

*The strain Rhodococcus erythropolis A4 is a source of enzymes nitrilhydratase and amidase, that catalyse conversion of nitriles and amides. These enzymes are used in industrial biotransformation and bioremediation. Since it was difficult to carry out genetic manipulations aimed at increasing the production of these enzymes in the strain A4, the corresponding genes (ami and nha1 + nha2) of a related strain R. erythropolis CCM2595, in which both plasmid and chromosome manipulations can be routinely performed, were identified and analyzed in this diploma theses. The ami and nha1 + nha2 genes from the strain R. erythropolis CCM2595 were isolated and sequenced together with the flanking regions (5.5 kb in total). The organization of these genes and the expected regulatory genes was described in the strain CCM2595 and mechanisms of regulation of expression of these genes were studied. For the analysis of transcription of amidase and nitrilhydratase genes from both strains of R. erythropolis, the promoter-probe vector pEPR1 replicating in Escherichia coli and R. erythropolis was used. Transcriptional fusion of Pami promoters of the strains A4 and CCM2595 and the reporter gfp gene were constructed. The activity of the Pami promoter was measured by means of fluorescence of gfp gene product (green fluorescent protein). Measurements of fluorescence of cells that carried the vector pEPR1 with the ami promoters from both examined strains showed that their activities are mostly constitutive and only to a limited extent induced by nitriles and amides.*