HOUSE CRICKET SMALL-SCALE FARMING: ON SITE MONITORING OF MICROBIAL LEVELS

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Background

Insect farming in Western countries is approaching and the requirements should be the same as for other animals. Rearing house crickets (*Acheta domesticus*) can be a low-tech activity requiring limited capital investment; insects in fact are kept in a closed environment where high level of biosecurity can be ensured.

Objective

Considered that little is known on the microbiology of house crickets farming, this research aims at monitoring the microbial levels on farm during a three months adult raising period in a small-scale farm in central Italy (Fig.1).

Fig. 1 – Cricket farm

Materials and Methods

The present research analysed a total of thirty-six superficial swab samples during three months of production. Each week, an area of 400 cm^2 for each cage was swabbed to evaluate the level of total aerobic mesophilic bacteria, *Pseudomonas* spp., *Enterobacteriaceae*, coliforms, *Staphylococcus* spp., *Enterococcus* spp., lactic acid bacteria, yeasts and moulds through viable count plating.

Results

The mean values of total aerobic mesophilic bacteria were 4.29 log cfu/400 cm^2 (SD 1.21) *Pseudomonas* spp. 2.31 log cfu/400 cm^2 (SD 1.67), *Enterobacteriaceae* 2.50 log cfu/400 cm^2 (SD 1.52), coliforms 2.33 log cfu/400 cm^2 (SD 1.49), *Staphylococcus* spp. 2.88 log cfu/400 cm^2 (SD 1.48), *Enterococcus* spp. 3.88 log cfu/400 cm^2 (SD 1.56), lactic acid bacteria 3.48 log cfu/400 cm^2 (SD 2.00), yeasts and moulds 1.59 log cfu/400 cm^2 (SD 0.52). *Salmonella* spp. was never detected while *Citrobacter youngae* was frequently isolated. Furthermore, from the microbiological analysis of dead crickets, *Serratia marcescens* and Proteus mirabilis were isolated growing symbiotically (Fig. 2).

Fig. 2 – *Serratia marcescens* and *Proteus mirabilis*

Discussion

Low insect density and high frequency in sanitization of the cages is required to maintain the microbial value constant throughout the life cycle. These results give valuable and update information for stakeholders: farms can be a reservoir of foodborne pathogens and prevalence of microbiological hazards has been studied in livestock farms while more data are requested by the European Food Safety Authority for risk assessment in insect farming.

References

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