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Impact of macro and microelements on the size of starch granules in potatowine during tasting experience

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The amount of starch obtained from potatoes is lower in comparison to cereals. In a sense, nowadays potato starch has become an increasingly frequent alternative to gluten-free flour as a supplement to gluten-free products (dough) and dough concentrates. In the potato (starch) industry, large granules of starch with a diameter $>40\ \mu\text{m}$ are the most desirable, as they determine fewer losses during the leaching of starch from potato pulp. The experiments included both edible and starch potato varieties of different maturity classes and different doses of macro- and microelements for soil and foliar application. Analysis was performed on an isolated starch of one granule size. The tests were conducted using a Mastersizer 2000 laser particle size analyser from Malvern Instruments LTD with a Hydro 2000 MU unit, based on small-angle laser light scattering ($\lambda = 633\ \text{nm}$), according to Mie scattering theory. Before the measurement, the starch was dosed into a measuring vessel, and subsequently, ultrasound was applied for 20 seconds. During the measurement, the obscuration was in the range of 10-15%. The apparatus performed 10,000 measurements in each cycle. The results allowed for estimation of small ($<20\ \mu\text{m}$), medium (20-40 μm) and large ($>40\ \mu\text{m}$) fractions. In the study material, large starch grains with a diameter $>40\ \mu\text{m}$ were dominant. The largest and the smallest amount of starch grains were produced by late and medium-early maturing potato varieties, respectively. An increase of the concentration of macronutrients resulted in the deterioration of the size structure of starch grains.

Biography

Bozena Bogucka since 2002 has worked as a Doctor of agricultural science at the University of Warmia and Mazury in Olsztyn. Her scientific activity has been concentrated on research related to the impact of macro and microelements on quantitative and qualitative characteristics of potato for the food and processing industry for over 10 years. She has published over 30 works in this field. Her area of interest also includes root food plants storing starch and an additional polysaccharide, inulin.

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