

# MOTH PRODUCTS



# INTRODUCTION

**Scientific name: *Vigna aconitifolia***

**Family: Fabaceae**

**Common name: mat bean, moth bean, matki, Turkish gram or dew bean**

**Origin: India**



# INTRODUCTION

- Moth bean is native to India , grown for food production and as a forage and cover crop.
- It is predominately grown in India, although it has been cultivated in the United States, Australia, Thailand and other parts of Asia.
- This crop is used as a source of food, feed, fodder, green manuring, and green pasture. Green pods are delicious source of vegetables.
- Since moth is a pulse thus it also a good source of vegetable protein.

# GROWING CONDITIONS

- ✓ Moth is mostly growing in hot and dry habitats of northern and western India.
- ✓ It is considered as one of the drought resistance crop which can easily tolerate high temperature up to 45°C and slight salinity.
- ✓ Most suitable soil for the cultivation of moth is dry sandy soil. Optimum temperature range for the cultivation of moths ranges from 25-37°C.
- ✓ The annual rainfall required for moth is around 200-300mm while it has been found that it can also grown even at 50-60mm of rainfall annually.

## VARIETIES OF MOTHS BEAN

### Normal maturity group

- required more than 90 days to grow.
- Moth Guj.1 (MG -1), Jadra (IPCMO943), Jwala (IPCMO 912), IPCMO 880

### Medium maturity group

- required 70-90 days to grown.
- These are IPCMO 912, CZM.

### Early maturity group

- category required 60-65 days to grow.
- Important characteristics includes high yield, suitable for drought area, resistant to YMV

## VARIETIES OF MOTHS BEAN

### State-wise recommended varieties:

STATES	Recommended varieties
Rajasthan	RMO-257, RMO-435, RMO 2004, RMO 225, RMO 40, FMM-96, Moth 880, Jwala, Czm 45,CZM 99, TMV
Gujarat	GMO 1, GMO 2, Maru Bahar, RMO-257
Maharashtra	CZM 45, CZM 99, RMO 435
Haryana	CZM 45, CZM 99

# PRODUCTION TREND (INDIAN SCENARIO)

- Cultivation of moth is done on approximately 9.26 lakh hectare of lands and the total production recorded as 2.77 lakh tones in India during 2012-17.
- Rajasthan is the largest producer of moths in India which is constitute 96.75% of area and 95% of total production.
- Followed by Gujarat (2.38% area and 3.6% production).



# NUTRITIONAL COMPOSITION OF MOTH BEAN

Constituent	Content (per 100g dry seed)
Protein (g)	24.3
Carbohydrates (g)	68.0
Lipids (g)	3.9
Ash (g)	3.8
Calcium (mg)	133
Phosphorus (mg)	356
Magnesium (mg)	183
Iron (mg)	11
Thiamine (mg)	0.50
Riboflavin (mg)	0.10
Niacin (mg)	1.7



## ESSENTIAL AMINO ACIDS COMPOSITION OF MOTH

<i>Amino acid</i>	<i>Moth bean (g/16 g N)</i>	<i>FAO reference protein (g/16 g N)</i>
Lysine	5.6	5.5
Leucine	7.0	7.0
Isoleucine	5.1	4.0
Valine	3.3	5.0
Methionine	1.0	} 3.5
Cystine	0.5	
Phenylalanine	4.7	} 6.0
Tyrosine	-	
Threonine	-	4.0
Tryptophan	0.70	1.0

Compiled from: Palmer and Thompson (1975), Gopalan *et al.* (1982) and FAO/WHO (1973).

# MANUFACTURING OF PAPAD FROM MOTH BEAN

**GRINDING OF MOTH BEAN**



**MIXING**



**KNEADING OF DOUGH**



**SHAPING**



**DRYING**



# MANUFACTURING OF PAPAD FROM MOTH BEAN

## 1. Cleaning of Moth bean :

- ✓ Moth bean are first cleaned for getting high amount and good quality of flour.
- ✓ For cleaning purpose mostly reciprocating air-screen cleaners and reel screen cleaners are used.
- ✓ Reciprocating air cleaner has two screen having different size of perforation which are used for separation of lighter materials like dust, leaves, husk etc.
- ✓ In reel screen cleaner there 2-4 cylindrical compartments, having different size of perforation screen which are fitted on a 5-7.5 mm diameter shaft. The cylindrical screen drum rotates at 5-35 rpm.

