



Research Paper

EFFECT OF SUBMERGED CULTURE PARAMETERS ON GROWTH AND ANTIMICROBIAL ACTIVITY OF *PAENIBACILLUS LAUTUS* RRT AY-2, AGAINST SOME PATHOGENS OF *ANTHRAEA ASSAMENSIS* HELFER

D. K. Gogoi^{1*}, S. P. Sandilya¹, P. M. Bhuyan¹, P. Dutta¹, K. Neog¹, L. S. K. Singh² and T. C. Bora²

¹Department of Biotechnology, Central Muga Eri Research and Training Institute, Central Silk Board,
Jorhat 785700, Assam, India.

²Department of Biotechnology, North East Institute of Science and Technology, Council of Scientific and Industrial Research,
Jorhat 785006, Assam, India.

*E-mail: gkdeep@rediffmail.com

ABSTRACT

Antheraea assamensis Helfer, which is endemic to North-eastern India and produces golden yellow silk, is prone to various entomo-pathogenic microorganisms due to outdoor nature of rearing. A bacterial strain isolated from a hot-spring of India and identified as *Paenibacillus lautus* RRT AY-2 was found to possess antimicrobial potentialities against some of the muga silkworm pathogens. The *in-vitro* culture parameters of the bacterium were optimized for growth and maximum production of the antimicrobial agent. Maximum growth as well as production of the antimicrobial agent was recorded at 35 °C with pH 7.5 in liquid media supplement with glucose and beef extract as C and N sources, respectively. *P. lautus* RRT AY-2 reached its maximum growth on 48 h of incubation, while it recorded the maximum antimicrobial activity at 54 h and specific rate of product formation was maximum in between 18 and 24h. Amendment of glutamic acid, aspartic acid and leucine in combination with glucose enhanced the growth as well as biosynthesis of the bioactive molecule. Glucose concentration of 1.2 % and NaCl at 2 % was found to be optimum for production of the antimicrobial agent. The solvent extracted crude antimicrobial compound was partially purified by Thin Layer Chromatography. The TLC purified active compound with UV λ -max 260 nm in ethyl acetate has got the lowest minimum inhibitory concentration (MIC) against *Bacillus sp.*, whereas the highest MIC was recorded against *Pseudomonas aeruginosa*. This bacterium may be utilized on muga silkworm to develop colonization resistance against pathogenic microbes as an alternative strategy for disease management.

Key words: Antimicrobial agent, hot-spring, MIC, *Paenibacillus lautus* RRT AY-2.