Essential Protection: Using UV-Sensitive Yeast To Evaluate Essential Oils as an Alternative to Sunscreen

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Cancer has a major impact on people around the world and is a large burden on society. Ultraviolet (UV) rays damage DNA, which significantly increases the risk of skin cancer, or melanoma. While conventional sunscreens protect the skin by blocking harmful UV rays, they also negatively affect the environment. Benzophenone-3 is a chemical commonly found in sunscreens, which harms and kills coral reefs by causing DNA damage, abnormal skeletal growth, and bleaching. There is also public concern that benzophenones have potential carcinogenic and endocrine adverse effects, although studies on humans have not supported this suspicion. Various ‘essential oils’ have been widely promoted as natural alternatives to sunscreen, but scientific evidence for this is largely lacking and has caused debate over their ability to protect against UV rays. We used UV-sensitive yeast as a model system to test the effectiveness of raspberry and carrot seed oils in blocking UV-induced cell death. The lids of Petri plates containing UV-sensitive yeast were covered with either sunscreen, raspberry seed oil, or carrot seed oil, then exposed to sunlight. The number of surviving colonies was counted, and this amount was compared to plates without sun exposure. Carrot seed oil, but not raspberry oil, blocked some UV rays but did not match the level of protection provided by commercial sunscreen. Our findings show that essential oils could offer protection from the sun, however; more research is needed to find an environmentally-safe alternative to sunscreen that fully protects our skin from the sun.

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