Residue of Imazalil and Its Major Metabolite in Citrus Fruits and Changes of the Concentration During Cold Storage

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Abstract

1) An improved method of simultaneously determining imazalil (IZ) and R14821 (R1), one of its major metabolites, in citrus fruits was investigated. With this new method each detection limit was more than 10 times higher than that of the original method (US EPA): a detection level of 0.001 ppm on a whole fruit basis was obtained for each compound.

2) Immediately after purchasing citrus fruits (grapefruit, orange and lemon) from the markets, concentrations of these compounds in the peels and the pulps were measured. All the samples were under regulation by the Japanese Food Sanitation Law. All peel samples were superior to the corresponding pulp in terms of concentrations and contents. When acceptable daily intake (ADI) of R1 is assumed same as that of IZ, intake of these citrus fruits in the normal diet would not be too harmful to humans, because all amounts of the compounds ingested through this route would be far lower than the ADI of IZ (0.025mg/kg of body wt./day).

3) By one-way analysis of variance and Student's t-test, IZ concentrations were reduced in the peels and the pulps of oranges stored in a refrigerator (7 ~ 10°C, for 1 to 3 weeks). R1 concentrations increased in both portions of lemons during cold storage. The molar ratios of R1 to
IZ in the peels of citrus fruits stored in a refrigerator for 3 weeks were about 2 times higher than those before cold storage, compared with each average value. The same was found in the pulp: the ratios were about 1.5 to 2 times higher than those before cold storage. However, each residual concentration ratio of both compounds in the pulps against that in the peels was almost constant among the citrus fruits even after various cooling periods in a refrigerator.