effect for removal of rhodamine B from wastewater compared with denitrifying bacteria loaded by zeolite.

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Evaluation of the biodegradation effectiveness of a persistent xenobiotic compound: Study of the influence of some process parameters

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This work aims to investigate the degradation of clofibric acid, a xenobiotic molecule, well-known as refractory conventional wastewater treatment process by a recently isolated bacterium from polluted effluents. The effects of several external factors such as: initial glucose concentration, initial pH and nitrogen source were evaluated in detail and optimized under batch experiments in agitated liquid cultures. Results revealed a significant influence of these parameters on bacterial growth and pollutant removal. From the experimental data, the optimum culture conditions for the pollutant removal were when bacterial growth took place under aerobic conditions, at 1 mg L^{-1} of CLA, 2 g L^{-1} of glucose, pH 7 and with 0.55 g L^{-1} of NH_4Cl as a source of nitrogen for an incubation time of 72 h. Obtained data also indicate the interest for utilization of this bacterium for the biodegradation of this refractory xenobiotic compound.

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Quality of tourist services – Analysis of tourist services from rural tourism wine-growing units

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The development and diversification of rural tourism services from the vineyards represents an actual and relevant theme for tourist research, with impact in all fields and subfields of the economic research area.

The paper proposes the approach of the vast issue of tourism services development, in connection with public services that contributes to their achievement, the approach covering both the theoretical plan of conceptually-methodological fitting from the field's literature, but also the concrete one of the empirical analysis. This aspect reveals the focus on an image of great accuracy, after our opinion innovative, through the rural vineyard area researched.

All this were realized based on the specialized analysis, of the field observation and the questionnaire application to the vineyards customers from the Recas area (Romania), on a sample of 1500 subjects, classified by gender, age, education, income, and to identify the model, was use the histogram of exigencies.

At the level of rural tourism vineyard units from Recas area, the diversification of the services is an important objective, in order to accomplish this objective, all the services offered by the tourist units are taken into consideration, focusing on the modernization, as well as on the improvement of the staff.

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Tourist product – An important element of ensuring the rural environment sustainability

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The combination between sustainable rural development and tourist units is a "must-have", as changing attitudes have been parallel to the preference for return to nature and various local products.

Starting from some studies that highlight the tourist's expectations from a rural tourism product (exceptional landscape, uniqueness, favorable price/value report, etc.), the aim of this research is the creation of a tourism product, including all elements (accommodation, food and recreation), which can sustain the sustainable development of the rural environment.

What makes that the personality of a rural location to be unique? The answer could be: architecture, location, type of activity. So, where to traditions, natural resources is added the rural cuisine, results a valuable tourist product which can be a "cure" to many of the rural areas' problems. Rural areas, which, finding an answer to this question, have made from rural tourism forms a way of life and additional income with which they pride themselves, the development of rural tourism forms in rural areas leading to a sustainable economic development of rural localities. A well designed rural tourist product attracts in the future other aspects of sustainable development: infrastructure creation, construction of accommodation base, trade improvement, etc.

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Heavy metal resistance of microorganisms from petroleum hydrocarbon contaminated soils located in Mersin, Turkey

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Refinery, production, transportation, storage of crude petroleum may cause to contamination of soils with polycyclic aromatic hydrocarbons (PAHs). Aromatic hydrocarbons and heavy metals are the major environmental issue that has been increased through industrial development. Aromatic hydrocarbons and heavy metals

are common environmental pollutants with toxic, genotoxic, mutagenic and carcinogenic properties. Microorganisms play a major role in cleaning of this pollution. Therefore, biodegradation using microorganisms is usually preferred. In this study, about 10 g of soil samples were aseptically collected from different petroleum contaminated sites in and around Mersin in Turkey. Bacteria were isolated from soil samples using an enrichment medium containing petrol and were isolated 38 bacteria. For heavy metal resistance selected mercury salt solution $HgCl_2$. Heavy metal resistance was determined by the plate diffusion method. The salt solutions for mercury were adjusted as 5 mM, 10 mM, 15 mM and 20 mM. The most resistance results were obtained from the FH5-3, FH 2-3 and FH 1-4 of bacterial cultures. However, the most sensitive resistance results were obtained from FH 1-5, FH 5-6, FH 7-1 and FH 7-2 of bacterial cultures.

