

ABSTRACT

The effect of short-term storage on the protein, phosphorus and phenolic content as well as peroxidase and o-diphenolase activities of cut, harvested Jamaican yam (*Dioscorea* Sp.) tubers (*D. rotundata*, *D. alata* and *D. cayenensis*) was studied. There was an initial increase in the total phenolic content up to the third week of storage followed by a gradual decrease to the sixth week. Phenolic content was found to be highest in *D. cayenensis* followed by *D. rotundata* and *D. alata*. The activities of peroxidase (EC 1.11.1.7) and o-diphenolase (EC 1.10.3.1) increased steadily up to the third week of storage and thereafter decreased to the fifth week. The intensity and rapidity of browning in the tubers when cut correlated very closely with the tuber o-diphenolase level and phenolic content while the onset of rotting correlated with the peroxidase activity levels in the cultivars studied.

The changes in glutathione, β -amylase, peroxidase and o-diphenolase levels were assayed

periodically during sprouting of minisetts obtained from the head, middle and tail sections of *D. alata* (cv. Sweet Yam) and *D. cayenensis* (cv. Round Leaf). The levels of these biochemical parameters were also assayed in sprouting and dormant tuber sections of both species. In both species the head portions exhibited highest activities followed by the middle and tail respectively also the sprouted tubers demonstrated higher activities when compared with the dormant tubers.

Minisetts obtained from the head, middle and tail sections of *D. alata* tubers sprouted uniformly whereas those obtained from *D. cayenensis* tubers showed a much slower sporadic sprouting pattern, with the head portions displaying dominant sprouting. Our results revealed that sprouting initiation of the minisetts from both species correlated well with increased glutathione levels, high levels of peroxidase and reduced levels of o-diphenolase.

Corroborative treatment of *D. cayenensis* minisetts using ascorbic acid (0.2%) gave improved sprouting rates. Treatment with a mixture of

thiourea (1.0% w/v) and ascorbic acid (0.2% w/v) gave improved sprouting in the tail derived minisettes only when compared to a control experiment using distilled water as treatment.