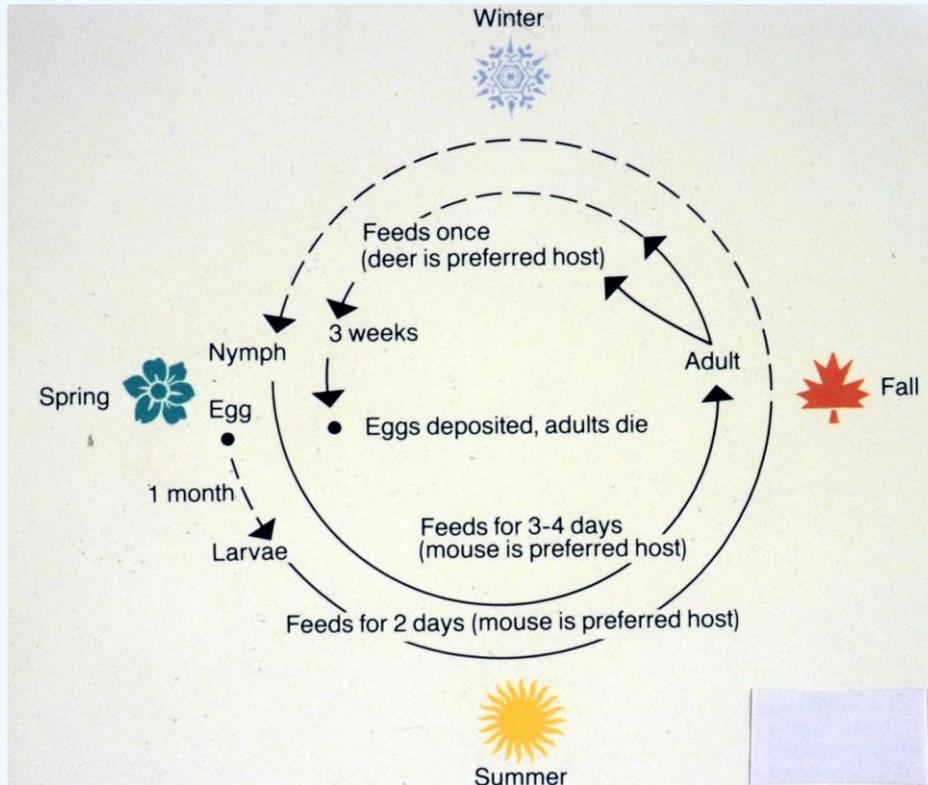
## Lifecycle takes one to two years:

→ egg

→ larva (feeds on small rodents, birds, reptiles)

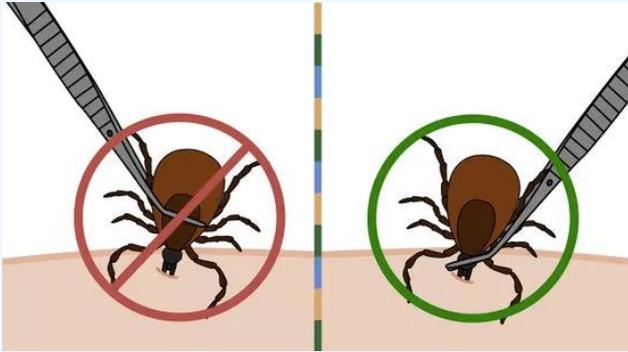
→ nymph (medium sized mammals)

→ adult (large mammals, deer), **an engorged female lays several thousand eggs and subsequently dies**



## Treatment:

It is most effective to **hold it with fine tweezers as close to the skin as possible**, carefully **pull it out using a rocking motion** and check that the entire body including pliers has been removed. The wound must be disinfected, preferably with iodine tincture.



## Ticks can cause dermatologic disease directly by their bite, or indirectly as vectors of other diseases:

- **Bacterial infections:** **Lyme disease**, tularaemia, babesiosis, rickettsial infections, ehrlichiosis and anaplasmosis, Q fever
- **Viral infections:** **tick-borne encephalitis**, Crimean-Congo hemorrhagic fever, Colorado tick fever...
- **Tick bite induced meat allergy:** is an allergy to the galactose-alpha-1,3-galactose (also known as alpha-gal), which is present in both tick bite saliva and red meat, therefore sensitization can occur. The recovery period has been reported to take between 8 months and 5 years as long as the person is not bitten by another tick.

