

**MANGO-LEAF SUN GUARD (MLSG): AN ECO-FRIENDLY  
SUNSCREEN BASED ON CARBON DOTS FROM MANGO LEAVES  
(*Mangifera indica* L.)**

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**ABSTRACT**

This study aims to develop and test the effectiveness of Mango Leaf Sun Guard (MLSG), a natural sunscreen lotion based on carbon dot from mango leaves (*Mangifera indica* L.). Mango leaves are prepared and synthesized into carbon diat using the hydrothermal method with the help of microwaves. The optimal formulation of MLSG is determined through a variation in the comparison of carbon dot and lotion base material. The effectiveness of MLSG in warding off UV rays was tested using a UV test card and a UV-Vis spectrophotometer to determine the Sun Protection Factor (SPF) value. The characteristics of the lotion, including pH, homogeneity, and dispersibility, were also tested. The results showed that the optimal formulation of MLSG was achieved by a ratio of carbon dot and lotion of 2:4. Tests using UV test cards prove that carbon dotss are able to reduce the intensity of UV rays. The results of the SPF test show that MLSG has a protection factor close to SPF 30, equivalent to commercial lotions. Testing of the characteristics of MLSG lotion showed a neutral pH, good homogeneity, and dispersibility close to SNI standards. MLSG has been proven to be effective in warding off UV rays and providing adequate protection against the harmful effects of sunlight, in addition to having good and safe characteristics because carbon dotss have good compatibility and low toxicity. This study shows the potential of mango leaves as an alternative raw material for the development of environmentally friendly natural sunscreens.

Keywords: mango leaves, *Mango Leaf Sun Guard (MLSG)*, carbon dot, SPF, sunscreen