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Biochemical status of fruit under the influence of post-harvest fungi: A review

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Abstract
Present research article deals with biochemical changes in fruits due to post-harvest fungi.

Keywords: Fruits, post-harvest fungi, biochemical content

INTRODUCTION

Fruit constitute an important part of human diet. Fruits are rich sources of sugars, amino acids, organic acids, vitamins and other nutrients but during pathogenesis various fungi and bacteria cause rot to a number of fruit cause biochemical changes which reduce their food and market values considerably [1] and [2].

Changes in sugar content

Tandon (1970) [3], Pandey et al. (1974) [4], Fush et al. (1980) [5] Reddy and Laxminarayana, (1984) [6] found that *Aspergillus niger* reduced sugar content in mango fruits. Chaudhary et al. (1980) [7] reported that *Pestalotia anonicola*, *Stachybotrys* sp. and *Trichderma viride* were decrease the total sugar and increase the reducing sugar. Similarly *Cladosporium oxysporum* and *Drechslera rostrata* loquat and capegoose-berry, respectively utilized their total sugar contents within ten days [8]. Singh and Sinha (1982) [9] found that *Aspergillus flavus* and *A. parsiticus* cause depletion in total, reducing and non reducing sugars of *Citrus sinensis* fruits. They found that decrease in total, reducing and non reducing sugars of guava fruit was observed due to *Aspergillus flavus* and *A. parsiticus*. Bilgrami et al. (1983) [10] revealed that there was sharp decline in the level of total, reducing and non reducing sugars of dry fruit during *Aspergillus flavus* infestation. Recently Sawant and Gawai (2011)[11] found that *Rhizopus stolonifer, Aspergillus flavus, Penicillium digitatum, Curvularia lunata* and *Fusarium moniliforme* were responsible for decrease in total sugar and increase in reducing sugar content of papaya fruit. Sawant and Gawai (2011a) [12] also reported that *Aspergillus niger, Fusarium roseum, Rhizopus stolonifer* and *Gleosporium musarum* were decreases the total sugar and increases the reducing sugar content of banana fruits. Gadgile (2011) [13] reported that *Aspergillus niger* caused the changes in sugars in mango pulp.

Changes in ascorbic acid

Nutritive value of fruits is mainly due to their high vitamins contents especially vitamin C. Anola, guava, mango, papaya and Indian plum are good sources of ascorbic acid. Vitamin C of fruits decreased by post-harvest fungi [2].

Tandon (1970) [3] found that ascorbic acid of mango pulp was decreased due to *A. niger*. Vitamin C content of mango fruit was depleted by *Phomopsis mangiferae* and *Phoma exigua* (Reddy and Laximinarayan, 1984 [6]). Similarly (Arya, 1993) [2] found the mango fruit infected with *Botryodiplodia theobromae* showed decrease in vitamin C content. Similar observations have been reported in guava [14] and[15], apple [7], [16], [6] and [17]), banana [18], Jujube [19], citrus [20], Musambi [9].

Changes in amino acids

Amino acids are chief structural component of plant cell and building block of protein. During pathogenesis fungi bring about changes in the amino acids of different fruits they are either depleted or new ones are produced [2]. Rai (1982) [21] and Arya and Lal (1986) [22] observed that post-harvest fungi are responsible for increase amino acid content in different fruits.

Changes in ash content

Ash contains all minerals. Fruits are rich source of source of minerals like calcium, phosphorous, sodium, magnesium and other minerals needed by the body [2]. *Aspergillus fumigatus* and *Penicillium digitatum* deteriorated maximum ash content in Local and Kesar variety respectively Verma et al. (1991) [23] reported *Aspergillus niger, A. fumigatus* and *A. luchuensis* were slightly decrease the ash content in bael fruits. Recently Sawant and Gawai (2011) [11] found that ash content of papaya fruit was depleted by *Rhizopus arrhizus, Aspergillus flavus, Penicillium digitatum, Curvularia lunata* and *Fusarium moniliforme* Sawant and Gawai (2011a) [12] also reported that *Aspergillus niger, Fusarium roseum, Rhizopus arrhizus* and *Gleosporium musarum* were responsible loss in ash content of banana fruits. Rathod (2010) [24] reported that ash, calcium and phosphorous contents of papaya fruit were decreased by *Alternaria alternata, Aspergillus flavus*, *Aspergillus niger, Colletotrichum gloeosporioides, Curvularia lunata, Fusarium equiseti, Fusarium moniliformae, Fusarium oxysporum, Penicillium digitatum* and *Rhizopus arrhizus*. Recently Bagwan (2010) [25] reported that post-harvest fungi deteriorate the ash contents of mango fruits. It can be concluded that post-harvest fungi deteriorate the ash content of mango fruit.

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Changes in calcium content

Gadgile (2009) [26] and Rathod (2010) [24] observed that post-harvest fungi deteriorated the ash percentage in mango and papaya fruits respectively.

Changes in phosphorous content

Rathod (2010) [24] and Gadgile (2011a) [27] observed that post-harvest fungi depleted the phosphorous content of papaya and mango fruits respectively.

Changes in organic acid content

Organic acids like citric acid, fumaric acid, malic acid, succinic acid, tartaric acid etc. are present in fruits. During pathogenesis these organic acids are either decrease or increase (Arya,1993**).**

Conclusion

It can be concluded that post-harvest fungi are responsible for changes in biochemical content of fruits.

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