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Postharvest Management in Agriculture

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and those dipped in 0.5% solution. The SO₂ not only preserved the fresh flavour of the fruit but prevented a burnt sugar off-flavour developing and the loss of colour. The maximum sugar content of 34.4% was

retained during 4 months of storage by dates that had been dipped in the 1.5% solution.

885 SAJJAN KUMAR. 1989. **Studies on the processing of date palm fruits (*Phoenix dactylifera* L.)** (M.Sc: thesis), Haryana Agricultural University, Hisar.

Two products, viz. *chuhara* (dry date) and date candy were prepared to standardize their processing technology. Various processing treatments were applied before the preparation of final products. The effect of each treatment was studied on the processing nutritional and keeping quality aspects in cvs. Khadrawy and Zaglool at doka stage of maturity. *Chuhara* from fruits of cv. Khadrawy can best be prepared by water blanching, followed by osmosis in sugar syrup. Good quality *chuhara* can also be prepared from cv. Zaglool with water blanching+osmosis but organoleptically cv. Khadrawy ranked first. The candy prepared by steam blanching with slow method of processing from cv. Zaglool, followed by Khadrawy were rated better. The per cent recovery of *chuhara* was maximum in water blanching+osmosis in cv. Zaglool, followed by cv. Khadrawy. In candy, the per cent recovery was higher in steam blanching with quick method of processing. Both the products stored for 60 days at room temperature remained in good condition without any appreciable loss in quality.

886 SHARMA, RK; SINGH, IS. 1987. **Effect of post-harvest application of 2-chloroethyl phosphonic acid on ripening and quality of Hayani and Khadrawi dates.** *Progressive Horticulture*, 19: 1-2, 128-131; 12 ref.

Fruits of both cultivars, dipped for 5 minutes in ethephon solution at 0, 250, 500, 750 or 1000 p.p.m., were held in perforated polyethylene bags at room temperature and sampled after 5 days. The highest ethephon rate best enhanced ripening and fruit quality. Hayani was more responsive to treatment than Khadrawi.

POMEGRANATES

887 CHANDEL, SS; GUPTA, D; KHOSLA, PK. 1989. **Solar drying of *Punica granatum* Linn. seeds.** *Renewable energy for rural development. Proceedings of the national solar energy convention.* (Hyderabad, India: 1988: 1-3 December)/edited by VVN Kishore; NK

Bansal. New Delhi: Tata McGraw-Hill, p. 415-419; 4 ref.

The seeds of *Punica granatum* (wild pomegranate) commonly known as 'Anardana' were dried in a solar cabinet drier. It was found that solar drying of seeds with initial m.c. of 72% to a desirable m.c. of 5.2% is achieved in a much shorter period than by open sun drying which takes about 6 d. The drying rates of the solar drying and open drying methods were compared to emphasize the efficacy of solar drying. Drying curves for both methods are given.

888 CHAUHAN, SK; LAL, BB; SHARMA, R. 1994. **Development of instant dehydrated wild pomegranate chutney.** *Journal of Food Science and Technology - Mysore*, 31: 1, 58-59.

The methods for preparing instant wild pomegranate chutney were evaluated and the products were analyzed for physico-chemical and nutritional characteristics. The product (T3, combination) had good amounts of vitamin C, sugar, ash and fibre. It reconstituted well in cold water and possessed all characteristics of fresh chutney. The product had a shelf-life of more than 6 months.

889 SONAWANE, CS; UTIKAR, PG; SHINDE, PA. 1986. **Post-harvest fungal flora of pomegranate.** *Journal of Maharashtra Agricultural Universities*, 11: 1, 107-108; 11 ref.

A survey of the fruit in local markets yielded isolates of 11 fungal spp. including *Aspergillus niger*, *Penicillium frequentans*, *Rhizopus* sp., *Alternaria alternata*, *Aspergillus flavus*, *A. fumigatus*, *Glomerella cingulata*, *Phoma* sp., *P. punicae* and *Phomopsis* sp.

PAPAYAS

890 GANESHAN, S. 1986. **Cryogenic preservation of papaya pollen.** *Scientia Horticulturae*, 28: 1/2, 65-70; 29 ref.

Pollen of *Carica papaya* cv. Washington and *C. cauliflora* cryopreserved in liquid nitrogen for 485 days retained viability as high as that of fresh pollen when germinated in vitro. Pollen stored for 300 days could effect normal fertilization, producing fruit and seed set on a par with controls, indicating no loss of fertility. Pollen samples exhibited high tolerance to direct freezing at ultra low temperatures, uncontrolled thawing to ambient temperature and refreezing to cryogenic temperatures. This method of preservation is recommended to papaya breeders and gene banks involved in conserving genetic resources of *Carica* species.

891 GUPTA, AK; PATHAK, VN. 1988. **Some new fungi associated with papaya fruits.** *Indian Phytopathology*, 41: 3, 479-480.

