

Effect of wheat puroindoline alleles on functional properties of starch

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Abstract Puroindoline *a* and *b* (*Pina*, *Pinb*) form the molecular basis of bread wheat grain hardness. Varieties with a softer endosperm and a wild genotype, in which both *Pina* and *Pinb* were present, seemed to produce less damaged starch flour than hard varieties, where *Pin* mutations occurred and changed the starch rheological properties. The functional property of starch samples extracted from wheat varieties with different *Pin* alleles was evaluated. Starch morphology was characterized by scanning electron microscopy and laser light scattering. Thermal properties were evaluated by differential scanning calorimetry. Amylose content, starch damage and rapid visco-analyser (RVA) parameters were also determined. Significant variations ($P < 0.05$) were identified between different *Pin* variants for the distribution pattern of starch granule volume, amylose content, starch damage, RVA viscosity breakdown and retrogradation, gelatinisation transition temperatures and enthalpies. Hard genotypes presented higher medium diameter granules and lower enthalpic values. However, the differences detected are more evident among varieties that present both *Pina* and *Pinb*, than among those presenting only one of the two (*a* or *b*).

Keywords Wheat starch · Puroindolines · Hardness · RVA · DSC · SEM

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