

# BINDING INTERACTIONS OF METHYLYXANTHINES TO BEECH WOOD

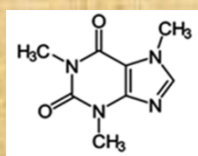
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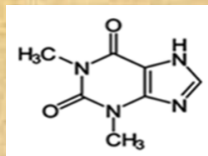


## Abstract

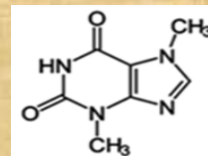
Methylxanthines are a group of xanthine potentially useful for protecting wood from biological pests. However, their interactions with regard to their properties has not yet been studied. For this reason, we studied the interactions of caffeine (CF), theophylline (TP), and theobromine (TB) with beech wood in the present study. Electron microscopy was used to visualize these interactions. **The results confirmed the different binding of the tested methylxanthines to the wood surface. The intensity of binding interactions decreased from caffeine to theobromine. These conclusions are in good agreement with our previous results of biological and chemical studies.**



Caffeine (20 g/L)



Theophylline (5.5 g/L)



Theobromine (0.33 g/L)



## Results and Conclusions

**CF** forms clusters of balls on wood, there are many of them and the balls are clearly visible.

**TP** forms clusters of fibrous formations on wood (it doesn't appear that they're somehow specially fixed on wood).

**TB** does not create any formations and no interactions are visible on the wood surface up to 10,000x magnification.

The results are affected by the concentrations of the substances used (corresponding to the maximum solubility in water). However, the binding interactions correspond to the results of experiments performed with wood-destroying fungi, where significant biocidal effects were found for CF, weak for TP and none for TB. Our findings prove the potential use of methylxanthines for wood protection.

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