Rice bean (Vigna umbellata): Grain, Starch and Protein Characteristics

Amritpal Kaur\textsuperscript{a}, Parmeet Kaur\textsuperscript{a}, Narpinder Singh\textsuperscript{a}, Amardeep Singh\textsuperscript{b}, Prabhjeet Singh\textsuperscript{b} and Jai Chand Rana\textsuperscript{c}. \textsuperscript{a}Dept. of Food Science and Technology, Guru Nanak Dev University, Amritsar, India, \textsuperscript{b}Dept. of Biotechnology, Guru Nanak Dev University, Amritsar, India, \textsuperscript{c}National Bureau of Plant Genetic Resources, Shimla, India

Rice bean (Vigna umbellata) is a multipurpose grain legume crop mainly cultivated for food, fodder and green manure. It is considered as underutilized. A large number of rice bean lines are available; however, their grain, starch and protein characteristics are not reported. In the present study grain, starch and protein characteristics of different rice bean lines were evaluated. Grains were evaluated for physicochemical, hydration, cooking and textural properties. Seed weight was related to protein content, hardness, chewiness and swelling capacity. Lines with higher protein content had higher hydration capacity and index, and lower hardness. Ash content, fat content and protein content of the rice bean lines ranged between 3 to 4.26\%, 0.30 to 1.98\% and 18.64 to 20.4\%, respectively. Amylose content of starches from different lines ranged from 21.12\%-69.14\%. Peak viscosity and breakdown viscosity were negatively correlated to amylose content. Storage modulus ($G'$) and loss modulus ($G''$) of cooked starch pastes showed negative relation with amylose content, relation was stronger $G''$. Total 27 major proteins of 103-15 kDa consisting of high MW (103.0-, 92.0-, 63.0 kDa), medium MW (58.0, 56.0, 50.0, 33.0-31.0 kDa) and low MW (29.0-20.0 kDa) were present. Polypeptide bands 94, 52, 28, 26 and 20 kDa were present in black, red, grey and green rice bean lines where as 68 kDa polypeptide was only present in black (RB 341993) and green(EC-18181) lines.