

Selection and identification and characterization of *Bacillus coagulans* from pig excrement and cattle rumen fluid ⁽¹⁾

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Abstract

Bacillus belongs to gram-positive bacteria that can secrete extracellular enzymes, form of spores to progress into dormancy and less likely to receive impact from the external environment, which is also suitable a feed additive for livestock and poultry. The objective of the study is to select and identify *Bacillus coagulans* with acid and bile salt-resistant and sporulation ability from pig feces and cattle rumen fluid. The 10 candidate strains of *Bacillus coagulans* were selected by screen culture agar and medium from pig feces and cattle rumen fluid, respectively. The strains were heated to 45°C for 24 hours to induce sporulation, and further heated up to 90°C for 30 minutes to kill non-sporulation of strains and 16S rDNA nucleotides BLAST, in order to identify the DNA similar to *Bacillus coagulans*. Subsequently, 6 candidate strains of bacillus coagulan were selected. Then treatment with pH 2 and 2% bile salt culture medium for confirming the acid and bile salt-tolerance ability and use of MALDI-TOF MS were applied to identify microbial species. The results showed that 5 candidate strains (R6, R8, R9, S7S and S10) belonged to *Bacillus cereus* and only R3 strain belonged to *B. coagulans*. In addition, the *B. coagulans* sporulation ability of R3 exceeded 1×10^8 cfu/mL. In conclusion, the *B. coagulans* R3 isolated and identified from cattle rumen fluid possessed the characteristics of acid and bile salt-resistant and sporulation ability, which had the potential to be used as a feed additive in livestock ration.

Key words: *Bacillus coagulans*, Rumen fluid, Sporulation ability.

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