



***In-vitro* Effects of Exogenous Fibrolytic Enzymes Cellulase and Xylanase on Ruminant Fermentation and Methanogenesis of Wild Guinea Grass (*Panicum maximum*) and Rice straw (*Oryza sativa*)**

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Abstract

Effects of exogenous Cellulase and Xylanase enzymes mixture (XC) on *in-vitro* fermentation of *Panicum maximum* (PM) and *Oryzasativa* [Rice straw (OS)] were evaluated in a series of experiments under batch culture system. Using a Completely randomized design, 500mg dry matter each from PM and OS were incubated for 24h with Cellulase and Xylanase mixture 1:1 ratio at 50, 100, 150, 200 μ l levels. It was repeated thrice. Total *in vitro* gas production (IVGP) improved significantly ($p < 0.05$) in enzyme treated samples as compared with the control for both PM and OS. Concentration of 200 μ l XC (T4) resulted in the highest IVGP for both PM and OS. Further, XC improved *in-vitro* dry matter digestibility (IVDMD) of both PM and OS significantly ($p < 0.05$) as compared with the control. Highest IVDMD for PM and OS were with T1 and T3, respectively. Highest total Ammonia-N percentage (NH₃-N%) in fermentation for PM and OS were with T3 and T4, respectively. In protozoa count T2, T3 and T4 were reduced compared to the control with OS. Finally it can be concluded, that supplementation with XC improved IVDMD of both PM and OS. T1 with PM and T3 with OS were the most effective enzyme levels for their IVDMD. Further use of fibrolytic enzyme is an effective way to improve ruminal fermentation characteristics of fibrous feeds as well as a way to significantly reduce methanogenesis. However, further investigations are necessary to identify the optimum levels of XC.

Keywords: Cellulase, Xylanase, dry matter digestibility, Methane