

Development of a face and body cleanser using *Cocos nucifera* (coconut) oil, coconut shell charcoal and rice husk charcoal

J. A. C. T. Jayasooriya*, C. S. Udawatte

College of Chemical Sciences, Institute of Chemistry Ceylon, Rajagiriya, CO 10107, Sri Lanka

Air pollutants and toxic elements can directly affect the skin as it is the outermost barrier protecting the body. In this study, a cleanser was formulated using charcoal, virgin coconut oil, and other local ingredients. An artificial sweat solution including NaCl, NH₄Cl, acetic acid, lactic acid was treated with coconut shell charcoal (CSC) and rice husk charcoal (RHC) varying the particle size, dosage, and the contact time with the solution, in triplicates. The remaining organic acids, NH₄⁺, and Na⁺ were determined by formalin titrimetric method and flame photometry. CSC having the particle size of 0.25-0.50 mm exhibited higher adsorption towards the two main components in human perspiration; NaCl and NH₄Cl than RHC, at an average contact time of 30 minutes. Therefore, CSC was used as the adsorbent. Virgin coconut oil was used as a moisturizer, an antioxidant, an emulsifying agent, sodium lauryl ether sulfate as the foaming agent and bee's honey as the binding agent, a thickener, an antimicrobial and a humectant. Other ingredients used were kaolinite, sesame oil, and sweet orange essential oil. The pH of the product was 6; therefore, pH balanced. The product showed significant antibacterial activity against *Staphylococcus aureus*, *Bacillus subtilis*, and *Pseudomonas aeruginosa* when subjected to agar well diffusion method. The highest result was observed against *Staphylococcus aureus*, giving an inhibition zone of 2.5 cm for 100 mg of the product, while 5 µg of Ciprofloxacin showed an inhibition zone of 3.0 cm. The product was easily spreadable, washable, and had a thick consistency. Patch test was done by applying 400 mg of the product on the dorsal forearm of 10 volunteers with a diameter of 1 inch, for 30 minutes, then rinsed off with water. No adverse effects were exhibited. Therefore, this product can be considered safe, and it achieves the desired attribute as a cleanser.

Keywords: Adsorbent, Face cleanser, Coconut shell charcoal, Antibacterial activity

*Corresponding author. Institute of Chemistry Ceylon, Rajagiriya, CO 10107, Sri Lanka
Email address: chandulajayasooriya@rocketmail.com