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MALAYOGLYPHUS CARMELITUS N. SP.,
A NEW MITE FROM DUST FROM A HOUSE ON MOUNT CARMEL
(PYROGLYPHIDAE : SARCOPTIFORMES)

BY
F. Th. M. SPIEKSMA.

Since the publications of OSHIMA (1964) and VOORHORST et al. (1964), house dust as a habitat for mites of the family Pyroglyphidae has received much attention (SPIEKSMA, 1967; SPIEKSMA and SPIEKSMA-BOEZEMAN, 1967; OSHIMA, 1970; VAN BRONSWIJK, 1972 b). This interest in the occurrence of mites in house dust was particularly stimulated by its medical implication: mites of the family Pyroglyphidae appeared to be the source of the house-dust allergen which can cause serious respiratory complaints (allergic asthma and rhinitis) in a certain percentage of the human population (VOORHORST et al. 1967; 1969; SPIEKSMA, 1967, 1973; MAUNSELL et al., 1968; MIYAMOTO et al., 1968; PEPYS et al., 1968; CHARPIN et al., 1971).

In several observations on the mite fauna of house dust it was shown that Pyroglyphid mites are by far the most abundant and ubiquitous (FAIN, 1967 a; SPIEKSMA and SPIEKSMA-BOEZEMAN, 1967; SPIEKSMA et al., 1971; HAARLOV and ALANI, 1970; OSHIMA, 1970; WHARTON, 1970; VAN BRONSWIJK and SINHA, 1971; VAN BRONSWIJK et al., 1971; CORNERE, 1971; FRANKLAND and EL-HEFNY, 1971; ORDMAN, 1971; STENIUS and CUNNINGTON, 1972).

These extensive studies have led to the discovery of numerous new species in the Pyroglyphidae. Also redescriptions and revisions have been published in the last seven years (FAIN, 1966, 1967 a, 1967 b, 1971; GAUD, 1968; OSHIMA, 1968; FAIN et al., 1969; FAIN and FEINBERG, 1970; FAIN and WHARTON, 1970; GRIFFITHS and CUNNINGTON, 1971).

FAMILY PYROGLYPHIDAE CUNCLIFFE, 1968.

The considerations concerning the systematic position of the new species which is described in this report, are based on the studies of FAIN. He distinguishes two sub-families within the Pyroglyphidae, viz. Pyroglyphinae and Dermatophagoidinae (see FAIN, 1967 b).

The main characters for this distinction are the poor sclerification and the uniform and regular striation of the cuticle, the absence of a tegmen (tectum) covering part of the gnathosoma, and the great length of the setae (sc e), l 5 and d 5 compared to the other idiosomal setae, in the Dermatophagoidinae. In the Pyroglyphinae the cuticle is more heavily sclerotized and irregularly striated, part of the gnathosoma is covered by a two or three-pointed tegmen, and the setae (sc e), l 5 and d 5 are about as short as the other idiosomal setae.
The sub-family Pyroglyphinae comprises three genera: Pyroglyphits, without adanal suckers in the male; Bontiella, almost without striation of the cuticle and with legs III longer and stouter than legs IV in the female; and Euroglyphus, with legs III and IV of the female equal or almost equal (see FAIN, 1965).

**Sub-Family Dermatophagoidinae Fain, 1963, 1967 b.**

In the sub-family Dermatophagoidinae five genera are placed: Dermatophagoides, without hysterosomal shield in the female and a regular and fine striation of the cuticle (FAIN, 1967 a); Sturnophagoides, with a (small) hysterosomal shield in the female (FAIN, 1967 a, 1967 b, 1971; FAIN and Feinberg, 1970); Guatemalichus, with a fusion of the apodemes I with the epigynial arc, and legs III stouter than legs IV in the female (FAIN and Wharton, 1970); Potocola, with the same fusion of apodemes I with the epigynial arc, but with legs III equal to legs IV, and with prominent tarsal spines (FAIN, 1971); and Malayoglyphits, with a coarser but still regular striation in the posterior part of the back in the female, a relatively poor development of the epigynium, and with shorter external scapular setae (sc e).

