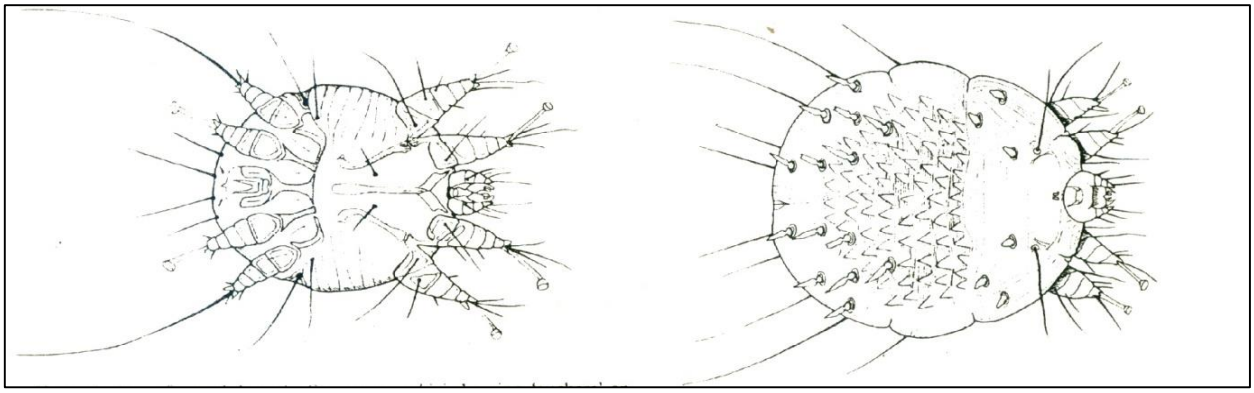
MITES

SCABIES MITES

Scabies mites (*Sarcoptes scabiei)* have a world-wide distribution and although they do not transmit any disease, they can cause intense itching. They are not vectors of any disease.

Morphology

The female mite is just visible to the naked eye (0.3 – 0.45mm). It is whitish and disc shaped. The dorsal surface is covered with numerous small peg-like protuberances and a few bristles. Adults have 4 pairs of short, cylindrical legs. The 1st and 2nd pairs end in thin-walled roundish structures known as "suckers". In the females, the posterior 2 pairs of legs do not have suckers, but end in long bristles.



Ventral view of an adult male *Sarcoptes scabiei* showing "suckers" on of legs

Dorsal view of an adult female *Sarcoptes scabiei* mite

Adult male scabies mites are only 0.20 – 0.25mm long. Apart from their small size, they may be distinguished from females by the presence of "suckers" on the last pair of legs.

Life cycle

The female scabies mite selects places on the body where the skin is thin and wrinkled, such as between the fingers, wrists, elbows, feet, penis, scrotum, buttocks and axillae and digs and eats her way into the stratum corneum. Most mites are usually found on the hands and wrists. In women, mites are often found on the hands and wrists, underneath and around the breasts and nipples. In young children, whose skin is soft, they may be found on the face and other parts of the body. After burrowing into the stratum corneum, they proceed in the skin, in winding tunnels, at the rate of about 1-5mm per day. These tunnels are seen on the skin as very thin twisting lines, a few mm to several cm long. The mite feeds on liquids oozing from the dermal cells and lays 1-3 eggs per day in her tunnel. The eggs hatch in 3-5 days, and small six legged larvae emerge. These larvae closely resemble the adults. They crawl out of the tunnels onto the surface of the skin, where a large number die, but a few succeed in either burrowing into the stratum corneum, or entering a hair follicle, to produce a moulting pocket. After 2-3 days the larva moults in the pocket to produce an eight legged nymph, which subsequently becomes an adult. After an immature
female is fertilized by a male, she enlarges in size and starts to burrow through the skin.

After about 3-5 days she starts to lay eggs in the tunnel. The life-cycle from egg to adult takes 11-20 days. Female mites nay live for about 1-2 months on man. Away from the host, they may survive 7-10 days under ideal conditions, but they usually live only 2-4 days.

Transmission

Scabies is transmitted only by close contact. It is therefore a family disease, spreading amongst those living in close association, especially sleeping together on the same bed. Actual transfer of mites takes about 15-20 minutes of close contact. The incidence of scabies often increases during wars and disasters.

