DISINFECTIONOF MICROORGANISMS WITH FAR-UVC 222 NM IRRADIATION

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The use of ultraviolet C (UVC) irradiation is an effective method of controlling microorganisms. This control strategy is used to disinfect surfaces, air and water. The most commonly used type of UVC is 254nm, unfortunately this radiation is harmful to humans and can cause skin cancer, dermatitis and other diseases [1]. It is known that FAR-UVC 222 nm irradiation has a disinfectant effect on microorganisms and that it is not harmful to human health. This study was designed to investigate the effects of FAR-UVC 222nm irradiation on a range of microorganisms including B. subtilis, P. aeruginosa, Rouxiela sp., A. flavus, B. cinerea, Cladosporium sphaerospermum and P. commune. To completely inhibit the growth of microorganisms, the exposure time and distance between the object and the lamp were determined. The results indicate that B. subtilis bacteria can be effectively destroyed by FAR-UVC 222 nm irradiation at a distance of 10 cm for 187 seconds. Thus, the initial findings of this study indicate that FAR-UVC 222 nm could be a feasible approach for pathogen biocontrol. Further studies will determine the exposure time and distance required for FAR-UVC 222 nm irradiation to inhibit the germination of fungal conidia and formation of bacterial colonies.

[1] K. Narita, et al., Chronic irradiation with 222-nm UVC light induces neither DNA damage nor epidermal lesions in mouse skin, even at high doses, 2018.