Thermal Treatments as Accelerated Aging Technique for Mitigating Rice Stickiness of Freshly Harvested Paddy

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Accelerated ageing is an artificial technique that induces ageing effect in fresh paddy within a short period of time while reducing the holding costs for millers. Thus, the aim of the study was to check the suitability of dry and steam heat treatments separately, as two accelerated aging approaches to mitigate the stickiness of freshly harvested paddy with preserved physicochemical and cooking properties. Freshly harvested cleaned *Bg352* paddy variety was subjected to dry heat treatments using a hot air dryer at different combinations of temperatures and drying times (60, 80 and 100 °C for 2, 4 and 6 hours) and steam heat treatments using mini boiler at different combinations of steam pressures (SP) and exposure times (SP; 0.5, 1.0 and 1.5 Kg/cm^2 for 5, 7.5 and 10 minutes). The samples were milled to study milling, physico-chemical, cooking and textural characteristics of rice. Rice stickiness of freshly harvested paddy was 3.23 ± 0.03. In dry heat treatment method, exposing of freshly harvested paddy to 100 °C for 0.5 hours has shown the significantly highest reduction in rice stickiness from 3.23 ± 0.03 to 0.71±0.03. The results revealed that the yield %, Water Uptake Ratio, Elongation Ratio, Solid Loss, Cooking Time and Whiteness Index were not significantly different (p >0.05) between naturally aged and treated paddy under 100 °C for 0.5 hours but, were significantly different (p <0.05) for broken rice%. In steam heat treatment method, freshly harvested paddy subjected to 1.5 Kg/cm^2 for 10 minutes has shown the significantly highest reduction in rice stickiness from 3.23 ± 0.03 to 0.67±0.03 while it has preserved the favourable parameters than the dry heat treatment. In conclusion, both dry and steam heat treatments accelerate the artificial aging of fresh paddy while steam heat treatment preserve the quality at significantly highest levels.

Keywords: Accelerated aging, Dry heat treatment, Steam heat treatment, Stickiness