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SCREENING OF FAVOURABLE ALLELES FOR β-CAROTENE CONTENT IN MAIZE INBRED LINES

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Carotenoids are natural compounds that play an important role for human nutrition and health; among them β-carotene is quite relevant, being a precursor of vitamin A. The nutritional value of staple crops like maize could be improved by provitamin A biofortification. A simple PCR assay was developed, that can be used to identify the alleles of the gene *hydroxilase3* associated with a enhanced or reduced provitamin A content (Vallabhaneni *et al*., 2009). The presence of alleles B or C of this gene, which is a hydroxylation gene codifying for a key enzyme in carotenoids pathway, could be considered a marker of a high β-carotene content in maize kernels. Eighty-six Italian inbred lines, selected as starting material for a breeding program focused at improving maize nutritional quality, were analysed by this method. Molecular analysis brought up to the identification of 11 lines carrying alleles B or C. Introgression of these alleles was tested in ten hybrids derived from crosses among these same lines. Total carotenoids were extracted from a set of inbreds and quantified by spectrophotometric analysis at 450 nm. Preliminary data revealed a range of variation from 14.67 μg g^{-1} dm to 40.67 μg g^{-1} dm. The evaluation of the ratio of provitamin A (α- and β-carotene) to non-provitamin A compounds (cryptoxanthin, lutein and zeaxanthin) is currently being carried out by thin-layer chromatography (TLC).