

On Some Mites from Stored Products of Grocery Shops in Howrah District, West Bengal

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Introduction

Most of the grocery shops having various types of household commodities become good habitats of various species of mites. Some of those infest cereals, pulses, spices and some other commodities kept in grocery shops, often doing minor to major damage and sometimes make those totally unsuitable for human consumption. Likewise, there are some beneficial mites also which act as predators of those injurious mites and help to keep their population below economic injury level. Also there are some which are fungal feeders and thrive on those grains having fungal infection. Though several workers reported mites occurring on various types of stored products from West Bengal and all those have been reviewed in Gupta (2012) but no study has ever been undertaken anywhere in India regarding occurrence of mites in the stored product commodities of grocery shops and their economic importance, if any.

Hence, it was thought necessary to conduct a preliminary survey of the mites occurring in stored product commodities of the grocery shops and their economic importance. The present paper includes the result of this study.

Material and methods

Study area- West Bengal, Dist- Howrah (Localities- Bally, Belur, Liluah, Salkia).

Study period- September 2017 to June 2018.

Sampling frequency- Fortnightly.

Sample size- 100gms (both in case of grains or flour).

Collection- By examining the samples under stereobinocular microscope and collecting the mites with brush moistened with alcohol.

Preservation- In 70% alcohol.

Mounting- Mounted in Hoyer's medium.

Identification- It was done by consulting the updated literature. While examining the relative abundance, nature of association and damage done, if any, were also recorded.

Results and Discussion

The identification of collected mite specimens revealed the occurrence of 17 species under 13 genera, 9 families, 3 orders which included 8 species under 5 genera of grain damaging mites, 6 species of 5 genera of predatory mites and 2 and 1 species each of fungal associated and uncertain associated mites. The list of mites along with their location, habi-

Table 1. List of mite species counted from stored products of grocery shops in Howrah district, during September 2017 to June 2018.

Species	Locality	Habitat	Abundance status	Economic status	Nature of association
Order- Astigmata					
Family- Acaridae					
1. <i>Acarus gracilis</i> Hughes	Howrah (Bally)	Wheat flour	1	A	Heavy infestation observed on wheat flour giving an pungent odour. This species not earlier reported on this habitat.
2. <i>Acarus siro</i> L.	Howrah (Bally)	Cumin seeds, Red gram	2	B	Moderate infestation observed on cumin seeds and red gram pulse. Damage done of moderate nature.
3. <i>Acarus ferris</i> (Oudemans)	Howrah (Bally)	Gram flour	2	B	Moderate infestation on gram flour making that clumpy.
4. <i>Rhizoglyphus</i> sp.	Howrah (Belur)	Rice	3	C	Occasional occurrence, observed on rotten rice grain making the grains with small holes.

5. <i>Tyroborus lini</i> Oudemans	Howrah (Bally)	Rice	3	C	Occurred only occasionally. No noticeable damage done.
6. <i>Tyrophagus putrescentiae</i> (Schrank)	Howrah (Belur)	Green gram	1	A	Abundantly found on pulse crop causing appearance of holes. It forms new habitat record.
7. <i>Caloglyphus berlesei</i> (Michael)	Howrah (Belur)	Wheat whole grain	1	B	This was found in association with a beetle and make the wheat grains with foul odour.
Family- Pyroglyphidae					
8. <i>Dermatophagoides pteronyssinus</i> (Trouessart)	Howrah (Bally)	Semolina	3	B	This mite is more common in house dust and its occurrence on semolina appears to be accidental through contamination.
Family- Glycyphagidae					
9. <i>Glycyphagus destructor</i> (Schrank)	Howrah (Liluah)	Wheat flour	2	B	A moderate infestation noticed on wheat flour in association with <i>Acarus gracilis</i> .
Order- Prostigmata					
Family- Cheyletidae					
10. <i>Cheyletus malaccensis</i> Oudemans	Howrah (Belur)	Semolina	1	A	Observed abundantly on semolina attacking <i>Dermatophagoides pteronyssinus</i> .
11. <i>Cheyletus aversor</i> Rohdendorf	Howrah (Bally)	Green gram, Split gram	3	C	Occasional occurrence. Importance not known.
12. <i>Cheyletus eruditus</i> (Schrank)	Howrah (Liluah)	Red gram, cumin	2	C	Often encountered in association with <i>Acarus siro</i> feeding not observed.
Family- Tarsonemidae					
13. <i>Tarsonemus</i> sp.	Howrah (Salkia)	Gram flour, semolina, wheat flour	3	C	Occasionally encountered, in association with wheat flour having fungal contamination.
Order- Mesostigmata					
Family- Phytoseiidae					
14. <i>Neoseiulus</i> sp.	Howrah (Salkia)	Wheat whole grain, flour	2	A	Predatory mite observed feeding upon <i>Caloglyphus</i> .
Family- Uroporidae					
15. <i>Fuscuropoda marginata</i> (C.L.Koch)	Howrah (Bally)	Bengal split gram, Split red lentil	2	B	Fungal associated mite.
Family- Parasitidae					
16. <i>Parasitus cansanguinus</i> Oudemans	Howrah (Liluah)	Broken rice, Wheat whole grain	1	A	It is infact a predatory mite but its occurrence in the present study was not found to be associated with any prey mite.

