IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

Quality Evaluation Of Seed Of Some Sesame Genotypes

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ABSTRACT

Sesame seeds are a decent wellspring of sound fats, protein, B nutrients, minerals, fiber, cell reinforcements, and other gainful plant compounds. Routinely eating significant segments of these seeds — in addition to a periodic sprinkling on a burger bun — may help glucose control, battle joint pain torment, and lower cholesterol.sesame is one of the most established oilseed crops. Around the world, it is utilized for its dietary, restorative, and modern purposes.

Sesame oil is frequently used to sauté meats and vegetables or is added to dressings and marinades. Sesame oil is accepted to have some significant medical advantages, such as giving heart-sound fats, fighting aggravation, and shielding skin from sun harm.

Sesame seed can be eaten crude, broiled or dried. It can shape a constituent of a wide assortment of food sources and sweet meats, Halva and so on it is likewise used to enliven bread, baked good and so forth. The main part of sesame oil >82% delivered in India, is used for eatable purposes. It is broadly utilized in the assembling of cleansers, beauty care products, fragrances, bug sprays, in drug items, in the planning of scented hair oil and as a vehicle of fat dissolvable nutrients. Other than use as creature and poultry feed and as human food, the cake is likewise utilized for modern purposes viz in making pastes and measuring of paper.

Sesame protein in wealthy in Sulfur containing amino acids, especially methionine and tryptopan.

Among the huge relationships body rate was adversely however fundamentally corresponded with test weight and oil content, oil content fluctuated essentially and adversely with palmitic corrosive, iodine esteem differed altogether yet adversely with palmitic corrosive and decidedly with oleic and linolenic acids. Nourishing quality record had critical however regrettable connection with palmitic and stearic corrosive and huge yet sure relationship with oleic and linoleic acids.

Key words— Sesame, oil , genotype, Seed.

INTRODUCTION

Oils and fats Comprise a vital Component of human diet as these are good source of energy and act as carriers of fat soluble vitamins. Oil cake or meal has high nutritional value in animal feed owing to its high content of good quality protein (Gill, 1994)

Oilseeds form the largest agricultural commodity after cereals in India, sharing 13 % of country's gross cropped area, about 5% of its gross national product and 10% of the value of all agricultural product. In India seven crop species providing edible oil are groundnut, rapeseed-mustard, sesame, sunflower, soybean, safflower and nigar. Out of these sesame is third largest oilseed crop extensively grown in India.

Sesame, botanically known as Sesamum indicum L. is perhaps the oldest oilseed known and used by man (Joshi 1961; Wiss 1971). In India its is grown under a system of small scale peasant agriculture. Mostly by small and marginal farmers. The crop is now grown in a wide range of environments, extending from semiarid tropics and sub-tropics to temperate regions. Consequently. The crop has a large diversity in cultivars and cultural systems (Sharma S.M., 1997)

With the share of 31 % of area and 26 % production, India is the largest sesame growing country and highest producer in the world. India occupies an area of 2.1 million hectares with the production of 0.6 metric tonnes whereas in world sesame occupies an area of 6.8 million hectare with the production of 2.5 metric tonnes. In India, Rajasthan, with 4.1 lakh hectares of sesame growing area ranks first. The other major sesame growing states are : Orissa, Gujarat, Maharashtra, Madhya Pradesh, Andhra Pradesh, Tamil Nadu, West Bengal and Karnataka. (Perspective Plan. 2020)

Sesame seed is a valuable nourishing food and is also used as flavouring agent. It is invariable dehulled for use as a food. On expression, sesame seed yields oil. Its oil has a desirable fatty acid composition and excellent stability against oxidative rancidity. Sesame has been described as "Queen of Oilseeds" because of the excellent qualities of the seed, oil and meal.

Sesame oil is rich in oleic and Linoleic acids, which together account for 85 per cent of the total fatty acids. The range of variation of different fatty acids of sesame oil is : myristic 0.1-0.3%; palmitic 7.8-9.4%; stearic 3.6-5.7%; arachidic 0.4-1.1%; hexadecenoic 0.0-0.5%; oleic 35.0-49.4%; linoleic 37.7 -48.4%; lignoceric is present in traces.

