International Journal of Botany Studies
www.botanyjournals.com
ISSN: 2455-541X
Received: 08-06-2021, Accepted: 23-06-2021, Published: 10-07-2021
Volume 6, Issue 4, 2021, Page No. 149-151

Changes and growth of processes fruits and vegetable: A review study

Moitrayee Devi*
Assistant Professor, Programme of Microbiology, Assam Down Town University, Panikhaiti, Guwahati, Assam, India

Abstract
This review paper is aimed to describes and investigate the prevalence and distribution of commonly occurred pathogens in the processes fruits and vegetables. These products have high nutritional value that attract, support and enhance the microbial growth in addition to both intrinsic and extrinsic factors that can hinder or increase the microbial distribution in the foods like carbohydrates, protein. In conclusion, bacteria are the most copious microbes that extremely found in these food products that other fungi and protozoa. Any products like fruits, vegetables, plant and plants products including leaves, roots, bulbs, and tubes are the most perishable foods in the world markets. So, therefore, it needs some adjustment and consideration like managing physical, chemical and microbial parameters to control and overcome the distribution of these microbes in the food products that can decrease the yield and may result economic loose.

Keywords: products, pathogens, physical parameters, chemical parameters, microbial parameter, fruits and vegetables

Introduction

Any products like fruits, vegetables, plant and plants products including leaves, roots, bulbs, and tubes are the most perishable foods in the world markets. In this review study i describe and investigate the prevalence and distribution of commonly occurred pathogens in the processes fruits and vegetables. These products have high nutritional value that attract, support and enhance the microbial growth in addition to both intrinsic and extrinsic factors that can hinder or increase the microbial distribution in the foods like carbohydrates, protein etc.

Fermentation enhances the nutrient content of foods through the biosynthesis of vitamins, essential amino acids and proteins, by improving protein and fibre digestibility, by enhancing micronutrient bioavailability, and by degrading anti-nutritional factors. It also provides a source of calories when used in the conversion into human foods of substrates, which are unsuitable for human consumption. Fermentation processes also enhance food safety by reducing toxic compounds such as aflatoxins and cyanogens, and producing anti-microbial factors such lactic acid, bacteriocins, carbon dioxide, hydrogen peroxide and ethanol which facilitate inhibition or elimination of food-borne pathogens. Therapeutic properties of fermented foods have also been reported. In addition to its nutritive, safety and preservative effects, fermentation enriches the diet through production of a diversity of flavours, textures and aromas. It improves the shelf-life of foods while reducing energy consumption required for their preparation. The production of fermented foods is also important in adding value to agricultural raw materials, thus providing income and generating employment [9, 10].

After harvesting, the sensorial and nutritional quality of foods from plant origin begins to decline because of the food deterioration and microbial growth (Shafiur-Rahman, 2007). Fruits and vegetables are prone to deterioration rapidly; they have a very short shelf life due to their high moisture content. In addition, they are still living organisms that carry out transpiration, respiration and maturation after harvesting, thus their metabolism continues to increase the rate of deterioration due to maturity, senescence and unfavorable environmental factors. Therefore, since they are perishable, they need immediate post-harvest treatments to reduce the microbial load and increase their shelf life (Lal Basediya *et al*., 2013).

Minimally processed fruits and vegetables attract consumers because they are fresh, nutritious, and ready for consumption. However, the use of agrochemicals during plant growth has caused increase in fungal resistance to chemical fungicides and the presence of toxic residues (Alikhani, 2014). There is a need to develop environmentally friendly techniques that can help on the reduction of spoilage and pathogenic bacteria and fungi in fresh fruits and produce, as requested by consumers (Barba *et al*., 2010; Boyacioglu *et al*., 2013). This review describes the most common preservation methods, as well as the emerging methods used to preserve fresh fruits and vegetables; emphasis is given to Lactic Acid Bacteria (LAB) as a potential sustainable option for food sanitation.

The starter bacteria

In fermentation, the raw materials are converted by microorganisms (bacteria, yeasts and moulds) to products that have acceptable food qualities. Spontaneous (natural) fermentations, i.e., processes initiated without the use of a starter inoculum, have been applied to food preservation for millennia. In a natural fermentation, the conditions are set so that the desirable microorganisms grow preferentially and produce metabolic by-products, which give the unique characteristics of the product. The majority of small-scale fermentation in developing countries and even some industrial processes such as sauerkraut fermentation are still conducted as spontaneous processes. Various types of starter cultures and even back-slopping are widely used in fermentation processes, even in industralised countries [1]. However, spontaneous food fermentations are neither predictable nor controllable. The natural microflora of the raw material is either inefficient, uncontrollable, and

unpredictable, or is destroyed altogether by the heat treatments given to the food.

