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Characterization of diverse rice accessions for protein content and its correlation with starch properties

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Rice is the major staple for many people in Asia and Africa. But the protein content of rice is generally very low and many rice consumers suffer from malnutrition. Nutrition can be improved by eating rice with high protein content. However, high protein content in rice may negatively affect cooking and eating quality which is mainly determined by starch physicochemical properties. The aim of this study was determine the protein content of a diverse set of rice accessions and its correlation with apparent amylose content (AAC), alkaline spreading value and paste viscosity properties measured by Rapid Visco Analyzer. A set of 65 rice accessions, mainly from Africa and a diverse set of 23 U.S. cultivars were used for the study. The African and U.S. accessions had protein content of 6.2–13.9% and 5.5–11.3% respectively. There was a positive correlation between protein content and AAC (r=0.31) and set back viscosity (SBV) (r=0.47). Protein content had a negative correlation with break down viscosity (BDV) (r= -0.57). The results indicate that rice with high protein is likely to have higher AAC and SBV, and lower BDV implying poorer cooking quality. However, a local African variety with the highest protein content of 13.9% also had an intermediate AAC of 21.1% implying that it is nutritious and suitable for eating by most rice consumers.

Biography

Maxwell Darko Asante is a Rice Breeder at the CSIR-Crops Research Institute. His current passion is to develop high yielding rice varieties that have improved nutritional, cooking and sensory qualities. He holds a PhD in Plant Breeding from the West Africa Centre for Crop Improvement, University of Ghana. He has done research at advanced institutions such as Cornell University and USDA-Dale Bumpers National Rice Research Centre in the USA. He has a number of publications in reputable journals to his credit.

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