# MANUFACTURING OF PAPAD FROM MOTH BEAN

## 2. Drying :

- ✓ Drying of moth bean is necessary reduce the moisture content.
- ✓ The process of drying can be performed either through Sun or mechanically.
- ✓ Sun drying process usually take 1-6 days where moth bean by spread over the floor/roof in a 5 to 7.5 cm thick layer and followed by manual stirring.
- ✓ Mechanical drying is performed either batch type or continuous flow type at temperature ranges from 600 -1200°C.

# MANUFACTURING OF PAPAD FROM MOTH BEAN

**3. De-hulling :** Removal of the seed coat is beneficial for the following reasons:

- ✓ Reduces anti-nutritional factors, such as tannins and insoluble fiber (non-nutrients that can bind protein and other nutrients), thereby improving nutritional quality, protein digestibility, texture and palatability.
- ✓ Removes astringent taste caused by tannins.
- ✓ Allows the production of higher quality flours, without browning/speckling (also increases leavening ability).

# MANUFACTURING OF PAPAD FROM MOTH BEAN

## 4. Grinding of moth bean

- ✓ Grinding of bean is mainly done with help of grinding machine and it should be smoothly grind so that texture of papad will be of good quality.

## 5. Mixing :

- ✓ After grinding, powder obtained from grinder should be properly mixed along with all the required ingredients to make powder more uniform.

## 6. Kneading

- ✓ Moth bean powder should be kneaded properly and during this process addition of water in to dough should be carefully monitored so that amount moisture should be present in appropriate quantity.

# MANUFACTURING OF PAPAD FROM MOTH BEAN

## 7. Shaping :

- ✓ The papad press is machinery operated. The papad dough is made from moth bean flour, salt, carbonates, farinaceous material and water. The dough is made into sheet form by press machine into 1-mm thickness and cut into circular shape by machine. The pressed circular shaped papad is dried to 14-15% moisture level at room temperature using dryer machine.

## 8. Packaging :

- ✓ The papad with a 14-15 % moisture label is packed in polythene sheets using a hand sealing machine and sent to the market after final packaging