## Lyme disease

- is the most common tick-borne infection in the Czech Republic and is also the most common anthroozoonosis in Europe
- in Europe, Lyme disease is due to the subspecies *B. burgdorferi sensu stricto*, *B. afzelii* and *B. Garinii* (gram-negative spirochetes)
- the disease develops in stages that begin weeks to years after infection, **only about 5% of people who come into contact with the infection develop the disease**
- lyme disease **can affect any part of the body**, most commonly the skin, central nervous system, joints, heart, and rarely the eyes and liver
- **on the skin it presents as erythema migrans, borrelial lymphocytoma, acrodermatitis chronica atrophicans**



**Diagnostic methods:** ELISA, Western Blot B – **IgM, IgG** level detection

**Treatment: ATB - doxycycline**, the route of administration and the duration of the course of antibiotics depends on the stage and organ involvement. It varies between 10 and 30 days.

# 1. Erythema chronicum migrans

Develops in **14 days to one month**, it **starts at the site of the tick bite** as red papule or macule that gradually expands. A central spot surrounded by clear skin that is in turn ringed by an expanding red rash (**like a bull's-eye**). It is the most common manifestation of Lyme disease (70-80%), but may also not appear at all. Causes **no pain, no itching**.





## 2. Lymphocytoma

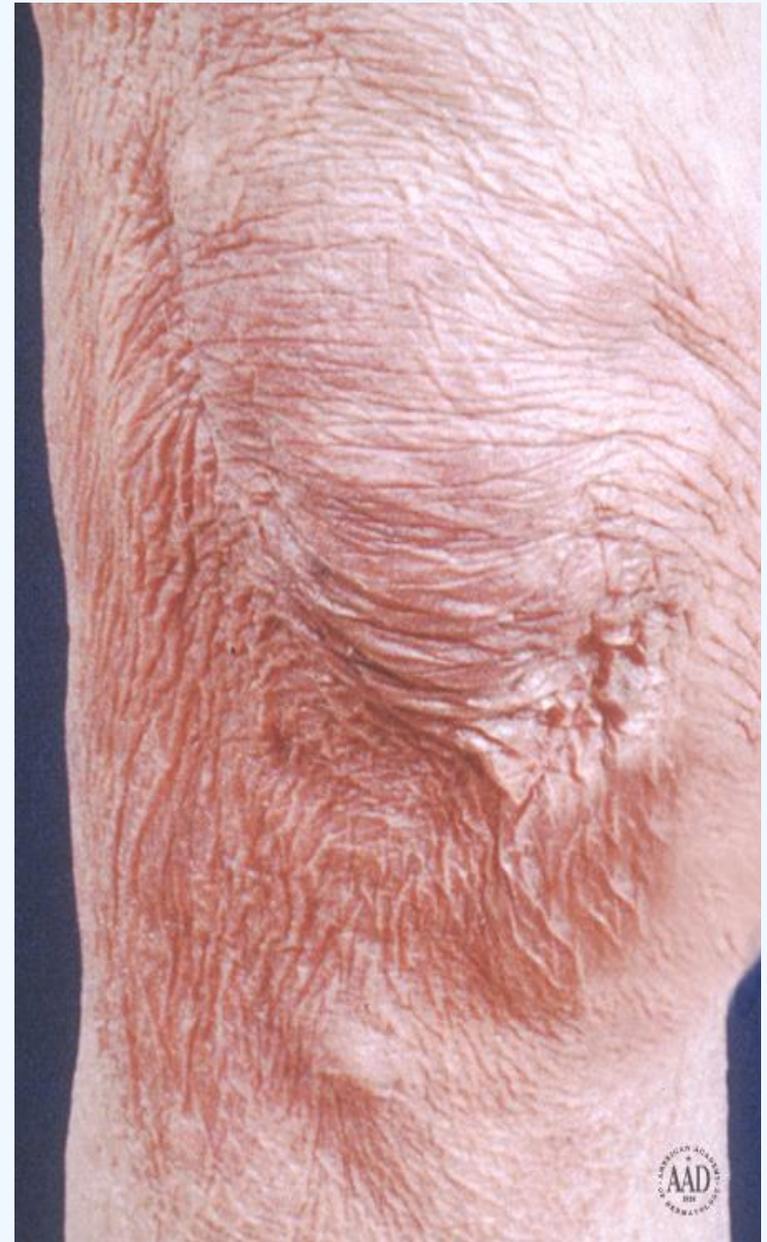
- is a **dark red to purple papule with a smooth glossy surface** ranging in size from a few mm to 3-5 cm
- it usually occurs **in children, a few weeks to months after infection**
- it is most often on the **auricle** of the ear, but it can also on the **tip of the nose**, the **areola** of the nipple or on the **scrotum**
- without treatment, it often persists for weeks and months, is rarer than erythema migrans





