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Modulating effects of *Azadirachta indica* secondary metabolites on the antimicrobial, radical scavenging and cytotoxic properties on neem cosmetics

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Statement of the problem: The resistance rate of pathogens to synthetic antimicrobial agents deserves novel therapies for efficient public health care. There is dearth of information of the chemical composition of most folk medicine from plant. We studied *in vitro* modulating effectiveness of *A. indica* secondary metabolites (AISM) on formulated neem soap, cream and toothpaste for management of infectious and oxidative stress diseases.

Methodology & Theoretical Orientation: Essential oils (EOs) were obtained by hydrodistillation and AISM characterized by GC-MS, while the radicals scavenging, antimicrobial and cytotoxicity of the neem cosmetics products (NCPs) without and with the AISM were examined by spectrophotometric, micro-dilution and hemolytic techniques respectively.

Findings: Caryophyllene (30.02%) and limonene (10.4%), were the dominant AISM in the leaf EO (LEO), while phytol (14.12%) and elemene (13.40%) were the main AISMs in the stem-bark EO (SBE). The NCPs without AISMs exhibited bacteriostatic effects (BEs) against three reference bacterial strains (*L. ivanovii*, *S. aureus*, *E. cloacae*) and two multi-drug resistant bacteria (*V. parahaemolyticus* and *E. coli* 180) at dose below 0.31 mg/ml. Similar BEs were observed against two clinical dermatophytes (*Tinea cruris*, *Tinea capitis*) and two fungal strains (*C. albican* and *A. fumigatus*) at concentrations below 0.50 mg/ml. On other hand at same dose, the neem soap formulated with the AISMs demonstrated bactericidal effects on most of the test pathogens reported to be linked to some infectious diseases. The NCPs produced with AISMs displayed noteworthy effects in scavenging known radicals associated oxidative stress diseases. None of the NPCs showed haemolytic activity on human red blood cells at 0.850 mg/ml except the soap.

Conclusion & significance: The study indicates that apart from tradition uses of *Azadirachta indica*, the EOs contained very potent secondary metabolites and possible new antimicrobial agents, as well as alternative to synthetic antiradical and may likewise be useful in pharmaceutical and cosmetics industries.

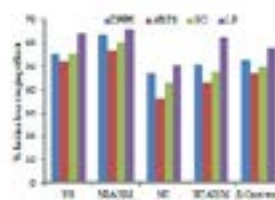


Figure 1: Radicals scavenging effects of *Azadirachta indica* secondary metabolites of neem cosmetics and reference compound on known oxidants reported to be associated with degenerative diseases.

Biography

S O Okoh is currently a Postdoctoral Research Fellow at the University of Fort Hare Alice, South Africa. His niche area is Phytochemistry and natural product chemist and he has explored different natural resources to produce various cosmetics and soap products including neem herbal antiseptic soap, cream, lotion and hand sanitizers. He has conducted ethno-botanical survey of over fifty medicinal plants used in management of infectious and degenerative diseases such malaria, cancers, skin diseases, diabetes, cardiovascular, dementia, arteriosclerosis in major villages in Nigeria and eastern Cape South Africa. Prior to joining University of Fort Hare, he has acquired valuable teaching and research skills at University of Lagos and Nigerian foremost Research Institute – Federal Institute for Industrial Research Institute, Lagos.

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