



Intramural airborne mites from poultry farm in Nagbhid, MS, India

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ABSTRACT

Airborne mites are the main material found in intramural dust. Dust is fine dry powder and it consists of various particles. Dust mites found in poultry dust are allergens causing allergy in sensitive individuals. Some of them have also been found to cause diseases in poultry birds. The mites were picked up from intramural dust of poultry farm. Air sampling was done by using Tilak Air Sampler. The dust from poultry form was collected and scanned under binocular microscope during study period June 2016 to May 2017. The mite *Dermatophagoides pteronyssinus* were in more number followed by *Dermanyssus farinae* which is actually associate with poultry birds i.e. chicken mites. The observation revealed mites found exhibiting seasonal fluctuations. Further investigation would include exploring more biodiversity of mites in intramural environment. Allergen load of mites in dust samples and clinical investigation.

Keywords: - Airborne mites, Allergen, Intramural, Poultry, Nagbhid.

INTRODUCTION

Mites are established in environment as cosmopolitan in occurrence immanent distributed all over the world. Mites are four-legged belonging to phylum Arthropoda and class Arachnida. They prefer humid condition as suitable environment rich in organic matter. Many species of mites are known to be present in stored food products such as cereal grains. Some of them are minute enough that they are suspended in air; therefore, investigation of mites also forms an important part in the field of Aerobiology (Shende and Korpenwar, 2018).

The intramural dust mite has maximum nutritional and environmental adaptability. Some are found in birds like chick, fowl, duck, pigeon etc., causing various infections in birds- externally and internally. The mites found in poultry dust are allergens causing allergy in sensitive individuals. It also results into aerobiopollutants (Jogdand *et al.*, 2007). Some of them are very tiny and light weights therefore are suspended in breeze, and forms exclusive part of Aerobiology. It takes 20 minutes to 2 hours for them to settle back down out of the air. The activities that create airborne

mites are spreading of straw, wood shaving by hand, placing out trays of chicks, transferring of hen, ruffling of feathers. Some are predatory. Most of the mites are ectoparasite. They feed upon blood, shed skin and dandruff etc. Mites are contaminants in fungal and other culture media (Bansod *et al.*, 2013; Damle, 2013).

The airborne mites were also trapped by using Tilak Air Sampler. It was first introduced, used and published by Tilak *et al.* (1969). Kern in 1921 was first to discover house dust mite as an allergen. Domestic mites feed on variety of material and they prefer protein rich substance. Some like moldy substrates. The poultry workers expose to airborne dust particles is substantial and produce occupational respiratory diseases may develop permanent breathing problems, and they are unable to work.

The main morphologic characters are the possession of four pairs of legs. (Spieksma, 1997). They are found intramural and in house, sheds of cattle's, poultry farm, stores house. Significant role of house dust mites responsible for health hazards such as respiratory allergy in sensitive individuals (Talib and Hare, 1985). It not only affects the individual working in the poultry but also the poultry birds and has affected the growth of birds and lying of the eggs. People working in the poultry farm breathe in many different airborne particles which together are called poultry dust. The activities that create airborne mites are spreading of straw/ wood shaving by hand, placing out trays of chicks, transferring of hens into cages and also ruffling of feathers and other activities of the poultry birds.

Spieksma 1991) in his research found that HDM are very often the cause of allergic rhinitis and asthma in sensitive people. Some mites have been found to cause allergy in sensitive victims and is potential allergens (Jogdand, 2007).

METHODOLOGY

The 'Volumetric Tilak air sampler' (Tilak and Kulkarni, 1970) is an electrically operated device was fixed in middle of the poultry farm It is located in Nagbhid tehsil (between 19.30'N & 20.45'N latitude and 78.46'E longitude) of Chandrapur district of Maharashtra at the height of 1.5 meter from ground level and runs continuously from June 2016 to May 2017. Fourteen slides were prepared from Vaseline coated cello tape on drum by impingement process, cello tape removed from rotating drum of the sampler at the end of 7th day respectively.

Airborne fungal spores and mites were observed qualitatively and quantitatively recorded and identified by using the standard literature and reference materials. The mites per cubic meter were calculated by the following formula: spores/Mites/m³ = No. of same type of spore/mite X 14 (Where 14 is the conversion factor for Tilak Air Sampler). Permanent slides are prepared from cellotape mounts in melted glycerine jelly. Add a drop of melted glycerine jelly over the tape by a dropper. Put a rectangular cover slip and press it to remove the air bubbles. The mounted slides were scanned by Binocular research microscope and microphotographs were captured by using microcamera which directly attached to the microscope.

Identification:

These mites had been identified according to the key given by Fain (1957) & the criteria of Hughes (1961) and other available literatures.

RESULT

The occurrences of airborne mites in the slide of Tilak air sampler were observed and identified.

Table 1: Percentage contribution of airborne mites from friend's poultry farm during study period June 2016 to May 2017.

Sr. No.	Types of Mites	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	Total	%
1.	<i>Dermatophagoides pteronyssinus</i>	56	80	56	42	14	28	42	14	-	-	14	-	346	29.67
2.	<i>Dermatophagoides farinae</i>	28	56	42	80	28	14	28	14	-	-	-	28	318	27.27
3.	<i>Cheyletus eruditus</i>	56	42	70	42	14	14	0	28	-	-	00	14	280	24.1
4.	<i>Fuscuropoda agitans</i>	28	42	56	42	28	-	14	12	-	-	-	-	222	19.03

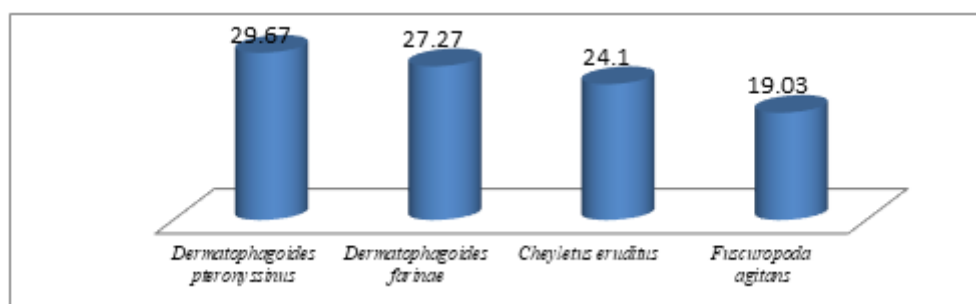


Fig. 1: percentage peculiarity of airborne mites of poultry farm from study period

The body of the mite *Dermatophagoides pteronyssinus* is small and oval; it is broader in middle and narrow at both ends. The general body structure has two parts i.e. Gnathosoma and Idiosoma. Eyes are absent, the gnathosoma has pedipalp. The first pair of leg is directed forward.

Dermatophagoides farinae was first found by Hughes in 1968. The First pair of leg is directed forward and is curved. First leg is expanded laterally. Anterior dorsal shield only about 1.4 times longer than width.

Cheyletus eruditus is a common predatory mite. The mites were numerous in the present investigations. It has modified mouth parts.

Dermanyssus gallinae is an important pest of domestic birds, especially chickens in all parts of the world.

CONCLUSIONS

The present investigation have been revealed four intramural airborne mites *Dermatophagoides pteronyssinus* (29.67%), *Dermatophagoides farinae* (27.27%), *Cheyletus eruditus* (24.1%) and *Fuscurospora agitans* (19.03%) were observed in slides which is made Tilak Air Sampler in friends poultry farm.

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