



Relationship between structural and biochemical characteristics and texture of corn grains

R.C. Pereira¹, L.C. Davide¹, C.A. Pedrozo², N.P. Carneiro³,
I.R.P. Souza³ and E. Paiva³

¹Departamento de Biologia, Universidade Federal de Lavras, Lavras, MG, Brasil

²Universidade Federal de Viçosa, Viçosa, MG, Brasil

³Embrapa Milho e Sorgo, Sete Lagoas, MG, Brasil

Corresponding author: L.C. Davide

E-mail: lisete.ufla@gmail.com

Genet. Mol. Res. 7 (2): 498-508 (2008)

Received February 13, 2008

Accepted May 15, 2008

Published June 10, 2008

ABSTRACT. The texture of corn grains is a fundamental characteristic for the industry as well as for grain producers and processors. To further understand the mechanisms involved in grain hardness, contrasting corn cultivars for grain hardness and protein quality were evaluated. The cultivars were Cateto L_{237/67} (hard endosperm and low protein value), QPM BR 451 (semi-hard endosperm and high protein value); Bolivia-2 (floury endosperm and low protein value), and Opaque-2 (floury endosperm and high protein value). Evaluations were carried out at 10, 20, 30, 40, 50, and 60 days after pollination in developing corn grains and in the mature grain. In developing grains, evaluation consisted in the determination of the area, percentage of starch granules, distribution of starch granules, and protein bodies in the endosperm. In mature corn grains, the parameters evaluated were: density, percentage of total proteins, levels of lysine and tryptophan, and banding pattern of zeins. The results

indicate that the higher physical resistance of corn grains from the cultivars analyzed is influenced by the high percentage of total proteins, high synthesis of 27-kDa zeins, presence of protein bodies, and perfect organization of starch granules in the endosperm, independent of their sizes.

Key words: Starch granules; Protein bodies; Zein; Endosperm; Corn