### 3. Acrodermatitis chronica atrophicans

- degeneration of the subcutaneous tissue, not earlier than one year after infection, but also several years after infection, predilection sites are **acral regions** of the body and skin areas **above large joints**.
- the **lesions red or blue-red and gradually atrophy**, the skin is as thin as **cigarette paper**, wrinkled, the blood vessels are clearly visible
- long-term complications include peripheral neuropathy.
- the causative agent is **always B. afzelii**.

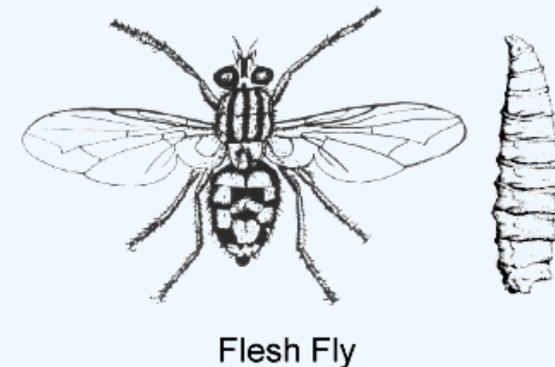
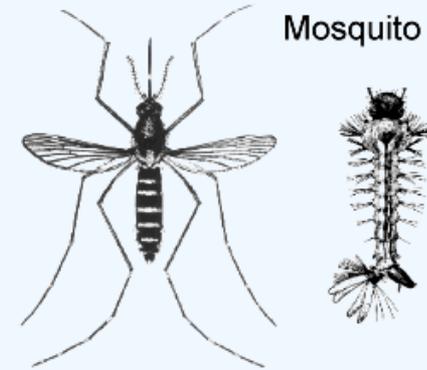




# STINGING INSECTS

## 1. *Diptera*

- **mosquitoes, stable flies, flycatchers, horse flies...**
- when injected, the **symptoms are caused by saliva** containing vasodilators and anticoagulants
- the clinical picture is determined by the type of insect, the intensity of the sting and the sensitivity of the victim
- **intensely itchy to painful erythematous maculopapules, urticaria, edema**, or accompanied by fever, nausea, headache and even a general allergic reaction.
- in the tropics of the diptera they **pose a risk of transmission** of leishmaniasis, trypanosomes, filariasis, malarial plasmodia (*Anopheles* mosquito) or flaviviruses causing e.g. dengue, yellow fever (mosquitoes)



**Myiasis**, which occurs mainly **in the tropics**, is caused by the **larvae of some flies, which lay eggs in wounds** and body orifices, and some even actively seek out the host. In our conditions, the larvae of some flies can be found in necrotic wounds (uncovered shin ulcers). Because the larvae feed on the necrotic tissue, they help cleanse the ulcer.

