

**Article history:**

Received : 09.05.2011

Accepted : 08.09.2011

## Estimation of pectin content in Jackfruit (*Artocarpus heterophyllus*)

■ RASHMI PATIL, G.D. JOSHI<sup>1</sup>, P.M. HALDANKAR<sup>1</sup> AND MRINAL MORE<sup>1</sup>

**Associated Authors:**

<sup>1</sup>Department of Horticulture, College of Agriculture, Dr. B.S. Konkan Krishi Vidyapeeth, Dapoli, RATNAGIRI (M.S.) INDIA

**Author for correspondence :****RASHMI PATIL**

Department of Horticulture, College of Agriculture, Dr. B.S. Konkan Krishi Vidyapeeth, Dapoli, RATNAGIRI (M.S.) INDIA

Email : mmore634@gmail.com

**Abstract :** A valuable byproduct that can be obtained from fruit wastes is pectin. Pectins are mixtures of polysaccharides that originate from plants and contain pectinic acids as major components and are water-soluble. Pectic substances are of interest to scientists of postharvest technology because of their important role in maintaining the texture of raw and processed fruits and vegetables. Pectins exist in varying amounts in fruit cell wall and have important nutritional and technological properties, mainly because of their ability to form gels (Westerlund *et al.*, 1991). The fact that majority of pectin produced in the world is extracted from waste (Peels) materials of lime processing industries. It is essential to estimate the pectin from all parts of jackfruit. New source of pectin identified will be helpful to the Indian processing industries in the present context, when we are still importing about 160 tonnes of pectins valued at about ten crores of rupees for use by fruit and vegetable processing industries. Under the circumstances, the present investigation was undertaken on estimation of pectin content in jackfruit.

**Key words :** Calcium pectate, At harvest, On ripening, Firm flesh, Soft flesh

**How to cite this article :** Patil, Rashmi, Joshi, G.D., Haldankar, P.M. and More, Mrinal (2011). Estimation of pectin content in Jackfruit (*Artocarpus heterophyllus*), *Asian J. Hort.*, 6 (2) : 536-537.

The pectin is used to manufacturing jams, jellies, marmalades, preserves, etc. It is also useful as a thickening agent for sauces, ketchups, flavoured syrups and as a texturising agent in fruit-flavoured milk desserts. Besides, it finds numerous applications in pharmaceutical preparations, pastes, cosmetics etc. It is also used as an emulsifying agent in the preparation of products like cod liver oil, ice-cream etc. and can be used to increase the foaming power of gases in water and also to glaze candied fruit (GITCO, 1999).

**Pectins:**

The 50 g of blended sample were extracted with 400 ml of 0.05 N hydrochloric acid (HCl) for 2 hrs at 80 to 90°C. Then volume was made upto 500 ml with distilled water and filtered through No. 4 whatman paper.

To the 100-200 ml aliquot 250 ml distilled water was added and the acid was neutralized with 1 N sodium hydroxide. Then 10 ml of 1 N sodium hydroxide was added in excess and allow to stand over night. Then 50 ml of 1N acetic acid was added and after 5 minutes 25 ml of 1 N calcium chloride solution was added. After allowing to

stand for 1 hr, boiled for 1–2 minutes. Then it was filtered through previously prepared, weighed filter paper and residue remained on filter paper was dried and weighed along with filter paper. From the difference, the pectin was calculated and expressed as per cent calcium pectate (Ranganna, 1986).

The results obtained from the present investigation are summarized below :

**Estimation of pectins (as calcium pectate):**

The pectin content in different parts of fruits *viz.*, carpel, perigone, rind core and seed were estimated.

The statistical analysis of pooled data presented in Table 1 revealed that the bulbs, perigones, rind, core and seed of firmflesh jackfruit at harvest contained 2.46, 3.38, 5.12, 5.62, 0.58 per cent pectin as Ca-pectate, respectively which on ripening declined to 2.00, 3.03, 4.65, 4.01 and 0.49 per cent, respectively. The bulbs, perigones, rind core and seed of softflesh jackfruit at harvest contained 2.71, 3.52, 5.24, 5.75, 0.70 per cent pectins as Ca-pectate, respectively which on ripening significantly declined to 2.06, 3.24, 4.59, 4.45 and 0.60 per cent, respectively. The

