

Microscopic examination of indoor dust: a useful survey tool for diagnosis and verification of environmental contamination of *Sarcoptes scabiei*



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INTRODUCTION

The human scabies mite *Sarcoptes scabiei* var. *hominis* (Linnaeus, 1758) (Acarina: Sarcoptidae) is an obligate parasite of humans that can cause the condition called scabies.¹ An entire family (four adults) living in an apartment in Roma, Italy, was afflicted by itch and recurrent erythematous papular lesions (figs. 1 A-B). Since the dermatologist suspected scabies, a microscopic examination of indoor dust was performed,² in order to diagnose this parasitosis with certainty and verify the environmental contamination.

MATERIALS AND METHODS

In June 2018, a manual collection of 7 indoor dust samples was carried out by the patients themselves from every room/area. The dust samples were sifted and examined under a stereomicroscope (0,75X - 5X) (Motic SMZ168, Milan, Italy). Arthropods fragments were extracted under stereomicroscope using the tip of a pin and then placed in a drop of Berlese solution on a microscope slide with cover slip (figs. 2 A-F) for the taxonomic identification by optical microscope (4X - 100X) (Motic BA310, Milan, Italy).²

RESULTS AND DISCUSSION

In 3 of the 7 samples it was possible to identify various adult specimens, nymphs, larvae and eggs of *S. scabiei* (figs. 2 A-F). All mites were non-viable. The microscopic examination of the indoor dust allowed to diagnose scabies, avoiding complex and invasive techniques, such as skin scraping.

Based on these results, contextually with the topical therapy applied to all members of the family (5% permethrin cream), the three areas contaminated with *S. scabiei* were sanitized with liquid nitrogen spray method (Criopest, Ecotrade Solution srl, Rome, Italy). Daily disinfection operations were also adopted: used clothes, bed linen, towels and other fabrics were periodically washed at 60°C. After cryogenic environmental treatment of the contaminated areas, daily disinfection operations and continuation of local therapy, the skin lesions disappeared in about 5 weeks. The subsequent 6-month follow-up was negative.

Contaminated household furniture and all clothing/bedding play a role in the spread of scabies in the home.⁴ The microscopic examination of indoor dust made possible to perform a certain diagnosis of scabies. Furthermore, this exam made possible to detect the environments of the house where the contamination with scabies mite was greater. Therefore, through treatment with liquid nitrogen, it was possible to sanitize the environments subject to risk, avoiding the usage of insecticides.

