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EFFECT OF POST HARVEST CHEMICAL TREATMENTS AND DRYING METHODS ON QUALITY ATTRIBUTES IN CHILLIES CV.INDAM-5

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ABSTRACT

An experiment was conducted on colour chilli variety Indam-5 to find out the effective chemical treatment and drying method for better consumer accessibility. There was no significant difference among the physical parameters i.e. weight loss during drying (%), pod length (cm) and pod circumference (cm).Both oven and polyhouse dryings were found to be efficient and there was no significant difference in percent damaged pods and oleoresins. Polyhouse drying resulted the less number of wrinkles, with good colour development that oven and Sun drying. Capsaicin content was highest (0.52) in oven dried pods compared to polyhouse and sun drying where as it was reverse in the case of capsanthin content (38997 EOA) and time required to reach 8-10% moisture (40h).Among the interactions calcium chloride with polyhouse drying resulted the minimum (5.18%) per cent of damaged pods, maximum content of oleoresin (9.82%) and capsanthin (40650 EOA) than control.

Chilli (Capsicum annum L.) is valued mostly for its pungency, coloring mater and oleoresin principles. Capsaicin is used in the preparation of balms, sprays, whereas the colour extracts (carotenoid pigments) are used as colour addition in food industry, poultry and prawn feed industry. Chilli oleoresin is also used in self defense sprays which are popular in western countries. Chilli fruits with deep red colour and low pungency are considered as paprika. The trade and use of Paprika in powder form is increasing rapidly. The biochemical analysis of quality parameters of chilli oleoresin can be beneficially separated into two fractions viz., high pungency fraction contains almost all the capsaicin present in total oleoresin, while colour fraction is the one which is devoid of pungency and is rich in colouring matter. Hence paprika is gaining importance for export due to its value added products viz., oleoresin, colour etc.

Andhra Pradesh is leading both in area and production contributing on an average of 25% of total area and over 40-50 % of the total production in the country. It has a good potential for quality production (3.17 t /ha) which are inturn most suitable for international trade. (CMIE 2007).Traditionally in South India after harvest the fruits are dried in Sun to a moisture content of less than 10 per cent. These

dried chillies are graded, packed in gunny bags for marketing and storage. The chillies before packing in the gunny bags, farmers add little water to the fully dried chilli to avoid the brittleness. Then these chillies with moisture packed in the bags goes to storage before they are used. During drying and marketing the chilli pods are heavily infested with microbes and thereby deteriorate the export quality.

Material and methods

An experiment was conducted at Post-Harvest Technology Laboratory, Department of Horticulture, College of Horticulture, Rajendranagar, Hyderabad. The chilli variety used in experiment is Indam-5 which is commercially grown in Khammam, Warangal and Guntur Districts. The experiment was laid out in a completely randomized block design with factorial concepts with three replications. The chemical treatments consists of 2.0% calcium chloride 0.1% sodium benzoate and untreated control where as drying methods followed are oven drying, polyhouse and Sun drying as control. The fresh ripe chilli fruits are dipped in the prepared chemical solutions for 10 minutes and the excess solutions were drained out.

In Poly house a continuous air inlet of 1 ft width was provided on top side of the polyhouse along the bottom of the vertical wall for the entry of natural air. Excepting this all other sides of poly house are closed. Hence natural air entered at one end of polyhouse chimney, which provided suitable condition for drying. The average meteorological data recorded during the study in poly house i.e wind speed 2.2 km/h, temperature 40.5 ^{0} C and relative humidity 30.85%.The oven dryer used for was designed and developed in the division of Agricultural Engineering, IARI, New Delhi. Chillies are spread uniformly in trays and are dried at 50 ^{0} C with the airflow rate of 0.019 m^3 /min. The moisture contents of the chillies were determined after every 2 h till it attained an optimum moisture content of 8-9 per cent.

Results and Discussion:

The data in table 1 revealed that their was no significant influence of chemical treatments and drying methods on weight loss in drying, pod length, pod circumference, due to drying, pre-treatment with chemicals and their interactions. It indicted that pod length of chilli is not affected by drying methods and pre-treatment with chemicals. Similar results were reported by Joy et al (2001) and Papakumari et al (2003). Oven drying was effective with less number of wrinkles followed by polyhouse where as highest in control. Similar results are reported by Mangaraj et al (2001), Paliniappan (1997). According to the Standard colour chart, the color of the pods was Burgundy (5123) in oven drying. carletre (5502) in poly house drying and red (5117) in Sun drying.

The data in table 2 revealed that Oven drying was found to be most efficient method to reduce the time of reach 8-10 % moisture in comparison with polyhouse drying and Sun drying. Similar performance of oven drying was reported by Mangaraj et al.(2001). It is interesting to note that there was no significant difference in drying

time due to treatment with chemicals indicating that the chemicals used this investigation have no effect on drying time.

There was no significance difference in percentage of damaged pods (5.64%) in oven drying with calcium chloride followed by polyhouse drying (5.18%) which were at par and maximum per cent (12.98%) of damaged pods observed in un treated pods at Sun drying. his could be attributed to the efficiency of calcium chloride in the retention of colour and prevention of fading. Similar results of efficient chemicals were reported by Umajyothi et al (2004)

Pods treated with oven drying recorded the maximum 8.95% content of oleoresin of which was significantly superior over the other methods of drying. With chemical treatments calcium chloride showed highest oleoresin content (8.78%) over the other treatments. among the interactions pods treated with calcium choloride with polyhouse found significantly highest per cent (9.82%) of oleoresin followed by oven drying with the same chemical.

The data in table 2 indicated that the higher percentage of capsaicin was recorded by oven drying (0.52%) which was superior over other drying methods. It could be attributed to uniformity in drying temperature. Similar results were reported by Mini et al (2000); Mangaraj et al (2001); Topuz and Ozdemir(2004).With chemical treatments there was no significance difference in capsaicin content between sodium benzoate(0.51%) and calcium chloride (0.50%).The beneficial effect of sodium benzoate 0.1% on the prevention of deterioration in capsaicin content could be attributed to the interfering mechanism of cell division, permeability of cell membrane and activity of enzymes as explained by Kaleemullah and Kailappan (2006).

Chilli pods treated with calcium chloride and dried in polyhouse has resulted significantly higher (40650EOA colour vlue) capsanthin content than control. It could be due to uniform air circulation of air which helps in maintain the optimum temperature and also protection from UV rays by polyhouse and also the strong adsorption affinity of capsanthin with adsorbents like calcium compounds as explained by Krishnamurthy and Natarajan (1973).

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