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Project Review

CREATION AND IMPLEMENTATION OF A HIGH PERFORMANCE SCIENTIFIC RESEARCH METHODOLOGY REFERRING TO WOOD (FURNITURE) CONSERVATION AND ECO-DESIGN UNDER THE SUSTAINABILITY CONCEPT

CNCSIS Exploratory research project: IDEI code ID-856/2008 (2009-2011)

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The project subscribes to the border research aiming to create and originally implement a methodological instrument for advanced scientific research in furniture conservation and eco-design. The project aims to develop the knowledge regarding the structure and composition for the basic materials used in these domains (wood, adhesives, finishing materials, consolidation resins), to make contributions to the understanding of the mechanisms involved in their ageing/degrading phenomena. The project is gathering interdisciplinary domains, which imply multi and interdisciplinary research, so that inter-institutional cooperation at national and international level is important.

The project objectives include methodology substantiation, micro-morphological characterisation and identification of the most important wood conservation and eco-design materials by microscopy techniques, their chemical structure analysis and identification by IR spectrophotometry and studies on the simultaneous determination of their micro-structural characteristics and chemical structure by means of FTIR microspectrophotometry, as well as the integration of these methods and their implementation in case studies.

The results up to date include a comprehensive methodology for the microscopic analysis of the considered materials (solid wood – different species, juvenile wood, branch wood, materials for wood conservation: adhesives, finishing materials, consolidation resins) by different adequate optical microscopy techniques (reflected light and transmitted light, UV fluorescence, dark field) and electron microscopy (SEM). This methodology was applied for the microscopic characterisation (optical microscopy) of the following materials: 22 wood species for historical furniture (complex characterisation sheets including not only the main macroscopic and microscopic characteristics important for their identification illustrated by representative pictures, but also reference literature data on the physical, mechanical and technological properties), juvenile wood compared to mature wood (3 wood species) and stem wood compared to branch wood (4 species), traditional finishing materials, natural adhesives and consolidation products for wood conservation (11 types of materials). The characterisation data sheets of these materials are included in the catalogue ***Microscopic characteristics materials for wood conservation and eco-design***, a deliverable material which is very useful not only for the specialists from the wood /furniture conservation laboratories but also for the specialists interested in the correct utilisation and valorisation of some less known and used secondary wood resources, such as the juvenile wood from forestry trimming operations and branch wood, for manufacturing of furniture or other interior design elements with high aesthetical value. Microscopic studies involved also degraded wood from different laboratory and field tests and, samples extracted from old wooden objects, test samples looking at the penetration of different consolidants in wood and samples from different eco-products made of secondary resources and differently mechanically processed. The study of the same materials by SEM is currently under way and providing a deeper useful insight into the micro-morphological characteristics of these materials.

The FTIR study of the conservation materials resulted in a laboratory data base useful for identification purposes and further studies on the natural and artificial aging of these materials, an important aspect for the scientific conservation. Results up to date were disseminated by more than 20 presentations and papers.

More details on the project can be found on: http://www.artimar.ro/ct/index.htm

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