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Processing of the lignocellulosic matters with cellulolytic bacteria isolated from the one hump camel foregut

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Abstract

Agricultural by-products are frequently used to feed livestock, but they often have low nutritional value. This study was conducted to improve nutritional value of wheat straw using cellulolytic bacteria isolated from the foregut of dromedary camel. Rumen fluid was collected from four fistulated camels. The cellulose-hydrolytic bacteria were isolated by using medium amended with carboxymethyl cellulose (CMC). The activity of carboxymethyl cellulase (CMCase) was determined by measuring the release of reducing sugars. The optimum pH and temperature for growth and CMCase activity of the isolates were determined. Three isolates (SH13, SH2, and SH22) showed maximum hydrolysis capacity and were selected for further investigation. The analysis of 16S rRNA gene sequences of these isolates showed that the isolates possessed 99, 94 and 98% similarity with *Escherichia coli*, and *Enterobacteriaceae*, respectively. Wheat straw was incubated with the isolated bacteria in liquid medium for 6 weeks. The results showed inoculation with SH22 isolates resulted in the highest disappearance of dry matter and crude protein content, and the lowest amount of neutral detergent fibre (NDF), iNDF and acid detergent fibre (ADF). Treatment with SH13 isolate had the highest digestibility of NDF and ADF, and treatment with SH2 had the highest truly degraded organic matter (TDOM) and partitioning factor (PF). Our data suggest that maybe bacteria isolated from camel foregut can increase digestibility and enhancing nutrition value of wheat straw.

Key words: Camel, Cellulolytic bacteria, Digestibility, Wheat straw

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