lular exudates when grown in defined media. Preparations of these exudates were employed at lab scale in the bating stage of the industrial leather tanning process, with very promising results as compared with other bacterial and commercial pancreatic extracts, namely in hand and physical tests such as texture, flexibility, bursting and elongation. The use of enzymes in the leather industry has been increasing over the last years. Beyond its traditional application in bating, enzymes can also be applied in soaking, and dehairing operations. It is desirable that the enzymes show good activity in the temperature range between 25 and 35 °C. This micro-organism was studied in order to improve its production of alkaline proteases in bioreactors (Lageiro et al., 2006). The chosen strategy for the study was the optimization of temperature and medium composition according to the maximum value of the specific growth rate obtained ($1.5 \pm 0.2\ h^{-1}$ at 40 °C) and then according to the highest protease production. Kinetic studies for protease production with chosen substrates were made. Bioreactors aeration, stirring speed and pH control optimization was made regarding the maximum protease production. It was also seen that a controlled pH of 8 causes a faster development of the microorganism but does not induce the protease activity, when comparing with a controlled pH of 7. It was also concluded that the protease production is much more effective when growth occurs without pH control; in this case, a protease activity of 66.9 ± 0.07 U/ml (by standard method Twining, 1984) was obtained.

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61.
Isolation and characterization of microorganisms from Arctic archipelago of Svalbard

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Extremophile research is supposed to have great potential for application in biotechnology. Enzymes from extremophiles could have similar mode of action like mesophilic homologues but could adapt to function in extremes conditions useful for application in biotechnology (Sellec and Chauduri, 1999).

Microorganisms were isolated from soil (three samples), glacier (seven samples) and a river (one sample) taken around Wrocław University scientific base in the Arctic archipelago of Svalbard were investigated. A collection of 130 morphologically distinct bacteria and 2 yeasts was obtained on nutrient agar or YPD medium using incubation conditions: 49 isolates at 10 °C, 48 isolates at 17 °C and 35 isolates at 23 °C. Out of 132 microorganisms 73% were Gram positive from which 50 rod-shaped bacteria and 49 *Actinobacteria* were not further analyzed. Biochemical API tests carried out on remaining 33 bacteria enabled identification of 18 isolates as: *Pseudomonas* (6 isolates), *Corynebacterium* (4 isolates), *Brevibacterium*, *Arthrobacter* (4 isolates), *Aeromonas hydrophila*, *Stenotrophomonas maltophila* (2 isolates). Further identification is carried out by sequencing of 16S rDNA.

Microorganisms were tested for their ability to utilize various constituents of petroleum, such as toluene, cyclohexane, heptane, hexodecane. All tested chemical compounds were utilized by four bacterial and one yeast species at room temperature during 6 days. These results indicate for the possibility of using new microorganisms to accelerate nature biodegradation rates in soils or water contaminated with petroleum hydrocarbons. Moreover the activity of lipases and proteases from investigated strains was checked. Ten species have lipases and 15 species proteases activity and three species seemed to be active in both enzymatic reactions.

The extreme diversity of the newly isolated microorganisms from various habitats, potentially enable catalysis of any reaction. The rate limiting steps are culture, screening, biochemical characterization and invention of new applications. Although microorganisms were isolated from pure environment which was not subjected to pollution, the isolated microorganisms have shown ability to degrade various carbohydrates typical for petroleum. Thus, further characterization of the collection and refining of culture conditions should give new enzymatic reagents for various industrial applications.

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62.
Production of *Grifola frondosa* enzymes on solid-state brewery industry wastes

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Spent brewery grains present a large economical burden to the brewery industry and big efforts are made to use spent grains as potentially valuable secondary raw material. *Grifola frondosa*, also known as Maitake, is a lignin and cellulose degrading basidiomycete with excellent nutritional and medicinal properties