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Changes in Cooked Aroma Constituents of γ-Ray Irradiated Onions during Storage

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γ-Irradiated onions (0.2, 1, 2 and 5 kGy) were stored for 1, 3, 7 and 11 weeks. Cooked onion aroma concentrates were prepared by a simultaneous distillation and extraction (SDE) method and analyzed by gas chromatography (GC) and gas chromatography-mass spectrometry (GC-MS) at all stages of storage. A total of 27 compounds was identified. The similarities among the GC patterns obtained from all the onion samples were calculated using the ratios of 148 peak areas. The qualitative and quantitative characteristics of the cooked aroma constituents of 0.2 kGy-irradiated onions were very similar to those of non-irradiated onions. The similarities between non- and 0.2 or 1 kGy-irradiated onions were great during all stages of the 11 weeks storage. However, similarities between non-and 2 or 5 kGy-irradiated onions were low during storage. The radiation dose of 0.2 kGy for preventing sprouting does not change the cooked flavor characteristics. A dose of 1 kGy is the irradiation limit before the cooked onion flavor is affected.

Keywords: γ-ray irradiation, onion, storage, cooked flavor, GC analysis

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