**Table 1 : Estimation of pectins (as calcium pectate) content of different parts of jackfruit types at harvest and on ripening**

Parameters	Firmflesh						Softflesh					
	At harvest			Ripe			At harvest			Ripe		
	2000-2001	2001-2002	Pooled	2000-2001	2001-2002	Pooled	2000-2001	2001-2002	Pooled	2000-2001	2001-2002	Pooled
Bulbs	2.44	2.48	2.46	1.98	2.03	2.00	2.68	2.74	2.71	2.01	2.11	2.06
Perigones	3.46	3.29	3.38	2.96	3.09	3.03	3.52	3.52	3.52	3.22	3.26	3.24
Rind	5.12	5.12	5.12	4.62	4.68	4.65	5.24	5.25	5.24	4.53	4.58	4.59
Core	5.62	5.63	5.62	4.01	4.00	4.01	5.78	5.71	5.75	4.44	4.46	4.45
Seed	0.57	0.60	0.58	0.50	0.49	0.49	0.69	0.71	0.70	0.61	0.59	0.60
S.E. ±	0.06	0.14	0.10	0.16	0.14	0.15	0.09	0.09	0.09	0.12	0.09	0.10
C.D. (P=0.05)	0.19	0.41	0.30	0.47	0.43	0.45	0.26	0.26	0.26	0.35	0.28	0.32

decline in pectins content in jackfruit could be attributed to the break down of Ca-pectate bond due to certain enzymatic actions during ripening. Further, it is also noticed that all the parts of softflesh jackfruit contained significantly higher pectin content than firmflesh jackfruit at harvest and ripe stage. Amongst the different parts of jackfruit the rind and core contained significantly higher pectins, irrespective of type and stage of jackfruit. The results analogous to these findings were also reported by Krishnamurthi and Giri (1949), Siddappa and Bhatia (1952), Jain and Lal (1957), Shetty and Dubash (1974), Vilaschandran *et al.* (1982) and Parab (1992) in case of jackfruit. Madhav (2001) reported that passion fruit rind was identified as a rich source of pectin (252.68 g per kg) followed by lime peel (180.48 g per kg).

## REFERENCES

**GITCO** (1999). *25 Prospective food processing projects*. Vol. 2, Gujarat Industrial and Technical Consultancy Organisation, Ltd. GITCO House, Ahmedabad. pp. 20-25.

**Jain, N.L.** and Lal, G. (1957). Some studies in the utilization of jackfruit wastes as a source of pectin. *Indian J. Hort.*, **14**(4): 213-222.

**Krishnamurti, C.R.** and Giri, K.V. (1949). Preparation, purification and composition of pectins from Indian fruits and vegetables. *Proc. Indian Acad. Sci.*, **29**(B): 155-167.

**Madhav, A.** (2001). Evaluation of fruit wastes as source of pectin. M.Sc. (Ag.) Thesis Kerala Agricultural University, Vellanikkara, THRISSUR, KERALA (India.).

**Parab, B.P.** (1992). Studies on some aspects of utilization of cashew (*Anacardium occidentale* L.) apple and jackfruit (*Artocarpus heterophyllus* Lam.) wastes. M.Sc. Thesis (Ag.), Konkani Krishi Vidyapeeth, Dapoli, RATNAGIRI (M.S.) India.

**Ranganna, S.** (1986). *Handbook of analysis and quality control for fruits and vegetable products*. 2<sup>nd</sup> Edn. Tata McGraw Hill Publishing Company Ltd., New Delhi.

**Shetty, S.R.** and Dubash, P.J. (1974). Pectic substances in *Artocarpus pubercesus* Wild. and *Garcinia pectoria* Roxb. *Indian Food Packer*, **28**(2): 14-16.

**Siddappa, G.S.** and Bhatia, B.S. (1952). Preparation of jelly from jackfruit rind. Central Food Technological Research Institute Bulletin No. 2. pp. 70.

**Vilaschandran, T.,** Kumaran, K. and Kumar, G.K. (1982). Evaluation of jackfruit type 'Varikka' for pectin. *Agric. Res. J. Kerala*, **20**(1): 76-78.

**Westerlund, P.A.,** Anderson, R.E. and Rahman, S.M.M. (1991). Chemical characterization of water soluble pectin in papaya fruit. *Carbohydrate Res.*, **15**: 67-78.

\*\*\*\*\*