

## ***In vitro* Antimicrobial and Antioxidant Activities of Cassia, Neem, and Fig Leaf Extracts Against Biofilm-Producing *Staphylococcus aureus* and *Candida* Species from Outpatients, Oyo Town, Nigeria**

Racheal Oluwayemisi Fashogbon<sup>1\*</sup>, Oyindamola John Samson<sup>1</sup>, Olusolabomi Jose Adefioye<sup>1</sup>, Christiana Ure Mbabic<sup>1</sup>, Odinakachi Mary Samuel<sup>1</sup>, Ronke Mary Ojamami<sup>1</sup>, Honey Temitope Ayeni<sup>1</sup>, Gbemisola Ogunleye<sup>2</sup>

<sup>1</sup>Department of Microbiology and Biotechnology, Faculty of Natural Sciences, Ajayi Crowther University, Oyo State, Nigeria

<sup>2</sup>Department of Microbiology, Faculty of Natural Sciences, Kings University, Osun State, Nigeria

<sup>3</sup>Department of Biological Sciences, Faculty of Natural Sciences, KolaDaisi University, Oyo State, Nigeria

\*Corresponding Author: [ro.fashogbon@acu.edu.ng](mailto:ro.fashogbon@acu.edu.ng)

### **Abstract**

Biofilm-related infections are difficult to treat due to limited effective management options, posing a significant clinical problem. Eradicating biofilm with antibiotics alone is challenging, highlighting the need for alternative treatments, such as plant extracts. This study aims to evaluate the antimicrobial and antioxidant potential of leaf extracts from Cassia, Neem, and Fig against biofilm-producing strains of *Candida* spp. and *Staphylococcus aureus* isolated from outpatients with high vaginal swabs (HVS) in Oyo Town, Southwest Nigeria. Isolation of *Candida* spp. and *Staphylococcus aureus* was done on Saboraud Dextrose Agar and Mannitol Salt Agar respectively. *Candida* spp. were identified and characterized using Chrom agar, germ-tube test, and Gram staining while biochemical and coagulase test was used to identify *Staphylococcus aureus*. Biofilm (tube test and Congo red agar) and antimicrobial assay using agar well diffusion was done on the isolates. Thirty-six (36) *Candida* spp. (55.56% *C. albicans*, 21.67% *C. krusei*, and 2.27% *C. glabrata*) and thirty-five (35) Gram-positive bacteria (45% *S. aureus*, 58.3% *S. epidermidis* and 43.1% *Streptococcus* spp.) were isolated. Thirty-one (86.11%) *Candida* spp. and twenty-six (74.29%) *S. aureus* isolates were positive for both Congo red and test tube tests. Ethanol extract of Cassia had the highest antimicrobial activity against *Staphylococcus aureus* while *Candida* spp. were only sensitive to ethanol extracts of the three plants. This study recommends that further studies should be carried out to discover the active components of Cassia, Neem, and Fig which can be harnessed for their potential to successfully treat infections caused by biofilm-forming organisms.

**Key Words:** High vaginal swab, Test tube test, Antimicrobial assay, Plant extracts, Biofilm formation