



Short Communication

A preliminary report of some stored food product mites of district Sangrur (Punjab), India

Navpreet Kaur Gill and Parminder Singh Dehar*

Dept. of Zoology and Environmental Science, Punjabi University, Patiala-147002, India
inderdehar08@gmail.com

Available online at: www.isca.in, www.isca.me

Received 12th June 2018, revised 30th August 2018, accepted 9th September 2018

Abstract

Mites are ubiquitous in distribution and are reported to be present almost in all the habitats. A great number of stored grains, dried fruits, various farinaceous products and stored food are often attacked by various types of mites. A faunistic survey of mites was conducted in many stored food product stores during one year study period, in Punjab. A total of 60 samples of different stored food products i.e. pulses, stored grains were taken for study. Approximately 63.33% (38 samples) of the samples contained mites and 13 mite taxa were identified, belonging to 7 families in 3 orders. Six species, namely, *Acarussiro*, *A. immobilis*, *Tyrophagusputrescentiae* and *Glycyphus destructor*, were abundant in numbers. *Glycyphus-destructor*, *Tyrophagusputrescentiae* and *Acarussiro* were dominant or intermediate in all stored food products examined. *Cheyletusmalaccensis* was the most common predatory mite. The highest percentage of infestation was recorded in the samples from stored food products of Dirba region.

Keywords: Stored food products, mites, acarussiro, infestation.

Introduction

Mites are most damaging pest of agricultural and stored food products especially of grains, grain flour and other cereal products. The mites can seriously reduce the quantity and also quality of stored products. In wheat, these mites damage the seeds and make them unsuitable for germination¹. Mites often infest grain and stored food during transporting, processing for consumption and storage. The stored products fed by storage mites become deficient in carbohydrate and protein contents. Some mite genera from family Acaridae and Glycyphagidae are important source of allergens to the worker of farm and stores²⁻⁵.

Acarus sp. and *Tyrophagus* sp from family Acaridae, *Lepidglyphus destructor*, *Glycyphagus domesticus* and *Gohieriafusca* from family Glycyphagidae are most common mite species reported from stored food products from all over the world^{2,5-8}. Tyroglyphidmites, commonly known as "Cheese mites" infest most stored products particularly grain, flour and other cereal¹.

The storage mites are source of many allergies and cause occupational allergy among farmers and other agricultural workers. The relationship between storage-mite sensitivity and allergic symptoms such as asthma, rhinitis, and conjunctivitis was first studied among a group of farmers in Scotland³. Allergens produced by stored mites cause respiratory disease and atopic dermatitis of farmers^{9,10}. Mites are also harmful for bakers, shopkeeper's upholsterers miners and some of occupational categories^{6,9,11,12}.

Considering the fact that Punjab is one of the most forward and high producer of agriculture products, especially of wheat and rice. Therefore the present study has been undertaken to explore mite fauna associated with important stored food products.

Materials and methods

During the present study, stored food grain and their products samples from different fields/localities from the Sangrur district of Punjab were collected. From March 2016 to March 2017 research was carried out. Total of 60 samples were collected from different grain store and grocery shops. The samples were brought to laboratory in zip locked polythene bags for further study. A complete record of date, time, temperature, moisture, pesticides/fertilizers used, type of field and locality was also maintained. With "Modified Berlese Funnel" storage mites were extracted¹³⁻¹⁵. The mites were kept in 70% alcohol. For further identification mites were mounted in Hoyer's Medium⁷.

Results and discussion

Result of the present research identified 13 species from 7 families, 3 orders from stored food products of District Sangrur, Punjab. In the present study, out of 13 species of stored food products of dist Sangrur, 9 sp. belong to Order Astigamta, 1 from Order Mesostigamta, 3 from Order Prostigamta. Out of the 60 samples collected, 38(63.33%) samples contained mites. The Astigamta mite were found dominant of the total sample examined (Table-1). The species composition and abundance of total mite fauna found in infested samples of stored food are

listed in Table-1 - *Tyrophagus longior* 78.94%, *Tyrophagus putrescentiae* 73.68%, *Acarussiro* 60.52%, *Cheyletus malaccensis* 60.52%, *Acarus immobilis* 57.89%, *Chelyletus eruditus* 55.26%, *Rhizoglyphus robini* 50%, *Glycyphagus destructor* 52.63%, *Dermatophagoides farinae* 39.47%, *Caloglyphus berlesei* 18.42%, *Suidasianesbiti* 13.15%, *Cunaxa sp.* 10.52%, *Dermnayssus gallinae* 7.89%.

