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Relationship between grain amylose content and pasting properties of some local rice varieties

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Amylose content (AC %) is one of the indicators used in determining the quality of cooked rice. Pasting properties or gelatinization behaviour in rice is helpful for understanding the textural change or retrogradation potency of the rice-based food products. A strong relationship does exist between AC and pasting properties and can be useful in predicting the quality of cooked rice and rice based products. A study was carried out to find out the relationship between AC and pasting properties of local rice varieties Bg 300, Bg 352, Bg 403, Bg 94-1, Ld 356, Bw 272-6b, At 405 and At 306. Each sample was replicated thrice.

AC was measured by Iodine calorimetry method and pasting properties by Amylograph. Pasting properties interpreted from Amylograph were, peak viscosity (PV), viscosity at the end of holding time at 95 °C / hot paste viscosity (HPV), final viscosity at end of cooling to 50 °C / cold paste viscosity (CPV), breakdown (BD) and setback (SB).

AC was significantly ($p<0.05$) different among rice varieties, ranging from 21.49±1.47 for At 405 to 36.93±0.35 to Bg 94-1. Paste viscosity profile of all rice varieties showed a variation in the pasting parameters. PV ranged from 813±58 BU for At 306 to 1240±150 in Bg 300. HPV ranged from 576±159 in At 406 to 897±55 in Bg 352, while the CPV ranged from 762±161 BU in At 405 to 2137±185 BU in Bg 352. At 405 has shown a low value for HPV, CPV, SB and BD. Lowest SB value for rice variety At 405 is an indication that this variety is softer among the varieties studied. PV ($r=0.392$) and HPV ($r=0.324$) had positive correlation with AC but not significant. AC significantly correlated positively with CPV ($r=0.556$, $p<0.001$) and SB ($r=0.456$, $p<0.05$). There was no correlation found between AC and BD.

Based on the amylose content and pasting properties of selected rice varieties, amylose content had influenced the Amylograph pasting properties. PV, HPV, CPV and SB are the important pasting parameters which determine better eating quality. AC and pasting properties are useful for determining better cooking properties such as gel hardness and stickiness.

Key words: Rice, amylose, amylograph pasting properties

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