

Efficacy of Microwave against *Oryzaephilus Mercator* Pest Infesting Dried Figs and Evaluation of the Product Color Changes Using an Image Processing Technique

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Abstract : In this study, microwave heating was employed for controlling *Oryzaephilus mercator* adults infesting stored Iranian dried fig. For this purpose, the dried fig samples were artificially infested with *O. mercator* and then heated in a microwave oven (2450 MHz) at the power outputs of 450, 720, and 900 W for 10, 20, 30, and 40 s, respectively. Subsequently, changes in the colors of the product samples under the effects of the varied microwave applications were investigated in terms of lightness (ΔL^*), redness (Δa^*), and yellowness (Δb^*) using an image processing technique. The results revealed that both parameters of microwave power and exposure time had significant impacts on the pest mortality rates ($p < 0.01$). In fact, a direct positive relationship was obtained between the mortality rate and microwave irradiation power. Complete mortality was achieved for the pest at the power of 900 W and exposure time of 40 s. The dried fig samples experienced fewer changes in their color parameters. Considering the successful pest control and acceptable changes in the product quality, microwave irradiation can be introduced as an appropriate alternative to chemical fumigants.

Keywords : colorimetric assay, microwave heating, *Oryzaephilus mercator*, mortality

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