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Improvement of ramoplanin production by submerged fermentation of *Actinoplanes* sp. ATCC 33076 using metal sulfates

Deniz Erkan and **Hulya Ayar Kayali**
Dokuz Eylul University, Turkey

Ramoplanin is a cell wall active lipoglycodepsipeptide antibiotic produced by fermentation of *Actinoplanes* sp. ATCC 33076. It is considered as the last resort antibiotic for the treatment of hospital infections including VRE, MRSA and CDAD. Ramoplanin is expected to be marketed in the forthcoming years. However, it's quite expensive price reveals the need for the low-cost but high efficiency ramoplanin production. It has been known that trace metals impact secondary metabolite production of microorganisms. Thus, we investigated the effects of zinc, iron and manganese on ramoplanin production. The final concentrations of metal sulfates were 15, 45 and 75 ppm. The optimal concentrations were determined as 75 ppm for iron and zinc and 15 ppm for manganese. Zinc significantly stimulated ramoplanin production and the highest ramoplanin yield was determined as 647.415 mg/L (7.782 fold of basal medium). The highest ramoplanin yields in the optimum concentrations of manganese and iron were determined as 251.073 mg/L (3.018 fold of basal medium) and 103.855 mg/L (1.248 fold of basal medium), respectively. The pH levels, extracellular protease, amylase and lipase activities, extracellular total protein and reducing sugar levels with respect to the varying trace metal type and concentrations were also investigated. It was observed that the limited utilization of carbon and nitrogen sources stimulated ramoplanin production. In conclusion, addition of optimal concentrations of zinc, iron and manganese sulfates were found effective in improvement of ramoplanin production. Optimization of trace metal complex containing media or development of trace metal feeding process may further enhance ramoplanin production.

Biography

Deniz Erkan has completed her Master's degree in Biotechnology at Dokuz Eylul University, Izmir, Turkey in 2015 and she is currently a PhD student of Biotechnology at the same university.

denizerkan87@hotmail.com

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