

UNIVERSITI TEKNOLOGI MARA

**COMPARATIVE STUDY OF SODIUM
HYPOCHLORITE AND ETHANOLIC
EXTRACTS OF *Lawsonia inermis*
AS SURFACE DISINFECTANTS**

ATIKA LIANA BINTI IDEMIN

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the degree of
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DECLARATION BY STUDENT

Project entitled “Comparative Study of Sodium Hypochlorite and Ethanolic Extracts of *Lawsonia inermis* as Surface Disinfectants” is a presentation of my original research work. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due reference to literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Project Supervisor, Puan Azlin Sham Binti Rambely. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Bachelor’s Degree in Medical Laboratory Technology (Hons).

Student’s signature:

.....

(Atika Liana Binti Idemin)

2015217892

940602-03-5236

Date:

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ABSTRACT

Lawsonia inermis (Henna) is a plant belongs to family Lythraceae. The presence of anthraquinones as major constituents to sustain antimicrobial activities has been revealed in phytochemical analysis of plant leaves extract. In this study, a simple quantitative suspension method employed to determine the efficacy of *L. inermis* extract and sodium hypochlorite as surface disinfectants. Both of them were tested against four most common nosocomial pathogens; *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Escherichia coli*, and *Pseudomonas aeruginosa*. Sodium hypochlorite showed high efficacy of disinfectant against *S. aureus* and *S. epidermidis* as the log reduction factor was more than 5 at all dilution (1:10, 1:100, and 1:1000). *L. inermis* extracts at 1:10 dilution (0.56 g/mL) was not efficient because the number of log reduction factor was less than 5. But, it was efficient against *S. aureus* and *S. epidermidis* at 1:100 (0.056 g/mL) and 1:1000 dilution (0.0056 g/mL). The Mean (SEM) for sodium hypochlorite and *L. inermis* extracts against *S. aureus* and *S. epidermidis* were 1.1 ± 0.55 ($p = 0.083$) and 1.3 ± 0.67 ($p = 0.081$), respectively. Sodium hypochlorite was efficient at dilution 1:100 (0.056 g/mL) and 1:1000 (0.0056 g/mL) and *L. inermis* extracts was efficient at dilution 1:1000 (0.0056 g/mL) against *E. coli*. The Mean (SEM) for sodium hypochlorite and *L. inermis* extracts against *E. coli* was 3.6 ± 0.69 ($p = 0.001$). Sodium hypochlorite and *L. inermis* extracts were efficient at all dilutions (1:10, 1:100, and 1:1000) against *P. aeruginosa*. The Mean (SEM) for sodium hypochlorite and *L. inermis* extracts against *P. aeruginosa* was 0.3 ± 0.33 ($p = 0.347$). In conclusion, both sodium hypochlorite and *L. inermis* extracts showed antimicrobial activities towards *S. aureus*, *S. epidermidis*, *E. coli*, and *P. aeruginosa*. Sodium hypochlorite worked best at the recommended concentration (0.56 g/mL). *L. inermis* showed minimum concentration at 0.0056 g/mL to eliminate all tested bacteria efficiently. Therefore, molecular studies should be conducted as confirmation for the effectiveness of each disinfectant against microorganisms. *L. inermis* extracts can be used as an optional to commercial disinfectant as it may give a negative effect to nature and also human health.

Keywords: *Lawsonia inermis*, sodium hypochlorite, disinfectant, suspension method