ANTIBACTERIAL OF PAPER SOAP WATER-SOLUBLE FROM USED COOKING OIL, *Piper betle* LEAF AND *Aloe vera* EXTRACTS

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This Final Year Project Report entitled **"Antibacterial of paper soap water-soluble from used cooking oil, *Piper betle* leaf and *Aloe vera* extracts"** was submitted by Raja Farah Nur Izzah binti Raja Omar, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Biology, in the Faculty of Applied Sciences, and was approved by

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ABSTRACT

ANTIBACTERIAL OF PAPER SOAP WATER-SOLUBLE FROM USED COOKING OIL, *Piper betle* LEAF AND *Aloe vera* EXTRACTS

The abundance production of used cooking oil lead to increasing food waste. This situation causes to other environmental issues like clogged drains and affect aquatic life. This is due to undissolved oil layers on the water surface, hardened and clumped in the sewer. Moreover, the use of alcohol-based hand wash and hand sanitizer makes the users' hands become itchy, dry and irritated. Therefore, a soap water-soluble paper with different ratios of *Piper betle* and *Aloe vera* extracts from used cooking oil were produced as an alternative to the current product. Betel leaves and *Aloe vera*, as medicinal plants have shown potential as antibacterial agents. Plant extract of betel leaves and *Aloe vera* were produced at 25% and 50% of (w/v) concentration. There were four different sample soaps prepared which are control soap (2 ml distilled water), 1:1 soap (1 ml betel + 1 ml *Aloe vera*), 1:3 soap (0.5 ml betel + 1.5 ml *Aloe vera*) and 3:1 soap. (1.5 ml betel + 0.5 ml *Aloe vera*). All formulated soaps were tested with antibacterial test which are number of colony formation in the environment and disc diffusion assay against *Escherichia coli* and *Staphylococcus aureus* for plant extracts and formulated soaps. The 1:1 soap result in highest effectiveness since it resulted in 100% of soap effectiveness before and after treatment onto the working bench in the lab. The 50% (w/v) concentration of betel leaves produced the greatest inhibition zone of *E. coli* and *S. aureus* at 11.50±0.71 and 12.75±0.35 respectively. The 1:1 soap result in greatest inhibition zone of *E. coli* and *S. aureus* with diameter zone of 8.5±0.71 and 10±1.41 respectively. Despite from that, all the sample discs of plant extracts and formulated soaps were produced no significance different among sample discs towards inhibition zone against *E. coli* and *S. aureus* using Post Hoc Tukey Test as the p-value were more than 0.05.