

## SHORT COMMUNICATION

# 6,7-DIMETHOXYCOUMARIN IN THE PEEL OF GAMMA-IRRADIATED GRAPEFRUIT

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**Abstract**—6, 7-Dimethoxycoumarin was isolated from the peel of gamma-irradiated mature grapefruit. It accumulates in fruits irradiated with relatively high doses (300 and 400 krad) and is absent from non-irradiated fruits.

IONIZING radiation has been found to stimulate phenolic biosynthesis in citrus fruit peel<sup>1,2</sup> and in other plant tissues.<sup>3,4</sup> In the course of a chromatographic survey of peel extracts from gamma-irradiated mature grapefruit (*Citrus paradisi* Macf., cv. Marsh Seedless), a blue-fluorescent compound was found to accumulate in fruits irradiated with relatively high doses (300 and 400 krad), in addition to the previously reported<sup>2</sup> accumulation of scopoletin and scopolin.

The unknown compound was extracted<sup>2</sup> from the flavedo (the external coloured peel layers) of grapefruit 7 days after irradiation with 300 krad. It was chromatographed on silica gel-H (Merck) column (50 × 2.4 cm) eluting with benzene-EtOAc (2:1, v/v). Final purification was performed on a second silica gel-H column with light petroleum (b.p. 60–80°)—*tert.* BuOH (7:3, v/v). Pure material was obtained after evaporating the combined extracts containing the fluorescent compound. Direct comparison with authentic material by co-chromatography (4 solvents, TLC) and by UV ( $\lambda_{\text{max}}^{\text{MeOH}}$  229, 292 and 341 nm) and IR analyses proved that the compound is 6,7-dimethoxycoumarin. The structure of this compound was further substantiated by its NMR spectrum.

No 6,7-dimethoxycoumarin could be detected in non-irradiated fruits, or was ever reported to occur in grapefruit peel.

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<sup>4</sup> D. E. KOEPPE, L. M. ROHRBAUGH, E. L. RICE and S. H. WENDER, *Rad. Botany* **10**, 261 (1970).