Table-1: Showing the percentage prevalence of different mite species infested samples. Total number of infested sample = 38 (63.33%)

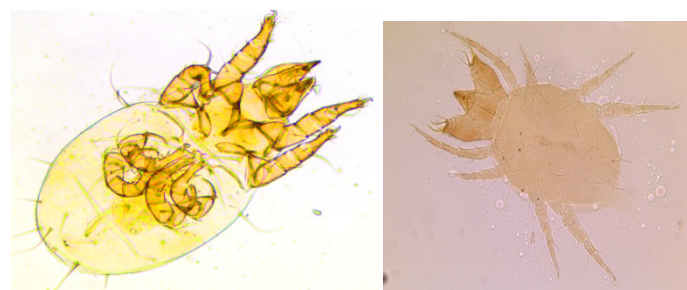
Mite Species		Samples infested	Percentage (%)
Order Astigmata			
Family	Acaridae		
	<i>Acarussiro</i>	23	60.52
	<i>Acarus immobilis</i>	22	57.89
	<i>Caloglyphus berlesei</i>	7	18.42
	<i>Tyrophagus longior</i>	30	78.94
	<i>Tyrophagus putrescentiae</i>	28	73.68
	<i>Rhizoglyphus robini</i>	19	50
Family	Saproglyphidae		
	<i>Suidasianesbiti</i>	5	13.15
Family	Pyroglyphidae		
	<i>Dermatophagoides farinae</i>	15	39.47
Family	Glycyphagidae		
	<i>Glycyphagus destructor</i>	20	52.63
Order Mesostigmata			
Family	Demanyssidae		
	<i>Dermnayssus gallinae</i>	3	7.89
Order Prostigmata			
Family	Cunaxidae <i>Cunaxasp.</i>	4	10.52
Family	Cheyletidae		
	<i>Chelyletus eruditus</i>	21	55.26
	<i>Cheyletus malaccensis</i>	23	60.52

Dermnayssus gallinae is a predatory mite and found accidentally in 3 food samples. Pathogenic and allergy causing mite². *Acarussiro* and *Glycyphagus destructor* are also reported in this research¹⁶. In this study, Acaridae family is the most prevalent family in all collected samples. These mites prefer a high relative humidity. *Tyrophagus sp.* and *Acarus Siro* were the dominant species. The concentration occurrence of mite fauna in samples may vary from place to place because of different environment conditions. The survey emphasizes the importance of mites in stored food products, further studies are highly desirable.

Some Identified Mite Species



Cheyletus malaccensis *Tyrophagus putrescentiae*



Rhizoglyphus robini *Cheyletus eruditus*

Conclusion

Data and fauna presented in this paper show the occurrence of different stored food product mites. 13 species were identified from 7 families and 3 orders. Among the three orders Astigmata was dominant followed by Prostigmata and Mesostigmata. Acaridae family mites were found all year around, the mite number depends upon environmental factors such as temp. and humidity.

During the present research *Tyrophagus sp.* were dominant. *Dermnayssus gallinae* which is a predatory mites of fowl was also found in some food samples which shows poor storage facilities in storage houses. High percentage of mite in stored food products alarms us not only damage and deterioration of food products but also from various diseases and allergies.

References

1. Solomon M.E. (1946). Tyroglyphid mites in stored product: Ecological studies. *Ann. Appl. Biol.*, 33(1), 82-97.
2. Arlian L.G. (1991). House-dust-mite allergens: a review. *Experimental & applied acarology*, 10(3-4), 167-186.
3. Cuthbert O.D., Wraith D.G. and Brostoff J. (1979). Barn allergy, asthma and rhinitis due to storage mites. *Clin. Allergy*, 9(3), 229-236.
4. Hallas T.E. and Iversen M. (1996). Sources of exposure of storage mites in the farming environment. *Ann. Agric. Environ. Med.*, 3, 9-12.
5. Hughes A.M. (1976). The Mites of stored Food and Houses. *Tech. Bull., Min. Agric. and Fisheries in London*, 63, 105-110.
6. Arlian L.G., Vyszynski-Moher D.L. and Fernandez-Caldas E. (1993). Allergenicity of the mite, *Blomia tropicalis*. *Journal of allergy and clinical immunology*, 91(5), 1042-1050.
7. Fain A., Guerin B. and Hart B.J. (1990). Mites and Allergic Disease. *Allerbio, Varennes en Argonne*, H.M.S.O., London, 1-190.
8. Hallas T.E. and Gudmundsson B. (1985). Mites of stored hay in Iceland. Related to quality of hay and the storage duration. *J. Agr. Res. Icel.*, 17, 31-37.
9. van Hage-Hamsten M. and Johansson S.G.O. (1992). Storage mites. *Experimental & applied acarology*, 16(1-2), 117-128.
10. Colloff M.J. (1998). Distribution and abundance of dust mites within homes. *Allergy*, 53(48), 24-27.
11. Dutkiewicz J., Jabłoński L. and Olenchock S.A. (1988). Occupational biohazards: a review. *American Journal of Industrial Medicine*, 14(5), 605-623.
12. Tee R.D. (1994). Allergy to storage mites. *Clin. Exp. Allergy*, 24, 636-640.
13. Macfadyen A. (1953). Notes on methods for the extraction of small soil arthropods. *J. Anim. Ecol.*, 22, 65-77.
14. Macfadyen A. (1957). *Animal Ecology: Aims and Methods* (3rd Ed.). Pitman, London, 380.
15. Macfadyen A. (1961). Improved funnel type extractors for soil arthropods. *J. Anim. Ecol.*, 30, 171-184.
16. Solomon M.E. (1945). Tyroglyphid mites in stored products. Methods for the study of population density. *Ann. appl. Biol.*, 33, 71-75.