**Genus Malayoglyphits Fain, Cunnington and Spieksma, 1969.**

In the discussion of the position of the genus Malayoglyphits, Fain et al., (1969) point out that this genus takes some kind of intermediate position between the Pyroglyphinae and the Dermatophagoidinae. The regular pattern of the striation, the poor development of sclerotized punctate areas of the cuticle, and the absence of a tegmen make the genus resemble the other genera of the Dermatophagoidinae. But the small length of the external scapular setae and the poor development of the epigynium place it close to the Pyroglyphinae. The authors stated: "The discovery of this intermediate form lessens the validity of the sub-family Dermatophagoidinae. We think, however, that the absence of the tegmen and the normal structure of the striation are sufficient to maintain this sub-family".

The characters of the new species described in this report support this judgment. This new species represents all main characters of the sub-family Dermatophagoidinae. But at the same time it can be considered as an intermediate form between Malayoglyphits as defined by the above cited authors, and the other genera of the Dermatophagoidinae.

This new species shows the regular striation, the poorly sclerotized areas of the cuticle and the absence of a tegmen as in the Dermatophagoidinae.

The shape of the vulva in the female, being a simple bow (instead of an inverted Y as in most Dermatophagoidinae) and the more equal sizes of legs III and IV in the male (legs III being clearly stouter and thicker than legs IV in Dermatophagoidinae) are characteristic for Malayoglyphits.

However, there are also characters which are representative for its intermediate position between M. intermedius (the only species of the genus until now) and the other Dermatophagoidinae. The length ratio of the setae sc i and sc e, which is 1:1 in M. intermedius and 1:5 or more in other Dermatophagoidinae, is 1:2 in the new species. The epigynium, almost absent in M. intermedius and strongly developed in Dermatophagoidinae, is poorly developed but clearly present in the new species.

It is proposed here to maintain the two sub-families Pyroglyphinae and Dermatophagoid-
Fig. 1: Malayoglyphus carmelitus n. sp.: Female, ventral view.
dinae on the above mentioned grounds. The characters of the new species strengthen the position of *Malayoglyphus* in the Dermatophagoidinae and emphasize its closer relationship to the Dermatophagoidinae than to the Pyroglyphinae. The definition of the genus (Fain et al., 1969) has to be revised.

**Definition:** Cuticle regularly striated, ventrally of the same fine structure as in *Dermatophagoides*, dorsally coarser in the posterior part. A punctate propodosomal shield, longer than wide, present in both sexes. The dorsal surface of the hysterosoma is slightly sclerotized in the posterior part. In the male a hysterosomal shield may be present or absent. Vulva in the shape of a bow, rather than of an inverted Y as in *Dermatophagoides*. Posterior lip of the vulva regularly striated. Epignymb poorly developed (or ? absent). All epimera free in both sexes. Legs slender. In the female, posterior legs equal or sub-equal. In the male legs III very slightly shorter than legs IV, or equal to sub-equal.

**Chaetotaxy:** Chaetotaxy of the idiosoma as in *Dermatophagoides*, except for the setae a e, missing in both sexes, and for the setae sc e, being relatively shorter, maximally twice as long as sc i. The chaetotaxy of the legs differs from that of *Dermatophagoides* in both sexes by the presence of 7 setae on tarsi I and II and of 5 setae on tarsi III. In the female the tarsi IV bear 5 or 4 setae; in the male these tarsi bear 3 setae and a small rounded papilliform production which seems to be the remnant of one of the two specialized sensory setae found in *Dermatophagoides*.

**Solenidiotaxy:** On genus I there is only one solenidion. Other solenidia as in *Dermatophagoides*. A famulus may be present on tarsus I.

**Type of the genus:** *Malayoglyphus intermedius* Fain, Cunnington and Spieksma, 1969.

*Malayoglyphus carmelitus* nov. spec.

