



PHYSIOLOGICAL STUDIES ON POSTHARVEST PHYSIOLOGICAL DETERIORATION OF CASSAVA TUBER

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ABSTRACT: Cassava (*Manihot esculenta*) is the most important root crop in the tropics and due to its drought tolerance, ability to grow in poor soils and resistance to herbivore, Cassava is well suited for cultivation by subsistence farmers. However, the short shelf life of the tuber due to Postharvest Physiological Deterioration (PPD) which limits cassava's economic and industrial potential. PPD in cassava is rapid, begins within 24 to 48 hrs after harvest and it release cyanide (HCN) which leads to oxidative burst of Reactive Oxygen Species (ROS). Several years of research have been accumulating evidence to consider PPD as a wounding stress deficient process involving changes in enzymatic activity and oxidative stress. The visible signs of deterioration are vascular streaking with a blue or black discoloration that renders the tubers unpalatable and unmarketable. However, this study pave the way for understanding the mechanisms behind this and gives practical solution for farmers to lengthen the shelf life of the tubers by delaying the onset of PPD.

Keywords: Cassava, constraint, genotypes, physiological and biochemical, postharvest physiological deterioration

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INTRODUCTION

Cassava (*Manihot esculenta* Crantz) is a vegetative propagated shrub belonging to the Euphorbiaceae family. In the tropics, where it is a major staple food crop, cassava is the 4th most important source of calories. Resilience to drought and disease and tolerance to low-soil fertility enable it to grow well under a wide range of climatic conditions, where few crops could survive without costly external inputs. Despite these agronomic advantages, cassava storage roots are far more perishable after harvest compared to other storage root and tuber crops, such as sweet potato, true yam, corn and potato. Therefore, cassava is range as a sensitive species of postharvest deterioration. The rapid deterioration of cassava storage roots significantly shortens its shelf-life for fresh consumption and impacts transportation and potential for income generation (Iyer *et al.*, 2010). This phenomenon is known as postharvest physiological deterioration (PPD).

Cassava tuber damage during harvest alters the equilibrium of natural physiological process of the exposed cells and subsequently their oxidative burst. Since PPD is a complex biological phenomenon, it is expected to involve early events (Buschmann *et al.*, 2000) as the observed dark strips of vessels due to oxidation of cell components (Reilly *et al.* 2004) as tissue wounding reaction (Beeching *et al.*, 2002). Later on, deterioration of cell allows microorganism growth. This review summarized the current knowledge on PPD is the challenging factor for cassava growers, processors and consumers.

MAJOR CONSTRAINT ON CASSAVA PRODUCTION

World production of cassava in 2017-18 was estimated at over 277 million tones. In cassava cultivation, India ranks 25th in area, 11th in production and 1st in productivity (34.95 ton/ha). India exports several forms of cassava product like raw cassava tuber, starch and sago. Tamil Nadu and Kerala together account for 98