

## Dust Mite Fauna from Poultry Farm, Culture Medium (Fungus) and Wheat Flour

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### Abstract

Mites are four legged belonging to phylum Arthropoda and class Arachnida. They prefer humid environmental condition rich in organic matter. They are found in almost every habitat. Many species of mites are known to be present in stored food products such as grains. Some of them are minute enough that they are suspended in air; therefore study of mites also forms an important part in the field of Aerobiology. The present investigation is Biodiversity of mite in intramural dust. In this study 04 different mites was found. The varied habitats in study were dust from poultry, wheat flour. The dust was collected from poultry houses. Mites found in wheat flour dust revealed single mite which is *Acarus*. Another site of collection was wheat flour mill and mites were observed in culture medium of fungus. The mites were mounted in glycerin jelly after treating it with lactic acid. The mites found in poultry dust are common predatory mite *Cheyletus*, *Dermatophagoides*, *Urodiaspis*, storage mite *Acarussiro*.

**KEYWORDS:** Arachnids, biodiversity, poultry dust, Aerobiology

### Introduction

Mites have established as cosmopolitan in occurrence ubiquitously distributed all over the world. They have been reported underneath the snow at Antarctica and found as terrestrial, aquatic, marine parasitic. Detritus mites have been found to be prey and predator mites. It brings about recycling of organic material as decomposer. The intramural dust ecosystem comprises the dust of indoor. The color of mites varied from white, translucent white to pale yellow in color. House 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 aero-bio pollutants. 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. Almost all animals – terrestrial or aquatic are parasitized by mites. Some are predatory. Most of the mites are ectoparasite. They feed upon blood, shed skin and dandruff etc. The color of mites varied from white, translucent white to pale yellow in color. Some are found in birds like chick, fowl, duck,

pigeon etc., causing various infections in birds- externally and internally. It also results into aero-bio pollutants. Mites are contaminants in fungal and other culture media. The airborne mites were also trapped using Tilak Air Sampler. It was first introduced, used and published by Tilak S. T. et al (1989). 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. Mites are free living and are useful in the biologic recycling process as scavengers or as saprophagous or parasitic mites. The poultry, flour mill workers exposure poultry dust is substantial and it may develop permanent breathing problems. The poultry, flour mill workers exposure poultry dust is substantial and it may develop permanent breathing problems.

#### **Material and Method**

The intramural dust mites were found in dust of poultry, flour mill and in fungus. The flour dust was collected from the flour mill. The dust was sieved and uniformly spread into thin layer onto petriplates. The mites were then picked up by moist needle dipped in 40% lactic acid. They were then placed in lactic acid for 24 hours. It was then mounted in freshly melted glycerine jelly. The standard preparation followed by Jogdand S. B. (1987). The unit of measurement of the mite in the present study is in micron. Micrometry is measurement of microorganisms. Microorganisms can be seen only under the microscope. For this a suitable scale of measurement should be in microscope itself. With the help of Stage Micrometer we find out exact value of one division of Ocular Meter in the microscope field. The measurement of the mites was

undertaken as given by Sharma P. D. (1997).

#### **Result and discussion**

Mites found in wheat flour dust revealed single mite which is *Acarus*. It belongs to family Acaridae of order Astigmata. The mite is oval in shape. The body shows presence of long setae all over. The length of seta is as long as the length of the body. The dust of poultry revealed *Cheyletus*. It is a common predatory mite of prostigmata order. The mouth parts are highly modified. *Urodiaspis* too was found in plenty in dust of poultry. It has long pedipalp. Depression at the region of articulation of legs is found on the ventral surface. So that short legs can be folded completely against the body. Grooves for the legs are well developed. Mites were also found in fungus.

The specimen were mounted and observed.

#### *Cheyletus*

Prostigmata Kramer, 1877

Cheyletidae Leach, 1815

*Cheyletus* Latreille, 1776

The *Cheyletus* was found in abundance during rainy season. The mite has modified gnathosoma. It has developed pedipalp. It has apical claw. The chelicerae are dentate and shaped like pincer as observed by Walter E.D. et al., (2013) with toothed opposed surfaces. It forms a powerful grasping organ. The legs are strong. The larva has three pairs of walking legs was also found. *Cheyletus* have been reported from sputum of patients with lung disorder observed by Keith R. Snow (1970). The length of body measures 437.5, width 200. I pair of leg measures 312.5, II leg is 35, III measures 237.5 and IV leg measures 287.5. Refer Fig 1.

### *Dermatophagoides*

Acari Linnaeus, 1758

Astigmata Linnaeus, 1758

Pyroglyphidae Cunliff, 1958

*Dermatophagoides* Bogdanov,  
1864

The body of the mite is small and oval; it is broader in middle and narrow at both ends. The general body structure has two parts- Gnathosoma and Idiosoma. Eyes are absent, the gnathosoma has pedipalp. The first pair of leg is directed forward as observed by Colloff M.J et al.,(1992). It shows four pairs of articulated legs in adult bearing setae. The Idiosoma is again divided into Propodosoma, region of Idiosoma where I<sup>st</sup> and II<sup>nd</sup> pair of legs are present. Metapodosoma, where III<sup>rd</sup> and IV<sup>th</sup> pair of legs present and Opisthosoma is the anal region of Idiosoma. Fig2.

