Effect of site, species and tree size on the quantitative variation of lipophilic extractives in Eucalyptus woods used for pulping in South Africa

Abstract

Lipophilic wood extractives have serious negative impacts on both pulping process and quality of produced pulp. This study aimed at identifying suitable wood materials for pulping with respect to their lipophilic extractives contents. The effect of site, species and tree sizes on the amount of lipophilic extractives was evaluated. The lipophilic extractives from selected *Eucalyptus* species used for pulping in South Africa were quantified using gas chromatography–mass spectrometry. It was revealed by the use of analysis of covariance (ANCOVA) that the quantitative variation of lipophilic extractives inEucalyptus woods is significantly affected by respective sites and tree species. Principal component analysis (PCA) revealed the correlation of the amount of lipophilic extractives in wood materials with tree species/clones and site soil composition. Thus, high amounts of lipophilic extractives were found in *Eucalyptus* trees grown at sites with a high composition of clay soil and organic matter. Whereas, Eucalyptus dunnii was found to contain a higher amount of lipophilic extractives than *Eucalyptus grandis* in all the sampled sites, implying an increased risk of pitch formation during the pulping process.

Keywords

Gas chromatography–mass spectrometry;
Eucalyptus woods;
Lipophilic extractives;
Principal component analysis