



IMPACT OF SUSTAINABLE AND INNOVATIVE POSTHARVEST PLANT PATOLOGY TECHNIQUES IN THE SENSORY CHARACTERISTICS AND ACEITABILITY OF GUAVA, ORANGE AND PAPAYA

¹SILVA, I.S.O.; ²SILVA, A.M.; ³TERAO, D.; ⁴BEHRENS, J.H.; ⁵MELO, W.L.B.; ⁶BIZETO, M.A.; ⁷CAMILO, F.F.; ⁸FRACAROLLI, J.A.; ⁹BIASOTO, A.C.T.

¹ Universidade Federal da Bahia - UFBA, Programa de Pós-Graduação em Ciência de Alimentos, – Bahia, italanut@gmail.com

² Universidade Estadual de Campinas – UNICAMP, Faculdade de Engenharia Agrícola (FEAGRI) – São Paulo, drisilva66@gmail.com

³ Embrapa Meio Ambiente, Empresa Brasileira de Pesquisa Agropecuária – São Paulo, daniel.terao@embrapa.br

⁴ Universidade Estadual de Campinas – UNICAMP, Faculdade de Engenharia de Alimentos (FEA) – São Paulo, behrens@unicamp.br

⁵ Embrapa Instrumentação Agropecuária, Empresa Brasileira de Pesquisa Agropecuária, São Paulo, washington.melo@embrapa.br

⁶ Universidade Federal de São Paulo – UNIFESP, mabizeto@unifesp.br

⁷ Universidade Federal de São Paulo – UNIFESP, ffcamilo@unifesp.br

⁸ Universidade Estadual de Campinas – UNICAMP, Faculdade de Engenharia Agrícola (FEAGRI) – São Paulo, jurosato@unicamp.br

⁹ Embrapa Meio Ambiente, Empresa Brasileira de Pesquisa Agropecuária – São Paulo, aline.biasoto@embrapa.br

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Brazil, the world's third-largest fruit producer, faces postharvest losses due to fungi, prompting the search for alternatives to chemical treatments. This study evaluated how sustainable antifungal strategies—ultraviolet C (UV-C) radiation, nanoemulsion of



oregano essential oil metabolites, and combined application (UV-C + nanoemulsion)—influenced the sensory characteristics and consumer acceptability of 'Suprema' guava, 'Lima' orange, and 'Papaia' papaya. For each variety, 10 fruits per treatment were individually processed, in addition to a control group ($n=10$). Modulated UV-C light was applied to guava (0.99 kJ m^{-2} , 30 Hz) and papaya (0.44 kJ m^{-2} , 30 Hz), and continuous UV-C light was applied to orange (1.99 kJ m^{-2} , 0 Hz). The nanoemulsions were formulated in a 2% (w/v) chitosan solution and its properties will be presented on the poster due to word limitation. 1 mL fruit^{-1} ($7.5 \text{ }\mu\text{L mL}^{-1}$; $\approx 0.71\% \text{ w/w} = 7.1 \text{ mg fruit oil}^{-1}$) was used for guava and orange and 2 mL fruit^{-1} ($5.0 \text{ }\mu\text{L mL}^{-1}$; $\approx 0.48\% \text{ w/w} = 9.5 \text{ mg fruit oil}^{-1}$) for papaya. In the combined treatment, UV-C was applied followed by nanoemulsion spraying. After the treatments, the fruits were stored at $20 \pm 2 \text{ }^{\circ}\text{C}$ for 1 day (guava) and 2 days (orange and papaya), conditions that reproduced commercial fruit establishments. The affective test was conducted with 85 consumers, and the samples were identified with three digits. Appearance and aroma acceptance were assessed using a 9-point hybrid hedonic scale. The intensity of sensory attributes (brightness, aroma, and expected flavor and juiciness of the fruit) was quantified using a 9-cm unstructured scale, anchored at the extremes with "weak" and "strong." Statistical analyses included ANOVA followed by Tukey's test ($\alpha = 0.05$). The results indicated a matrix-dependent effect: in guava, the nanoemulsion increased acceptance and attributes (brightness, expected flavor/juiciness, and aroma intensity) (ANOVA, $p < 0.05$). In orange, the combined treatment increased acceptance of the juice's appearance and aroma and increased brightness and aromatic intensity (ANOVA, $p < 0.05$). In papaya, UV-C alone improved acceptance of the whole fruit's appearance and aroma, brightness, and expectations of flavor/juiciness (ANOVA, $p < 0.05$). It is concluded that the emerging treatments tested can improve the sensory characteristics of the fruit and its acceptability, while controlling post-harvest fungal diseases, in a sustainable way for the environment (natural and biodegradable product) and for consumer health (absence of toxic chemical residues), being important to select the most appropriate strategy for each fruit.

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