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Analysis of DNA sequence in segmentation, multivariate probability measurement and one-dimension visualization

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In the face of vast amounts of genetic data, how to make use of biological information technology to show the characteristics of the DNA sequence efficiently and quickly is a kind of frontier thesis. In this report, segmented statistical analysis technology is used to measure DNA sequence and one dimensional visualization. Aiming at the measuring sequence, we use segmentation, multivariate probability statistics method to determine the base content in field through one-dimension visualization method to show the distribution trend and characteristics. Taking advantage of the model, different DNA sequence testing results such as human's, animal's, plant's, sample data and the visualization results will be unfold in this report.

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Development of microwave physio-chemical pretreatment method for the bioconversion of wheat straw waste into biogas and value added product

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Biofuels produced from various lingocellulosic materials such as wood, agricultural or forest residues have the potential to be a valuable substitute/complement to gasoline. Many physicochemical structural and compositional factors hinder the hydrolysis of cellulose present in biomass to sugars and other organic compounds that can later be converted to fuels. The goal of pretreatment is to make the cellulose accessible to hydrolysis for conversion to fuels. Various pretreatment techniques change the physical and chemical structure of the lignocelluloses biomass and improve hydrolysis rates. During the past few years, large number of pretreatment methods has been developed including alkali treatment, ammonia explosion and others. Many methods have been shown to result in high sugar yields, above 90% of the theoretical yield for lignocelluloses biomasses such as woods, grasses, corn and so on. Lignocelluloses are often a major or sometimes the sole components of different waste streams from various industries, forestry, agriculture and municipalities. Hydrolysis of these materials is the first step for either digestion to biogas (methane) or fermentation to ethanol. However, enzymatic hydrolysis of lignocelluloses with no pretreatment is usually not so effective because of high stability of the materials to enzymatic or bacterial attacks. Pretreatment of lignocelluloses materials to disrupt their recalcitrant structures is a crucial step in biofuel production. Most pretreatment processes require a high temperature reaction which is often achieved through conventional heating. The present work illustrates about the microwave method for pretreatment of lignocelluloses wastes for conversion to biogas. In this study, microwave-based heating was used to pre treat wheat straw via soaked in water, presoaked in different concentrations of alkali solutions and then treated by microwave or conventional heating. Finally, the effects of temperature, solid content and treatment time on microwave pretreatment of wheat straw were investigated. Thermal and alkaline microwave treated rice straw was anaerobically processed in continuous stirred tank reactor at particular rpm temp and pH condition to biogas. Quality and quantity of biogas/gm of biomass and NPK of spent slurry was estimated.

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