Screening of Nattokinase Enzyme Producing Microorganisms

Rajani Gopal Gad*[1,2], V Sheela[1], S Nirmala[2]

[1]Synkromax Biotech Pvt Ltd, Chennai, India, [2]SRM University, Ramapuram Campus, Chennai, India

Nattokinase is a potent fibrinolytic enzyme, which belongs to the group of alkaline serine protease. Nattokinase was first derived from *Bacillus subtilise* var *natto*, isolated from traditional Japanese soybean food, Natto. This enzyme offers a completely natural means of preventing and dissolving blood clots. It closely resembles plasmin and actually enhances the production of plasmin. It is a potent cardiovascular drug and the enzyme activity is enhanced in the plasma for a longer half-life with oral administration. Compared with conventional clot dissolving drugs, Nattokinase has several advantages, such as, safety, convenience, oral administration, confirmed efficacy, prolonged effects, preventive effect, low cost and stability in gastrointestinal tract and these characters make Nattokinase a promising oral medicine for thrombolytic therapy.

Nattokinase is truly a multidimensional nutrient supplement and can play a key role in treating hypertension and hypercoagulation. It has a 4-fold greater thrombus dissolving ability than plasmin and very efficiently initiates endogenous fibrinolysis by cleavage and inactivation of plasminogen activator inhibitor-1. This ultimately leads to efficient lysis of detrimental coagulation of blood in the body. This enzyme is classified under Nutraceuticals and available as an OTC product. Best Nattokinase, New Nattokinase, Nattokinase X-tra, Nattozymeetc are some of the brand names available in the market..

In this research work, as a first step, massive isolation work was carried out in order to screen for Nattokinase producing microorganisms. Seventy cultures were isolated from various sources and preliminary plate assay method (hydrolysis of casein) was carried out. Out of these seventy cultures, thirty three were shortlisted, which were very much positive in the preliminary plate assay method. *Bacillus sp*, which exhibited high enzyme activity at pH 8.0 and above and at a temperature of 37°Cwas selected for further studies. The physiochemical properties of these enzymes have been characterized and their effectiveness in thrombolysis *in vitro* has been further studied.