**Female** (holotype) (Figs. 1, 2, 4-8): Length of the idiosoma is 320 µ, width 214 µ. In 4 paratypes: 344 x 245 µ; 348 x 235 µ; 348 x 245 µ; 340 x 235 µ. Dorsally, the striation of the cuticle is slightly coarser than in *Dermatophagoides* spp., especially the posterior part. The propodosomal shield is 87 µ long and 40 µ wide (in 4 paratypes: 96 x 46 µ; 96 x 45 µ; 96 x 43 µ; 90 x 49 µ), with vague lateral edges. The genital apodemes are normally developed; the short epignymb arc is punctate. The external opening of the bursa lies in the median line, a little behind the anal slit, surrounded by a small punctate area. The internal orifice of the bursa is sclerotized and has the shape of a wide cup without radial expansions.

Tarsi I and II are respectively 37 and 46 µ long (in 4 paratypes: 43 and 56 µ; 43 and 49 µ; 40 and 46 µ; 40 and 49 µ). Tarsi III and IV are respectively 59 and 65 µ long (in 4 paratypes: 69 and 75 µ; 59 and 65 µ; 62 and 69 µ; 72 and 78 µ).

Lengths of some idiosomal setae: sc e: 35 µ; sc i 15 µ; h: 85 µ; d 5: 110 µ; 1 5: 240 µ. Solenidia of tarsus I: o I: 30 µ; o 3: 20 µ. Other characters as given in the definition of the genus.

**Male** (allotype) (Figs. 3, 9-11): Length and width of the idiosoma are respectively 283 and 193 µ. In 4 paratypes: 271 x 199 µ; 283 x 205 µ; 240 x 168 µ; 243 x 187 µ. Propodosomal shield as in the female. The hysterosomal shield is extending just posteriorly to d 2. The weakly sclerotized ring around the anus is closed, and has its greatest width in the anterior half. This ring is 48 µ long and 35 µ wide. Adanal suckers small.
Tarsi I and II are respectively 43 and 49 µ long (in 4 paratypes: 43 and 49 µ; 40 and 49 µ; 37 and 46 µ; 38 and 46 µ). Tarsi III and IV are respectively 54 and 52 µ long (in 4 paratypes: 56 and 56 µ; 54 and 52 µ; 49 and 49 µ; 52 and 52 µ).

Lengths of some idiosomal setae: sc e: 30 µ; sc i: 15 µ; h: 78 µ; d 5: 120 µ; l 5: 230 µ. Solenidia of tarsus I: ω 1: 24 µ; ω 3: 20 µ.

**Inadults**: General characters as in the female, except for the genitalia. By the relative lengths of the setae sc i and sc e (1: 2) they can be distinguished from *M. intermedius* (1: 1).
Fig. 4: Four different views of the bursa copulatrix of *Malayoglyphus carmelitus* n. sp.

Fig. 9: *Malayoglyphus carmelitus* n. sp. Male. ventral view.
Locality: In October 1972, a sample of dust was collected by brushing from a cupboard, in the house of Mr. W. Anker situated on the slope of Mount Carmel in Haifa, Israel. The dust was sent to the Department of Allergology, University Hospital, Leiden, by mediation of Miss E. Geröova, physician. The dust sample was placed under conditions of 25°C temperature and 70-80 percent relative humidity, which are optimal for the growth of most Dermatophagoidinae (SPIEKSMA, 1967; KoeKOEK and Van BRONSWIJK, 1972). A small amount of human skin scales and powdered yeast was added as nutrient medium (SPIEKSMA, 1967; Van BRONSWIJK, 1972 a).

During two months the mites that might be present in the dust, were allowed to grow and multiply. After this period the dust sample was inspected and a number of live mites were collected for identification. The species is named after the locality where the dust sample had been collected: Mount Carmel.

Paratypes in the collection of the author.

Figs. 7-8: Tarsi of *Malayoglyphus carmelitus* n. sp., female. Ventral views: tarsus III (7); tarsus IV (8).

Figs. 10-11: Tarsi of *Malayoglyphus carmelitus* n. sp., male. Ventral views: tarsus III (10); tarsus IV (11).
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