Microbial attributes and shelf life evaluation of raw milk fortified with Hypotrigona squamuligera honey extracts.

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ABSTRACT

The use of natural additives in the preservation of functional foods such as milk has been an area of significant study. The present study was aimed at using *H. squamuligera* honey extracts in the preservation of raw milk following the research by Dzomba *et al.*, (2012) in which the honey showed to have antimicrobial and antioxidant activity. Raw milk was obtained from a local farm in Bindura. The milk was split into two samples, of which one was treated with *H. squamuligera* honey extracts (fortification) and the other was left untreated (unfortified). Both samples were stored in the freezer. Total viable count method, using pour plate technique was used to analyse the microbial attributes of the honey. The antioxidant activity and shelf life evaluation was determined by the DPPH scavenging ratio and peroxide value respectively. Samples that were treated with the *H. squamuligera* honey extracts significantly inhibited the bacterial growth, T-test p > 0.05 as compared with unfortified raw milk. The mean bacterial count of fortified milk was $7.13 \times 10^5$ at 100% concentration of the extracts and for unfortified it was $1.17 \times 10^7$. The bacterial inhibition showed a concentration dependent pattern. Low inhibition was observed at 10%, 20% and 50% concentration. The results obtained from the DPPH radical scavenging activity and the peroxide value showed a significant difference in antioxidant activity since they had higher values of 5.77 and 5.76 respectively at (p > 0.05, t crit.2.77). The antibacterial activity of the honey can be attributed to the presence of the hydrogen peroxide which activates the natural occurring lactoperoxidase system found in raw milk. Due to the antibacterial activity of the honey and its preservative nature *H. squamuligera* honey extracts can be used in the preservation of milk samples.