### *Urodiaspis*

Mesostigmata Canestrini 1891

Urodiasoidae Tragardh, 1944

*Urodiaspis* Berlese, 1916

It is dark reddish brown in color. In one gram of dust 758 mites were found. It has globular body. The gnathosoma is reduced and has long pediplap. The anterior ventral portion of body is excavated so that gnathosoma and tritosternum are enclosed in a cavity. The cavity is camerostome. Depression for legs is found on ventral surface. The legs are short and can be folded completely against the body. The grooves for the legs are well developed. The legs are short and stout and it remains curved. The marginal plate is fused to dorsal plate anteriorly as in study by Baker E.W et al., (1958). The mites were found in abundance in the month from July to September. The mites were not observed in summer and winter season as was also observed by Bansod V. M 2016. The length of *Urodiaspis* was found to be 562.5. I

leg measures 124.58, II 149.6, III measures 147.8 and IV measures 160. Refer fig 3.

### *Acarus*

Acaridae Latreille, 1802

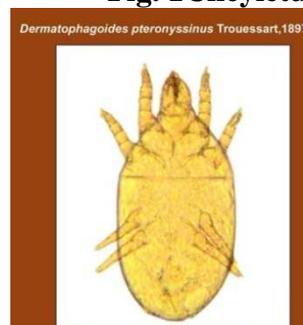
Astigmata Linnaeus, 1758

*Acarus* Linnaeus, 1758

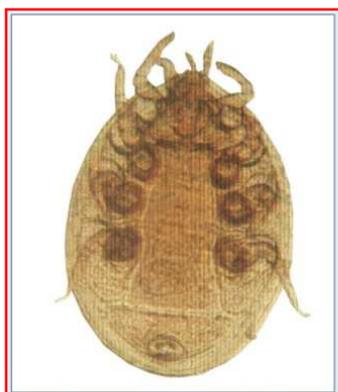
It is a storage mite. *Acarus* of family Acaridae of order Astigmata as first reported by F.Th.M. Spieksma (1991). The body is soft, shiny and translucent. It is oval in shape. The body is large and is characterized by the presence of long setae all over the body. All four pairs of legs are slender. Mouth parts are reduced. The length of setae is as long as the length of the body of mite. It follows the observation made by Coombs C. W. (1968). Claws are absent. It measures 337.5 in length. 16 pairs of setae were found. The length of the mite found is 350, I leg 162.5, II measures 175, III is 150, and IV 167.5. The setae measures 337.5 in length. Refer Fig 4.



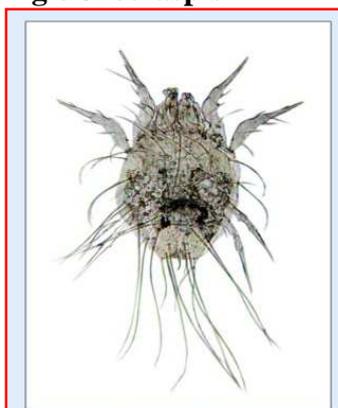
**Fig.1 Cheyletus**



**Fig.2 Dermatophagoides**



**Fig-3 Urodiaspis**



**Fig. 4- Acarus**

### Conclusion

The present investigation revealed four intramural dust mites. *Cheyletus*, *Dermatophagoides* and *Urodiaspis* were found in dust of poultry. *Acarus* was found in wheat flour.

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### References

- Baker E.W & Wharton G .W: 1958. Book of An Introduction to

Acarology, Urodiaspidae Edn 1, 117.

- Bansod V. M: 2016 . 'Mites: Its biodiversity and exposure to poultry dust and health effects on poultry workers' Asian Journal of Multidisciplinary Studies 2321-8819,4(3), 23- 25 .
- Colloff M.J & Spieksma F.TH.M: 1992. 'Pictorial Keys for the identification of domestic mites' Journal of Clinical & Experimental Allergy 22, 823- 830.
- Coombs C. W. 1968. 'Changes in the arthropod fauna of an experimental bulk of stored wheat' Journal of Applied Ecology **IV**, 563.
- F.Th.M. Spieksma: 1991. Journal of Clinical & Experimental Allergy Domestic mites: their role in respiratory allergy 21, 657.
- Jogdand S. B. Airospora at Aurangabad. 1987. PhD thesis, Marathwada University Aurangabad. 435.
- Keith R. 1970. Snow The Arachnids: An Introduction. Mites London Edn.1, 127.
- Kern. 1921. 'Dust sensitization in bronchial asthma' Journal of M. Clin. N. America 5:751-758.
- Sharma P. D. 1997. Methods in Microbiology Edition II Rastogi Pub., 31- 34.
- Tilak S. T. & Jogdand S. B.: 1989. Impact of Environment on the incidence of House Dust Mites Journal of Aerobiology 2(1&2) 35-38.
- Walter E.D. & Proctor H. C. 2013. Mites: Ecology, Evolution & Behaviour Life at Microscale Edition II Ind Springer Publication, 55.