

## Application of an immobilization technique for the production of protease from *Bacillus subtilis*

Harini G Krishna Murthy  
India

As the demand for proteases increases, it was expected that active strains could be used as catalysts in different industries. Alkaline protease produces rapid lysis of viscous exudates, show good results in the treatment of inflammation foci and edemas, accelerates and potentiates the effect of antibiotics and sulfamide preparations and decomposes viruses and bacterial toxins. In the present work, the strain employed was *Bacillus Subtilis*. The genus *Bacillus* was erected by Cohn in 1872 to accommodate a bacterium described by C.G. Erhenbergis 1835 as *vibrio subtilis*. And it had growth at 37°C, in a shaker incubator. Cheaper sources of both carbon and nitrogen sources are the key attraction for the commercialization of the production process and thus ability of the microbial agent to grow and produce enzymes using these sources has been arguably a point of interest (Mehta. V & Kanekar. P.P et al). Using batch fermentor was done by the mass production of protease (72 Hrs). The optimal conditions for enzyme production were PH-8.0(3273U/ml), citric acid and mannose as carbon sources and yeast extract as nitrogen source along with salts. The enzyme was immobilized on calcium alginate by cell entrapment. Protease immobilization is important in many applications, such as biosensors, bioorganic synthesis and protein hydrolysis, heterogeneous biocatalysts, selective absorbents, controlled released protein drugs, analytical device and solid phase protein chemistry. The optimal reaction temperature of enzyme was 160C (2967U/ml). The immobilization process significantly improved thermal and storage stability (1hr at room temperature and at 5°C it will be up to 1-2 months) of the free enzyme. These were 5°C-70°C. Centrifugation was done at 27°C, and productivity was improved after immobilization than free enzyme. Immobilized Enzyme activity was 1000% more than free enzyme Activity. The Protein estimated in enzyme assay at 300nM was 47.5KDA.

## Comparison of tree diversity in both burned and unburned area of the central Zagros forest

Mazer Hydari  
Iran

Fire is a natural ecological disturbance factor in forest. The study area is located at Jalavand forest, Kermanshah Province, Central Zagros Forest, Iran. The fire event occurred in 2008 where 15 ha of forest were burned in 1 days and sample collection was done 4 years later in 2011. In each study area 30 plots 5 R were random methods. Trees species and number of tree were recorded in circle sample plots. Species richness indices were used. The means of different diversity indices were calculated and t-test was used. To analyze data we used the biodiversity and spss16 software. The results indicated mean species Shannon index: 1.19 and 1.84, Simpson index: 0.61 and 0.78, Menhinik index: 0.82 and 1.41, Margalev index: 1.11 and 2.15 in burned and unburned area. Results showed statistically significant differences in diversity indices. The quantity of biodiversity index and number of species were higher in the burned area.

maziarheidari1364@gmail.com