MINISTRY OF FOOD PROCESSING INDUSTRIES
GOVERNMENT OF INDIA

PROCESSING OF CHIRONJI

AATMANIRBHAR BHARAT

PM Formalisation of Micro Food Processing Enterprises Scheme (PM FME Scheme)

INTRODUCTION

- *Buhanania lanzan,* belongs to family Anacardiacae. Chironji is a hardy plant and thrives wellon rocky, gravelly red soils and also on saline andsodic soils but does not survive under water logged conditions.
- It grows in pockets of soil between crevices of barren rock and degraded rocky areas including salt-affected soils.
- 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 MARKET

• Chirongi Market in terms of production, consumption, covers Indian States of Madhya Pradesh. Chhattisgarh, Maharashtra. Bihar. Jharkhand, Orissa. Andhra Pradesh and Gujarat and By Type

•It is widely used in food industry and has aromatic and medicinal use as well.

•About 75 % of farmers sell their produce at farm level to the village merchants, retailers, big producers or to pre harvest contractors. They cannot afford to transport their produce to distant markets on account of non availability of transport facilities, expensive transport and malpractices in market. Information regarding demand, supply, price, market outlook, knowledge of consumer's preference, marketing channels are important.

• In forest areas the proportion of flowers and seed collection is much less than the areas around villages. However local middlemen purchase the dehulled kernels of chironji from villages and supply it to wholesale markets. It ultimately reached to expellers from wholesale market.

BENEFITS OF CHIRONJI

• *Buchanania lanzan* is nutritional, and used as palatable a substitute of almonds in confectionery.

• The edible seed kernels of chironji contain a pleasant, slightly acidic flavour, and are eaten raw or roasted.

•It yields fatty oil known as Chironji oil which is a best substitute of olive and almond oils in both confectionery and indigenous medicine used for glandular swellings of the neck.

•Fruits are laxative and also used as an alternative medicine to relieve fever.

•Kernels of fruits are also used as ointment in skin diseases. It has a great potential in employment generation particularly for the forest dwellers.

BENEFITS OF CHIRONJI

- Fresh ripen fruits and extracted seed kernels have several nutritional and medicinal properties. Seed kernel and extracted kernel oil is used for the preparation of several Indian dishes.

- Traditional indigenous knowledge revealed immense importance of almost all parts of plant like roots, leaves, fruits, seeds and gum for various medicinal applications like cure for blood disorder, fever, ulcers, burning sensation of body, diarrhoea, dysentery, asthma, snakebite, etc.

- Due to direct harvesting of economically important parts of tree from natural habitat, genetic resources of *B. lanzan* are facing severe threat of extinction and need immediate conservation efforts.

VARIETIES

Thar Priya

- It has been identified as variety at central Experiment Station, Horticultural, Godhra.
- The tree has spreading growth habit, thick trunk, evergreen, dense foliage and drooping branches. It is regular bearer and flowers in the second week of February. Peak period of fruit set is fourth week of February.
- It ripens in third week of April. Fruit pulp has total soluble solids 23.50^{o} Brix, total sugar 15.61 %, vitamin C 46.35 mg/ 100g. Stone weight 0.41 g, kernel weight
  0.09 g and kernel protein 30.00 %. Fruit yield per plant is 13.20 kg during 9th year of orchard life under rainfed conditions of hot semi-arid ecosystem.

Thar Priya

RAW MATERIAL

- A tree of the dry region is found in north. west and central India. Plants may be seen in forest area of Uttar Pradesh. Madhya Pradesh. Chattishgarh, Maharashtra. Bihar. Jharkhand, Orissa. Andhra Pradesh and Gujarat.
- Flowers are typical of family anacardiaceae. Flowering starts in the month

  of January-February on the well-developed panicles
- The fruits of *chironji* mature in 4 to 5 months and are harvested manually in the month of April and May. The green colored skins of harvested *chironji* fruits turn black on storage which has to be removed before shelling
- The *chironji* kernels contain about 52% oil which oil is used as a substitute for olive and almond oils, while the whole kernel is used in sweet-meats or as a substitute for almond kernels. *Chironji* oil is extracted from the fruits of *Buchanania lanzan* and is known as "*char*" in India.

COMPOSITION OF CHIRONJI FRUITS

CONSTITUENTS	FRESH FLOWERS
Starch	12.1
Proteins (%)	63-72
Fats (%)	59g
Niacin	1.5
Vitamin like Thiamene	0.69mg
Oil	34-47%
Phosphorus (mg/100 g)	528mg
Riboflavin	0.53 g
Vitamin-C (mg/100 g)	5.0g

HARVESTING OF CHIRONJI NUTS

- **Harvesting of *chironji* nuts -**The plant has great medicinal value and the kernels are used as expectorant and tonic. The fruit of *Chirongi* mature in 4 to 5 months and harvested manually in the months of April and May.