Sesame cake and meal are also important as a source of protein for human nutrition. However. The seeds contain some anti nutritional constituents, phytic and oxalate. Phytic and oxalic acids reduce the availability of certain minerals besides rendering the proteins insoluble and imparting bitter taste to the cake. Since they are more concentrated in seed coats, they can be minimized by dehulling the seed. Sesame cake also contains 19.3 mg/g iron, 1.0mg/g of thiamine, 5.3 mg/g of niacin and 0.4 mg/g of riboflavin. Sesame protein is rich in methionine and tryptophan but deficient in lysine. Thus sesame cake from dehulled seed can serve as a nutritious human food.

Sesame seed can be eaten raw, roasted or parched. It can form a constituent of a wide variety of foods and sweet meats, Halva etc. it is also used to decorate bread, pastry etc. The bulk of sesame oil >82% produced in India, is utilized for edible purposes. It is widely used in the manufacture of soaps, cosmetics, perfumes, insecticides, in pharmaceutical products, in the preparation of scented hair oil and as a vehicle of fat soluble vitamins. Besides use as animal and poultry feed and as human food, the cake is also used for industrial purposes viz in making glues and sizing of paper. (Wealth of India, 1968)Thus seeing its excellent nourishing property and varied utility the present investigation, "Quality evaluation of seeds of some sesame (*Sesamum indicum* L.) genotype" was undertake with the following objectives:-

1. To study the variability in oil content and oil quality of different sesame genotypes.
2. To find out the nutritive value of the meal from different sesame genotypes.
3. To work out correlation between various parameters.

REVIEW OF LITERATURE

This chapter envisages the survey of work done earlier in sesame seed quality. The pertinent literature has been presented as follows:

Test Weight;

The oleaginous edible seeds of *Sesamum indicum* are traditionally esteemed for their oil and are also acquiring additional importance as a source of protein for human nutrition. The seeds are small in size. The weight of 1000 seeds ranged from 2.0 – 3.5 g. The seeds vary in colour from white trough brown to black. The pericarp forms 9.8 – 10.2 pr cent of the weight of the seed. The dehulled cake is white in colour. (Wealth of India 1968).

Moisture Content:

Bernardini (1985) showed that sesame seed had 6-7% moisture.

Amin and Kothari (1989) reported that the seeds of sesame cultivars had 3.41 – 5.13% moisture.

Oil content:

Tashiro et al. (1990) observed that the oil content of the sesame seeds ranged from 43.4 to 58.8%. The average oil content found for the white seeded strains was 55.0%. Strains with light coloured seed coats tended to have higher oil content which was related to seed soze. Black seeded strains tended to have a higher percentage of seed hull.

Tashiro et al. (1990) further reported that strains having light coloured seed coat tend to have higher oil conent than those having white seed coats.

Rajeswari and Ramaswamy (1994) reported that oil content of sesame varieties ranged from 43.9 to 48.6% and that of hybrids from 43.06 to 47.50%. Lee and Lee (1995) analyses the Korean and foreign sesame germ plasm and showed that kadal and Suwon 88 had the highest oil content. The differences in average oil content between the varieties was 9.2%.

Fatty acids:

Muralidharudu (1994) reported that in sesame palmitic acid ranged between 9-13.6%, stearic acid between 3.0 – 6.2% and oleic acid between 34 – 43.5% while linoleic acid varied from 33 to 45%.

Lee *et al.* (1995) found a variability of 13.2, 14.7 and 23.8% for palmitic. Oleic and linoleic acid contents in Korean and foreign sesame germplasm material. They also stated that early maturing varieties were higher in oleic and linoleic acids than the late maturing ones.

Baydor (1996) reported significant differences in fatty acid contents of 20 sesame varieties of native and foreign varieties.

Iodine Value:

The iodine value of oil obtained from different varieties of sesame seeds varied from 104-118 (Menezes dt al. 1950).

Mineral Matter:

Bernardini (1985) showed that sesame seed had 5-7% minerals.

Patil at al (1994) reported that the sesame seeds had 6.2 – 6.5% minerals.

Protein:

Lee and Lee (1995) reported that the varietal differences in protein content of sesame seeds amounted 9%. Black seeded varieties had 8.24% higher protein content and higher essential amino acid content than white seeded ones.

Rajeswari and Ramaswamy (1994) reported that protein content in seeds of sesame varieties ranged from 181.6 to 256.8mg/gm and that of hybrid from 202.4 to 228.8 mg/gm. They also observed difference in protein banding pattern of different varieties.

MATERIAL & METHODS

The present investigation namely "Quality evaluation of seeds of some sesame (*Sesamum indicum* L.) genotypes" was conducted for one cropping season.