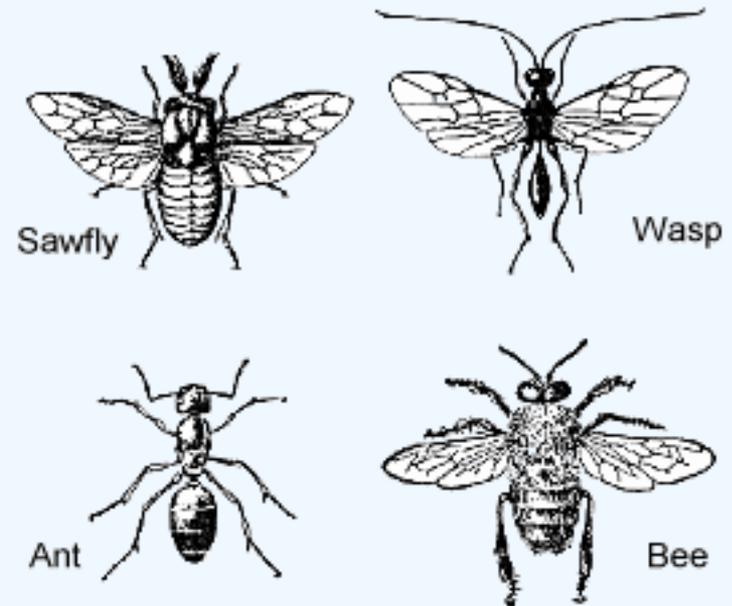


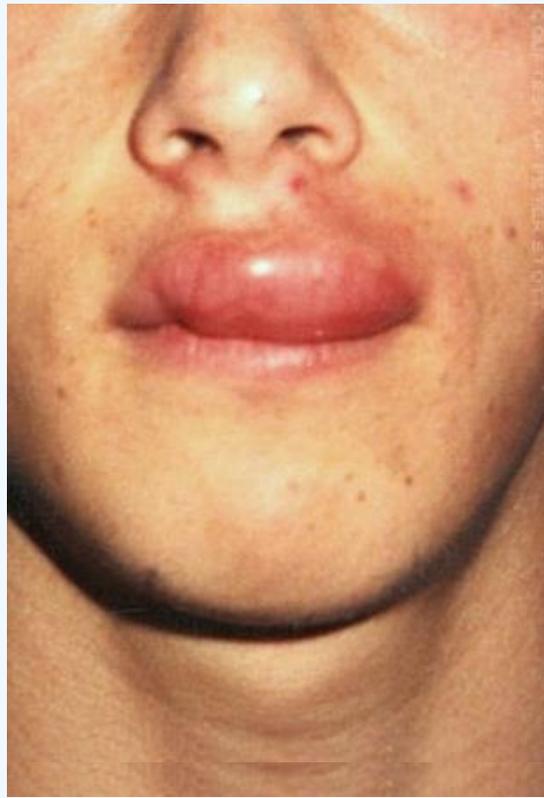
## 2. Hymenoptera

- bees, wasps, hornets, ants ....
- manifested by pain, itching, erythema and swelling at the injection site
- multiple injections can lead to systemic toxicity with the possibility of cardiovascular failure, anaphylaxis

### Therapy: symptomatic

- surface disinfection, antihistamines in general, corticoid external (in case of allergic reaction and in general)
- in case of secondary antibiotic infection
- desensitization is possible for allergic individuals.





# OTHER MITES

## Pyemotes mites

Bites from pyemotes mites tend to happen in very specific situations, the mites DO NOT infest homes. Bites most often occur **in nature when we come into contact with insects that are infested with these mites.**



### **Pyemotes tritici - straw itch mite**

Occurs when people who handle straw (e.g. when feeding livestock) develop an itchy rash from the pyemotes mites that are infesting the insects living in the straw.

### **Pyemotes herfsi - oak leaf gall mite**

Occurs in people working with wood – insects in the wood that are the mite carrier. The rash that results from the bites is usually described as a red patch with a small blister in the center, most often found on the neck, face, arms, or upper torso.

