Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 4680-4684

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-7 pp. 4680-4684**
Journal homepage: http://www.ijcmas.com

Original Research Article

Study on Present Practices of Chironji Nut (*Buchanania lanzan*) Processing in Chotanagpur Plateau Region

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Keywords

Chironji, Wholesaler, Retailer, Consumer

A B S T R A C T

Chironji (*Buchanania lanzan*) is an important non-wood tree species found in deciduous forests throughout the greater part of India. It is a multipurpose tree and very important plant for rural and tribal economy. It is used as a fuel, fodder, alternative host for *Kusmi* lac insect, and also used in cosmetic items and soaps. Seeds/ kernel are nutritional, palatable and used as a substitute of almonds in confectionery. Realizing the importance of chironji in tribal economy a study has been conducted to know the traditional method and present practices of chironji nut processing in Chotanagpur plateau region. Although, the *chironji* nuts and kernels have been used extensively but there is no machinery for processing of *chironji* nut. At present shelling of *chironji* nut is done manually and some time by locally made machine. skin removal by hand rubbing followed by drying. Dried nut is broken by hand hammer or rubbing between a pair of stone-slab followed by separation of kernel from the hull. In some areas local artesian developed motorized machines for breaking and separating, but the machines were not specifically designed. So they are again manually separating.

Introduction

Buchanania lanzan (*chironji*) is a tree species which belongs to the family Anacardiaceae and is commercially very useful. This is found throughout India, Burma, and Nepal. The plant grows on yellow sandy-loam soil and is commonly found in the dry forests of Jharkhand, Madhya Pradesh, Chattisgarh, Varanasi and Mirzapur districts of Uttar Pradesh *Chironji* is an almost evergreen, moderate sized tree, with straight, cylindrical trunk, up to 10-15 m height and tormentors branches. Bark is rough, dark grey or black, fissured into prominent squares, 1.25-1.75 cm thick, and is reddish inside. The fruits of *chironji* mature in 4 to 5 months and are harvested manually in the month of May and June. The green colored skins of harvested *chironji* fruits turn black on storage which has to be removed before shelling. In order to remove the skin, fruits are usually soaked overnight in plain water and rubbed between palms or with a jute sack. The water containing fine skin are decanted and

washed with fresh water to obtain cleaned nuts. The cleaned nuts are then dried in sunlight and stored for further processing, i.e. shelling. The dried nuts are shelled by rubbing with a stone-slab on a rough surface followed by manual separation of kernels. Although, the *chironji* nuts and kernels have been used extensively, available literature on their physical and engineering properties is very scanty. The *chironji* nut has very good demand in foreign markets and thus, has become an important crop. Therefore, to earn foreign exchange the government and private agencies have evinced keen interest in developing this industry, both by increasing its production and processing capacity. According to currently available information on manual shelling of *chironji* nuts, only 30 - 40 % are recovered as whole kernel sand the rest are in broken forms which are sold at a much lower price. The method used for manual shelling of *chironji* is very tedious and time consuming. Therefore, there is a need to develop a *chironji* nut decorticator to save time and reduce drudgery so that its shelling efficiency is improved better quality *chironji* kernel. Considering these thing in mind this experiment is conducted.

Materials and Methods

The study was conducted by selecting Chironji growers from the four blocks of Netarhat Platue of Chotanagpur region of Jharkhand state during 2013 and 2014 (two years. The information on status of chironji fruit crops in Chotanagpur plateau region was collected by interaction with the scientists from different institutions functioning in the region like Horticulture and Agro-Forestry Research Programme (ICAR Research Complex for Eastern Region) and National Bureau of Plant Genetic Resources, Base Centre, Ranchi. Information was also collected from available literature on management of plant genetic resources of fruit crops under Chotanagpur plateau conditions. Ten fully grown healthy chironji plants aged between 15 to 20 years were selected from five kilometer radius of Netarhat plateau. Netarhat Residential School and Forest Bungalow was center part of working area. Information on people's perceptions on chironji crop was collected through field visit and personal interaction of the local people. Data on different chironji seeds were collected by several personal visits to the farmers home and vender shop. Kernel of dried chironji seeds were extracted by hand hammer (method 1) or by stone slab (Jata) (method 2) or by machine (method 3). In Jata the stone disk was 70-80 cm thick. Lower disk was static and upper disk was movable. In modern method, chironji nuts were put in mechanical automatic machine that removes kernel from seed. The recovered kernel was expressed in percent and the efficiency of seed extraction method was compared

