

## Strategic combination of *Eucalyptus* species for the potential management of dissolving pulp quality

Roshini Govinden<sup>1</sup>, Lucretia Govender<sup>1</sup> and Tamara Bush<sup>2</sup>

<sup>1</sup>University of KwaZulu-Natal, <sup>2</sup>Forestry and Forest Products, CSIR, South Africa

Dissolving pulp is manufactured from *Eucalyptus*, pine and wattle in South Africa. The stored wood chips are vulnerable to degradation due to microbiological metabolism and spontaneous combustion. Use of these chips could result in poor pulp quality. This study describes the microflora indigenous to two *Eucalyptus* species and a combination of the two and determines whether there are any correlations between wood chip quality and chemical and physical properties of the wood species and their microflora before and after exposure to simulated weather conditions. Microbial strains were identified after sequencing of 16S and 18S rRNA amplicons separated by Denaturing Gradient Gel Electrophoresis (DGGE). Fungal and bacterial species were isolated, cultured, identified and screened for lignocellulolytic enzyme activity. Ninety two and 88% of the fungi isolated were capable of producing cellulase and xylanase, respectively. Preliminary results reveal correlations between the microflora, seasons (greater diversity and loading in summer) and the chemical and physical properties of wood chips (lower cellulose and viscosity in summer) as well as *Eucalyptus* species (significantly higher cellulose and viscosity for the combination and *E. nitens*). This investigation provides proof of concept that combining wood with different deterioration rates results in an overall increase in pulp quality. Indigenous microflora of each wood species may be one of the contributing factors to poor/good pulp quality, as significant correlations were made between enzyme production of microorganisms and pulp quality and yields.

### Biography

Roshini Govinden obtained her postgraduate degrees at the University of Marseilles (France), and KwaZulu-Natal (South Africa). She spent over 7 years at HIV Prevention Research Unit, MRC (Senior Specialist Scientist) as the Laboratory Manager, Project Leader and Principal Investigator of several clinical trials testing HIV prevention drugs. She is currently Senior lecturer in the Department of Microbiology (UKZN) and her research interests include biofuels, biopulping and engineering industrial yeast strains for ethanol production.

govindenr@ukzn.ac.za