ABSTRACT

Cassava leaves serves as a source of alternative proteins for people in developing countries who could not easily access the available protein sources. However, its use is limited by the presence of toxic compounds, particularly cyanogenic glycosides. Thus, use of appropriate processing technique is indispensable to reduce the toxic compounds to a safer limit before utilization of cassava leaf. The objective of this study was therefore to evaluate the effect of *Lactobacillus plantarum* and *Saccharomyces cerevisiae* strains, and their co-culture on nutritional contents and antinutritional factors of cassava leaf during fermentation. A 4 × 5 factorial experimental design was used to determine the effect of fermentation setups and time on chemical composition, antinutritional contents, in vitro protein digestibility and mineral contents of cassava leaf. During 48 h of fermentation, a significant change ($p < 0.05$) in moisture, protein, fiber, fat, and ash contents were observed. Protein content was improved by 34.91%, while in vitro digestibility of protein was improved by 28.07% during 48 h of *L. plantarum* fermentation. Cyanide, oxalate, tannin, and phytate contents were decreased significantly ($p < 0.05$) for all fermentation setups. The highest reduction in cyanide (97.17%) and oxalate (86.44%) was achieved under *L. plantarum* fermentation. The highest reduction in tannin (93.25%) and phytate (91.11%) was achieved under co-culture fermentation of cassava leaf. A significant ($p < 0.05$) reduction of mineral contents except iron was observed during 48 h of fermentation. A significant ($p < 0.0001$) strong negative correlation was found between protein with cyanide (−0.8164), oxalate (−0.7991), phytate (−0.7851), and tannin (−0.6906). In vitro digestibility of protein also showed a strong significant ($p < 0.0001$) negative correlation with phytate (−0.9628), oxalate (−0.9407), cyanide (−0.9305), and tannin (−0.8493). Application of *L. plantarum* and *S. cerevisiae* in cassava leaf fermentation showed significant improvement of nutritional qualities by reducing the antinutritional factors and toxic compounds. Fermentation of cassava leaf using these strains ascertain utilization of cassava leaf for human consumption to tackle protein energy malnutrition.