During 1975-78, 22 fungi were detected on pawpaw fruits from markets in Jaipur, India. These were *Alternaria alternata*, *Ascochyta caricae*, *Aspergillus flavus*, *A. fumigatus*, *A. nidulans*, *A. niger*, *A. tamarii*, *A. terreus*, *Botryodiplodia theobromae*, *Cochliobolus spicifer*, *Colletotrichum gloeosporioides* [*Glomerella cingulata*], *Curvularia lunata* [*Cochliobolus lunatus*], *Cylindrocarpum sp.*, *Fusarium equiseti*, *F. moniliforme* [*Gibberella fujikuroi*], *F. oxysporum*, *F. scirpi*, *F. semitectum* [*F. pallidoroseum*], *F. [Microdochium] tabacinum*, *Penicillium islandicum*, *Phoma jolyana*, *Rhizopus oryzae* and *R. stolonifer*. Of these *F. scirpi* and *M. tabacinum* are reported from India for the first time and their taxonomy is described.

892 GUPTA, AK; PATHAK, VN. 1986. **Survey of fruit markets for papaya fruit rots by fungal pathogens.** *Indian Journal of Mycology and Plant Pathology*, 16: 2, 152-154; 4 ref.

Of fungal storage rots detected in markets in Jaipur during 1975-78, 5 were of major importance, particularly those caused by *Aspergillus flavus*, *Rhizopus oryzae* and *Fusarium equiseti*.

893 KANNAN, M; MUTHUSWAMI, S. 1989. **Proteolytic activity of papain from eight papaya genotypes.** *South Indian Hort.*, 37: 1, 6-9; 4 ref.

An assay method which measures the amount of tyrosine released by papain from a standard casein solution was evaluated. Latex was collected from selected fruits of 8 *Carica papaya* genotypes at 5 different stages. After drying, the latex was subjected to analysis of papain activity through tyrosine release. In all genotypes the activity increased with time after fruit set up to 90 days; of the 5 stages, papain extracted during the 4th stage (75-90 d after fruit set) showed the highest activity. Results indicate the greater reliability of the tyrosine release assay method, (seen to be more accurate), less time consuming and more efficient than the conventional milk clotting assay. Papain activity was highest in CP15/2 (Co5).

894 MEHTA, PM; RAJ, SS; RAJU, PS, JR. 1986. **Influence of fruit ripening retardants on succinate and malate dehydrogenases in papaya fruit with emphasis on preservation.** *Indian Journal of Horticulture*, 43: 3/4, 169-173; 16 ref.

Postharvest treatment of pawpaw fruits with GA₃, vitamin K, silver nitrate, kinetin or cobalt chloride

extended the shelf-life appreciably without any adverse effect on palatability. The suppressed levels of succinate and malate dehydrogenase activity during the post-harvest ripening of the treated fruits indicated lower levels of mitochondrial respiratory activity and retardation of ripening.

895 SAXENA, RM; SHARMA, KD. 1981. **Deterioration of papaya fruits by fungi.** *Agricultural Science Digest, India*, 1: 2, 140-142; 7 ref., tab.

Twenty-four fungi were isolated from the external and internal surface of pawpaw fruit tissues in storage and during artificial ripening. *Aspergillus flavus*, *A. niger*, *Penicillium funiculosum*, *Penicillium citrinum*, *Paecilomyces varioti*, *Alternaria alternata*, *Drechslera papendorffii*, *Fusarium moniliforme* [*Gibberella fujikuroi*], *F. solani* and *Rhizopus arrhizus* were most virulent and actively decayed fruit at 28-35°C by rotting and by hydrolysing the reserve carbohydrates.

JACKFRUITS

896 GUPTA, PN; SINGH, B. 1987. **Effect of pre-harvest chemical sprays on postharvest shelf-life of jack fruit.** *Symposium on Himalayan horticulture in the context of defence supplies*. p. 76-77.

Fruits [of *Artocarpus spp.*] do not ripen uniformly on the tree or in storage. The effects of 1.0-2.5% CaNO₃, 1.0-2.5% CaCl₂ or 1.0-4.0% Na₂CO₃, sprayed before harvest on post-harvest shelf life were recorded. Weight losses were reduced most by 2.0% CaNO₃ followed by 2.0% CaCl₂ and 2.5% CaNO₃ sprayed 15 days before harvest; the 2.0% CaNO₃ treatment maintained shelf life for 19 days at room temperature and resulted in the best fruit flavour and firmness. Spraying fruits 30 days before harvest was in no case beneficial.

897 JOHN, PJ; BALASUBRAMANYAM, N; NARASIMHAM, P. 1993. **Effect of packaging, processing and storage conditions on the quality of raw jack fruit curry in flexible pouches.** *Journal of Food Processing and Preservation*, 17: 2, 109-118.

"Ready to eat" raw jack fruit (*Artocarpus heterophyllus* Lam.) curry (pH 4.2), having acidic tomato gravy, packed in a flexible pouch with/without vacuum and heat processed in boiling water for 30 min, was stored at 3 different conditions, room temperature (28C), refrigerated low temperature (4C) and frozen state (-18C). The vacuum packed product, placed in a secondary pack of polyester/foil/polyethylene laminate had a storage life of 120, 270 and more than 360 days at 28, 4 and at -18C, respectively. The stored product was safe