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Physicochemical characterization and functionality of acetylated amaranth starch (Amaranthus hypochondriacus)

Aguirre Mandujano E, Santiago Santos B, Ramírez Santiago C and Sandoval Castilla O Autonomous University Chapingo, Mexico

In recent years there is a growing interest of consumers living with celiac diseases by gluten free foods. However, the elimination of this component causes adverse changes in the properties of the dough, poor texture and quality defects. The incorporation of starches of different botanical origin, native or chemically modified, such as amaranth (*Amaranthus hypochondriacus*) may be an option to imitate the rheological properties of gluten. Therefore, in the present work starch was obtained from amaranth grain (*Amaranthus hypochondriacus*) var. Revenge, with a yield of 23% (w/w) with respect to the amount of grain used. The starches had a composition (w/w) of 5.7% moisture, 7.2% protein, 0.54% ethereal extract, 0.18% crude fiber and 1.52% ash. An acetylation modification was carried out and starches were obtained with 0.64% acetyl groups and a degree of substitution of 0.024%. The hydrated grain had an area volume mean diameter of D=3.38 μ m and 5.5% (w/w) amylose. The maximum viscosity was reached after cooling of the gel, reaching values of 1650 Cp for native starch and 1300 Cp for acetylated starch. The functional properties (water retention capacity, swelling power) of the modified starch were lower than those of the native starch, while its solubility index showed higher values.

Recent Publications

- 1. Jekle M, Mühlberger K and Becker T (2016) Starch gluten interactions during gelatinization and its functionality in dough like model systems. Food Hydrocolloids. 54(Part A):196-201.
- 2. Copeland L et al. (2009) Forms and functionality of starch. Food Hydrocolloids. 23(6):1527-1534.
- 3. Sánchez Rivera M M et al. (2005) Title of the article. Carbohydrate Polymers. 62(1):50-56.

Biography

Aguirre Mandujano E obtained his PhD in Biotechnology from Metropolitan Autonomous University, México in 2009. He is a Professor of Agro Food and Technology and Chemistry at Autonomous University Chapingo, México, for 37 years. He has more than 10 years of experience in Food Science and is an author of 12 scientific publications.

eleagman@yahoo.com

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