Results and Discussion

Chironji is an important tribal fruit crop. Demand of chironji kernel is very high in national and international market. Whole kernel which is extracted from chironji nut has high market value. In chironji, after harvesting, kernel from the seed taken out using stone slab or hand hammer. However, this traditional practice result very poor whole kernel recovery. Some dedicated machines also used for this purpose in cities (Simdega and Khunti). Kumar *et al.,* (2012) and Bhatnagar *et al.,* (2002) documented the processing of chironji. This study was performed to know the relative efficiency among the methods for kernel recovery. Genotype response towards different methods of kernel extraction also studied (Table-01).

Table.1 Whole Kernel (%) recovery using various methods

	By Hand Hammer			By Stone slab			By Machine		
Plants	**2013**	**2014**	**Pooled**	**2013**	**2014**	**Pooled**	**2013**	**2014**	**Pooled**
BL 01	53.20	50.2	51.70	58.60	61.60	60.10	80.20	74.20	77.20
BL 02	61.80	54.2	58.00	62.40	58.20	60.30	79.80	76.60	78.20
BL 03	49.00	52.66	50.83	51.80	57.00	54.40	87.00	83.80	85.40
BL 04	55.94	48.42	52.18	58.60	62.80	60.70	83.40	82.80	83.10
BL 05	51.84	56.28	54.06	55.40	59.40	57.40	78.80	76.20	77.50
BL 06	51.60	51.4	51.50	61.60	55.00	58.30	85.00	80.60	82.80
BL 07	55.82	48.6	52.21	58.40	59.00	58.70	76.00	78.40	77.20
BL 08	49.40	51.14	50.27	51.40	59.60	55.50	73.00	86.60	79.80
BL 09	44.40	54.88	49.64	57.80	63.20	60.50	84.80	84.80	84.80
BL 10	53.66	54.20	53.93	56.60	58.80	57.70	75.40	83.40	79.40
CD $_{0.05\%}$	5.18	N.S.	4.59	N.S.	N.S.	N.S.	8.40	N.S.	6.17
SE (d)	2.54	2.92	2.30	4.61	3.78	3.00	4.13	4.09	3.09
SE (m)	1.79	2.07	1.63	3.26	2.67	2.12	2.92	2.89	2.19
CV (%)	7.63	8.85	9.82	12.72	10.04	11.51	8.12	8.02	8.59
Mean	52.66	52.19	52.43	57.26	59.46	58.36	80.34	80.74	80.54

Table.2 Comparison among various methods of efficiency of Whole Kernel (%) recovery

Method for Kernel Extraction	**2013**	**2014**	**Pooled**
By Hand Hammer	52.66	52.19	52.43
By Stone slab	57.26	59.46	58.36
By Machine	80.34	80.74	80.54
CD $_{0.05\%}$	2.67	2.468	1.60
SE (d)	1.14	1.05	0.68
SE (m)	0.80	0.74	0.48
CV (%)	2.87	2.62	1.71

