Thesis Title	Preparation of Green Cosmetic Ingredients and Its Utilization in Topical Emulsion
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ABSTRACT

In the global efforts to reduce generated hazardous waste green chemistry is progressively integrating with modern developments in science and industry. Cosmetic chemists are combining natural ingredients with synthetic ones, providing a larger set of ingredients with which to formulate. The result is that products formulated with natural ingredients represent one of the fastest-growing cosmetic market segments. Natural cosmetics, 100% cosmetic ingredients and organic makeup are the example of recently cosmetic market. In this thesis, the research has focused on the preparation of new cosmetic ingredients by using natural base material to generate green cosmetic ingredients. The study is divided into two sections: the synthesis of silver nanoparticles using natural reducing agents and the preparation of aluminium (Al) complex of phycocyanin (PC) from *Spirulina platensis*. Silver nanoparticles were successfully prepared by an eco-friendly synthesis method using *A. concinna* pods and *P. emblica* extracts as reducing agent. The obtained silver-Soap pod nanoparticles have average particle size of 20.9 nm and silver-Emblica is 41.2 nm. They showed the antimicrobial activities against gram positive (*S. aureus*) and gram negative (*E. coli*) bacterial. Moreover the cosmetic emulsion product was successful developed using silver nanoparticles as antimicrobials. The Al-PC complex was successfully prepared. The complex is dark greenish-blue and it helps

maintaining and improving stability of PC. The utilization of Al-PC complex as colorant in cosmetic products was studied and it showed promising potential to be used as novel, natural derived blue color for cosmetics.

Keywords: Green cosmetic ingredient/Silver nanoparticle/Natural reducing agent/ Aluminium complex/Phycocyanin