

Patcha Sooksabai 2012: Electron Spin Resonance Study on Kluai Hom Thong after Gamma-Irradiation. Master of Science (Physics), Major Field: Physics, Department of Physics. Thesis Advisor: Assistant Professor Teerasak Veerapaspong, D.Eng. 97 pages.

Nowadays, fruit irradiation is more popular in many countries because it can slow down ripening process and control insect pests during storage period, so shelf life of fruit can be extended. However, customers may doubt about safety of the irradiated fruits. Then, it is necessary to use efficient techniques to determine the previous radiation treatment in fruits. Electron spin resonance (ESR) spectroscopy is one of the most famous techniques for identifying the irradiation history in vegetables and fruits. In this research, ESR method is applied to investigate the irradiation of Musa (AAA group) or Kluai Hom Thong - one of the most popular types of bananas in Thailand. It is also the leading fruit in the agriculture food exportation in Thailand. Because of short shelf life, irradiation process enables the bananas to be sent to the customers in other countries before they are rotten. The samples are dried under air-dry oven and are made to a powder before measuring ESR signals. From ESR measurements, the signal of all samples shows 2 peaks – one in the central and another in the right side of the central one. Irradiated samples have the same pattern of ESR signal as non-irradiates ones; but, they have approximately more than 2 times in the intensity. In addition, ripening process increase the intensity of the right peak after 3 days, and it also causes decrement in the intensity of the central peak. Due to the difference in ESR intensity between irradiated and non-irradiated samples during the entire storage period, the intensity of the central peak can be used as a clear evidence to confirm the irradiation history of Kluai Hom Thong. The sample preparation by using air-dry oven may produce free radicals but it is convenient, fast and cheap. Therefore, this method is appropriate to be a brief examination of previous irradiation.

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