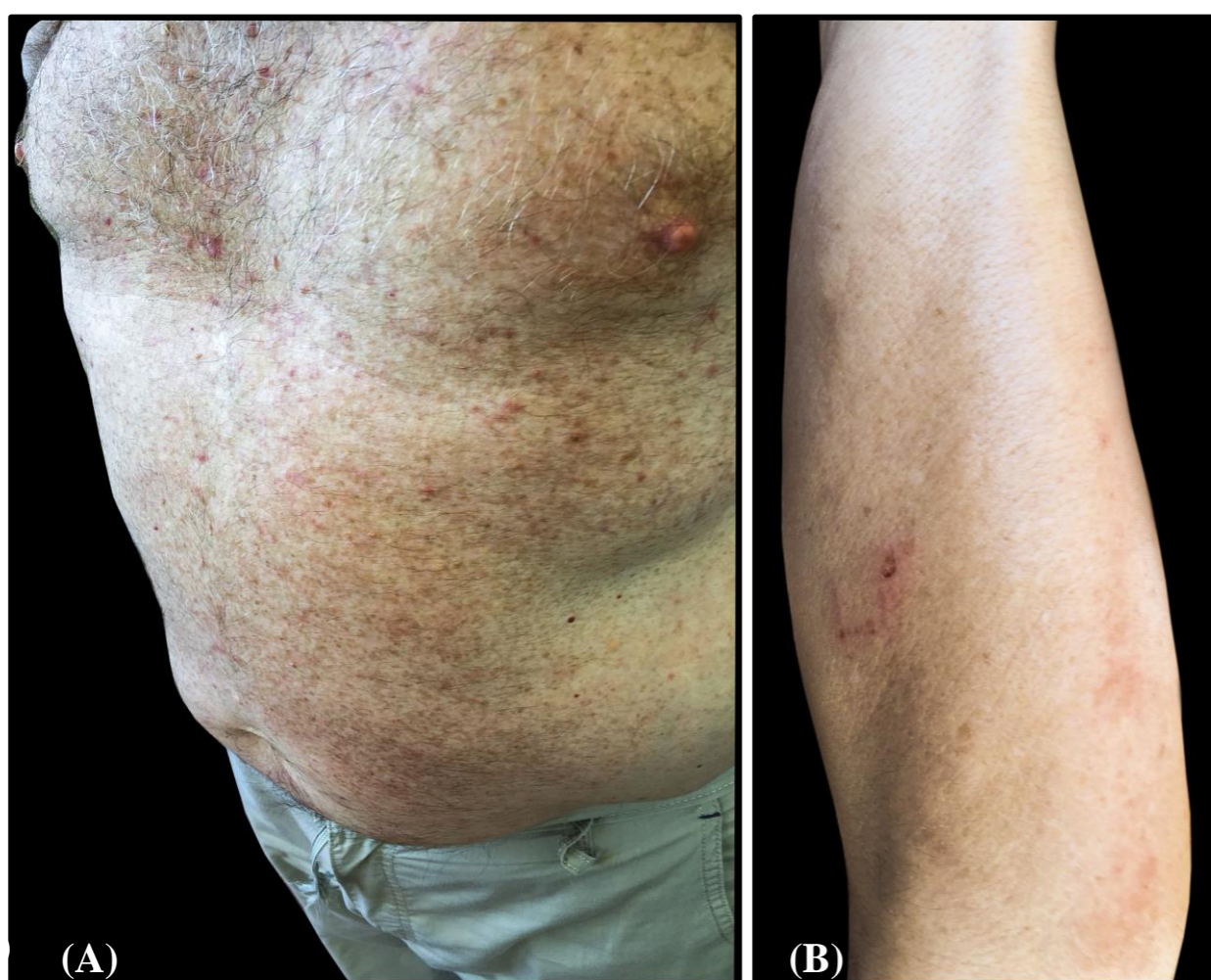


Fig. 1: Diffuse erythematous papular lesions on chest and abdomen in a men (A) and on forearm in a woman (B).

