

## Abstract

### Bacteria as food source for synanthropic mites (Acari: Acaridida)

The lysozyme activity is usually exhibited by the cell of immune system as unspecific immunity. Lysozyme is also involved in digestion of bacteria in some organisms, such as ruminants, folivorous monkeys and birds, rabbits, termites or Diptera Cyclorrhapha. The antropogenous mites inhabited bacteria reach habitats including house dust and stored product. Although in some species the lysozyme activity has been reported, nothing is known about utilization of bacteria. The main goal of this study was to find whether mites utilize bacteria as a food source.

The activity of lysozyme as the enzyme hydrolyzing the cell walls of G<sup>+</sup> bacteria was measured on 10 species of acaridid mites (i) in the whole mite extracts (WME) and (ii) in the spent growth medium extracts (SGME). In addition, the pH optima of lysozyme activities were found for both fractions separately. In biotests, the effects of bacterial enriched and control rearing diets on population growth were compared. The bacteria were added into rearing diet (*Micrococcus lysodiekticus* – 5 % w/w) and population growth starting from 20 specimens was observed 21 days after cultivation in optimal conditions (85 % RH and 25°C except *D. farinae* - 75 % RH). The numbers of individuals on both diets were compared. As bacteria-feeding species were suggested species of significantly higher numbers on bacteria-enriched diet than on control (T-test).

The lysozyme activities were found in WME and SGME of all tested species in different levels. The results also showed that the mite lysozymes have similarities to ruminant stomach lysozyme and Cyclorrhapha midgut lysozyme, in being active at middle acid pH values. Curves of pH optima also showed, that the mite lysozymes could be resistant to acid endogenous proteinases. The species differs in their population increase on bacteria-enriched diets. Among tested species, *T. lini*, *L. destructor*, *C. redickorzevi* and *D. farinae* were referred as bacteria feeding. Lower degree of bacteriophagy was observed in *G. domesticus* and *A. ovatus*, and for *T. putrescentiae*, *T. brevicrinathus*, *A. siro* and *A. gracilis* there were no significant differences in population increase on bacteria-enriched and control diets. In spite of biotests, digestive function of lysozyme in these species is indicated by: (i) activity of lysozyme in WME and SGME; (ii) pH optima corresponding to physiological conditions in midgut (ventriculus and caeca).

These results confirmed the ability of studied antropogenous mites to digest bacteria. The bacteria-mites interactions as well as allergen potential