Determination of the effect of UV-C light on the molds isolated from dried persimmons

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Ultraviolet light (254 nm) is a non-thermal intervention technology that can be used for surface decontamination of foods.In this study, it was aimed to investigate the UV-C resistance of different mold isolated from dried persimmons *in vitro* and also to determine the resistant mold isolates to be used as a test culture in studies on UV-C treatments.Total of 66 fungal isolates obtained from dried persimmons were incubated twice at 25 °C for 7 days in order to activate cultures.At the end of the last incubation period, 2 ml of sterile distilled water containing sterile 0.05 % (w/v) Tween 80 was transferred to the tubes containing mold cultures and vortexed for 30 seconds.Appropriate dilutions were done to prepare spore suspensions of 10^5 spores per ml and the numbers were validated by microscobic examination by using a Thoma counting grid and also plate count methods.0.1 ml of the spore suspensions were inoculated to Malt Extract Agar plates by using spread plate method to obtain initial spore count of 4 log unit per plate.Then,plates were placed in a closed UV-C chamber, at a distance of 10 cm between the UV-C light, and treated with UV-C doses at 1.2 kJ/m^2 and plates were incubated at 25 °C for 3-5 days while untreated plates were used as a control group.The resistances of molds against UV-C were ranked by K-Independent samples-Kruskal-Wallis test using IBM SPSS 20.Result obtained in this study revealed that UV-C light was found to be effective technology at different levels of inhibition of molds.While the initial numbers of spores per plate was about 4 log unit,UV-C treatment reduced the number of inoculated mold spores about ≥ 4 log unit for the 34.85 % of the isolates,on the other hand the reduction levels in the range of 2.2 -<4 log unit were obtained for the 33.33% of isolates.For the rest of the isolates (31.82%), the colonies above the detection limit were not counted and reduction levels were < 2.2 log, and the exact reductions of these resistant cultures were determined by using lower inoculation levels of about 2 log unit per plate and UV-C treatment was applied at the same dose.As a result of these treatments, 61.90% of the resistant isolates were below the detection limit.It is determined that there is significant difference between the UV-C light inhibition effects on different mold species($p < 0.05$).Mold species that showed the most sensitivity under UV-C treatments are; *Byssochlamys*, *Mucor*, *Geotrichum*, *Basipetrospora*, *Ulaclodium*, *Endomyces*, *Paecilomyces*, *Chaetomium*, *Penicillium*, *Moniella*, *Aspergillus*, *Trichothecium*, *Chrysonilia*, *Cladosporium*, *Monascus*, *Rhizopus* and *Alternaria*, respectively.Traditionally dried food products which are open to microbial contamination and stored in inappropriate conditions could cause increase in the existing mold load and reduce the microbial quality of the product.UV-C treatment to food is environment friendly as it does not result in any waste and the process does not require any chemical agents.Owing to limited use of chemical disinfectants, appliance of UV-C systems in the food industry with optimum parameters, product safety will be ensured and economic losses will be reduced by inhibiting mold growth during storage of food and preventing possible mycotoxin production.Inhibition of mold growth on the surface of the food can be achieved by using UV-C treatments thus use of chemical disinfectants can be restricted.In recent years, there has been an increase in publications for testing the efficacy of UV-C treatment for the inhibition of molds present on food.In this study, UV-C resistance of different molds isolated from dried persimmon was detected and it is found that resistant strains should be used as test cultures in the studies about the efficacy of UV-C applications in

foods.

Keywords: Dried persimmon, mold inhibition, UV-C light