

# STUDIES ON ANTIFUNGAL EFFECTS OF FORMULATION BASED ON COFFEINE AND AATMOS

Kwaśniewska P.W.<sup>1</sup>, Woźniak M.<sup>2</sup>, Ratajczak I.<sup>2</sup>, Mazela B.<sup>1</sup>, Cofta G.<sup>1</sup>

## ABSTRACT

Caffeine is one of methylxanthine compounds, which has confirmed insecticides and bactericides properties. Extracts of plants containing methylxanthines also showed fungistatic activity. The paper presents preliminary results of biological and chemical analysis of Scots pine (*Pinus sylvestris* L.) wood treated with formulation based on caffeine and [3-(2-aminoethylamino)propyl]trimethoxysilane (AATMOS) in water solution. The wood treated with above mentioned formulation obtained resistance against microfungi (*Aspergillus niger*) and wood destroying fungi (*Coniophora puteana* (Schum. ex Fr.) Karst. BAM Ebw.15). Prepared protective system was used for sapwood of the pine samples treatment. Wood samples were impregnated by both soaking and vacuum method. The fungicidal value was determined according to PN EN 113 and mycological test against microfungi causing mold growth phenomenon were conducted based on EN ISO 846. Results showed that preparation consisting caffeine and aminosilane was very effective in suppressing these tested fungi.

The principal changes in the wood structure after treatment were performed using FTIR spectroscopy. The concentration of silicon in wood samples was determined by AAS. The results of chemical analysis allows to determine whether there are interactions between chemical compounds and wood material. It has been proved that the formulation based on caffeine and aminosilane can be used in wood protection.

Key words: caffeine, antifungal effects, wood destroying fungi

## ACKNOWLEDGEMENT

The project is supported by Norway Grants and the National Centre for Research and Development of Poland (NCRD) as a part of Polish-Norwegian Research Program in the frame of the project "Superior bio-friendly systems for enhanced wood durability" (No. Pol-Nor/203119/32, DURAWOOD).