

# Preface

The pulp and paper (P&P) industry is traditionally known to be a large contributor to environmental pollution due to its large consumption of energy and chemicals. Biotechnological methods, however, offer potential opportunities for changing the industry toward more environmentally friendly and efficient operations compared to the conventional methods. The importance of biotechnology lies in its potential for more specific reactions, less environmentally deleterious processes, energy savings, and capacity to be used in place of nonbiological processes. Increased pulp yield, improved fiber properties, enhanced paper recycling, reduced processing and environmental problems, and energy efficiency are all consequences of biotechnological processes in the pulp and paper industry. The number of possible applications of biotechnology in pulp and paper manufacture has grown steadily during the past 3 decades. Many applications have approached or are approaching commercial reality. Applications that have been successfully transferred to commercial use include xylanases for bleach boosting; cellulases for improved drainage; lipases for pitch removal; cellulase–hemicellulase mixture for deinking and fiber modification; esterases for stickies control; and levan hydrolase, proteases, cellulases, amylases, etc. for slime removal. “Biotechnology for Pulp and Paper Processing” gives updated information on various biotechnological processes useful in the pulp and paper industry; these processes could help in reducing environmental pollution problems, in addition to other benefits. Various chapters deal with latest developments in the areas like Tree improvement, Raw material preparation, Pulping, Bleaching, Deinking, Fiber modification, Slime control, Stickies control, Production of dissolving grade pulp, Shive removal, Vessel picking, Degradation of pollutants, Retting of flax, Treatment of exhaust gasses for removal of odorous emissions, and Biosolids management. *Biotechnology for Pulp and Paper Processing* also includes a chapter on Forest Products Biorefinery. Biorefineries actually can help pulp mills use by-products and residual products of the papermaking process to create additional high-value revenue streams. The major benefits, limitations, and future prospects of these processes have also been discussed.



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Bajpai, P.

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