A LIST AND SURVEY OF STORED-PRODUCT MITES IN CHINA

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Introduction

The stored-product mites comprise an important part of stored-product entomology. In this country, mite infestations are common in stored grain and food products. It not only inflicts heavy damage to stored food products, but also affects quality and seed germination of grain. In addition, the presence of stored-product mites have caused acariasis in humans, such as dermatitis, invasion of the human body, and allergic asthma. So the stored-product mites are important in the storage of grain and food products, in food hygiene, and in human health.

Since 1957, owing to the practical need of grain storage, stored-product mites have been studied. At the present time 58 species of Chinese stored-product mites belonging to 20 families in 4 suborders are recorded. Of the above species, 30 species of mites belong to the Acarida, and are the more important stored-product mites in China.

A List of Chinese Stored-Product Mites

Mites occur in stored grain and food products, especially in Shanghai, Sichuan, Northeast China and coastal areas, where the relative humidities are higher. The most abundant species are Tyrophagus putrescentiae (Schrank), Aleuroglyphus ovatus (Troupeau), Suidasia nesbitti Hughes, Glycyphagus domesticus (De Geer), Lepidoglyphus destructor (Schrank), Carpoglyphus lactis (L.) and Cheyletus malaccensis (Oudemans). A total of 58 species of Chinese stored-product mites are listed as follows:

Arachnida

Acari

Acariformes

Acarida

Acaridae

Acarus siro L.

Tyrophagus putrescentiae (Schrank)
T. longior (Gervais)
T. casei (Oudemans)
T. fungivorus Oudemans

Aleuroglyphus oratus (Troupeau)

Lardoglyphus zacheri Oudemans
L. konoi (Sasa & Asanuma)

Caloglyphus berlesei (Michael)
C. mycophagus (Megnin)
C. oudemansi (Zachvatkin)

Rhizoglyphus callae Oudemans

Thyreophagus entomophagus (Laboulbene)

Suidasia nesbitti Hughes
S. medanensis Oudemans

Scatoglyphus polytremetus Berlese

Glycyphagidae

Glycyphagus domesticus (De Geer)
G. privatus Oudemans
G. ornatus Kramer

Lepidoglyphus destructor (Schrank)
L. michaeli (Oudemans)

Blomia freemani Hughes

Ctenoglyphus plumiger (Koch)

Gohieria fusca (Oudemans)

Chortoglyphidae

Chortoglyphus arcuatus (Troupeau)

Carpoglyphidae

Carpoglyphus lactis (L.)

Pyroglyphidae

Dermatophagoides farinae Hughes
D. pteronyssinus (Trouessart)

Euroglyphus maynei (Cooreman)

Anoetidae

Histiostoma feroniarum (Dufour)

Oribatida

Oribatulidae

Scheloribates laevigatus (Koch)

Actinedida

Cheyletidae

Cheyletus eruditus (Schrank)
C. malaccensis (Oudemans)
C. trouessarti Oudemans

Acaropsis sollers Rohdendorf

Cheletomorpha lepidopterorum (Shaw)

Eucheyletia harpyia (Rohdendorf)
E. reticulata Cunliffe
E. taurica Volgin
E. sp.

Bdellidae

Spinibdella sp.

Cunaxidae

Cunaxa setirostris (Hermann)

Tydeidae

Tydeus interruptus Thor.

Tarsonemidae

Tarsonemus granarius Lindquist

Pyemotidae

Pyemotes herfsi Oudemans

Scutacaridae

Acarophenax tribolii Newstead & Duvall

Raphignathidae

Raphignathus sp.

Parasitiformes

Camasida

Parasitidae

Eugamasus butleri Hughes

Ascidae

Blattisocius dentriticus (Berlese)
B. tarsalis (Berlese)
B. keegani Fox

Dermanyssidae

Hypoaspis lublica Voigts & Oudemans

Androlaelaps casalis (Berlese)

Eulaelaps stabularis (Koch)

Haemogamasus pontiger Berlese

Ameroseiidae

Kleemannia plumigera (Oudemans)

K. plumosa (Oudemans)

Uropodidae

Leiodinychus krameri (Canestrini)

A Survey of Stored-Product Mites in China

Since 1957, studies of stored-product mites have been conducted in China. Thereafter, studies of the life history of important stored-product mites, such as *Tyrophagus putrescentiae*, *Aleuroglyphus ovatus*, *Suidasia nesbitti*, *Carpoglyphus lactis* and *Cheyletus malaccensis* were carried out.

