

**DEVELOPMENT OF AN ACTIVATED CARBON
INCLUDED NATURAL RUBBER LATEX PILLOW**

A dissertation submitted to the
Faculty of Animal Science and Export Agriculture
Uva Wellassa University

In partial fulfillment of the requirements for the award of
Bachelor of Science in Palm & Latex Technology and Value Addition

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2014

ABSTRACT

Activated carbon has numerous applications due to its higher adsorption property. Thus, it is capable of adsorbing volatile organic compounds (VOC) which are also considered as air pollutants in the atmosphere. Many VOCs are toxic, posing a high risk to human health as a result of their widespread use and occurrence in laboratory, home and also other workplace environments. Presently natural rubber latex foam pillows are used to give cushioning effect at different circumstances. The incorporation of activated carbon into natural rubber latex foam pillow can provide VOC adsorption property apart from its cushioning effect. Among several sources of getting activated carbon, coconut shell based activated carbon is more common and economically feasible. Therefore, a study was conducted to develop an activated carbon included natural rubber latex pillow to find out the maximum activated carbon level that can be incorporated into natural rubber latex pillow without affecting its physical properties.

Two separate experiments were established to fulfil the objectives of the research. Experiment I was compromised with eight treatment levels having 0% to 7% activated carbon levels with other compounding ingredients. Each treatment was replicated 3 times and CRD was adapted as the experimental design. The most desirable activated carbon level was selected via four common physical properties (hardness, density, tensile strength and compression set) were determined and. Then, it was used for the Experiment II together with the control which has 0% activated carbon to investigate the acetone (a VOC) adsorption capacity. Both treatments were replicated 3 times.

The results of the experiment I reveal that, there was no significant difference between the 2% of activated carbon treated sample and the control sample. But, based on the result of the experiment II, there was a significant difference in acetone adsorption capacity between the activated carbon treated sample and the control sample. Therefore, the natural rubber latex foam pillow currently available in Sri Lankan market can be successfully value added by incorporating coconut shell based activated carbon to get the similar cushioning effects together with the air purification ability upto a certain level.

Key words: Activated Carbon, Adsorption Capacity, Cushioning Effect, Natural Rubber Latex Pillow, Volatile Organic Compounds