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Effect of Lignocellulose-Degrading Bacteria Isolated from Termite Gut on the Nutritive Value of Wheat Straw as Ruminant Feed

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Abstract : This study was conducted to investigate nutritive value of wheat straw processed with termite gut symbiotic bacteria with lignocellulosic-degrading potential including Bacillus licheniformis, Ochrobactrum intermedium and Microbacterium paludicola in vitro. These bacteria were isolated by culturing termite guts contents in different culture media containing different lignin and lignocellulosic materials that had been prepared from water-extracted sawdust and wheat straw. Results showed that incubating wheat straw with all of three isolated bacteria increased ($P<0.05$) acid-precipitable polymeric lignin (APPL) compared to control, and highest amount of APPL observed following treatment with B. licheniformis. Highest and lowest ($P<0.05$) in vitro gas production and ruminal organic matter digestibility were obtained when treating wheat straw with B. licheniformis and control, respectively. However, other fermentation parameters such as b (i.e., gas production from the insoluble fermentable fractions at 144h), c (i.e., rate of gas production during incubation), ruminal dry matter digestibility, metabolizable energy, partitioning factor, pH and ammonia nitrogen concentration were similar between experimental treatments ($P>0.05$). It is concluded that processing wheat straw with isolated bacteria improved its nutritive value as ruminants feed.

Keywords : termite gut bacteria, wheat straw, nutritive value, ruminant
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