Aleuroglyphus ovatus is one of the most prevalent pests of stored food products in China. A study has been carried out on the morphology and classification of Chinese Acarida mites (Hsin Kai-lo and Shen Chao-peng, 1963).

Carpoglyphus lactis is an important stored-product mite, which not only inflicts heavy damage to stored sugar, dried fruit and sweet chow-chow but also causes acariasis in humans. It is almost exclusively found in stored food products containing lactic, acetic and succinic acids which are produced by bacterial activity. As *Carpoglyhpus lactis* multiplies to enormous numbers on dried fruit, sugar and sweetmeat, it can give rise to acute alimentary canal trouble. Studies on the biology and mode of infestation of this mite were carried out and the morphology of each stage in its life history described (Shen Chao-peng, 1979).

Chang Kuo-liang (1958) published "The mites of stored grain and their control" based on observations in various places in our country and the result of a field survey. In this paper seven stored-product mites were recorded. The discussion on endanger, conditions for incidence and methods for control of stored-product mites were carried out.

Xue Yao-niar (1959) published "Control of mites." In this paper, the damage, transmission, life habits, prevention and elimination of stored-product mites were discussed.

Chang Kuo-liang and King Lee-chung (1960) published "The species of stored grain mites and distribution in China," in which fourteen stored-product mites were recorded.

In 1960, Institute of Shanghai Grain and Oil Company reported that there were 16 species of stored-product mites in Shanghai.

Wang Siao-chu (1964) published "Five new records to Chinese Acarida" and in this paper five species are recorded: Suidasia medanensis Oudemans, Suidasia nesbitti Hughes, Lardoglyphus zacheri Oudemans, Lardoglyphus konoi (Sasa & Asanuma), and Scatoglyphus polytremetus Berlese.

Hsin Kai-lo (1965) summarized the achievement of research on stored-product mites by scientists all over the world and published "Recent Research Progress in the Stored Product Mites." The article contents: (1) Introduction, (2) Problem of classificaiton, (3) Problem of ecology, (4) Research in the control of stored product mites, (5) Stored product mites associated with acariasis, (6) Research in the rearing technique of stored product mites as well as 135 references.

Lu Lian-gao (1980) has compiled "The stored product mites" after a survey of many years. This book is divided into four divisions: (1) Introduction of stored product mites, (2) Description (through figures) of stored product mites, (3) Control of stored product mites, (4) Research techniques for stored product mites. In the second section, a total of 28 stored product mites were recorded in Sichuan Province.

Species belonging to the family Cheyletidae are all freeliving, predatory mites, pradaceous on Tyroglyphida, Tetranychida, Eriophida, scale insects and other small creatures. It is therefore one of the factors controlling populations of Tyroglyphida, Tetranychida, Eriophida, Coccoda, etc. In this country, eight species of Chinese Cheyletid mites belonging to the four genera are recorded (Shen Chao-peng, 1975).

Cheyletus malaccensis Oudemans is a common species in China. It is mostly found in places where Tyroglyphida mites are prevalent. Each Cheyletus malaccensis Oudemans feeds on ten Tyroglyphida mites a day and on about a hundred mites in its entire life history (Shen Chao-peng, 1975).

Few have studied how to control mites in grain and food. Chang Kou-liang and King Lee-chung (1963) reported that chloropicrin proved to be an effective fumigant for the control of the grain-infesting mite Tyrophagus putrescentiae in its active stages (larval, nymphal and adult). The medium lethal dose was 0.28 mg per liter with an exposure period of 4 hours, but the chloropicrin was not toxic to the egg stage of this mite.

In recent years, the Shanghai First Medical College determined that the genus Dermatophagoides was the source of allergy asthma in human. A survey of the seasonal prevalence of Dermatophagoides farinae Hughes, as well as the relationship between seasonal prevalence of Dermatophagoides farinae and asthma was conducted. Shanghai First Medical College also studied injections of Dermatophagoides farinae Hughes. The mites of genus Dermatophagoides are both damaging to human health and are used as immune treatment preparations.

Recently, a preliminary survey on infection of mites in Chinese medicine, prepared by a pharmacy, was carried out in Hangzhou China. It was found that there were many stored-product mites (mainly Tyroglyphida mites) infecting Chinese medicine, particularly in the bolus made of powdered Chinese medicine and honey. The problems have been brought to the attention of the concerned department.

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