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The removal of pentachlorophenol with laccase as polyphenol oxidase and the toxicological evaluation of the degradation products

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To further explore the importance of toxicological estimation after enzymatic treatment, we studied the removal results of pentachlorophenol with laccase as polyphenol oxidase and the synthetic effluent. Additionally, we investigated the influence of enzyme load (4.55–134.28 U mL^{-1}), pentachlorophenol concentration (2–75 mg L^{-1}), reaction time (0–25 min), and hydrogen peroxide concentration (5–820 μmol L^{-1}). The results indicated that the maximum removal percentage of pentachlorophenol was 87.4% after 14 min of reaction time when experimental parameters were as following: hydrogen peroxide 101.2 μmol L^{-1}, enzyme 74.3 U mL^{-1} and pentachlorophenol 45.9 mg L^{-1}. *Lactuca sativa* and *Artemia salina* were used to estimate the toxicity of the products which appeared after enzymatic treatment. Above results indicated that laccase was very efficient for removal of pentachlorophenol, simultaneously, the products which were obtained after enzymatic action indicated relatively high toxicity. The lethal concentration LC50 which was gained for *Artemia salina* was 52.7% and the inhibition concentration IC50 which was obtained for *Lactuca sativa* was 26.9%. Moreover, the enzymatic treatment should be united with other kinds of treatment for further degradation and toxicity reduction of pentachlorophenol.

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Waste gas biotreatment

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Biotechnology has been applied to find green and low cost environmental processes in the waste gas treatments. Odorous and volatile organic compounds emissions represent a serious problem related to biowaste treatment, because they may be carried away several kilometres, depending on weather and topographical conditions.

The most used systems are the biofilters, working in normal operating conditions in terms of temperature and pressure. Due to this, they are relatively cheap and highly efficient.

Waste air bio-treatment with biofilters was developed as a reliable and cost-effective technology, the pollutants biodegradation by microorganisms leading to harmless end-products. Biofilters are also efficient systems for odorous off-gases from composting processes treatment.

Results revealed that the main part of the volatile organic compounds load was degraded within the biofilters. As a conclusion, the benefits of the biotechnology use, such as environmental monitoring and inspecting, pollutant removal, soil and groundwater treatment, molecular nanotechnology, green energy and so on, really make the great changes in our environment and living life.

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Okara valorization process by fermentation with *Bacillus licheniformis*: Obtention of hydrolytic enzymes, bioactive compounds, and protein hydrolysates

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Okara is a by-product obtained during the manufacturing process of soy milk that has a great potential for food industry due to its richness in proteins and high content in bioactive compounds (isoflavones). However, it is underused due to its low bioavailability caused by its high fiber content and insolubility. *B. Licheniformis* is a Gram-positive bacterium used in the biotechnology industry to produce industrial enzymes (proteases, α-amylase, lipases, chitinases, etc.) that also can be used to modify unsoluble by-products and hence obtain highly valuable biological products. The aim of this work was to develop a biorefinery process of Okara using fermentation with *B. Licheniformis* as a biological tool. Once the optimal fermentation conditions (pH, temperature, substrate concentration) were determined, we obtained a new product that was rich in enzymes (proteases and lipases) and where the organic matter from Okara was modified by the hydrolytic enzymes excreted by *B. Licheniformis*. In second place, a biorefinery process to separate the valuable fractions – (1) hydrolytic enzymes, (2) soluble protein hydrolysates, and (3) soluble extracted bioactive compounds – was evaluated. This separation was designed using size