

Sarayut Khadkum 2008: Effect of Gamma Radiation on Trypsin Inhibitor Activity of *Jatropha curcas* Seeds. Master of Science (Applied Radiation and Isotopes),
Major Field: Applied Radiation and Isotopes, Department of Applied Radiation and Isotopes. Thesis Advisor: Assistant Professor Wanwisa Sudprasert, Ph.D. 96 pages.

Jatropha curcas is non-edible oil crop predominately used to produce biodiesel. The seed cake produced after oil expulsion which is rich in protein can be used as animal feed. Nevertheless, using *Jatropha curcas* seed in animal feeding has a limitation due to its toxic and antinutritional factor such as trypsin inhibitor. The effect of gamma radiation on trypsin inhibitor activity of five accession number (16, 20, 21, 62 and 65) of *Jatropha curcas* seeds from different regions of Thailand was studied. The average seed weight was from 0.70 to 0.78 g. The kernel to shell ratio in seeds was 65:35. The seeds were subjected to gamma irradiation at 0, 10, 20, 30 and 60 kGy, respectively using cobolt-60 gamma radiation with a dose rate of 0.1748 kGy/min. All treated seeds were defatted by using the soxhlet apparatus containing petroleum ether as a solvent. Trypsin inhibitor activity was assayed by measuring the initial rate under the suitable condition. i.e., pH 10.0, the proportion of 1:6 trypsin solution:trypsin inhibitor and 30 min incubation. The study found that gamma radiation at doses of 10 to 60 kGy decreased the trypsin inhibitor activity by 11.30 ± 0.81 to 60.29 ± 2.57 %, respectively. Moreover, gamma radiation did not affect the chemical composition of the sample. Lineweaver-Burk plot indicated that trypsin inhibitor in sample functioned as a competitive inhibition. Gamma irradiation may be chosen as a simple method to improve the quality of *Jatropha curcas* from the nutrition point of view.

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Thesis Advisor's signature

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