Fig.1 Whole Kernel (%) Recovery Using Hand Hammer

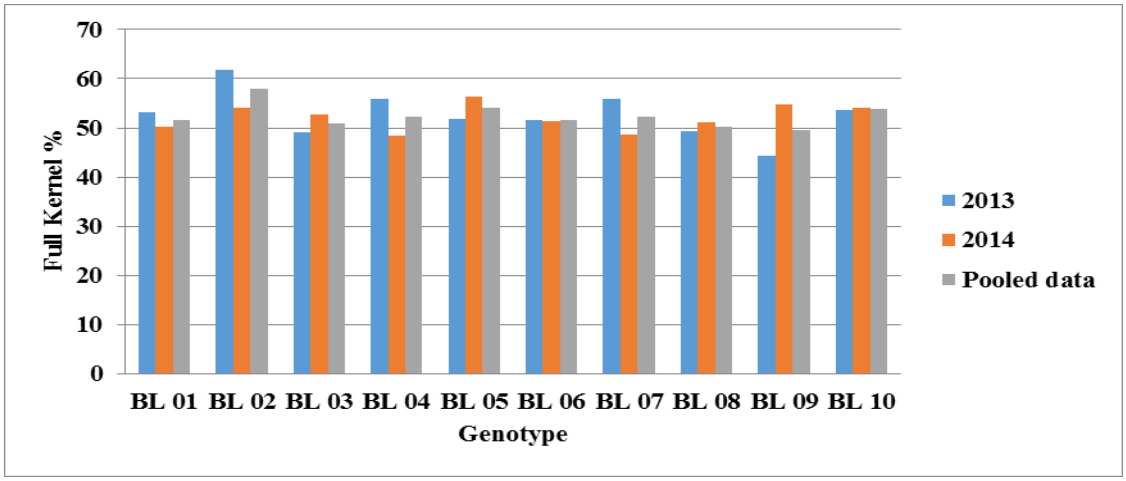


Fig.2 Whole Kernel (%) Recovery by Stone Slab

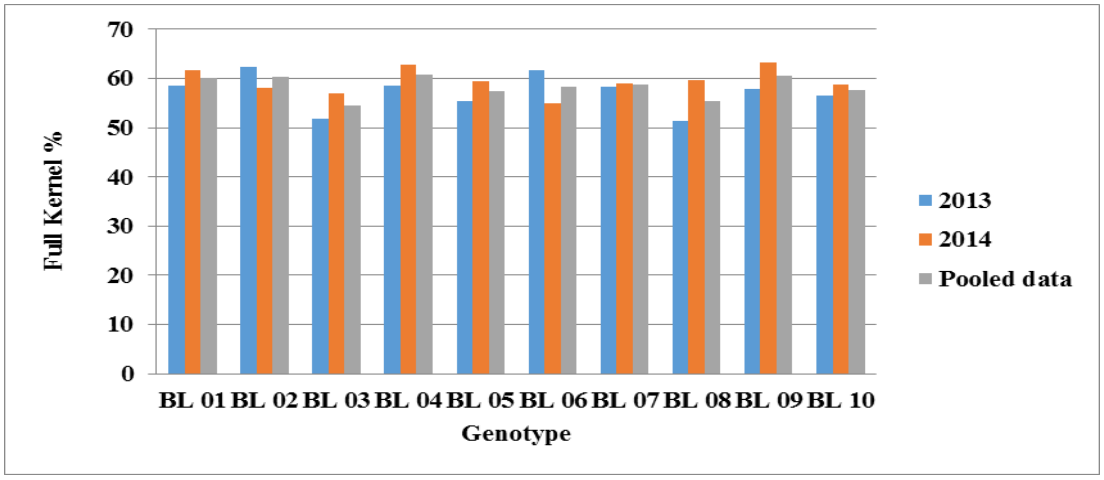


Fig.3 Whole Kernel (%) Recovery by Machine

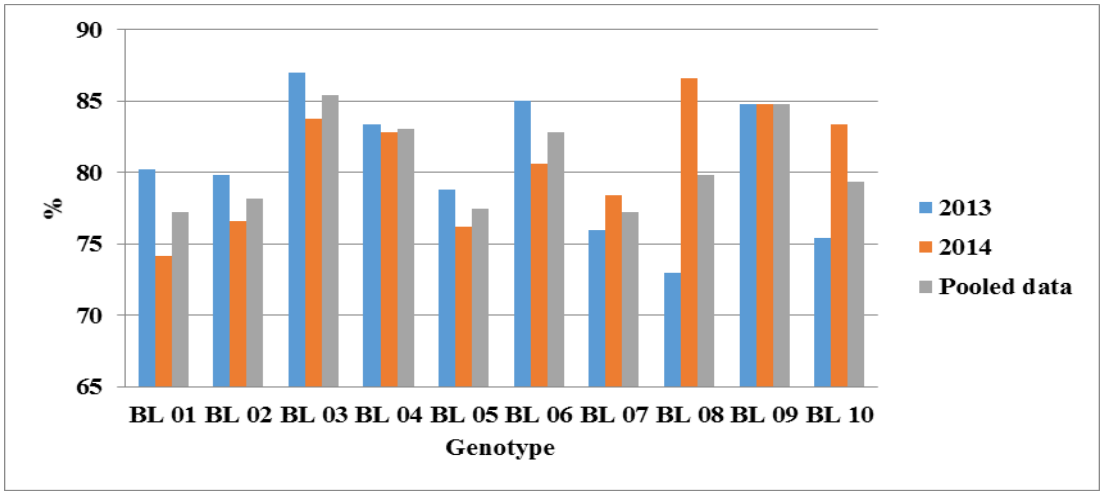
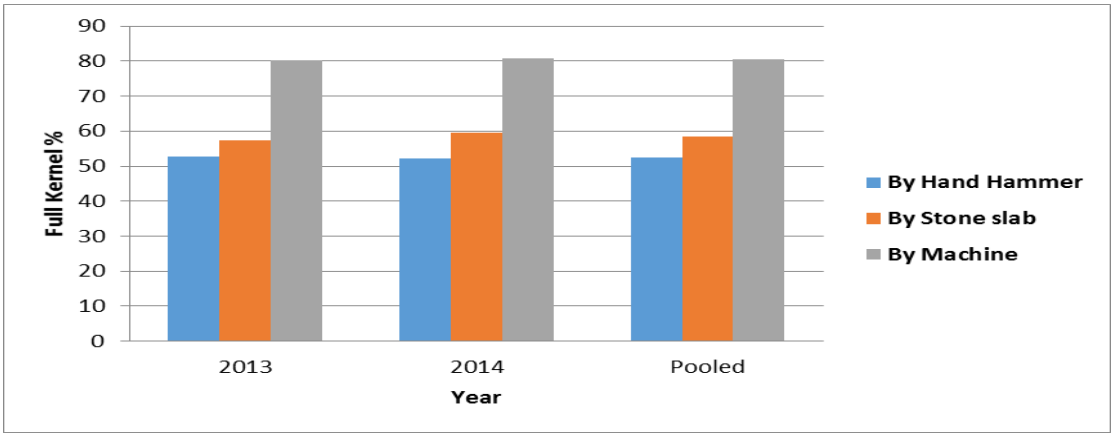


Fig.4 Comparison among various methods of efficiency of Whole Kernel (%) recovery



Significant statistical differences among the genotypes were noted for kernel recovery for hand hammer and by machine (in pooled data). Whole kernel recovery was noted significantly better in BL02, BL05 and BL10 using hand hammer. Similarly, genotype BL03, BL04 and BL09 respond significantly better than others in kernel recover using machines. Machewad *et al.*, (2003) reported that chironji showed variation in kernel recovery in different genotypes. It indicated that genotypic differences exist towards kernel recovery in chironji. Therefore, selection of genotype may be practiced judging the method of extraction.

Table 02 showed relative efficiency between various methods of kernel recovery from chironji fruits. Significant differences were noticed (2013, 2014 and pooled data) among the methods of whole kernel recovery. Data revealed that use of machine (80% recovery) was far better that traditional method. Hand hammer (52.43%) and stone slab (58.82%) clearly showed poor whole kernel recovery. Less kernel recovery may be due to poor quality (efficiency) of tools.

Tribal often harvest the fruits from forest, extract the seed from fruits and sold the produce to local vendors, mostly tribal. Local vender sold it to whole seller, and whole seller extracts the kernel by employing labour. It seems that development of some improved hand held tool for seed extraction is necessary for primary processing at village / household itself. It may reduce the bulk and also add the value of the produce. Alternately, in cities, chironji kernel should be extracted by machine only.

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