

## Thematic Area 6: Chemistry

### Extraction and Characterization of Green Surfactants from Fruits of *Solanum Incanum* and *Solanum Aculeastrum*

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#### Abstract

In Kenya there are plants which produces a lot of fruits, and juices from these fruits have been used traditionally as; soaps materials for washing clothes and other cleaning purposes, and as medicinal ointments. The efficacies, quantities and qualities of these fruit juices has remained unknown to date. The general objective of this study was to extract green surfactants from fruits of *Solanum incanum* and *Solanum aculeastrum* and explore their properties and applications in the modern settings. The processing of these bio-surfactants involved, solvent extraction under controlled conditions of temperature, time, pH, solvent to feed ratio and properties of the feed material such as composition and particle size. Characterization was done for pH, surface active agents, metal cation and conductivity of the surfactants using pH meter FTIR, and conductivity meter respectively. Determination of the surfactant concentration levels using emulsification stability method. Agar disk-diffusion method was used to screen the in vitro antimicrobial activity of the extracted fruits surfactant. The percentage yield of the fruits surfactants was >50%, with *Solanum incanum* having highest of 65.063%. FTIR analysis showed the presence of saponin functional groups. UV-Vis analysis confirmed high concentration of saponins in the fruits of *Solanum aculeastrum* than *Solanum incanum*. The surfactants produced a stable foam reaching a maximum percentage height stability of 92.883% for the ripe fruits of *Solanum aculeastrum* and the scum formed was stable even after 3 days. The fruit surfactants inhibited the growth of both *E. coli* and *Candida albicans*. The results confirmed potentially high surfactant activity of the fruits extracts, indicating a promising future commercial applications and farming of these plants as cash crops.

**Keywords;** Biosurfactants, Surface active agents, surfactant activity cash crops, Saponins.