The non-starter bacteria

In some fermented dairy products, additional bacteria such as Cit+*Lactococcus lactis* subsp. *lactis*, *Leuconostoc* spp., *Lactobacillus kefir*, and *Propionibacterium freudenreichii* subsp. *germanii*, often referred to as secondary microflora, are often intentionally introduced to produce aroma compounds and carbon dioxide in cultured buttermilk and certain cheeses. Other types of secondary microflora include undefined mixtures of yeasts (*Debaryomyces* spp. and *Geotrichum* spp.), moulds (*Penicillium camemberti* and *Penicillium roqueforti*), and bacteria (*Brevibacterium linens*, *Micrococcus* spp., and mesophilic lactobacilli). The use of micrococci and *B. linens* is usually limited to surface-ripened and mould-ripened cheeses; mesophilic lactobacilli, which can form biofilms and be a source of contamination in a dairy, are believed to contribute considerably to the formation of cheese aroma from amino acids. For example, a useful cooperation between starter *L. lactis* and glutamate – dehydrogenase-positive *L. casei*/*L. paracasei* strains to stimulate flavour development in Gouda and Cheddar cheeses has been suggested [11].

Literature Review

According to the study conducted by Pla *et al*., 2005; Badosa *et al*., 2008,microbes inhibits vegetables and fruits are vary depending on different factors like plant products components, natural viability of the products, presences of soil accompanying the products during the pre and post-harvest condition. Beside to these, it's vary also based of the other variation reminiscent of biological structure of the food, for instance damage or cut vegetables and fruits than intact structure favors microbial distribution (Ponce *et al*.,20033).

Lactic acid bacteria; pseudomonas, Erwinia, Pontoea, Micrococcus, Flavobacterium, and Gram positive sore forming (Bacillus, Clostridium), are the widely dominant bacteria reported from fruits and vegetables. In addition, different types of molds such an s Alterneria, Penicilium, Fusarium and Aspergillus are also the commonly existed molds. These organisms can impact the economic value of fresh cut products by decreasing the products shelf life through spoilage and posing risk to public health (Ngugen and Carlin, 1994).

The primary sources for bacterial contamination that affect the bacteriological quality and safety of the final products are present even before the crop is planted, these contamination are may be due to soil pathogens, wild and domestic animals, irrigation in soluble water(waste solid waste material), inadequate use of animal manure as a fertilizers, inadequate field works that can result poor hygiene and sanitation or due to rain fall problem in the temperature of the field (Zaho *et al*., 2005).

During processing and packing of the specific food products there is specific sources of contamination or there are uncertain handling problem at the storage or improper temperature at the storage conditions and cross-contamination and inadequate preparation method that pose fresh fruits and vegetable contamination (Rico *et al*., 2007).

Special attention must be paid to treat read to use fruits and vegetables which industry has grown due to constantly increasing damage for fresh, health and convenient foods (Lamikarn *et al*., 2002). Consumers have also become more critical about use of synthetic addictives to preserve foods, and enhance characteristics such as color, flavor and textures (Buhn *et al*, 2000).

It should be emphasized that minimally processed fruits and vegetables processing techniques can promote a faster physiological and biochemical changes, microbial degradation of the products (Ongeng, 2006), which may result in degradation or deterioration of foods like color changes, textures, aroma (Varo quaur and Wiley, 1994). Therefore, it needs proper handling procedures (keeping personal and environmental sanitation), proper physical and chemical parameters for storage(Ph, Temperature …), proper harvesting, preparation and storage to keep the fresh fruits and vegetables and further more to increase shelf life of the products and promote the individual or public health.

Between 25 and 40% of fruits and vegetables are lost before consumption due to deficient post-harvest management. After the fruit has been harvested, quality needs to be assured for a time period long enough, that the fruit can be transported and distributed. Post-harvest losses can be reduced by controlling the rate of transpiration and respiration, reduction in microbial contamination and providing external membrane protection, with the consequent extension in shelf life (Bisen *et al*., 2010).

Conclusion

Bacteria are the most copious microbes that extremely found in these food products that other fungi and protozoa. So, therefore, it needs some adjustment and consideration like managing physical, chemical and microbial parameters to control and overcome the distribution of these microbes in the food products that can decrease the yield and may result economic loose.

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