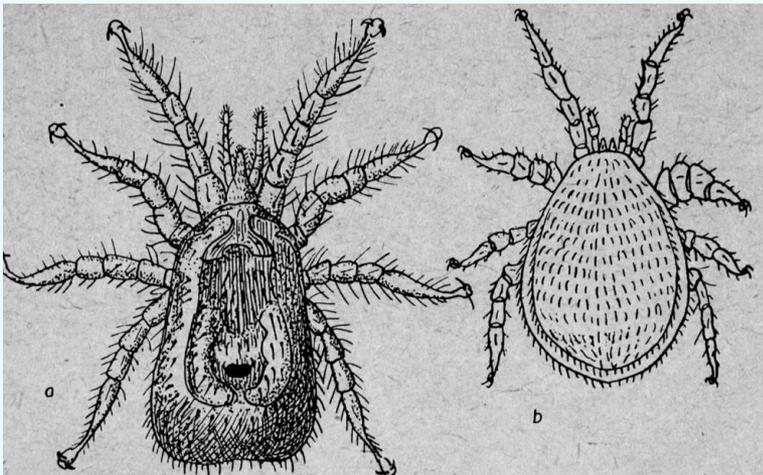
**Treatment is symptomatic** – antihistamines + local corticosteroids.



## Cheyletiella mites

Mites that live on the skin of **dogs, cats, and rabbits**, where they feed on tissue fluid and cell detritus. They do not burrow into the skin, but live in the keratin level. Symptoms in animals include intense itching, scales on the skin, and hair loss. The lesions are usually on the **back** of the animal. Cheyletiella mites move quickly, in infected animals there is a visible movement between the scales, which is referred to as "**walking dandruff**", so an attentive breeder can detect the parasites himself. Treatment in animals: topical pesticide or ivermectin.

**Human is not a suitable host, only places where there is close contact with animals (cat, dog, rabbit) are affected - abdomen, thighs, arms.** Symptoms in humans include multiple red, itchy bumps. The mites do not multiply, die quickly and the symptoms subside within a few days.

