

INDOOR DUST DIRECT EXAMINATION (E.D.P.A.®) AND AGRI-FOOD PRODUCTIVE CHAIN

Gabriele Mannucci* (1), Simona Principato (2), Iolanda Moretta (3), Mario A. Principato (3)

(1) Landini Giuntini Spa, Città di Castello (PG)- Italy, (2) Urania Research Center, Perugia (Italy), (3) Department of Veterinary Medicine, University of Perugia (Italy)

The E.D.P.A. ® (Indoor Dust Direct Examination) is an innovative method for detecting traces of insects and mites in the dust of confined environments (1,2). Its usefulness in the search for environmental pathogenic arthropods has been known for some time, while little is known about its application in the industrial field, particularly in the agri-food productive chain. Reported herein is our experiment with the systematic use of E.D.P.A.® in the research for arthropods in a pet food factory, in a ham factory and in a dairy factory , in order to evaluate , objectively, the advantages of its application. In the pet food factory a fortnightly monitoring was carried out for one year, collecting environmental dusts from 17 fixed points of the production premises. The samples were soon examined through E.D.P.A.® in order to detect the possible presence of pests. In the ham and in the dairy factories, two kinds of sampling were carried out: one on the environment (in the maturing cells) and the other one on the food products, in two different times: two months before the end of the food maturing period and after the corrective measures were applied by spraying the ALISTAG™ protective food coating agent. The monitoring carried out in the pet food factory gave as a result the identification of larval outbreaks of some pests, such as *Plodia interpunctella*, *Ephestia kuehniella*, *Tribolium confusum*, *Oryzaephilus surinamensis*, *Stegobium paniceum*, revealing also a pest of recent spread in Italy, *Necrobia rufipes*. Where the infestation was low, no corrective action was taken; where the infestation was high and in the sites where the larval outbreaks were found, a targeted treatment was performed using pyrethroids. In the ham factory and in the dairy factory the examination of samples was useful to identify the species of the pest: *Tyrophagus putrescentiae* in the ham factory and *Acarus siro* in the dairy one. Moreover the infestation rate could be checked, which was strongly lowered after the application of ALISTAG™. The results emphasize how the use of E.D.P.A.® in the agri-food productive chain can allow to have the following advantages: 1) to identify the infesting species and their development outbreaks; 2) to monitor the infestation after the corrective actions carried out specifically; 3) to reduce the use of biocides; 4) to control the frequency of disinfestation and treatment sites; 5) to reduce the risk of infestation and damages to food products and raw materials; 6) finally, but not less important, to identify also the possible presence of pathogenic arthropods (e.g. *Glycyphagus domesticus*, *Lepidoglyphus destructor*, *Cephalonomia gallicola*) that can be responsible for occupational diseases, in particular entomodermatitis, in the sector operators. The systematic use of E.D.P.A.®, therefore, has shown not only an immediate effectiveness in identifying the infesting species and the rate of environmental infestation, but also a long-term efficacy, highlighted by a reduction of the infestation as a result of highly targeted corrective actions with the consequent reduction of the risks of expensive damages to goods and humans.

[1] Principato M., Moretta I., Stingeni L., Lisi P., Caraffini S., Assalve D., Hansel K., Principato S., Masini P., Pivotti I. 2014. Artropodi di interesse dermatologico in ambiente confinato. Universitas Studiorum S.r.L. Casa Editrice. Mantova.

[2] Stingeni L., Bianchi L., Hansel K., Neve D., Foti C., Corazza M., Bini V., Moretta I., Principato M. 2017. Dermatitis caused by arthropods in domestic environment: an Italian multicentre study. Journal of European Academy of Dermatology and Venereology 2017: 31:1526-1533.