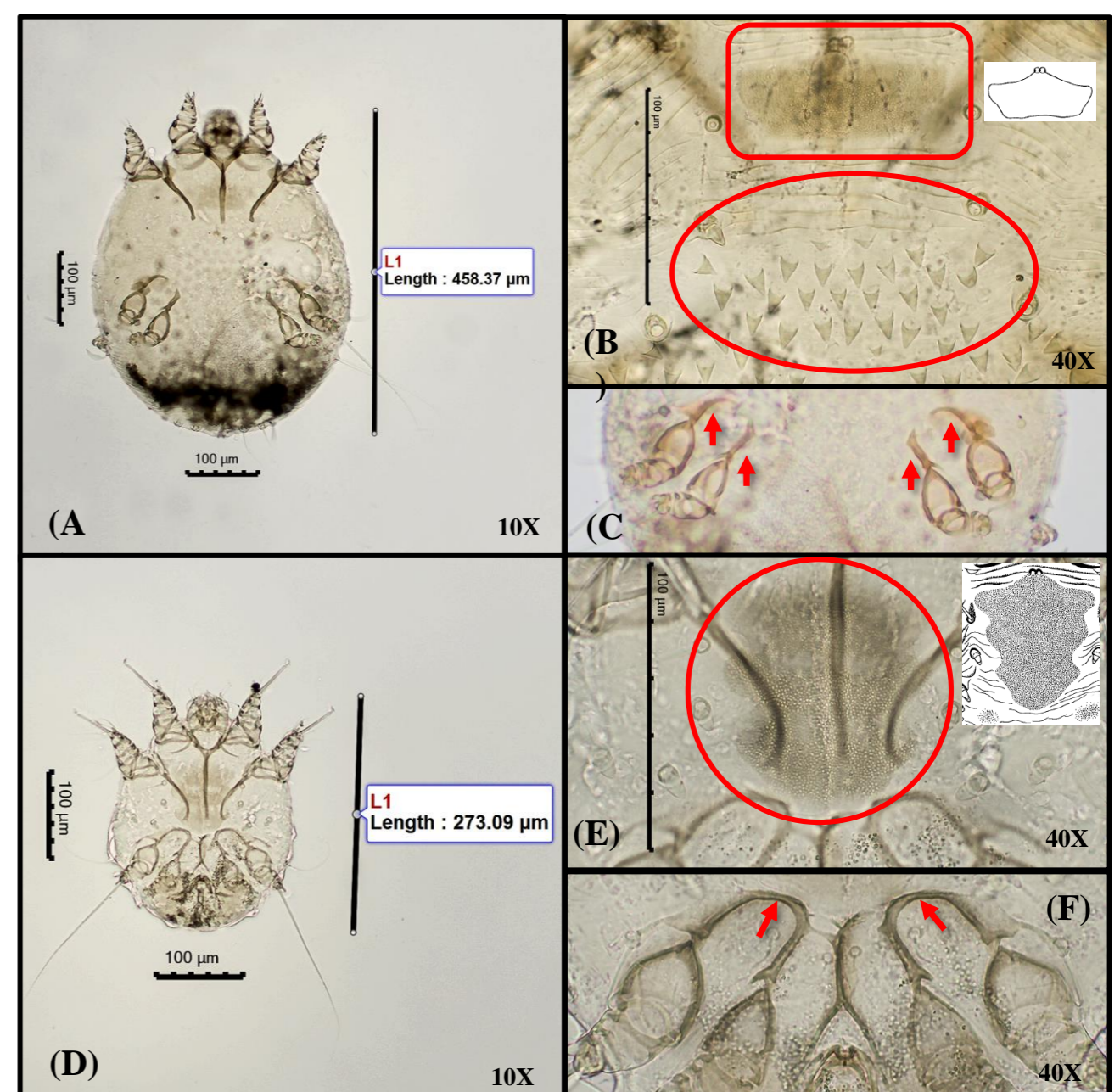


Fig. 2: Light micrographs of *Sarcoptes scabiei* var *hominis* on microscope slides and cover slips in a drop of Berlese solution: (A) female in ventral view (10X); (B) propodosomal dorsal shield (red rectangle) flattened in female (see the drawing) and dorsal spines (red ring) (dorsal view - 40X) (draw by Fain, 1968); (C) epimers III and IV free in females (red arrows) (40X); (D) male in ventral view (10X); (E) propodosomal dorsal shield (red ring) more elongate in males (see the drawing) (dorsal view - 40X) (draw by Fain, 1968); (F) epimers III and IV (red arrows) fused to form an arch in males [(Optical microscope - Motic BA310, Milan, Italy) (Motic Image Plus 3.0, Milan, Italy)].

BIBLIOGRAPHY

- 1 - Arlian LG, Morgan MS. A review of *Sarcoptes scabiei*: past, present and future. *Parasit Vectors*. 2017;10(1):297. Published 2017 Jun 20. doi:10.1186/s13071-017-2234-1
- 2 - Stingeni L, Bianchi L, Hansel K, Neve D, Foti C, Corazza M, Bini V, Moretta I, Principato M. Dermatitis caused by arthropods in domestic environment: an Italian multicentre study. *J Eur Acad Dermatol Venereol*. 2017 Sep;31(9):1526-1533. doi: 10.1111/jdv.14438. Epub 2017 Jul 18. PMID: 28653403.
- 3 - Fain A. Etude de la variabilite de *Sarcoptes scabiei* avec une revision des Sarcoptidae. *Acta Zool Pathol Antverp*. 1968;47(1):1-196.
- 4 - Scheinfeld, N. Controlling Scabies in Institutional Settings. *Am J Clin Dermatol* 5, 31-37 (2004).