

- ACARIASES . -

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A C A R I A S E S .

The term acariases is applied to every disease caused by Acarina. The acarina form a separate order in the class Arachnida. Some of the members of this order are commonly known as mites and ticks.

The abdomen of the acarina is unsegmented and fused with the thorax, giving the entire body a more or less sack appearance. In many the body is marked with transverse lines which appear like the divisions between minute segments. The majority of the acarina are very small, but some, as certain ticks, are of considerable size.

All families of this order, except one, bring forth their young from eggs. The sexes are separate in all the Acarina; however, there is a smaller number of male than females. The males also differ from the females in being smaller and in certain details of conformation. They often have different habits of life.

Neumann divides this order into ten families, five of which are of pathological importance. Their names are as follows:- Ixodidae, Gamasidae, Trombididae, Sarcopridae, and Demodecidae. All of these have representatives on domestic mammals, and all are found on birds except the Demodecidae.

The members of the first three families and certain individuals of the family Sarcoptidae merely live on the epidermic scales, and the remains of hairs and feathers or prick the skin in order to suck the blood. This action on the part of the parasite does not cause disturbance beyond the points of attack. However, the remaining individuals of the family Sarcoptidae and all the members of the family Demodecidae usually cause a very serious disease known as psora or scabies. This serious disturbance is the result, not only

of numerous bites but of the venom implanted, of the galleries they excavate, and of the deep situation in which they locate themselves. These two groups of parasites are called Non-Psoridic and Psoridic respectively.

The Non-Psoridic Acarises will be considered in the order of the families.

The Ixodidae are temporary parasites which show very little preference to the species of its host, the larvae, the nymphae, and the males being often found on the most diverse animals which may differ in order and class. In this family are the common wood mites, the dog ticks etc. They attack dogs, horses, cattle, sheep, goats, and man. They are propagated more or less distinctly from their host upon low growing shrubs, weeds and trees, from which they fall upon the passing animal. On becoming gorged with blood they fall to the ground and from the swollen body of the female the eggs comes forth and produce a new generation.

The family Gamasidae contains two genera which are parasitic on domestic animals. These are the Gamasas and the Dermanysses. The first of these is of little importance, except that Turnbull has found in the ear of the ox an Acarus which is supposed to belong to this genus. The Dermanysses may be found on the horse, dog, cat and ox. But they are always accidental having come from fowls which are their natural hosts. When these parasites are transferred to the horse which is most subject to invasions, a pruriginous affection may appear which has often been mistaken as scabies. The affection, however, will disappear of itself in a few days if all poultry be banished from the stables.

The family Trombididae, as far as the writer has been able

to learn, is of little importance in this country and no where does it seem very serious upon domestic animals. The same is true with regard to the family Sarcoptidae; they being met with but rarely on domestic animals and then as foreign bodies.

Psoric Acarases.-- We will now consider acarases as caused by the psoric members of the families Sarcoptidae and Demodicidae. The affections caused by these acarina are characterized by their gravity, more or less serious alterations of the skin and their greater or less difficulty of cure.

The psoric sarcoptidae differ from the psoric Demodicidae in that the former is located at various depths in the epidermis, while the latter usually locates in the sebaceous follicles.

Sarcoptinic Scabies.-- Sarcoptinic Scabies comprises nearly all the itches or psorae of man and animals. Scabies was known in the days of Greece and Rome, and Moses excluded mangy animals from being offered at sacrifices. However, very little was known of the cause of the trouble until the seventeenth century. Moutet in 1634 was the first to locate the exact spot where the Sarcopt of human itch was found. Recent investigation has for its principal object the anatomy and physiology of the acarus and the treatment of the disturbances of the skin caused by it.

The life history of the psoric Sarcoptidae is divided into four periods as follows:-- 1st, the larvae period in which it has but three pairs of legs and has not the genital organs present. During the growth of this period, it undergoes two or three moultings becoming inert at each of these crises. 2d, The Nympha period is characterized by four pairs of legs and larger size though of little growth. 3d, The Pubescent period is the age of coupling and is the

last period for the male. 4th, Ovigerous Female. This period is spent in egg-laying and is usually reached at about fifteen days from the egg. It is estimated that each female will produce at least fifteen new individuals and that in three months she will have 1500000 descendants.

The psoric sarcoptidae attacks the epidermis of the animal upon which they live and their punctures are followed by the formation of more or less thick crusts, probably because they deposite a venomous saliva in the small wound.

The psoric sarcoptidae are divided into three genera:- Sarcoptes, Psoroptes and Symbiotes. The sarcoptes are divided into two species - the sarcopt of scabies and the dwarf sarcopt.

Sarcopt of Scabies: this species attacks both man and mammals and are the cause of what is ordinarily called itch or mange. One peculiarity in the habits of this sarcopt is that it deposits its eggs at the bottom of furrows or sub-epidermic galleries which renders its cure somewhat difficult. The sarcoptes scabies varies in dimensions and secondary anatomical details according to the species of mammal it lives upon; hence we have numerous varieties.

The dwarf sarcopt lives upon the head of the rabbit and cat but is of no economic importance.

Psoroptes: The psoroptes only contain one species - the Psoroptes Communis.

The common psoropt does not make sub-epidermic galleries like the sarcopt. It lives in societies among the crusts which it forms by pricking the skin of its host. It produces special dermatosis on the horse, ox, sheep, goat and rabbit.

