

## A NOTE ON MITES (ACARINA) AND ASPERGILLUS (FUNGOUS) IN BALED MOULDY HAY

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In January of this year I received from a point in the lower Fraser Valley, an ounce vial of hay debris which was swarming with mites of several species; on the bottom of the vial were large numbers of very small, yellow bodies, globular in shape and of varying sizes. The message accompanying the hay stated that the sample came from baled hay which had been sold rather widely in the immediate vicinity and the farmers using it were greatly troubled over the effects of it on their cattle. Shortly after eating the hay the animals became afflicted with violent fits of coughing which became so serious that after three days this fodder was changed for another supply but it was three or four days longer before the coughing subsided. There seemed no intestinal disturbance or diarrhoea but the coughing was so violent that the discharge of faeces from the cattle plastered the walls of the barns directly behind the cattle stalls. Farmers and two veterinary surgeons called in for consultation declared they had never seen anything like these attacks.

I promptly sent the sample of hay and the mites to the Dominion Entomologist with a plea for identifications and suggestions and he turned them over to Dr. H. H. J. Nesbitt of the Division of Entomology. Dr. Nesbitt returned me the following list of nine species of mites from that small sample of hay:

- Acarus siro* L. (*Tyroglyphus fari-nae*)
- Tricholaelaps* sp. (near *A. glasgowi* Ewing)
- Cheyletus eruditus* Latr.
- Cheletomorpha venustissima* (C. L. Koch)
- Ctenoglyphus* (*Glyciphagus*) *plum-iger* (Koch)
- Glyciphagus cadaverum* Schr.

*Sieulus* sp. (near *S. plumiger* Oudms.)

*Tyrophagus dimidiatus dimidiatus* (Herm)

*Scirus* sp.

Some of these mites are vegetable feeders and some are parasitic upon the others. *Acarus siro* L. is the almost universal grain and flour mite; genus *Cheyletus* according to Banks, "contains many species; a number have been found on the skins of birds where they doubtless feed on the parasitic analgesid mites. They are very small (about 0.5 mm in length), live freely, and prey upon other mites and small insects. They seize the prey with their big palpi, insert the mandibles and suck it dry. Some have thought that there must be poison glands in the palpi, since the prey ceases movement very soon after capture." "The genus *Glyciphagus* does not appear to be as common in this country as in Europe; possibly owing to their minute size they have not been collected. One species occurs on seeds. The original species of the genus and some others have been found in sugar. The mites sometimes spread to the hands of those handling such materials and produce a skin disease known as "grocers itch." (I reported the occurrence of this mite causing "grocers itch" in a store in Nanaimo before this Society last year. See Proc. Ent. Soc. Brit. Col. **39**: 23, October, 1942). The other species of this list were apparently feeding upon the moulds in the hay or upon the fermenting hay itself.

Nesbitt remarked that he doubted whether any of the mites could have caused the effects which were reported from the cattle. And he continues: "You will notice, however, that we found the little sulphur-coloured fruiting bodies of an *Aspergillus* sp. Strasburger et al. in

their text book of Botany, 1912, say that some species of *Aspergillus* are pathogenic to man and other mammals and that *Aspergillus fumigatus* which lives in fermenting heaps of hay at a temperature of 40°C. causes mycosis of the external ear, throat and lungs. The suggestion is very strong that *Aspergillus* was the cause of the bovine trouble. That the hay has been mouldy at some time is evident from the fact that there was such a large population of Acarid mites and by the additional fact that spores of another mould *Mucor* sp. were found."

Now the fungus genus *Aspergillus* contains a large number of species which are widespread, occurring in soil and on straw, grain and vegetable matter. The species in general grow best at rather high temperatures, 35°C. to 40°C. (Henrici) (4). This condition would obviously occur in fermenting, mouldy hay as was the sample submitted. Dodge (2) lists 33 species of the genus which have been reported in various parts of the world as being pathogenic to human beings, laboratory animals and to birds. Several species are reported as occurring in the human ear, others as growing in human nails and one species described in France, in the lungs of an ass. Of these 33 species, the one at first sight appearing likely to fit our case is *Aspergillus fumigatus* Fresenius (with 5 synonyms) reported from various countries in Europe and from New York State. This is the commonest species isolated from cases clinically resembling tuberculosis of the lungs in which *Mycobacterium tuberculosis* has not been found. It apparently causes severe epizootics in birds and is

less fatal in man, not reaching epidemic proportions. It is pathogenic for laboratory animals (Dodge) (2).

In these pathogenic records, however, fungus in one form or another was recovered from the tissues or sputum of affected animals, indicating an actual growth in the bodies concerned. In the instance under discussion here, the effect may have been induced in either one of two ways: (1) the simple ingestion of vast numbers of perithecia affecting the nervous system probably the vagus nerve, inducing violent contractions of the diaphragm with consequent coughing; or (2) which is more likely, the mouldy hay was heavily infected with actual spores in addition to the small, yellow, globular perithecia and these spores, on being inhaled during feeding, induced irritation of the lungs and respiratory passages and produced the coughing.

Under the circumstances it is quite possible that a non-pathogenic species of *Aspergillus* was concerned, since the violent symptoms in the cattle cleared away within a few days after the mouldy hay was removed. It would seem, however, that the species is not common, otherwise the symptoms of distress in the cattle would have been frequently reported in the past, since the feeding of mouldy hay in this Province is by no means unusual.

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## References

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