

Abstract

Major Urinary Proteins (MUP) are pheromonal transmitters involved in chemical communication in rodents. Complexes of MUPs and ligands mediate information about genetical background of an individual and co-create individual scent profile. They play a significant role in kinship determination, the crucial factor in the choice of a mating partner. It is assumed that the MUP production is energetically demanding due to the pressure of sexual selection, and the transmitted signal is thus supposed to be honest. This theory hasn't yet been experimentally tested, neither was proven the effect of another intense selection pressure- a parasitic infection. In my thesis, I describe the effect of an infection of a parasite *Toxoplasma gondii* on MUP production. The results suggest that the production is altered in both sexes, the production decreasing in males to the level of male castrates (or the female level). Considering the results of more detailed analysis of the infection we assume that the energetical demands of the MUP production doesn't allow the production of ordinary amounts of MUPs during the first phase of the infection as the energy is primarily devoted to the infection control. The increased production in latter phase can be attributed to the importance of scent communication. Decreased levels of MUP in a diseased animal might help it being tolerated in the society of other individuals. The infection influenced negatively not only the MUP production but also the reproductive potential in males, which was manifested by significantly lower weight of cauda epididymis, reflecting the sperm production. Furthermore, partial results also confirmed differences in MUP production between males and females in inbred strain C57BL/6 and in crossbred free-living mice. In contradiction to previously reported data, the difference was several folds lower. In the course of the experiment I have also observed possible shifts in measurable amounts of MUPs during the storage caused by degradation processes. Neither the effect of different storage temperatures (-20 °C and 80 °C) nor the effect of elimination of salts by coagulation was observed. Despite the observed variation between intervals the effect of time on the MUP volume was not found significant.

Key words: Major Urinary Proteins, MUP, *Toxoplasma gondii*, parasites, infection, pheromone, odor, scent marking