

Enzymatic activity of anthropogenic proto-organic soils in soilless farming

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In soilless agriculture and horticulture coir is the more used substratum to grow plants because it is widely available and more environmentally friendly than sphagnum or peat. In Italy, soilless agriculture concerns an area of about 1,000 hectares, particularly concentrated in Sicily. The southern coastal belt of this region is the area interested by the most significant experiences in the application of techniques of soilless cultivation that, recently, has been used also for growing table grapes.

Starting from the above consideration we suppose that the features of the coconut fiber underlay an evident transformation and that even after few years of table grape cultivation, such organic material undergone to a transformation that allows for the formation of a proto-organic soil (a proto-Histosol, we supposed). If this is true, we believe that, in this case, to speak about soilless cultivation is for sure misleading for the common people, as we should define this cultivation “on anthropogenic soils” instead.

To fit the aims of this survey we used a big greenhouse devoted to soilless cultivation of table grape in a farm in the Southern Sicily. We have considered the enzymatic activity that characterized the coconut fiber after 3 cycles of cultivation of table grapes. We used as a control the coconut fiber that the farmer used to prepare pots for soilless cultivation and coconut fiber of: 6 pots at the end of the first productive cycle 6 pots at the end of the second cycle and 3 pots at the end of the third cycle. On these organic samples we investigated three enzymes, belonging to oxydoreductase (catalase and dehydrogenase) and hydrolase (urease) classes. Statistical analysis of the investigated enzymes was developed using IBM Statistic SPSS v20 by ANOVA, Tukey test HSD for $p \leq 0.01$ and Multivariate Statistical Analysis.

Results have shown significant differences in enzymes content and quality among coir tests. The use of the coco fiber, as nutritive substratum under fertigation, has positively influenced the growing and proliferation of soil microbes and thus enzymatic activity. In merely 3 productive cycles the stage of decomposition of the organic residues changed highlighting a substantial evolution of such organic material.