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PAPER MILL SLUDGE AS A GOOD SUBSTRATE FOR ENZYME PRODUCTION BY OYSTER MUSHROOM (*PLEUROTUS OSTREATUS*)

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The largest by-product in pulp and paper industry is sludge and disposal is major solid waste problem for the industry (Battaglia et al., 2003; Geng et al., 2006). It was predicted that global production of paper mill sludge rise over the 50 years by between 48 and 86% over current levels (Mabee & Roy, 2003). The landfilling of waste paper mill sludge has become less achievable in recent years as environmental concerns have lead to rapidly increasing costs. Sanchez (2010) report that the mushrooms have economical, ecological and medicinal values. Their advantage is also that they are able to colonize and degrade a large variety of lignocellulosic materials and other wastes which are produced in agricultural, forest and food-processing industries. We studied the growth of oyster mushroom (*Pleurotus ostreatus*) on pulp and paper industry solid wastes. During the study, we investigated whether solid-state fermentation and growth substrates (de-inking paper mill sludge, primary sludge) are appropriate for *P. ostreatus* production of enzymes relevant to the pulp and paper industry. Following fermentation, extracellular protein was extracted and the specific activities of four enzymes were determined: the cellulase, xylanase, lipase, and peroxidase activities. These enzymes are used in the paper industry for the improvement of various industrial processes and in many other applications. Results show that *P. ostreatus* can grow on pulp and paper industry solid wastes, which will help to minimize the waste volume, and to decrease the ecological impact. Furthermore, these pulp and paper industry solid wastes are good substrates for the production of commercially interesting enzymes.

Biography

Mija Sezun has completed her PhD on biological and biotechnological sciences. Her doctoral thesis included the environmental biotechnology area. At the moment she is working at the Pulp and Paper Institute and mainly deals with biotechnology in the paper industry through the use of enzymes in the process of paper production. Currently researching the production of enzymes by using fungi by applying paper mill sludge, as the substrate for the cultivation of fungi. In addition to the fungal enzyme production she also deals with the use of commercial enzymes to improve the efficiency of processes in the paper industry.

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