Title Pre- and post-harvest factors influencing the quality of Uapaca kirkiana fruit

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Abstract

Utilization of *Uapaca kirkiana* (Muell. Arg), a highly valued indigenous fruit of the miombo woodlands in Africa, is limited by a short shelf life and quality variability after harvest. Possible factors contributing to these postharvest problems have been evaluated in Malawi and Zimbabwe. A study to determine relationships between fruit yields and quality, and soil and tree factors in wild natural stands showed that trees were associated with acidic, low fertility soils and generally contained low leaf K, Ca, Zn, B and P. Fruit yields varied among and within sites between 2002 and 2004, suggesting alternate bearing, and showed strong associations with canopy size, yields in preceding years and some soil and foliar nutrients. Interviews with fruit gatherers, who were also selling the fruits, revealed that harvest timing was based on experience, season, color changes, natural abscission, taste and morphological changes such as fruit size. Early in the season, fruit were harvested by forcefully knocking them down from trees, followed by incubation in soil, clay pots, plastic bags and baskets at home to induce ripening. Cracking constituted the highest form of damage in fruit sampled from roadside markets. Analysis of fruit quality at harvest and after storage identified large variations in size, color at harvest and during storage, and soluble solids concentrations (SSC) after ripening within and among trees. With increasing harvest date, fruit weight loss during storage and postharvest skin darkening decreased while color at harvest and SSC of ripened fruit increased. Postharvest damage to unripe fruit and exposure of ripe ones to direct sun caused more fruit skin darkening. Fruit stored at ambient temperatures softened to acceptable levels within three days of harvest. Storage in clay pots hastened fruit softening, but cold storage delayed softening, providing opportunities for prolonging storage life. On average, ripe fruit were acceptable for sale for only 3-4 days. The study demonstrated important linkages among preharvest, harvest and postharvest factors and their influence on *U. kirkiana* fruit quality. Changes in fruit physiological status influenced postharvest handling practices by fruit gatherers, providing a basis for further postharvest research to improve storage, quality and shelf life.