

PDF - ONION IS ASSOCIATED WITH MICRO-ORGANISMS WHICH ARE CAPABLE OF CAUSING SPOILAGE - researchcub.info

ABSTRACT

Onion is associated with micro-organisms which are capable of causing spoilage. Onions with rots were examined microscopically. A solution of it was made and the serial dilution of 1:10⁻¹----- to 1:10⁻⁵ made from 10ml of the onions sample. From the dilution, 1ml of each diluent was plated on nutrient and saboor and dextrose agree to permit the growth of the common bacterial and fungi, from the rotten onions. Duplicate plates were performed for each dilution. The plates were swirled gently to ensure even distribution of diluent and was incubated in inverted position at 37°C for 24 hours. After 24 hours, the colonies were counted, with values yielding 30 to 300 (to avoid TFR and TNTC), the viable count per ml was determined by multiplying the average number of colonies of the duplicate plates by the corresponding factor (MPN table). Gram staining was carried out on the colonies and examined microscopically. Representative colonies were separately sub-cultured on nutrient agar slopes for confirmatory characterization of the organism present. Biochemical test for identification was also carried out. The result showed a mixed flora of bacterial and fungi including moulds as the organism responsible for spoilage of onions. The fungi isolated were *Mucor* spp, *rhizopus* spp, *Aspergillus* spp and *saccharomyces* spp. The bacteria isolated from the sample were *staphylococcus aureus*, *streptococcus pyogenes* and *Bacillus* spp.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND INFORMATION

Onions is a vegetable crop and ancient in nature if is through to have been domesticated in the central Asia. It is one of the oldest vegetable cultivated by man for food. In the world onion buld are found in ancient Egypt, India, China and Europe during the middle ages, and in the late sixteenth or early seventeenth centuries, it spread to the new world by the Spaniards. The crop is now wide spread in both temperate and tropical regions with Europe as the largest producers (cobleby and Steele, 1976).

In the tropic most onions are grown with irrigation during the relatively cool dry season in semi arid region, they are not good crop for hot wet tropic. Onions can be grown under a wide range of climatic condition but they succeed best in a mild climate without excessive rainfall or great extremes of heat and cold. They are not suitable to regions with heavy rainfall in the lowland humid tropics. Cool conditions with an adequate moisture supply are most suitable for early growth followed by warm drier condition for maturation, harvesting and curing. They can be grown on a variety of soils, but the soil should be retentive of water, non – packing and rich in nutrient, a good fertile loam usually gives the best result. They may be grown successfully on peat soils. The soil optimum pH is about 6.0 – 7.0 (alkaline) (carl and Hall, 1986).

In storage a specific environment must be provided for the onions, if a high quality product is to result. Storage losses are a function of storage environment as well as the condition and cultural practices used during the growing season. Proper control of storage environment can however, significantly extend the storage season from that which would result from storage environment that were not matched to the condition of the onions when placed in storage (carl & Hall, 1986).

Onions may be stored in bulk or may be placed in palletised bins that are stacked in a storage

structure. The use of bins may make handling of onions convenient but it does make ventilation of the onions more difficult. Improved bins design may alleviate the ventilation problems in future (Cobley and Steele, 1976).

Onions are packed locally by using basket and jute bags these packaging material come locally from palm; bamboo and fibrous jute trees, also they have different sorts and sizes. These packaging materials have the function for transportation and storability of the onions. Again these packaging material are locally available and relatively cheap. Apart from these few advantages mentioned they have no barrier to dust, not suitable for measuring weight and can easily be crushed which might lead to damage of the onions.

The deterioration of raw onions may result from physical factors; actions of their own enzymes, microbial or combination of these factors. Mechanical damage resulting from action of animals, birds or insects or from brushing, wounding, bursting, cutting, freezing, desiccation or other mishandling may predispose towards increased enzymatic action or entrance, and growth of microorganisms. Also previous damage by plant pathogens may make the part of the crop used as food unfit for consumption or may open the way for growth of saprophytes and spoilage by them. Contact with spoilage onions may bring about transfer of organisms causing spoilage and increasing the wastage. Improper environment condition during harvest, transit, storage and marketing may favor spoilage.

Genera of bacteria usually present in onion include *Pseudomonas* spp, *Bacillus* spp, *Chromobacterium*, *Enterobacterium*, *Flavobacterium*, *Lactobacillus* *serratia*, *Staphylococcus* spp, *Streptococcus* spp and others and perhaps genera containing plant pathogens, such as *Erwinia* and *Xanthomonas*. Growth of some micro-organisms may take place between harvesting and processing or consumption of the vegetable. Adequate control of temperature and humidity will reduce such growth (Frazier and Westhoff, 1978).

1.2 AIMS OF THIS RESEARCH PROJECT

The aims of this research project are:

- 1 to isolate, identify and characterize the different micro-organisms that are responsible for the spoilage of onions.
- 2 To categorize the pathogenic micro-organisms associated with the spoilage of onions.

1.3 STATEMENT OF PROBLEMS

The society is a place where a vegetable is been consumed everyday. This project research goes a long way in identifying problems which is encountered when spoilage occurs in onions; onion bulb that is contaminated when consumed causes severe stomach ache (presence of enterobacteriaceae) because of the pathogenic micro-organisms present in it and this in turn is hazardous to one's health. The pathogenic micro-organisms present in the spoilage of onions are detrimental to humans e.g *Pseudomonas* spp., *Staphylococcus* spp, *Erwinia* etc.

Onions been a member of the vegetable group is used widely in seasoning, flavouring and sometimes cured and stored as spicing agent. The proper storage of onions makes it available for use all year round and the effect of spoilage micro-organisms affecting it has an adverse effect on the society at large because it makes onions not readily available to the society; that is why studies is been carried out in this project research to minimize and or stop spoilage of onions.

1.4 HYPOTHESIS

HO-A mixed flora of bacteria and fungi is found in spoilt onions.

Hi-bacteria and fungi found in onion result in the onions own enzymatic actions causing physical, microbial

or combination of these factors leading to entrance and or growth of micro-organisms.

1.5 SIGNIFICANCE OF STUDY

The justification of this project research is to ascertain the different micro-organism responsible for the spoilage of onions. In this process bacteria and fungi were isolated identified and characterized because they are the microorganisms associated with the spoilage of onions.

The deterioration of raw onions can also result from physical factors, actions of their own enzymes, microbial action or combination of these factors. In physical factors; the storage patter can affect the raw onions that is if it is stored in bulk or may be placed in palletized bins and this does not make ventilation of the onions easily, so improved bins design may be of great help. In action of their own enzymes; if the raw onions is crushed during packaging, handling, this may inturn allow the penetration of micro – organisms which will now alter the enzymatic action of the raw onions and may lead to spoilage of the onions flesh which is meant for food and if consumed could be hazardous to health.

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