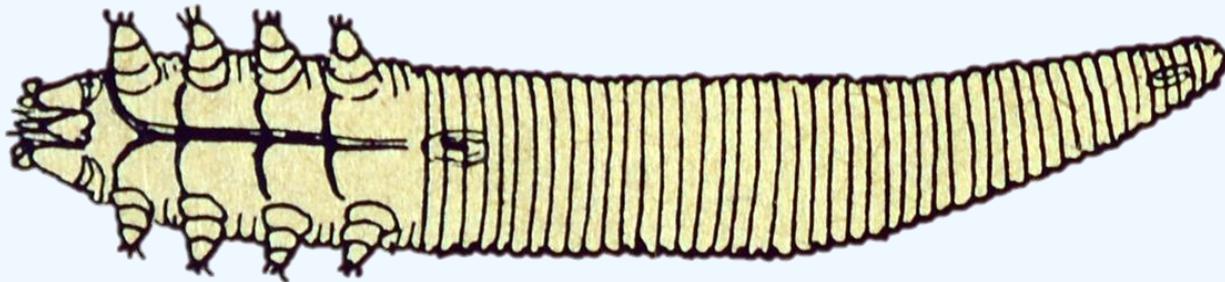


# DEMODICOSIS

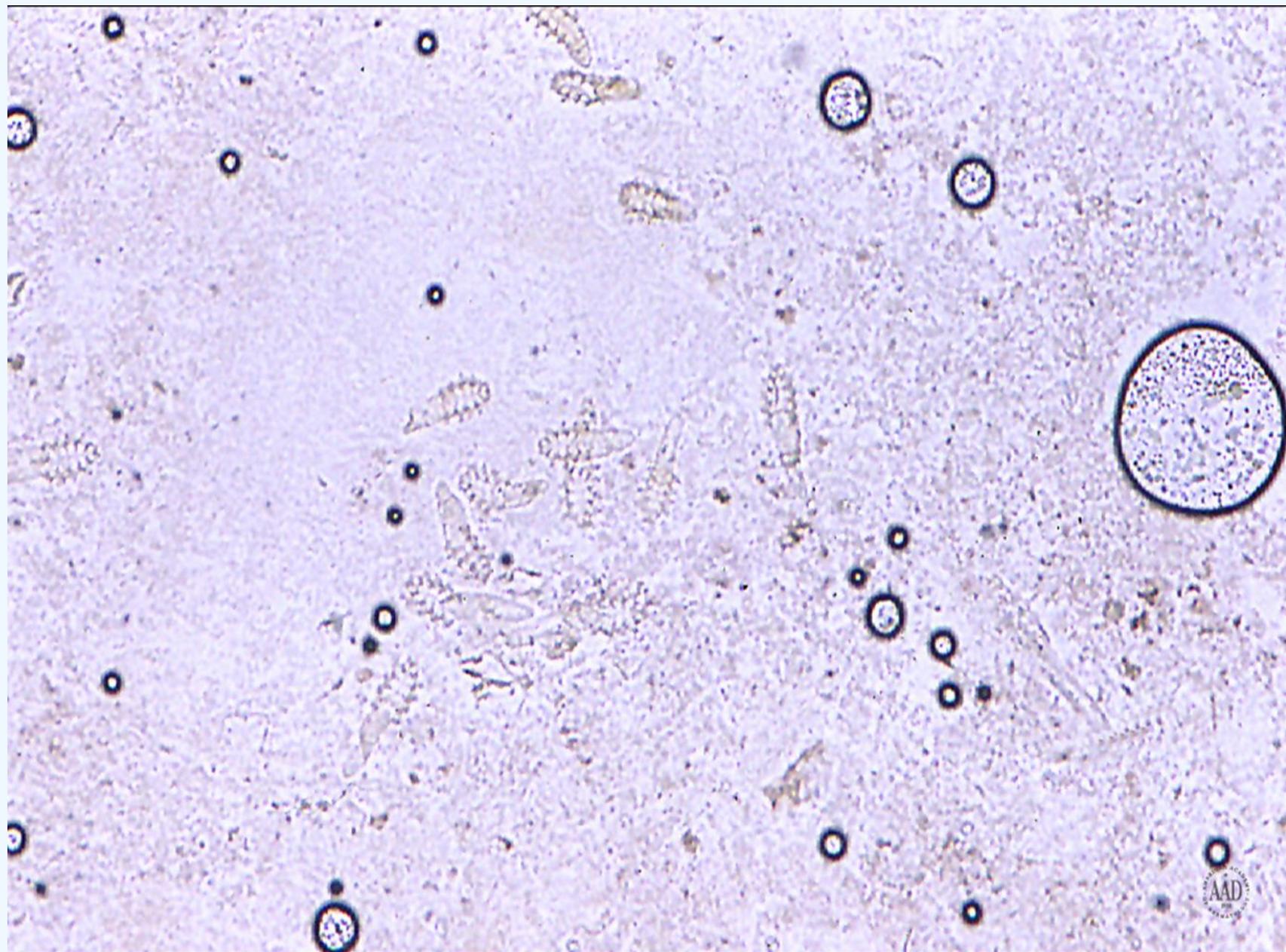
## Demodex

Tiny mites that live and feed in the lumen of human hair follicles (**Demodex folliculorum**- 0,3-0,4mm) and in the sebaceous glands (**Demodex brevis** - 0,2mm). Most commonly, they can be found **on the chin, nose, forehead, eyelashes and ears**. Three or more individuals can live in one follicle. They are an **integral part of the human microbiome and usually cause no problems**, but **sometimes they cause a condition called demodicosis**. Symptoms most often include **follicular scale, redness, sensitive skin and itch**. Macules, papules, eczema, folliculitis and pigmentation have also been described. **Increased numbers of demodex mites have been observed in conditions like rosacea, perioral dermatitis or otitis externa.**