Symbiotes: four species are found in this group, two of which interest us - the Common Symbiot and the Auricular Symbiot.

The Common Symbiot also lives in colonies without excavating sub-epidermic galleries. It causes a localized scabies, the extension of which is slow, and which is more particularly observed on the horse and ox.

The Auricular Symbiots live in the auricular concha of the dog, cat and ferret and gives rise to a disease which is remarkable because of the nervous disturbance accompanying it.

Demodetic Scabies. The acrina of this family live in the hair follicles and the sebaceous glands of several species of Mammalia. The disease is very rarely met with and when it has been found does not seem to be very contagious. However, when it does occur, its successful treatment has been found very difficult indeed. In fact successful treatment has only been performed by the protracted and patient efforts of a few men. Its deep seated position makes the cause of this difficulty apparent. A general idea of the disease may be had by observing its effects upon a dog.

"At the commencement, there are merely somewhat red depilations, about the elbows, hocks, around the eyes and at the toes; and in the place of the hairs are seen small papules with a pityriasic powder covering the parasitic patches.

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Gradually these depilations extend, and become reder and their borders are covered with an abundant purulent matter. Pruritus is intermittant but marked.

The disease at last becomes generalized. A crowd of acne pimples are scattered everywhere - sometimes confluent, sometimes discrete; some yet in the papular stage, others pustular. In these pustules are often found prodigious numbers of these acarina. At the parts most severely affected the skin is moist and cracked, and in the folds there is a yellow viscid matter. The animal exhales a

foeted odor that is absolutely nauseating. When the malady has arrived at this stage, it has produced a profound effect upon the whole organism; the appetite - which was for a long time unimpaired and even increased - now diminishes, emaciation begins, and this gradually goes on to marasmus.

Acariases in Kansas. Acariases manifests itself in Kansas, chiefly in two forms, namely:- Scabies of Cattle and Scabies of Sheep.

Scabies of Cattle. This disease is also called Texas itch, range itch and cattle mange. Two varieties of acrina - belonging to the family Sarcoptidae - affect cattle in this country. These are first, the Psoroptes Communis; second, the Symbiotes Communis. The first is the one which most frequently affects them. Quoting largely from a bulletin by Richard W. Hickman, of the U. S. Department of Agriculture - we find that this acrina lives on the surface of the skin and gives rise to great irritation and itching by biting, and is most frequently found upon the sides of the neck and shoulders and at the base of the horns and at the root of the tail. From these points it spreads to the back and sides and may invade nearly the entire body. Its principal manifestations are more or less numerous pimples, exudation, and abundant scaling off of the skin, falling out of the hairs, and the formation of gray-brownish scabs. In the course of time the skin becomes thickened, stiff, wrinkled, and acquires the consistency of lather.

When mange has spread over a large portion of the body, the animal loses flesh, and becomes weak and anemic, rendering it less able to withstand and combat the effects of the mites. At the same time the decreased vigor and lessened vitality of the affected animal favors the more rapid multiplication of the mites and further

extension and intensification of the disease.

Scabies does not appear to affect cattle which are doing well on grass, nor attack those in good condition over three years old. However, it seems that such cattle may harbor the parasites through such a period of thriftiness, unobserved, until weakened by cold and exposure of winter or lack of sufficient food, or because of both, the disease may again become apparant and may result in greater or less loss if neglected. The animals which suffer most are calves, yearlings and two-year-olds, and those in poor condition.

The second variety of these parasites, mentioned above, produce what is known as Symbiotic mange, or tail mange. It remains generally localized upon the depression on the back part of the croup and at the base of the tail. It may, however, extend over the entire surface of the body if the treatment of the disease and care of the affected animals is neglected. These cases, however, are rare. Tail mange has almost no spreading tendency, and its contagiousness is hardly noticeable. It yields readily to treatment and any remedy that will destroy the activity of parasite producing Psoroptic or common form of mange will readily kill that causing Symbiotic or tail mange.

Scabies of Sheep. This disease is also commonly caused by a variety of the same species as that for cattle mange.

In a case of psoroptic scabies, the attention is attracted to slight alterations in the fleece, which is fluffy and matted in places. If the animal be watched evidence of pruritus will be noticed, which is manifested by the sheep, rubbing, scratching or gnawing itself, and tearing out the wool. These phenom^{na} become more apperent when the animals become heated by driving, etc.

On examining the skin papules will be found of a whitish or yellow color which contrasts with the faint rosy tint of the integument - this is the result of the punctures of the Psoropt. The punctures becoming more numerous, the papules become closer together and become confluent while the skin becomes slightly thickened. Over the papules scum accumulates and results in the formation of vesicles and pustules, which when dry form crusts. The crusts fall off and are replaced by others which are thicker and more compact than the first. Gradually the crusted surface spreads - as the acrina seek the outer edge of the crust - from the withers and upper part of the back down on the sides leaving a bare thickened and wrinkled skin which gradually recovers its integrity.

The parasites abandon the regions where their presence has caused the formation of dry compact crusts, so that very few can be found there. However, they are found most abundantly at the parts most recently attacked. Here they may be seen with the naked eye and appear as white specks.

The parasite prefers the tender and delicate lambs tegs as a habitat.