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**FORMULATION OF A NATURAL SUNSCREEN: EXTRACTION AND UTILIZATION
OF BRASSICA OLERACEA (BROCCOLI SPROUTS) AS ANTIOXIDANTS FOR UV
PROTECTION**

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**FORMULATION OF A NATURAL SUNSCREEN: EXTRACTION AND
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ANTIOXIDANTS FOR UV PROTECTION**

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ABSTRACT

FORMULATION OF NATURAL SUNSCREEN: EXTRACTION AND UTILIZATION OF *BRASSICA OLERACEA* (BROCCOLI SPROUTS) AS ANTIOXIDANT FOR ENHANCING UV PROTECTION

Ultraviolet (UV) rays from the sun are one of the main causes of skin damage and high potential for skin cancer. The conventional sunscreen usually contains synthetic ingredients such as synthetic antioxidants that can cause bad impact to skin health and may potentially disrupt hormonal balance through oxidative stress mechanisms. This study explores the potential of broccoli sprouts (*Brassica oleracea*) as a natural source of sulforaphane (SFN), a bioactive compound known for its antioxidant and photoprotective properties, for use in sunscreen formulations. Broccoli sprouts were cultivated under ambient conditions and harvested on the fifth day. Soxhlet extraction was performed using two solvents namely ethanol and dimethyl sulfoxide (DMSO) to evaluate their efficiency in extracting SFN. The antioxidant activity of the sunscreen was assessed through the DPPH (2,2-diphenyl-1-picrylhydrazyl) assay, where the formulated sunscreen that extracts using DMSO as solvents exhibited higher radical scavenging activity up to 90% compared to the ethanol extract which have only between 75 to 80% and their sun protection potential was evaluated using UV-Visible spectrophotometry. The formulated sunscreen showed moderate UV absorbance, which up to 15 indicating the potential application of sulforaphane as a natural UV-protective agent. This study demonstrates that broccoli sprouts offer a promising, plant-based alternative to synthetic compounds in sunscreen, contributing to the development of safer and more sustainable skincare products. Further research is recommended to optimize extraction conditions, improve formulation stability, and validate product efficacy through vivo testing.