GINGELLY (TIL, ELLU)

Sesamum indicum 2n = 26

Centre of origin : Africa

Related species : So far 36 species were recorded in the genus *sesamum* 20 of them occur in Africa.

Wild species utilised in breeding programme

S.*alatum* 2n = 26

Resistant to phyllody *S.alatum* x *S.indicum* alatum is having dormancy.

S.*malabaricum* (2n = 26) Occurs in Travancore of Kerala. It freely crosses with cultivated gingelly. Oil content is low 32% It is utilised to induce male sterility in cultivated sesame.

S.laciniatum 2n = 32

Tolerant to phyllody, drought and jassid resistant.

Fertile auto allopoly ploid produced by crossing *S.indicum* x S.*laciniatum*

↓

Sterile, Double.

S.prostratum occurs in S.India (2n = 26)

Tolerant to drought.

Breeding objectives

1. **Breeding high yielding varieties tolerant to drought.**
2. **Breeding white seeded varieties**

Finest quality of oil is obtained from white seeded lines.

3. **Development of mono stemmed varieties.**

By this more population per unit area and yield can be increased. Monostemmed varieties are low yielders.

4. **Development of multicapsule / axil and multicarpellary varieties.**
5. **Rice fallow varieties** :

Shorter in duration.

6. **Non- shattering varieties**

African lines.

7. **Resistant to disease**

Powdery mildew;

Phyllody - transfer from wild species.

Breeding Methods :

1. **Introduction** : African lines.

2. **Pure line selection.**

TMV4 - Sattur local
TMV5 - Srivaikundam local
TMV6 - Andhra local.
SVPR1 - Western Ghat white seed variety

3. **Hybridization and selection**.

a) **Inter varietial**

Co1 (TMV 3 x SI 1878) x SI 1878, TMV 3 (S.A local x Malabar local), Paiyur-1

b) **Inter specific** : Male sterile lines evolved by crossing with *S.malabaricum.*

4. **Population improvement**

5. **Poly ploidy breeding**

6. **Heterosis breeding**

Epipetalous nature makes emasculation and crossing easier

Use of CMS lines is also being attempted.

7. **Embryo rescue technique.**

SESAMUM VARIETIES FOR TAMIL NADU

Variety	Parentage	Duration
Co 1	(TMV 3 x SI 1878) x SI 1878	90
TMV 3	South Arcot local x Malabar local	80
TMV 4	Pure line selection	80
TMV 5	PLS from Srivaikundam local	80
TMV 6	Selection from Andhra local	85
SVPR 1	Selection from Western Ghat white	80
Paiyur 1	SI 2511 x SI 2314	90
VRI 1	Selection from Tripathur local	75

MUSTARD and RAPE SEED

Brassica sp (2n = 16, 18, 20, 22, 36, 38 and 48)
Brassicaceae or *cruciferae*

The genus *Brassica* contains more than 3000 species of which 40 are of economic importance. Cultivated brassica can be broadly divided in to two distinct types viz.

Vegetable type : Cabbage, Cauliflower, turnip

Oil seed type - Rape seed and mustard.

Taxonomy :

Harberd (1972) examined 85 species of **Brassica** and grouped species of the genus into cytodemes. These cytodemes are composed of different species with the same chromosome number and which are cross fertile and other having species with different chromosome number and cross infertile. According to him most important agricultural species are four diploids, three allopolyploids, each belong to a separate cytodeme.

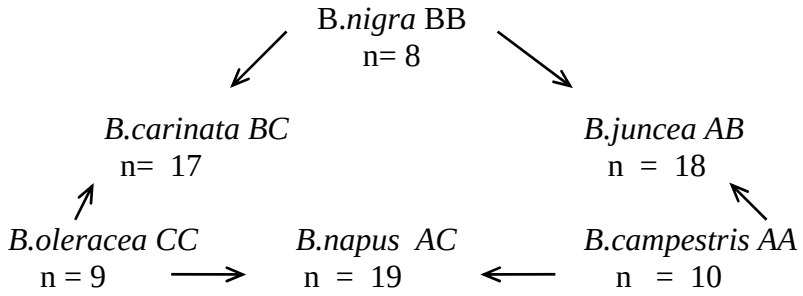
Four diploids are :

1. *B.nigra* - Black mustard
2. *B.oleracea* - Cabbage
3. *B.campestris* - Rape seed.
4. *B.tourne frotii* - Wild turnip

Three allopoly ploids

1. *B.napus* - Rape seed of Europe
2. *B.juncea* - Indian mustard
3. *B.carinata* - sthipplam mustard (veg / oil seed)

The genetical relationship between the oilseed brassicas are diagramaticaly represented as follows.



B.*napus* will cross readily with B.*campestris* but with extreme difficulty in case of *B.oleracea*.

Rape seed

Botanical name	2n	Economic characters
1.*Brassica compestris*	20	Indian Rape Seed. Self sterile in nature. Important oil seed crop of North India. 3 Cultivated types. B.*campestris* var. Brown sarson B.*campestris* var. Yellow sarson

		B.*campestris* var. toria
2. B.*napus*	38	European Rape Seed. Self fertile.
Mustard		
1. *B.nigra*	16	**Black mustard** : Native of Eurasia. 28% fixed oil. Used as medicine pungent due to glucoside sinigrin.
2. *B.alba*	24	**White mustard** : Young seedling used as Salad, yellowish seed 30 % oil.
3. *B.juncea*	36	**Indian mustard**. **RAI** 35% oil. Leaves used as herb contains sinigrin.

MUSTARD

Breeding objectives :

1. **Seed yield** : Yield is the end product of many biological processes which are under control of complex polygenic systems. An ideal plant type is having increased branch number, pods per plant, seeds per pod and seed size. Further yield increase could result from increase in biomass and harvest index. Increased biomass can result from reduced photo respiration and increased light saturated rate of photosynthesis.

2 **Early maturity** : For use in various multiple cropping sequence.

3. **Resistance to abiotic factors**

Frost resistance is needed to prevent yield losses. Winter hardiness is very important.

4. **Resistance to biotic stress**

Powdery mildew
Black leg
Sclerotinia rot, alternaria blight
mustard aphid - so far no resistance source identified.

5. **Herbicide resistance** : (Atrazine simabine)

A few sources of resistance is available.

6. **Shattering resistance**

B.napus - highly shattering
B. *juncea* - tolerant. Introgressive breeding done.

7. **Increased oil content and quality**

High oil content 45% yellow seed varieties > oil.
For industrial purpose > Erucic acid.
Development of low erucic acid cultivars for edible purpose.
Reduced linolenic acid content is also desirable.

8. **Meal quality**

Meal having less Glucosinolate content.

Breeding methods :

1. Introduction - Regina from Sweeden

2. Simple selection

E.G. Seeta, Krishna, Kranti.

3. Hybridization and selection

Intervarietal

a) Bulk method
b) Pedigree method
c) single seed descent

Inter specific

4. Back cross method

5. Population improvement

R S, mass selection

6. **Heterosis breeding**

CMS lines

7. **Mutation breeding**

E.G. Regina, RLM 198

8. Tissue culture technique for production of homozygous diploids

Saline resistance screening. Induction of mutation in haploids.

9. Embryo rescue technique for inter specific crosses.