TRADITIONAL METHOD OF PROCESSING

- **De-skinning of *chironji* nuts:** The skin of the harvested green nuts turns black on storagewhich has to be removed before shelling.
- The nuts areusually soaked overnight in water and rubbed with palms for small scale processing and with the jute sack for large scale processing.
- The water containingfine skin is decanted. The nuts are washed with fresh water to obtain clean nuts .The cleaned nuts are dried in sun for 2 to 3 days and stored for further processing i.e., shelling.

SHELLING

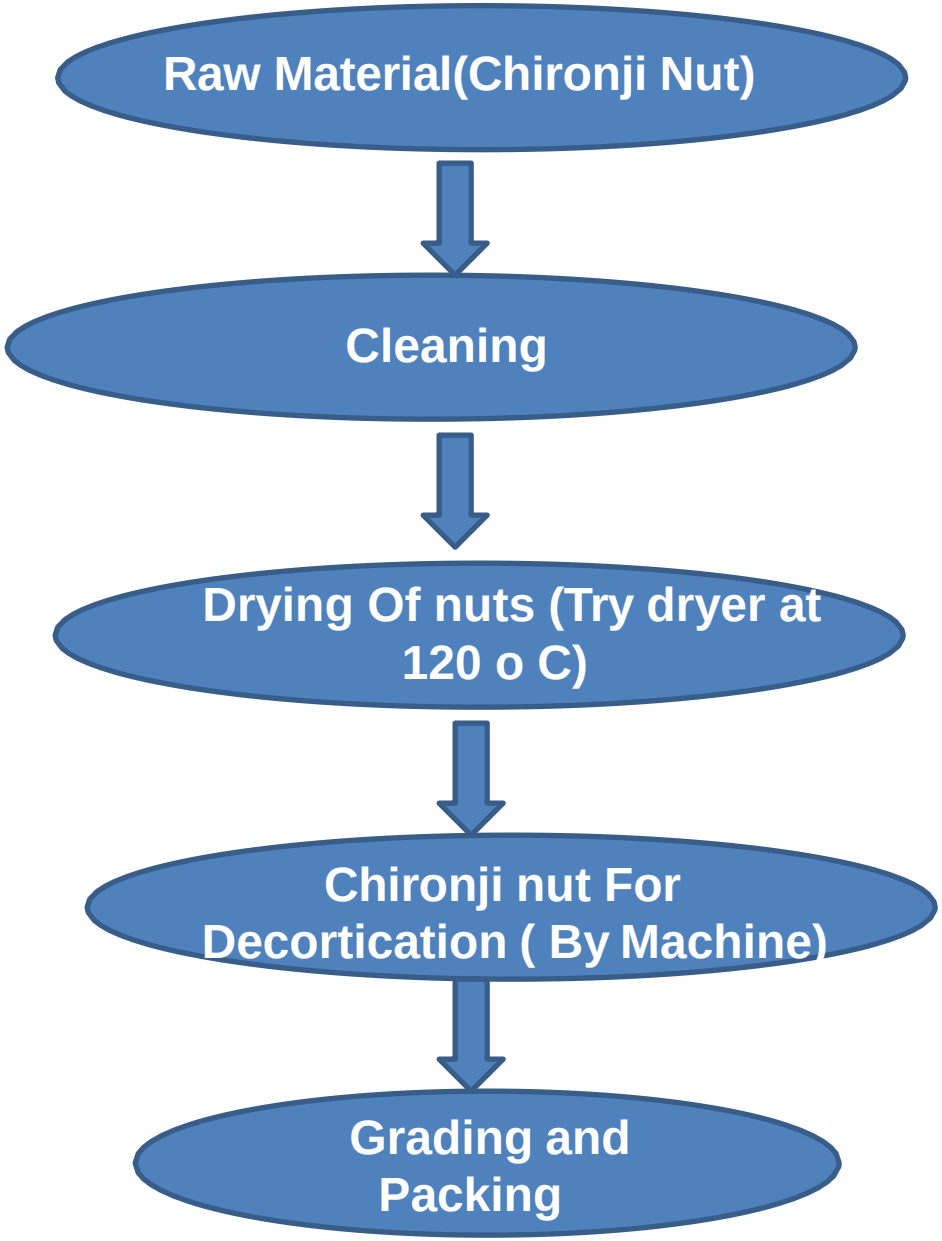
- Shelling is the process of separating kernel from hull. For small scale (home level), the dried nuts need to be shelled by the prevailing method, i.e. by rubbing with a stone-slab on a rough stone

- surface followed by manual separation of kernels and for large scale shelling horizontal stone under runner or burr mill needs to be used.. 6.

SHELLING Contn…

- The Sheller should be made of two stone discs of 75 - 80 mm thickness and 450 - 500 mm, the upper disc being stationary and about 2 mm deep lines be engraved starting from center towards periphery of lower disc and the two discs connected through a shaft of 30 - 40 mm diameter .The impact and abrasive forces, which separates coat from kernel and split the kernel. The unit to be connected to grader through power driven shaft in such a way that split or shelled kernels fall on the grader. Power to be transmitted to under runner through a shaft from grader which is connected to 5 HP diesel engine. The efficiency of the under runner is low and it will cause more broken and powder. So, there is need of chironji decorticator for shelling efficiently.