Family- Laelapidae

17. <i>Androlaelaps casalis</i> (Berlese)	Howrah (Bally)	Rice, Gram flour, Wheat flour	3	B	It is a predatory mite found in association with <i>Tyroborus</i> sp. To which it was attacking.
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Abundance : 1 = Most abundant; 2 = Moderately abundant; 3 = Least abundant.

Economic status : A = Most injurious; B = Moderate injurious; C = Less injurious.

tat, relative abundance, economic importance status and nature of association etc. have all been given in Table1 which is self explanatory.

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Conclusion

This paper reports the occurrence of 17 species of mites under 13 genera, 9 families, 3 orders which include 8 species

under 5 genera of grain damaging mites, 6 species under 5 genera of predatory mites, 2 and 1 species each of fungal associated and uncertain associated respectively. *Acarus gracilis* and *Tyrophagus putrescentiae* were found most damaging types on wheat flour and pulses, respectively, while *Cheyletus malaccensis* was the most dominating predator.

Reference

Gupta, S.K. 2012: *Handbook. Injurious and beneficial mites infesting Agri-horticultural crops in India and their management.* Nature Books India, New Delhi : 362pp.

Is Ganga on the Verge of Drying?

JAYASHREE NANDI

A new study has set off alarm bells on the health and flow of river Ganga. It has found that the summer water flow in the river is severely depleted, so much so that there may be hardly any flow in the non-monsoon months in large stretches of the river from Varanasi to Kolkata in the coming years, the study published in *Nature's Scientific Reports* recently has predicted.

The base-flow (groundwater inflow) into the river may have decreased by 50% from the beginning of irrigation days in the 1970s, mainly a result of indiscriminate extraction of groundwater. In next 30 years the report suggests that groundwater contribution can decrease by up to 75% compared to 1970s in the non-monsoon months.

This also means that pollution levels may rise further as there will hardly be any dilution of the sewage and other pollutants that drain into the river and remain concentrated.

"In the coming decades the river will become non-existent in many stretches. It is a catastrophic scenario but we see it happening if immediate steps are not taken to control groundwater extraction in 2-3 kms zone of the river. This will affect river life and ecology and lives of communities dependent on the river for irrigation, for drinking water, even industries will be impacted," said Abhijit Mukherjee, Associate Professor of Geology and Geophysics at IIT Kharagpur and lead author of the study.

The authors said that there are many reports which

have indicated that the river is drying but no quantitative information was available on these trends. Some studies have also suggested that climate change could be impacting flow.

This study, however, used long term satellite data, hydrological modelling, hydro-geo-chemical and isotope studies to arrive at how much base flow was decreasing and how much groundwater had been extracted. The level of groundwater depletion rate is the range of 0.5 to 38.1 cm/year between the summer of 1999 and 2013, according to the study.

"We looked at 28 locations through satellite data. Around 19 locations showed severe depletion trends. In some areas, the aquifers are drawing river water because there is no groundwater at all. This is called streamflow capture," added Mukherjee. Areas around Varanasi, eastern Bihar and downstream of Farakka barrage in West Bengal are worst affected.

Authors of the report— Mukherjee, Soumendranath Bhanja and Yoshihide Wada of International Institute for Applied Systems Analysis (IIASA), Austria — also noted in the study that "such streamflow reduction due to intense groundwater pumping is of utmost concern during low flow seasons like pre-monsoon season in Ganga basin ... the depletion in river water volume will also have a profound effect on future food security in Ganga basin— the bread basket of south Asia. The highly productive Indo-Gangetic basin would experience substantial reduction in food production if groundwater continued to be extracted in current unsustainable rate."