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INVESTIGATION OF THE POTENTIAL EFFECT OF BI0-SECURE DETERGENT AGAINST CONVENTIONAL DETERGENTS

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ABSTRACT:

With the advent of industrialization and rapid urbanization prevalent in emerging economies like India, time has come to seek for alternatives at local level to protect our Environment and safeguard the quality of life. The present study dwells at the need to develop an eco-friendly product for washing clothes keeping in mind our basic necessity. Detergents have been paid far lower attention when compared with other pollutants like heavy metals, polyaromatic hydrocarbons and pesticides. They are the prime causal agents for eutrophication and ground water contamination in most parts of our country.

KEY WORDS: Bio-Secure Detergent; Testing on fabrics , earthworms, survey of the product at local level.

INTRODUCTION:

It is well known that there are many types of pollutants causing havoc to life and one such is detergent. This study draws attention towards detergents and its key ingredients that deteriorate the quality of the environment. Detergents are widely used chemicals in all sectors including the domestic, industrial and agriculture. They are predominantly used for cleaning purposes. It would be difficult to imagine the existence and development of man without these super chemicals. Though the toxic effects of these detergents on plants, animals and microbes have been investigated earlier, the search for new cleaning agents is gaining popularity. Such Conventional detergents may contain chemicals that are harmful to skin as well as to the environment. We the conscious individuals need to work towards a "Cleaner" and "Greener" planet. We can do our bit by turning our home into Eco-friendly haven. So the purpose of my project aims to investigate the cleaning action of the alternative detergent when compared with the conventional one on fabric and its consequent effect on fabric quality and skin. This study attempts to explore the alternative agents that replace conventional detergents for washing and cleaning purposes. One such detergent was prepared which contained chemicals that were harmless to the environment and were readily available in market. The results obtained from this study showed that the Bio-Secure detergent was relatively more effective in removing oil stains, pickle stains, ink stains and dirt from clothes when compared with few conventional varieties. The effect of this detergent on skin was also studied using Earthworms as indicator species. There was no effect of Bio-Secure detergent on Earthworms skin and activity as against the effect seen for the conventional ones. Likewise, the impact of the Bio-Secure detergent on hands was very minimal as was evident from the feedback obtained when the survey was conducted for 15 households in the city of Visakhapatnam. When the cost of raw materials was calculated, the overall cost of this detergent was found to very affordable to the common man. The results therefore portray that the Bio-Secure detergent is quite effective as far as cleaning action is concerned and is also safe towards environment. This study is however limited by time and scale. Further replication of this work is needed on different categories of clothes, for different sections of the society, effect on parts of washing machine, long term studies on Earthworms at different concentrations and a large scale survey to be conducted involving 1000 households. In view of the benefits elicited in this short term study, it hold possibility of having an 'Eco-friendly Laundry Product' and so it will be truly a smart choice to switch to such products for a healthy living and safe environment.

METHODOLOGY ADOPTED:

This study involves three phases – Formulation of Bio-secure Detergent, Investigating its effect on removal for dirt, oil and ink stains, effect on skin through a survey and a short term study on Earthworms in the laboratory. The Bio-Secure detergent was prepared in the laboratory by mixing SAP Soap with borax and sodium carbonate in warm water and then diluting it with tap water. Neem and Tulsi were also used during the making of this product. The product was left for 24 hours and then used in the laboratory on different garments. The product was checked for its efficiency in removal of dirt and oil stains that were fresh. Further it was used to remove oil stains that were dried until 24 hours. Its effect on ink stains was also investigated. In all cases it was found effective when compared with the conventional detergent. Then, the acceptability of the product at household level and its marketability was checked by distributing it to 15 households in the city of Visakhapatnam. The response of the families was positive and instilled hope that this project could be carried forward. A short term study on earthworms was then designed to investigate its effect on skin keeping in mind that the Earthworm's skin is very sensitive to minor changes in the environment. Five sets of treatment plates were kept –

control, 1% conventional detergent, 3% conventional detergent, 1% Bio-Secure detergent and 3% Bio-Secure detergent. The Earthworms survived in all the plates except for the conventional plates. They succumbed to the toxicity of the chemical surfactants in conventional detergents at both lower and higher concentrations of 3% and 1%. However, the Earthworms survived well in plates containing 3% Bio-Secure detergent until Day 3 after which they died. The Earthworms were found to be active in control plates and plates containing1% Bio-Secure detergent until Day 5 after which the experiment was terminated.

RESULTS:

The results of this study therefore documented the negative effects of chemical surfactants on skin of Earthworms as against Bio-Secure detergent. From survey illustrated that Bio-Secure detergent was found quite effective in its cleaning action, soft on hands and had negligible effect on skin of Earthworms except when used at high concentration of 3%. So, it's time for all of us to shift to eco-friendly detergents.

CONCLUSIONS:

This study is preliminary in its objective and yet further in depth study on a large scale is required to overcome its limitations of time constraint.

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