



## The pharmacological effects of *Albizia gummifera* and *Spathodea campanulata* mixtures on *Staphylococcus aureus* and *Escherichia coli* species

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Submitted on 3<sup>rd</sup> September 2021. Published online at [www.m.elewa.org/journals/](http://www.m.elewa.org/journals/) on 30<sup>th</sup> November 2021  
<https://doi.org/10.35759/JABs.167.1>

### ABSTRACT

**Objective:** The aim was to determine the pharmacological effects from the mixture of *Albizia gummifera* and *Spathodea campanulata* trunk bark powder in proportions of 25/75, 50/50 and 75/25 (mass/mass) on the bacterial growth of two strains of *Staphylococcus aureus* and *Escherichia coli* species.

**Methodology and Results:** Primary and secondary metabolites such as carbohydrates proteins, polyphenols, cardiac glycosides and alkaloids were revealed, quantified in the aqueous and hydroethanolic extracts of these different preparations through colorimetric tests and spectrophotometric assays. The pharmacological effects resulting from the mixture of *Albizia gummifera* (A) and *Spathodea campanulata* (S) at different proportions was determined through the calculation and interpretation of the *Fractional Inhibitory Concentration Index* (FICI) parameter. A synergistic effect was observed in the aqueous extract of the mixture (A) and (S) in the respective proportions of 25/75 (FICI equal to 0.75 for *Escherichia coli* and 0.625 for *Staphylococcus aureus*). On the other hand, the antagonistic effect was manifested with the aqueous extract in proportions of 75/25 (FICI= 2.5 for *S. aureus*).

**Conclusion and application of the results:** These results suggest that the aqueous and hydroethanolic extracts of the mixtures of *Albizia gummifera* and *Spathodea campanulata* trunk barks possess secondary metabolites interacting with each other and have antibacterial activity towards the two strains of *Staphylococcus aureus* and *Escherichia coli* species. The pharmacological effects existing between these two plants vary with the proportions of each in the mixture. At 75/25, the mixture of *A. gummifera* and *S. campanulata* represents the original recipe used by the traditional healers, which may not be beneficial because of the antagonistic effects. Overall, this study underlines the importance of controlling the proportions of the different ingredients used in the preparation of effective herbal recipes.

**Keywords:** Pharmacodynamic interaction; *Albizia gummifera*; *Spathodea campanulata*; Antibacterial activity.