# MANUFACTURING OF BHUJIA FROM MOTH BEAN

GRINDING OF MOTH BEAN



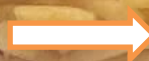
ADDITION OF ALL THE INGREDIENTS



KNEADING



EXTRUSION



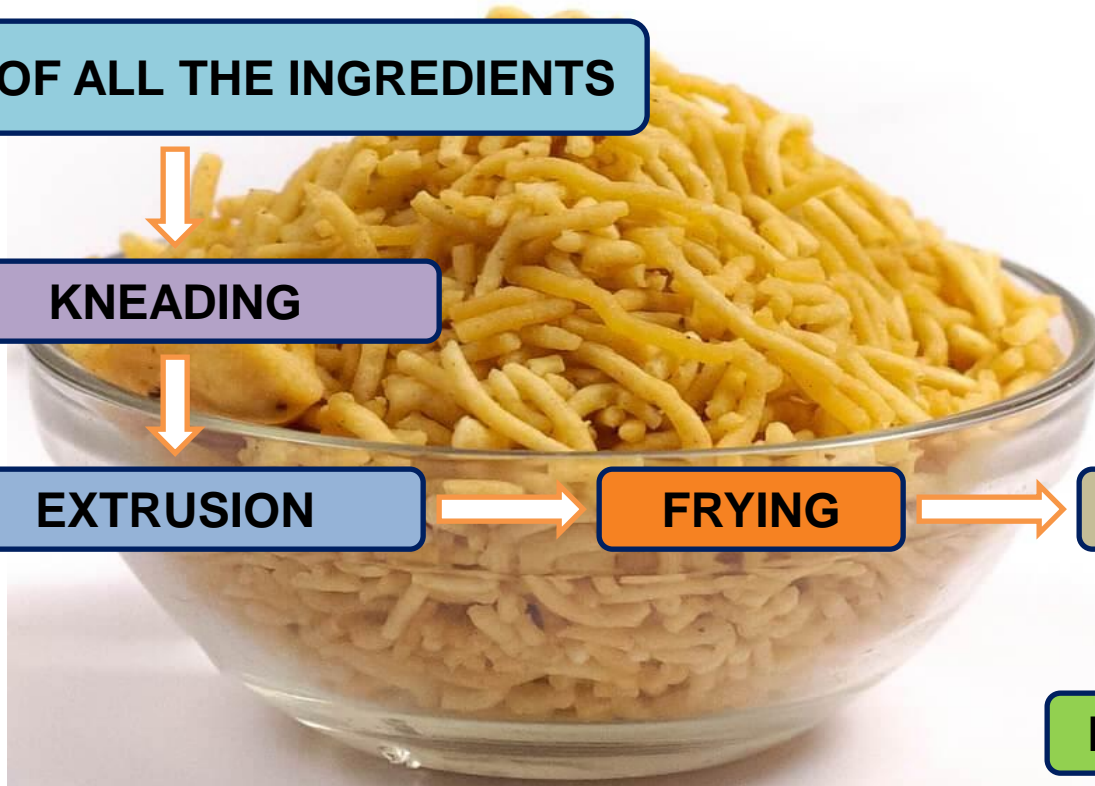
FRYING



DRYING



PACKAGING





# MANUFACTURING OF BHUJIA FROM MOTH BEAN

## 1. Grinding of moth bean :

- Grinding of bean is mainly done with help of grinding machine and it should be smoothly grind so that texture of bhujia will be of good quality.

## 2. Addition of ingredients :

- Ingredients such as such as salt and spices are added in appropriate quantity. While adding these ingredients proper regulation of FSSAI must be followed.

## 3. Kneading

- moth bean powder should be kneaded properly and during this process addition of water in to dough should be carefully monitored so that amount moisture should be present in appropriate quantity.

# MANUFACTURING OF BHUJIA FROM MOTH BEAN

## 4. Extrusion :

- After kneading, dough is passed through an equipment called as extruder. Extrusion is done to cut down the dough in a proper shape.

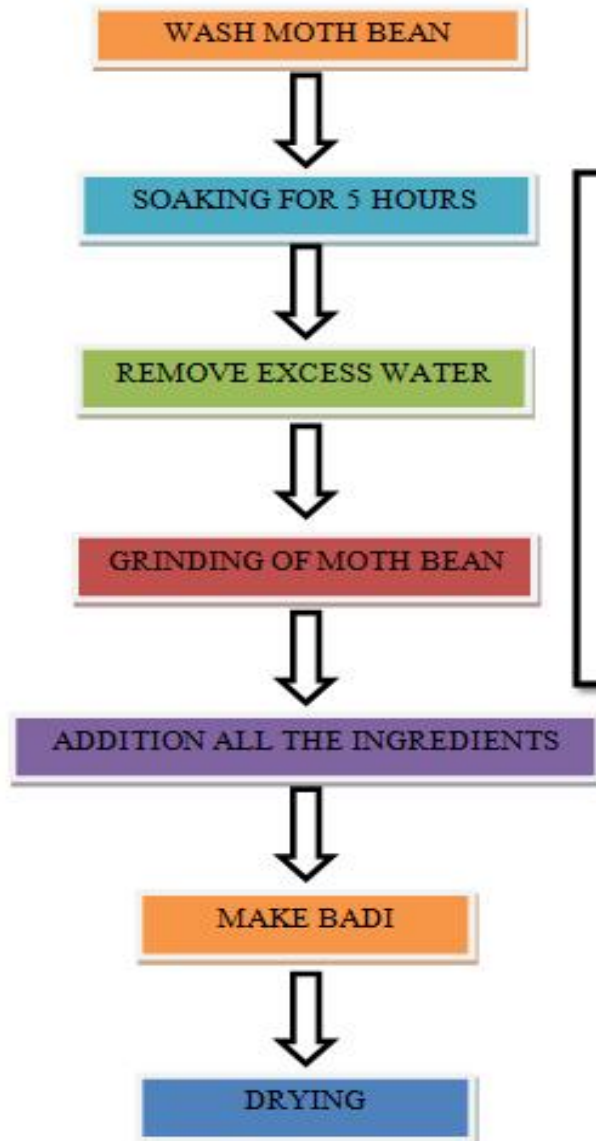
## 5. Frying :

- Product obtained from extruder are fried deeply in oil.

