

Observations on the spread of *Pyemotes ventricosus* (Prostigmata: Pyemotidae) in houses in Umbria, Central Italy

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Abstract: The spread of *Pyemotes ventricosus* (Newport, 1850) was observed during three years in 460 houses where dermatoses of environmental origin were reported. The period of highest mite spread was from May to August. This parasitic infestation was among the most important causes of human dermatitis in summer.

Introduction

Pyemotes ventricosus (Newport, 1850) is a prostigmatic mite. It may also be accidentally parasitic on man (Hewitt *et al.* 1976; Rycroft and Kennedy 1981; Betz *et al.* 1982; Kunkle and Greiner 1982; Hanks *et al.* 1992; Principato and Polidori 1993; Letchford *et al.* 1994; Principato 1998; Grob *et al.* 1998). Although the systematics of this mite are known and its presence is frequently reported in food stores, with repeated episodes of human dermatitis, very little is known about its frequency and indoor spread and the possible risks for people and domestic animals. The aim of this survey has been, therefore, to determine the period of the maximum development of this pest, related to the outbreak of serious dermatoses, and to establish the main places of its development.

Materials and Methods

The direct examination of indoor dust from 460 Umbrian human dwellings, from which an intense pruritic papular eruption was reported, was continued during three years. Dust was collected by sweeping the floor of the houses carefully. The mites were extracted through flotation with NaCl, observed through a stereomicroscope, isolated with a thin needle and mounted on a slide in Berlese solution. Mites were then counted and identified to species.

Results

P. ventricosus was the fourth most frequent mite in dwellings after *Dermatophagoides pteronyssinus*, *D. farinae* and *Glycyphagus domesticus*, and the second most important acarine cause of human dermatitis after *G. domesticus* (fig. 1).

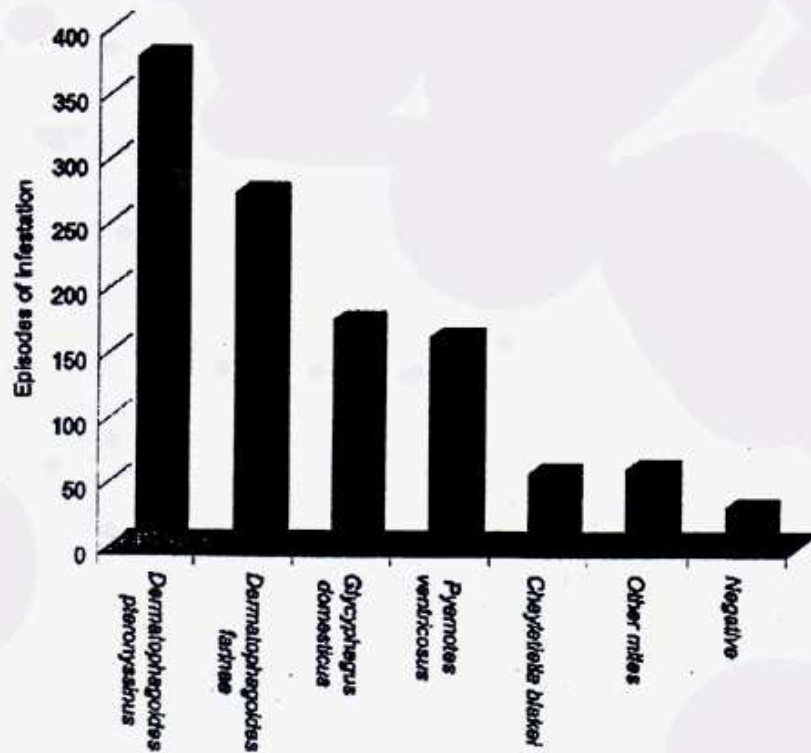


Fig. 1 - Frequency of infestations in the 460 dwellings examined.

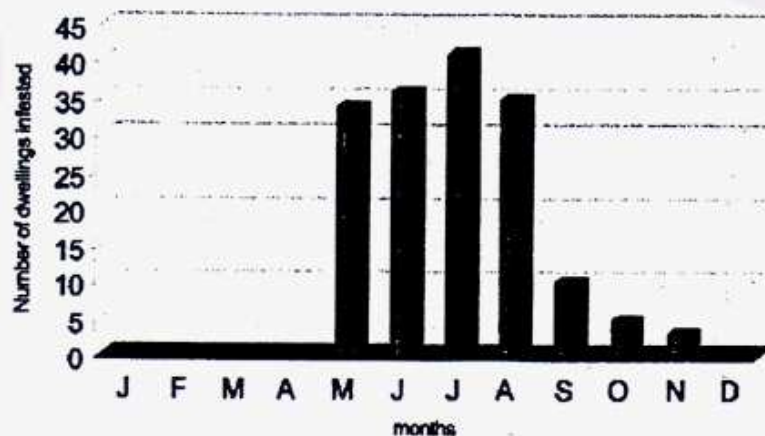


Fig. 2 - Occurrence of *Pyemotes ventricosus* during three years in 460 dwellings.

Higher population density of *P. ventricosus* was detected from May to August; from September to November, the density decreased to zero (fig. 2).

The gravid females of this species were frequently observed in June and by September some males, which were usually rare, were also found (fig. 3).

