

Investigation of the Bioactivity and Efficacy of Personal Care Products Formulated Using Extracts of *Azadirachta indica* A. Juss

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Abstract : *Azadirachta indica* (Neem tree) also referred to as an all-purpose tree is used in a wide range of medical preparations in tropical and subtropical countries for prevention and management of various livestock, crops products and human diseases. In Nigeria however, the potentials of this plant have not been fully exploited thus it causes an environmental nuisance during the fruiting season. With a rise in the demand for herbal personal care products globally extracts from different parts of the neem plant were used as the bio-active ingredients in the formulation of personal care products. In this study, formulated neem soap, body cream, lotion, toothpaste and shampoo are analyzed to determine their antibacterial, antifungal, and toxicity properties. The efficacies of these products for management of infectious diseases, both oral and dermal, were also investigated in vitro. Oil from the neem seeds obtained using a mechanical press and acetone extracts of both the neem bark and leaves obtained by the maceration method were used in the formulation and production of the neem personal care products. The antimicrobial and toxicity properties of these products were investigated by agar diffusion, and haemolytic methods respectively. The five neem products (NPs) exhibited strong antibacterial activities against four multi-drug resistant pathogenic and three none pathogenic bacterial strains (*Escherichia coli* (180), *Listeria ivanovii*, *Staphylococcus aureus*, *Enterobacter cloacae*, *Vibrio spp.*, *Streptococcus uberis*, *Mycobacterium smegmatis*), except the neem lotion with insignificant activity against *E. coli* and *S. aureus*. The minimum inhibitory concentration (MIC) range was between 0.20-0.40 mg/ mL. The 5 NPs demonstrated moderate activity against three clinical dermatophytes isolates (*Tinea corporis*, *Tinea capitis*, and *Tinea cruiz*) as well as one fungal strain (*Candida albican*) with the MIC ranging between 0.30 - 0.50 mg/ mL and 0.550 mg/mL respectively. The soap and shampoo were the most active against test bacteria and fungi. The haemolytic analysis results on the 5 NPs indicated none toxicity at 0.50 mg/ mL in sheep red blood cells (SRBC).

Keywords : antimicrobial, *Azadirachta indica*, multi-drug resistant pathogenic bacteria, personal care products

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