



MICROBIAL SPOILAGE OF CASHEW APPLES AND ITS PREVENTION

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Abstract

The microorganisms responsible in the spoilage of cashew apples were investigated. Among the Yeasts Rodotorula sp. (red yeast), Cyptococcus sp., Torulapsis sp., Candida sp. and Saccharmyces sp., were observed. The fungi associated are Mucor sp., Aspergillus niger, Rhizopus sp., and Collitotrichum gloeosporoides. The prevention of cashew apples' spoilage by yeast and fungi are outlined.

Cashew (*Anacardium occidentale* L) so far considered a neglected plantation crop, is now gaining importance under the world bank development programme. The availability of cashew apples in our country amounts to 10 lakh tonnes in the total cultivated area of 4.2 lakh hectares. Eventhough technology for the utilization of cashew apples are known, it is seldom used except in Goa, where it is used in the preparation of alcoholic beverage, cashew "Feni". The apples could be used in the preparation of jam, jelly, pickles, cool drinks etc. The efficient utilization of cashew apples is possible profitably in the industrial sectors in the production of alcoholic beverages. The utility of the apples are limited mostly because of the perishable nature of the apples.

Cashew apple juice contains 8-12 per cent of sugar and it is rich in Vitamin C (260 mg/100 c.c.). The apples cannot be stored for more than a day without the microbial spoilage. In the present study the author reports the microorganisms associated in the spoilage of cashew apples.

Materials and Methods

The cashew apples at various stages of spoilage were collected from the field (experimental plot, Central Plantation Crops Research Institute, Regional Station, Vittal.) The apples collected from the field were kept in laboratory and it was observed daily for the growth of yeast and fungi. Streak plate method was followed for the isolation of yeast and fungi using media for yeast flora and Potato Dextrose Agar (PDA) medium respectively. Temporary mounts were prepared to identify the fungi based on morphology and sporulation (Bessy, 1968) and the yeast isolates were tentatively identified to generic level (Barnett et al 1979).

Results and Discussion

The observation revealed that, the yeasts are the primary invaders responsible in the spoilage of cashew apples. The yeast gains entry into the apples through the damages caused while harvesting the nuts and apples from the tree. Further the secondary invaders are fungi. The apple splitting was also noticed in certain cases due to **Collitotrichum gloeosporiodes** infection, even when the apples are intact in the tree. The fall of apples to the ground is sufficient to have contact of soil microorganisms. The proper utilization of cashew apples are possible, if it can be stored for 2 or 3 days without the microbial spoilage.

The yeasts mainly involved in the spoilage of cashew apples were **Rodotorula** sp. (red yeast), **Torulopsis** sp., **Cryptococcus** sp., **Candida** sp. and **Saccharomyces** sp. The fungi associated in the spoilage are **Mucor** sp., **Rhizopus** sp., **Aspergillus niger** and **Collitotrichum gloeosporiodes**. Since the pH of the juice is around 3.8 to 4.0 (acidic) it does not favours the growth of bacteria and actinomycetes. The insect (apple borer) sometimes attacks the apples in the field and this damage will leave way for the entry of yeasts and fungi. The insect maggots are also responsible in the spoilage of fallen apples in the

field. There are many possibilities of checking the microbial spoilage of cashew apples and these are;

1. harvesting the cashew apples without damaging the surface.
2. washing the cashew apples after harvesting to reduce the surface microbial load.
3. dipping the cashew apples in antifungal antibiotics to inhibit the growth of yeast and fungi. Low concentration of griseofulvin or cycloheximide could be used to prevent the yeast and fungal spoilage.
4. The ideal method to prevent the spoilage is to extract the apple juice, while harvesting the nuts from the tree. The extracted juice can be used in the preparation of various products especially for alcoholic beverages on industrial scale and the pulp can also be used as feed in piggery. The harvesting of nuts is easier only when the apple ripens due to the formation of abscission layer.

The yeasts and fungi are responsible in the spoilage of cashew apples. It is possible to prevent the microbial spoilage of cashew apples and thereby increasing the possibilities of better utilization of cashew apples in our country.

Acknowledgement : I am grateful to senior Scientist-in-charge, C.P.C.R.I. Regional Station, Vittal for providing the facilities.

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