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POSTER SESSION

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SELECTION ACCUMULATIVE CULTURE, PRODUCING HYDROGEN

Production of hydrogen from renewable basic materials such as organic waste or wastewater is a promising way for inexpensive and ecologically clean production of H₂. Waste from the food industry and agricultural waste rich in carbon compounds can be transformed into hydrogen and in addition fatty acids and alcohols. Selection and study hydrogen-forming bacteria are an important stage in obtaining molecular hydrogen as an energy source in the fermentation of organic waste.

Accumulative cultures which form hydrogen have been allocated from various ecosystems. The samples for cultivation of hydrogen-forming bacteria involved in experiment were such: bird droppings, cow manure, sludge from station of waste water treatment, soil after growing vegetables, soil after growing flowers. Accumulative culture obtained on medium with native potatoes as a substrate. Nutrient medium was prepared as follows: potatoes peeled, cut into pieces (1-2x1-2cm), then were bring in 100 ml glass bottles, fill up 2/3 of unsterile tap water, pH 7,0-7,5. Glass bottles with samples were boiled for 15 min and were inoculated culture medium and put down by rubber plugs, incubated at 30 °C for 7 days.

Growth accumulative culture was determined visually by turbidity of the liquid phase, the formation of gas (the bubbles in the medium and the formation of foam on the surface) and the destruction of potatoes. Gas compounds have been analyzed by gas chromatograph LHM-8MD.

It was determined that the fermentation accumulative culture form H₂ and CO₂, and water-soluble the exometabolites – acetate, propionate, methanol, ethanol. Culture the most actively produced hydrogen allocated from samples of bird droppings, sludge from station of waste water treatment and soil after growing vegetables (13,31%, 10,27%, 30,1% hydrogen, respectively). Culture from cow manure and soil after growing flowers were the least active (0,8%, 1,2% hydrogen, respectively).

Thusly, the obtained active accumulative culture capable of producing hydrogen from native potatoes, as main source of carbon, which will be use for future experiments on the selection of the association effectively producing hydrogen.