

# GEOGRAPHICAL AND ECOLOGICAL DISTRIBUTION OF MITES OF THE FAMILY PYROGLYPHIDAE (ASTIGMATA)

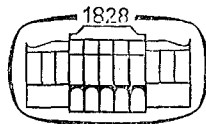
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The mites of the family Pyroglyphidae Cunliffe have been extensively studied since the discovery that some species are able to produce bronchial asthma in man.

So far 11 genera and 25 species have been recognized in this family. Most of these mites live in house dust or in nests of birds. A few species are known from various habitats, mostly dried skins and stored food.



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### DIVISION OF THE FAMILY PYROGLYPHIDAE

The Pyroglyphidae have been divided into two subfamilies: Pyroglyphinae and Dermatophagoidinae.

The Pyroglyphinae are characterized by the strong sclerotisation of the cuticle and the presence of a distinct tegmen partly covering the chelicerae dorsally. In the female by the sclerotization and generally greater development of the posterior vulvar lip and the poor development of the epigynium. The Pyroglyphinae live in rather dry and often hot habitats but some species are also found in house dust.

In the Dermatophagoidinae the cuticle is soft and striate, there is no tegmen, the posterior vulvar lip is short and soft and in all the genera except one (*Malayoglyphus*) the epigynium is well developed and strongly sclerotized. These mites live mostly in house dust or in bird nests. This group contains the most important producer of asthma in man: *Dermatophagoides pteronyssinus*.

Ecologically the Pyroglyphidae are free-living mites. However from the morphological point of view they present all the characters of the parasitic Psoroptidia. The genital suckers are vestigial, the tarsi do not bear claws as in the freeliving species but they end in a well-developed sucker. Moreover, the chaetotaxy is strongly reduced and presents the same pattern as in the genus *Psoroptes*. The *vi* and *ve* setae are lacking. The tibiae I and II bear only one hair, the tarsi I—II only eight setae. In the female there are only two pairs of anal setae. Another character that is encountered in the Pyroglyphidae and is also frequent in the Psoroptidia is the apical position of the solenidion omega I on the first tarsi. In the males of most of the species of Pyroglyphidae the tarsus IV bears two very small subapical sucker-like hairs which are homologous with the tarsal copulatory suckers found in the Acaridae. These vestigial suckers are also present in most of the Psoroptidia (e.g. Epidermoptidae, Psoroptidae, Sarcoptidae, etc.).

## HABITAT OF THE PYROGLYPHIDAE

Among the 25 species known in the family Pyroglyphidae, 9 live chiefly or exclusively in the dust of houses. They all belong to the subfamily Dermatophagoidinae except one, *Euroglyphus maynei*, which belongs to the Pyroglyphinae.

1. The most important of these house-dust species is *Dermatophagoides pteronyssinus* (Troessart). This mite is cosmopolitan and it has been found in all the countries of the world where investigations have been performed.

The dust of the houses seems to be the true habitat of that species. Very rarely has it been found in other conditions such as dried skins or on the human body. The restricted character of its habitat is in relation with the food requirements of that species which feeds mainly on the corneous material desquamating from human skin.

This species is, strictly speaking, not a parasite because it is not able to live permanently on the body of man. The discovery of some specimens on the skin of patients suffering of mange was probably purely accidental (FAIN, 1969). The pathogenic action of this species is therefore never in relation with the permanent presence or the mite in the lung or on the skin, but is basically allergic in nature and is produced by a repeated contact with the excretions, the secretions or the somatic antigens issued from the dead mites.

Some recent investigations in Pérou have shown the presence of *D. pteronyssinus* in houses at the altitude of 3300 m (CACERES and FAIN, 1974).

2. Another species also very common in house-dust, at least in Europe and in some places of Asia and America, is *Euroglyphus maynei* Cooreman. This species has so far not been extensively studied concerning its food requirements and its possible pathological manifestations. We think that actually it plays an important role in the production of pulmonary allergy.

3. A third cosmopolitan species living in house-dust is *Dermatophagoides farinae* Hughes. This species seems to be more frequent in North America than in Europe or Asia. In Europe it is much less frequent in the houses than the two preceding species. It is probably able to play a part in the production of bronchial allergy but its importance is less at least in the Old World, when compared with *D. pteronyssinus*.

4. *Dermatophagoides microceras* Griffiths et Cunnington is morphologically very close to *D. farinae* and difficult to separate from the latter. So far it has been found in houses of Europe and U. S. A.

There are five other species of Pyroglyphidae that have been found in house-dust, mainly or exclusively in tropical or subtropical countries.

5. *Sturnophagoides brasiliensis* Fain is common in the houses in Brasil and Malaya. We found it once in a house in France. That house was occupied by a Brazilian who made frequent trips to Brazil.

6. *Malayoglyphus intermedius* Fain et al. was described from house-dust in Malaya. We found also this species in house-dust from South Africa.

7. *Malayoglyphus carmelitus* Spieksma, has been described from house-dust in Israël.

8. *Dermatophagoides halterophilus* Fain et Feinberg, is known only from house-dust in Malaya.

9. *Dermatophagoides neotropicalis* Fain et van Bronswijk, was described from house-dust in Surinam.

Besides these 9 species living in house-dust the family Pyroglyphidae contains 16 other species which occupy various habitats, mainly nests of passeriform birds, especially swallows, starlings, sparrows and swifts. A list of these species and of their main habitats is given by FAIN and LOWRIE (1974).

## FOOD REQUIREMENTS OF THE HOUSE-DUST MITES

Except for *D. pteronyssinus* which is able to feed on the skin dander of human origin, the food requirements of the other mites found commonly in house-dust is not known. It seems that the *Cheyletus* spp. are able to survive in the house-dust by predateding the *Dermatophagoides* specimens. We do not know if the mites of the families Acaridae and Glycyphagidae are able to survive and reproduce in house-dust. The occasional presence of these mites in house-dust does not prove that they are able to colonize this biotope. As a matter of fact the true habitat of these acarids and glycyphagids is not house-dust but stored food, mainly flour, wheat, grain, cheese, dried fruits, etc. It is possible that the presence of these mites in dust is the result of repeated introductions in the houses of contaminated food. New investigations and experimental work could tell us if the house-dust constitutes a good medium and is able *per se*, to fulfil all the biological requirements of these mites.

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