PROCESSING OF CHIRONJI



PROCESSING OF CHIRONJI

Fig: (1) Chironji tree; (2) Manual harvesting; (3) Traditional sheller for Chironji kernel shelling; (4) Driving mechanism of sheller (under runner) at cottage level; (5) Chironji leaves with immature nuts; (6) Harvested stored nuts; (7) Cleaned nuts; (8) Chironji kernels; (9) Grader for grading at cottage level; (10) Manual separation of kernels form hull and brokens

MACHINES FOR CHIRONJI PROCESSING

- **Grader**

The main purpose of grader is separate the kernals from the hulls and to separate the kernels of different sizes. The shelled or splitted kernels will pass through grader. The grader is having 3 screens of various sizes and screens are moving by oscillating motion driven by shaft. Here grader separates the shelled produce as per its opening size, but due to poor performance of under runner, again need to separate kernels from hull.

Cylinder Seed Grader

CHIRONJI SEED DECORTICATOR

Usage/ Application	Charoli Decorticator
Type Of Machines	Charoli Decorticator
Capacity	200 - 1100 Kg per Hr.
Model	Charoli Or Chironji Seed Decorticator with Grader Model

VALUE ADDED PRODUCT

Value Added Product:

Chironji Nut
Chironji kernel (can be used for preparation of different kinds of sweets)
Chironji pulp (products like squash, RTS, and nectar may be prepared from the pulp of the fruit)

Storage of Value Added Product:

Broken chironji as well as chironji exposed to high levels of moisture easily damaged by pests,
thus lime coating and usage of polyethylene bags is suggested to preserve overall
characteristics.

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CHIRONJI PROCESSING STEPS

Harvesting crop (180 days after sowing)

The matured seeds

Cleaning

Decortications of chironji

Grading the seeds according to their size.

packed and stored in damp free environment.

QUALITATIVE ASSESSMENTS OF THE FINISHED PRODUCTS

According to the FSSAI's Food Products Standards & Food Additives regulations, 2011 following are the standards which are to be adhered to for fennel processing.

.Quality Specification (physical parameters analyzed in field level):

- Chironjee seeds shall be wholesome, mature, clean & dried

- It shall have characteristic size, shape and color (Gray to Black)
- Foreign matter (Organic and Inorganic) – Max 5%
- Broken and damaged seeds – Max 4%
- Percentage of seed floating on water – Max 10%
- It shall be free from mould, living and insect, fragments, rodent contamination.

CHIRONJI KI BARFI

Fry Chiroji a little
And grind coarsely

Make sugar syrup and grind Chirongi is added to the sugar syrup

Make Chironji Barfi
when It thicker

CHIRONJI AND MAKHANE KI KHEER

Ingredients

1 cup Phool Makhana (Lotus Seeds)
1 teaspoon ghee
1 liter Milk
1/4 cup Jaggery
1/2 teaspoon Cardamom Powder (Elaichi)
1/2 inch Cinnamon Stick (Dalchini)
Saffron strands , a few Ingredients for Roasted Nuts1 tablespoon Badam (Almond)
Sliced 1/4 cup Raisins
1 tablespoon Chironji
1 teaspoon ghee

CHIRONJI AND MAKHANE KI KHEER

We will first roast the phool makhana in ghee until crisp and aromatic. Heat a teaspoon of ghee and roast heavy bottomed pan and condense the milk until it becomes just close to half. Makhana while continuous stirring until they become light brown and crisp. Coarsely grind half of the roasted makhana in a mixer grinder and keep aside. We will use the remaining roasted makhana as a whole into the kheer.

- Boil the milk in a utensil.

CHIRONJI AND MAKHANE KI KHEER Contn..

- Once the milk is condensed, add the jaggery, the roasted Makhana (whole) and coarsely ground Makhana. Mix well and cook on a medium flame for 5 to 10 minutes, while stirring occasionally until the kheer becomes thick and the makhana has absorbed and cooked through.

- While the kheer is cooking, heat a teaspoon of ghee into another small pan and roast all the dry fruits in it till lightly brown and you get a roasted aroma.

- Add the half of the roasted dry fruits to the Makhane Ki Kheer and simmer for 3-4 minutes and turn off the heat.

ESSENTIAL OIL EXTRACTION

The recovery process of essential oil

- supercritical extraction
- Pressing, extraction with solvent extraction.
- Extraction with fat.
- and distillation (distillation).

The steam distillation process (direct) is a steam distillation using steam. It flows through a circular pipe which is located below the porous material and the vapor moves upward through the material that is located on the top sieve.

CONTACT DETAILS

National Institute of Food Technology Entrepreneurship and Management

Ministry of Food Processing Industries

Plot No.97, Sector-56, HSIIDC, Industrial Estate, Kundli, Sonipat, Haryana-131028

Website: http://www.niftem.ac.in

Email: pmfmecell@niftem.ac.in

Call: 0130-2281089