Effects of glycerol and chestnut tannin addition in cassava leaves (Manihot esculenta Crantz) on silage quality and in vitro rumen fermentation profiles

ABSTRACT

The effects of glycerol and chestnut tannin addition on non-ensiled and ensiled cassava leaves which were then incubated in an in vitro rumen system were investigated to evaluate the ensiling characteristics and fermentation profiles, respectively. Both non-ensiled and ensiled cassava leaves were prepared using laboratory-scale minisilos with 4 different treatment types of additives. The treatments were Control (cassava leaves without additive [S0]), Cassava leaves + 3% dry matter (DM) of glycerol (SG), Cassava leaves + 3% DM chestnut tannin (ST), and Cassava leaves + 3% DM glycerol + 3% DM chestnut tannin (SGT). The cassava leaves silage recorded with high concentration of lactic acid, negligible amount of butyric acid, and low concentration of ammonia-N, demonstrates a well-preserved silage quality after 4 weeks fermentation. The in vitro total gas production and volatile fatty acid (VFA) concentration did not differ between the treatment groups, but the in vitro dry matter digestibility (IVDMD) and the in vitro organic matter digestibility (IVOMD) increased after the ensiling process. The addition of glycerol alone or in combination with chestnut tannin showed propiogenic property in the non-ensiled cassava leaves. Chestnut tannin, when added singly or in combination with glycerol, reduced the ammonia-N and iso-VFA concentration in the ensiled cassava leaves. Furthermore, the addition of glycerol and/or chestnut tannin improved some of the silage quality and showed no detrimental effects on the in vitro rumen fermentation profiles.

Keyword: Cassava leaves; Glycerol; Tannin; In vitro; Rumen fermentation