Even when the number of mites isolated

through the direct examination of indoor dust was low, it was always associated with an episode of human dermatitis. The people affected soon recovered after they were given a specific environmental treatment. Furthermore, *P. ventricosus* did not appear to depend on particular temperatures or humidities in the house, since it was isolated, on its own or together with other mites that need a high RH rate

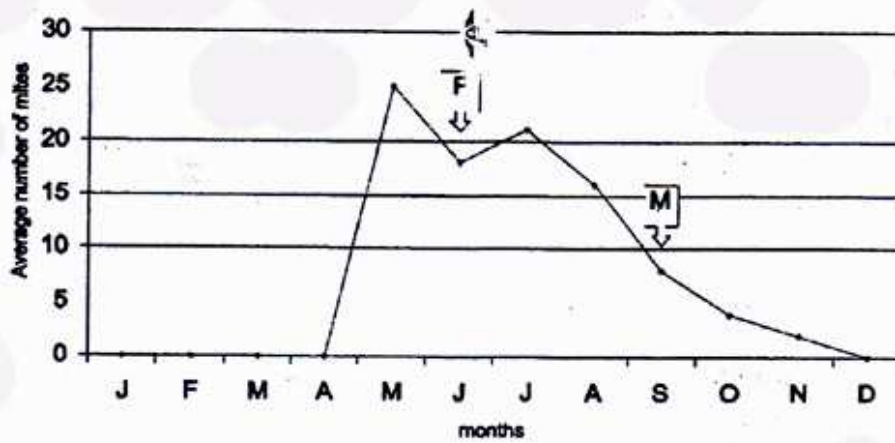


Fig. 3 - *Pyemotes ventricosus*: average number of mites removed by the direct examination of indoor dusts. F, Females; M, Males.

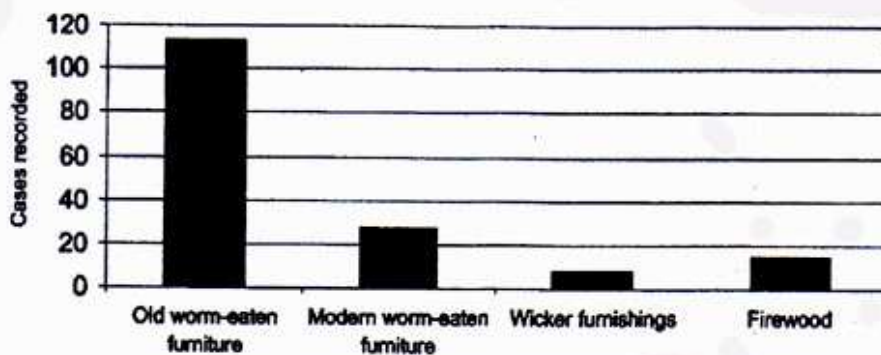


Fig. 4 - *Pyemotes ventricosus*: origin of infestation.

or with mites found at 45-55% RH. The main origin of infestations was furniture, both new and old, such as wicker objects infested by the beetle *Anobium punctatum* and also of firewood, which in many cases had remained in the room since the previous winter (fig. 4).

The dermatitis by *P. ventricosus* was reported mainly on man and there were only 3.6% cases when it was observed in dogs living in those houses, showing cutaneous eruptions on their abdomen and the insides of their thighs. The resultant distribution of lesions on humans was characteristic, since they occurred not only on the trunk and the arms, but also in the neck and in the areas tightened by the elastics of clothes. Furthermore, some lesions appeared in small groups and were intensely pruritic.

Discussion and conclusions

We found that human infestations by *P. ventricosus* are very frequent in the 'spring-summer period in Umbrian houses. Mites showed a clear periodic occurrence, with gravid stages occurring mainly in June-July. In September most of the mites isolated were dead and the infestation decreased in October-November, as did the cases of dermatitis. The most serious episodes were observed in the reproductive period of the mites and in particular when the parasites came from furniture eaten by larvae of hylophagous beetles, but only when they were present. The anamnesis seemed extremely confused, since the patients attested to the outbreak of lesions in quite different conditions, even outdoors, in their cars or while they were having a shower. Actually, this anamnestic diversity

leads to the suspicion of infestation by *P. ventricosus*, for this mite causes lesions some hours after its bite and when people are engaged in different activities. We never found any correlation between the presence of *P. ventricosus* and *Plodia interpunctella* (Lep. Phycitidae) in the houses, a moth that frequently infests farinaceous foods in larders or cupboards. However we always reported the presence of this mite in association with woodworms, in order to isolate the parasite a few times even under the beetle's elytra (Principato and Polidori 1993). As for the lesions observed on domestic animals, we think they could be caused by *P. ventricosus*; Kunkle and Greiner (1982) reported papular eruption due to *Pyemotes* sp. in 12 horses, thus recording cases of dermatitis in animals. Infestations were eliminated and complete recovery was obtained after the removal of the worm-eaten furniture, wherein the mites had developed. Good results were obtained but only temporarily after moth control that was associated with another treatment of the whole flat or house by fumigation. In consideration of the high spread of this mite in Umbrian houses and its pathogenic action on man, we think it is important to deepen the study of its biology and its adaptability with further research.

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