

Effect of Acmella Pod Extracts on Controlling Microbes Present on Dairy Processing Surfaces

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Identification of microorganisms in dairy processing surfaces (DPS) is important in controlling safety of the finished products. Hence, this study was conducted to identify and control bacteria on stainless-steel (SS) DPS using Acmella (*Acmella oleracea* L.) flower pod water extract. Three SS (ALSI 304) food processing surfaces were contacted with fresh pasteurized milk for 2 hours, and then the surfaces were rinsed with fresh water. Two of the surfaces were sanitized with Acmella extract and a commercial sanitizer (positive control) separately while keeping the remaining one untreated as the negative control. Swab samples were collected using 100cm² template after 2, 4, 8, 12, 24 and 48-hour time periods, and the total plate counts were obtained using the plate count agar media. All the test surfaces were kept undisturbed at ambient condition (28-30°C RT, 75-80% RH) for 48 hrs. Further, the samples taken from the inoculated surfaces after two hours were subjected to Gram staining and VITEK 2 analyzer for microbial identification. The results revealed that there were 2.31, 1.39 and 5.59 Log CFU/100cm² of bacterial counts in the Acmella treated, positive control and negative control surfaces, respectively after 12 hours, where the initial population was 3.35 Log CFU/100cm². The reduction of microbial growth in Acmella treated surface was not significantly different ($p>0.05$) to the reduction observed in positive control, but differed significantly from the negative control ($p<0.05$). Moreover, there was a significant difference ($p<0.05$) of 5.52 LogCFU/100cm² microbial density between Acmella sprayed and the negative control surfaces at 48-hour. Further, there were six gram-positive and one gram-negative isolates identified on SS of DPS namely *Pseudomonas fluorescens*, *Staphylococcus warneri*, *Staphylococcus pasteurii*, *Staphylococcus haemolyticus*, *Bacillus circulans*, *Microbacterium lacticum* and *Paenibacillus odorifer*. Hence, Acmella pod extract can be used as an effective alternative for commercial sanitizers in suppressing the growth of microorganisms on DPSs.

Keywords: Dairy processing surfaces, Pasteurized milk, Acmella extracts, Stainless steel surfaces, Surface sanitiser

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