**Therapy:** metronidazole, ivermectin, sulphur, salicylic acid...







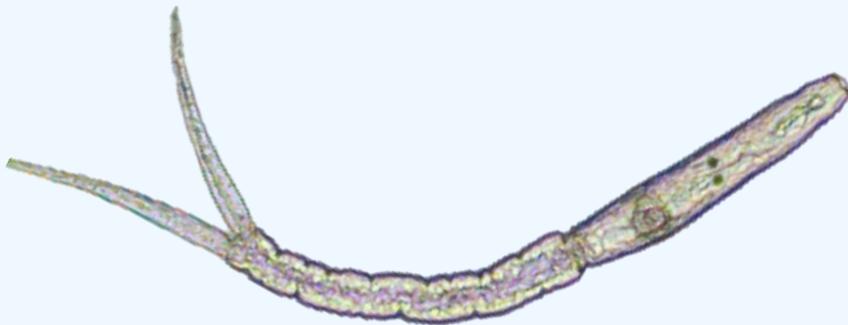


# WORMS

## 1. Swimmer's itch - cercarial dermatitis

Is an allergic skin reaction caused by the penetration of **cercariae** into human skin. These cercariae are immature larval forms of parasitic flatworms (schistosomes). They are released **from infected aquatic snails** into lakes, ponds, and lagoons. Most patients become infected while bathing in nature. Swimmer's itch develops on exposed areas of the skin, when cercariae **mistakenly penetrate human skin, rather than its usual hosts – aquatic birds** such as ducks, swans, geese, gulls. Humans are not proper hosts, so after penetration, the cercariae quickly die and **trigger an allergic reaction** in the skin at the site of penetration - represented first by pink, about 2 mm in diameter large macules, later by **papules and unpleasant intense itching**. These lesions **disappear spontaneously after 2-3 weeks**.

**Treatment** of cercariae dermatitis is **only symptomatic** (not causal) and relieves the intensity of pruritus and rash. An antihistaminic or mild corticosteroid cream can be beneficial.



## 2. Cutaneous larva migrans

Is a parasitic skin infection **caused by hookworm larvae** that usually infest cats, dogs and other animals (most common species are *Ancylostoma braziliense* and *Ancylostoma caninum*). Humans can be infected with the larvae **by walking barefoot on sandy beaches contaminated with animal faeces**. This parasite is commonly found in the tropics and subtropics – e.g. Caribbean beaches. Hookworms live and lay eggs in the intestinal tract of animals, their excrements contain eggs and contaminate soil, especially on the beaches. In the sandy soil, larvae hatch from the eggs.





It is also known as **creeping eruption** as once infected, the larvae migrate under the skin's surface and cause itchy red lines or tracks. They can penetrate broken but also completely intact skin. Then they migrate within the epidermis - in the stratum spinosum. They **never penetrate basal membrane and go deeper into the dermis** (In an animal host, the larvae are able to penetrate the dermis, infect the blood and lymphatic system and then complete their cycle in the GI tract.)

**The larva creates 2–3 mm-wide, snakelike tracks** stretching 3–4 cm from the penetration site. These are slightly raised, flesh-coloured or pink and cause intense itching. **The most common entry places are the soles and backs of the feet.**

## Treatment:

Cutaneous larva migrans is self-limiting. Humans are an accidental and 'dead-end' host so the hookworm larvae eventually die. In most cases, **lesions will resolve without treatment within 4–8 weeks.**

To shorten the course of the disease - **ivermectin, liquid nitrogen, laser treatment.**

**Antihistamines and topical corticosteroids provide symptomatic relief of itch.**



# SPIDERS



## 1. Yellow sac spider (*Cheiracanthium punctorium*)

This spider lives in southern Europe, as well as in the warmer regions of the Czech Republic. As its name suggests, yellow sac spider does not build prey nets, but a **cobweb cocoon** on the tops of vegetation. The spider **does not attack spontaneously, unless it feels endangered** – e.g. when the cocoon with eggs is being manipulated with or, if a person touches the spider.



It is dangerous because its **chelicerae can bite through human skin** and inject venom (unlike most spiders in this region), but it still does not pose a serious threat.



The bite causes **intense pain (much greater than a bee or wasp sting), swelling and possibly sweating**. The effects of the bite usually subside within 24 hours. Cooling the affected area can alleviate the symptoms.



## 2. Moravian steppe spider (*Eresus moravicus*)

Is a venomous spider that you can encounter in southern Moravia, it is also **the most venomous spider in the Czech Republic.**

The bite of this spider **causes fever accompanied by heartbeat acceleration, feeling of intense pressure in the head and redness of the face.** These symptoms go away after about two hours. The bitten person feels severe headaches for the rest of the day.



THANK YOU FOR YOUR  
ATTENTION :)

