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FROM SEED TO PASTA III

A SUSTAINABLE DURUM WHEAT CHAIN
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CHARACTERIZATION OF THE SEED PROTEOME OF TRITICUM DURUM VARIETIES SELECTED FOR THEIR DIFFERENT IMMUNOGENIC POTENTIAL.

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The wheat gluten proteins are studied, not only for their technological properties for the production of pasta and bread, but also because they are involved in an autoimmune disease, the celiac disease, which affects genetically predisposed individuals. Previous *in vitro* digestion studies showed that different quantities of immunogenic peptides originate from different wheat varieties, and that environmental factors can influence the content of these peptides in the same variety. In this research, two durum wheat cultivars, Saragolla and Cappelli, were studied to compare the reserve proteome, the embryo proteome and the immunogenic peptides amount, with the aim to characterize not only the nutritional and technological characteristics, but also their immunogenic potential. Gliadins were separated by 2D-PAGE and quantified by densitometric analyses, as they contribute to the production of immunogenic peptides. *In vitro* digestion of the gliadin fraction revealed that the two cultivars have different immunogenic potential which can be partially explained with the difference observed in the gliadin composition.

The embryo proteome was also analyzed by 2D-PAGE to identify any differences in the enzyme and metabolic component of the seed proteome, which could eventually influence the quantity of gluten proteins in the endosperm. A higher abundance of antioxidant enzymes and stress response proteins has been observed in Saragolla respect to Cappelli. Furthermore, the total phenolic content, the antioxidant capacity, and the aminoacidic composition of wheat flours were analyzed in both cultivars. The differences observed at proteomic level were confirmed by the antioxidant activity measured in flours.

ABSTRACT