

# Camel mange

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*Summary: Sarcoptic mange occurs wherever dromedaries are kept, but it is less prevalent than in the past. It is caused by Sarcoptes scabiei var. cameli and is transmitted by both direct and indirect routes. The symptoms are characteristic; clinical diagnosis is easy, in contrast to laboratory diagnosis. Various acaricides are available for treatment, and a recently introduced acaricide has certain advantages over others. The attention of camel keepers should be drawn to the indirect transmission of mange, and the prophylactic value of dietary supplements.*

KEYWORDS: Camels - Ectoparasitoses - Prevalence - Treatment.

Mange is an ectoparasitosis which is described in all the publications concerning diseases of camels. It is widespread and, according to Curasson (1), the commonest disease of these animals. However, current conditions under which camels are kept and utilised have reduced the importance of this skin disease.

Before 1950, when camels were important for civil and military transport, mange was regarded as a major disease. With the decline of the large trading caravans and the camel-keeping tribes, conditions are seldom as favourable for the spread of the disease as when large numbers of dromedaries congregated at a given site with caravans continually arriving and departing. Such animals were usually in poor condition and fatigued by long journeys; their feeding was poor and the hygienic conditions unsatisfactory.

Today camel keeping is focussed on breeding and milk production, and the epidemiology of mange has altered. In particular, it is rare to find concentrations of animals, and the herds are not grouped except during transhumance. It is also rare to find the overcrowding which favours the spread of the disease. Recent surveys of the diseases and breeding of dromedaries have reported a limited frequency of this parasitosis (6, 7).

## Aetiology

Camel mange has only one causal agent, a mite of the family Sarcoptidae, *Sarcoptes scabiei* var. *cameli* (8). This mite is practically confined to the genus *Camelus*; human beings are infected occasionally.

The life cycle of the mite lasts for 4-5 weeks. Fertilised females dig burrows into the epidermis, causing inflammation and intense pruritus.

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Direct transmission takes place by contact between animals, when larvae, nymphs or adults are transferred from an infected camel to a healthy one. Infestation can also be contracted indirectly from objects which have come into contact with an affected camel, such as harnesses, tents and tree trunks, and may also be acquired through contact with soil. The parasite survives off the host for a maximum of 2 weeks.

Factors favouring infestation have been mentioned above, but the principal factor is poor condition. Age might be important – both very young and very old camels are particularly susceptible – and season as well, the disease being most acute during the cold season and in rainy periods.

### **Symptoms and lesions**

Infestation commences at areas of thin skin: the head, base of the neck, mammary gland, prepuce and flank. The head becomes affected rapidly in every case, for the animal uses its teeth to scratch affected areas.

The incubation period is 2-3 weeks (4). The invasive phase is characterised by erythema and numerous small vesicles, accompanied by intense pruritus.

About two weeks after the first sign, the affected regions of skin have lost their hair, becoming reddened and moist. The lesions may become generalised after 20-30 days.

Later the skin becomes dry and hard, with folds forming in the neck, around joints and on the thighs. Itchiness is less pronounced. This is the hyperkeratotic stage.

During the development of mange, itchiness distracts the animals from eating, so that they often become emaciated. Decubitus sores may develop, as well as secondary infections, particularly with pyogenic bacteria.

The specific lesions are confined to the integument and comprise hyperkeratosis with areas of keratosis (4).

### **Diagnosis**

Mange is easy to diagnose clinically from the concurrence of pruritus, depilation and encrusted plaques. Only the invasive stage may be difficult to diagnose, but the intense pruritus is characteristic of this parasitosis. Other skin diseases which have to be differentiated from mange are depilation with thickening of the skin caused by massive tick infestation, eczema (rare in camels), and non-pruriginous depilations occurring in certain camels in very poor condition, or following pox in young camels, or in cases of ringworm.

The hyperkeratotic stage is easy to recognise by large areas devoid of hair, with thickened skin and folds around the joints, affecting the hind limbs and neck.

Laboratory diagnosis involving detection of the mite is often difficult. Direct microscopy of a skin scraping (done until the skin starts to bleed) may not always disclose the parasite. Better results may be obtained by treating the specimen with a hot 10% solution of potassium hydroxide. Higgins (3) recommended centrifugation and examination of the deposit for mites.

## Treatment and prophylaxis

The history of mange treatment goes back a long way, starting with tars prepared from trees and shrubs. Curasson (1) described a number of plants used in such preparations. Today mange is treated effectively with acaricides, some of which have been the object of trials on camels, and are used in certain countries for controlling the disease.

The most commonly used preparation is lindane (the gamma isomer of HCH), an organochlorine parasiticide used in a concentration of 0.05% (4) or 0.02% (3). It is applied by brushing or as a spray, although brushing is used only on the worst and least accessible lesions. Spray treatment must be applied thoroughly to all parts of the body in order to reach mites within galleries burrowed into the epidermis. Treatment should be repeated after an interval of 8-15 days.

It is also necessary to treat with acaricide the objects the affected animal may have been in contact with, particularly saddles. It is advisable to move camels away from an infested place for 2 weeks, the time required for free-living mites to die off.

Among the organophosphorus compounds, malathion at 0.75% does not seem to be very effective (5). The literature contains few other reports of acaricide trials.

More recently a broad-spectrum parasiticide, ivermectin, has been found effective against mange in cattle. A trial was conducted on camels by Hashim and Wasfi (2), who obtained good results with two subcutaneous injections, 2 weeks apart. This is an interesting observation, for ivermectin is easy to administer, and is also effective against certain nematodes, one of which (*Haemonchus longistipes*) is pathogenic for dromedaries. It would be worth testing the efficacy of a single injection. The mode of use of ivermectin on lactating females requires investigation, for it would be hard to persuade camel keepers not to drink the milk during the excretion phase of the product.

From the prophylactic standpoint, it would be desirable to treat the entire herd. If this is impracticable, priority should be given to young camels and breeding males. The attention of camel keepers should be drawn to the indirect transmission of mange, and thus to the need to treat with acaricide the harness and other equipment, observing the necessary precautions for curative and prophylactic application. It is necessary to bear in mind that camel keepers know little of the toxicity of parasiticides.

It would also prove valuable to limit the deterioration in bodily condition which occurs during the dry season, but this would not be easy in regions where camel breeding takes place under natural conditions. However, agricultural by-products are available in certain countries, and their use as dietary supplements would help to overcome the physiological conditions which predispose an animal to mange.

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## REFERENCES

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