Clinical features

Clinical diagnosis is by the detection of the thin, twisting tunnels made by the female mites. These are easier to see on fair-skinned than on dark-skinned individuals. The faeces deposited in the tunnels may be visible through the skin and appear as dark spots. It may be possible to remove the mite at the end of a tunnel with a sharp dissecting needles, and identify it under the microscope.

The scabies rash: This is a follicular, papular rash that occurs mainly on areas of the body not infected with burrowing mites, such as the buttocks and around the waist and shoulders. The rash can also occurs on other parts of the body such as the arms, calves and ankles. It does not appear on the head, centre of the chest or back, nor on the palms of the hand or the soles of the feet. The rash is produced by a cell-mediated hypersensitivity reaction to mite antigen. Frequently a patient is unaware that he is infected, until the rash appears. When a person is infected with the scabies mite for the first time, this rash does not appear until about 4-6 weeks later. In those who have been infected earlier, a rash may develop within a few days after re-infection. It may persist for several weeks after the mites have been destroyed. The rash is very pruritic especially at night and the resultant scratching frequently leads to the development of secondary bacterial infections. These may be quite severe, leading to boils, pustules, etc., Streptococcal infections may be complicated by acute post-streptococcal glomerulonephritis. The seriousness of the symptoms is not always directly related to the number of mites, and severe reactions may be found on people harbouring few mites.

Crusted scabies;

(Norwegian scabies) is a rare condition, which is characterized by the formation of thick keratitic crusts over the hands and feet, scaling eruptions on other parts of the body, and usually large numbers of mites, but little pruritus. Patients with this condition are highly infectious, because of the cast numbers of mites in the scales that are formed. The development of crusted scabies is sometimes associated with the extensive use of corticosteroids, which may result in a loss of immunity.

Treatment

All cases of scabies can be cured, as there are no resistant infections. However, methods aimed at killing the mites will not immediately reduce the itching caused by the rash. Separate medical treatment may be necessary if secondary infections have become established.

The most commonly used treatment for scabies is the application of a 25% benzyl benzoate emulsion on the patient, from the neck downwards. After allowing 5-10 minutes for the application to dry, the patient can redress. The application must be left on for 12-24 hours, before bathing. After a bath, it should be reapplied, for a total of 3 times on consecutive days. The use of benzyl benzoate (BB) cream is not recommended for children below 5 years

of age. In this age group sulphur compounds (mitigal or tetmosol) are used, in the same manner as BB cream, except that sulphur compounds can be applied on the face and head, unlike BB cream. An alternative treatment is the use of 1% HCH cream or lotion, applied as for BB cream. The 10% crotamition cream or lotion is a very safe treatment, especially for young children, but upto 5 applications may be necessary. Because scabies is highly infectious, it is very important to treat all members of a family or community living in close association together, and not just the individual with a particularly bad infection, otherwise re-infestation will soon occur.

SCRUB TYPHUS MITES

Certain species of trombiculid mites are vectors of *Rickettsia tsutsugamushi* which causes the disease known as scrub typhus. These vector species of the genus *Leptotrombidium* are found only in Asia, including Sri Lanka. Other trimbiculid mites in many parts of the world cause itching and a form of dermatitis known as scrub-itch.

Morphology

Adult mites are small (1-2mm), usually reddish and covered dorsally and ventrally with numerous feathered hairs giving them a velvety appearance. There are 4 pairs of legs ending in claws. The body has a construction between the third and fourth pairs of legs. The nymph resembles the adult, but is smaller. Neither the adults nor the nymphs are of direct medical importance, they do not bite man or animals. It is only the larvae which are parasitic and hence spread disease. The free-living nymphs and adults of *Leptotrombidium* have specialized ecological requirements. Frequently only very small areas of ground, often just a few square metres, prove to be suitable habitats. This results in a very patchy distribution of Leptotrombidium mites over small areas, but in some situations, habitats may comprise several square kilometers.

HOUSE-DUST MITE

Dermatophagoides pteronyssinus is found all over the world. It is a very small (0.3 mm) mite that lives among bed-clothes, mattresses, carpets and general house dust. The life cycle, egg to adult takes about 3 weeks. They feed on discarded skin scales, and other organic debris. They are very rarely seen, but the faeces they produce are highly allergenic, often resulting in symptoms such as asthma and rhinitis.