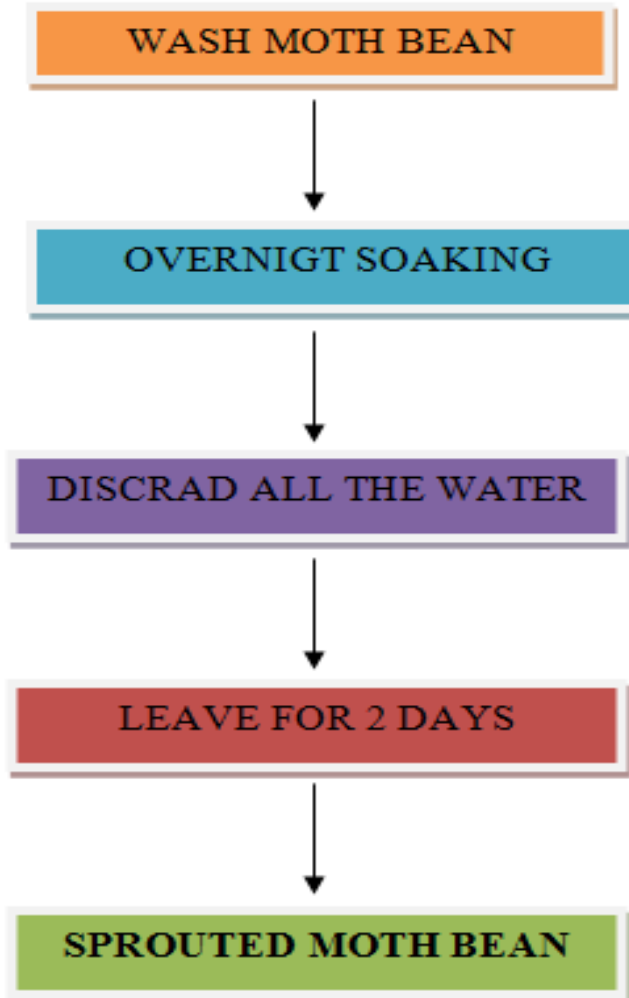
## 6. Drying :

- It is done to lower down temperature of fried product as well as drying process also remove some amount of oil at the same time.

# MANUFACTURING OF MASALA BADI FROM MOTH



# MANUFACTURING OF SPROUTS FROM MOTH BEAN



# EQUIPMENT FOR MOTH BEAN PROCESSING

## 1. WEIGHING MACHINE :

- ❑ For getting good quality of product, all the ingredients should be properly weighed with the help of digital weighing machine.



## 2. SIEVE :

- ❑ It used for sieving flout of moth bean so that only fine powder can be utilized for manufacturing purpose. Without sieving coarse powder will be mixed up



# EQUIPMENT FOR MOTH BEAN PROCESSING

## 3. DOUGH MAKER :

- ❑ Dough maker is used for dough preparation at a larger quantity and in lesser time. All the ingredients are mixed together uniformly with help of dough maker.



## 4. EXTRUDER MACHINE :

- ❑ It is used for cutting the dough in to thick and small shape which will be appropriate for frying process.



# EQUIPMENT FOR MOTH BEAN PROCESSING

## 5. SHEETING AND CUTTING MACHINE :

- ❑ It used to roll the papad and cut in to proper shape.



## 6. FRYER :

- ❑ Fryer is used for deep frying of bhujia.



# EQUIPMENT FOR MOTH BEAN PROCESSING

## 7. PAPAD DRYING MACHINE:

- ❑ Papad drying machine is used for drying of papad before final packaging.





# HEALTH BENEFITS

- ✓ Have anti inflammatory properties.
- ✓ Rich source of protein.
- ✓ Prevent constipation.
- ✓ Boost immunity.
- ✓ Lowering the blood pressure.
- ✓ promoting Healthy Skin.
- ✓ Consumption of moth helps in reducing LDL (bad) cholesterol.
- ✓ preventing the symptoms of diabetes.

# CONTACT DETAILS



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