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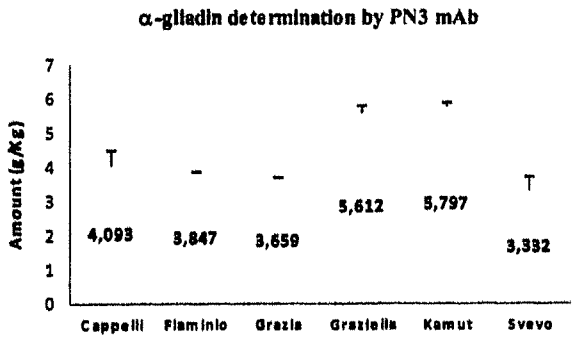
Abstract Book

Figure 2. α-gliadin amount (g/Kg) as determined by two-step ELISA with PN3 mAb.



[1] M.F. Kagnoff (2007) Celiac disease: pathogenesis of a model immunogenetic disease. *J. Clin. Invest.* 117(1): 41-49.

[2] H.J. Ellis, S. Rosen-Bronson, N. O'Reilly, P.J. Ciclitira (1998) Measurement of gluten using a monoclonal antibody to a coeliac toxic peptide of A gliadin. *Gut* 43: 190-195.

[3] H.J. Ellis, E.L. Pollock, J.W. Engel, J.S. Fraser, S. Rosen-Bronson, H. Wieser, P.J. Ciclitira (2003) Investigation of the putative immunodominant T cell epitopes in coeliac disease. *Gut* 52: 212-217.

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Chemical composition and antioxidant activity of propolis

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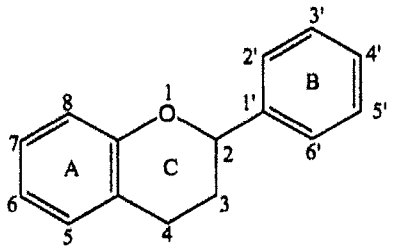
Propolis, or bee glue, is a brownish resinous material collected by worker bees from the leaf buds of different tree species. It has been employed extensively since ancient times as natural remedy of different illnesses and due to biological and pharmacological activities, also till to-day it is extensively used in folk medicine. Since in literature there are only few scientific studies about its antioxidant properties, such as the correlation between chemical composition and antioxidant properties, and no one attending to potential interactions between propolis and phospholipidic membrane, in this work we faced these

matters focusing on propolis samples collected from region of different territorial typology (barena, countryside, outskirts of town, wood).

Total Polyphenolic Content (TPC) determination has been carried out by different methods: Folin-Ciocalteau, DPPH-quenching, enzymatic assay developed by our research group and CEAC assay, a modification of the TEAC assay, where trolox was substituted with catechin in order to obtain comparable results of TPC. Antioxidant properties have been evaluated using the inhibition of lipid peroxidation (ILP) method, based on oxidation of linoleic acid in SDS micelles by molecular oxygen. All results show very high polyphenolic content, in accordance to the high antioxidant activity found by ILP method. Potential interactions between propolis and phospholipidic membrane have been examined by Differential Scanning Calorimetry and spin label Electron Spin Resonance. It has been found that propolis doesn't cause significant alteration on the ordered structural characteristics of phospholipidic membrane, inserting into the deep of the bilayer, close to Δ^{15} double bond of the polyinsatured fatty acid chains, where can operate against peroxidative degradation of membrane themselves.

In the second part of this work, we focused on polyphenols we identified as major constituents of propolis: seven flavonoids and three caffeic acid derivates. Correlating ILP results of these compounds with their molecular structure we verified that antioxidant properties are mainly due to: a) two *orto* hydroxyl group in the B ring; b) the hydroxyl group at C3 in association with double bond C2-C3 conjugated with the B ring.



TPC values depend on the method adopted and generally little correlate with antioxidant capacity measured by ILP method; furthermore DPPH and CEAC assays give positive results only for molecular structures that meet almost one of two rules above reported. As a consequence also these two methods represent an interesting, but not exaustive, test for antioxidant capacity, because give negative results for compounds of lower antioxidant properties.

In conclusion, galangin, caffeic acid and its derivatives caffeic acid phenethyl ester and 1,1-dimethylallylcaffeate represents the major components, characterized by higher antioxidant properties, of the analyzed propolis samples, while pinocembrin and crysin are present at higher concentrations - at least a factor two with respect to the previous - but show lower antioxidant capacity.