Experimental Technique:

The experiment was laid out under the field conditions during rabi, 1996-97 at the Oilseed Research Farm of Mauranipur Jhansi Research Station of C.S.A. University of Agriculture & Technology, Kanpur.

Seed Material:

Seed samples for analysis were obtained from the breeder (Sesame), oil seed Section, C.S.A. University of Agriculture & Technology, Kanpur.

Treatment:

This was an Advance Varietal Trial of AICORPO Comprising of eight genotypes namely RT-274 (White), TKG-21 (White), RS-160(White), OS-10 (Black), OS-18 (Black), ORM-17 (Black), JTS-8(Whit) and TC-25(White).

Experimental Design:

The experiment was laid out in randomized block design with eight entries and three replications.

Observations Recorded:

1. **Physical Characteristics**
   a. 1000 seed weight
   b. Moisture content
   c. Husk percentage
2. **Nutritional Characteristics**
   a. Oil content in whole seed
   b. Fatty acid composition of the oil.
   c. Iodine value of the oil.
   d. Oil stability Index
   e. Nutritional Quality Index
   f. Protein Content in defatted cake
3. **Correlation studies**

Details of Observations

(1) Test Weight

100 seeds were counted and the their weight in grams was recorded. It was converted to 1000 seed weight which is called test weight.

(2) Moisture Content

About 1 gram of the seeds from each treatment were weighed and put in a petridish and dried for 1 hour at 105 C in force circulatory oven,. The samples were then put in a dessicator and cooled to room temperature and weighed again. The moisture content in seeds was then calculated and represented in percentage. (estimated by AOAC method 1970).

(3) Curde Protein Content in defatted oil cake

Crude protein was determined by multiplying total n Content in defatted seed cake by the factor 6.25. Total N content in defatted seed cake was determined by micro-Kjeldahi method (AOAC 1970). Percent N in the sample was calculated using following formula.

$$\% \text{ of N} = \frac{1.4 \times N.V.}{W}$$

$$\text{Protein } \% = N\% \times 6.25$$

Where – N is normality of HCl and V is the titre value of sampl minus titre value of blanks and W is weight of sample

4. Oil Content

Oil content in sesame seeds was determined by Soxhlet extraction procedure usng petroleum ether of B.P. 40-60 C (AOAC 1970).

The seeds material was dried at 105 C for one hour, ground in a pestle morter and 0.2 gm sample was weighed in a thimble and plasced in Soxhlet extractor. The oil was extracted with petroleum ether (40-60 C

B.P.) for six hours in a flask., The petroleum ether was evaporated and oil was dried in an oven for one hour at 100-105 C. The oil was cooled and weighed and oil percentage was then calculated.

$$\text{The oil percentage in seed sample} = \frac{\text{Weight of extracted oil (g)} \times 100}{\text{Weight of sample (g)}}$$

5.Fatty acid composition

Fatty acid composition of sesame oil was determined by gas liquid chromatography. Methyl esters of seed oil were prepared according to the method of Luddy et al. (1968).

6.GLC Condition

Column: 15 % DEGS (Diethylene Glycol succinate) on chromosorb W (80-100 mesh)

Detector: Flame ionization detector (FID)

Carrier gas: N_2

Besides, H_2 (0.5 kg/ cm^2 and air (0.8 kg/cm^2) are also used in this detector as a fuel.

Column temperature	190 C
Detector over temperature	240 C
Injector port temperature	240 C
Recorder speed	1 cm/minute
H_2 gas pressure	1.5 kg/cm^2
Carrier gas pressure	2.0 kg/cm^2

The retention time was measured and fatty acids were identified by comparing with the retention time of standards. The area under each peak was calculated by measuring peak heights and base widths.

7. Iodine Value: Iodine value was calculated from fatty acid content in oil. Oleic acid, linoleic acid, linolenic acid content were multiplied by separate factors as shown below: (Method advocated by jamieson, 1943).

Oleic acid % in oil x 90 = X_1

Linoleic acid % in oil x 181 = X_2

Linolenic acid % in oil x 274 = $\underline{X_3}$

$\sum X$

Iodine value was then calculated with the help of a formula which gives the iodine value-

$$\text{Iodine value} = \frac{\sum X \times 0.956}{100}$$

8. Oil Stability Index: Oil stability index was calculated by taking the ratio of oleic/linoleic acids as described by Carpenter et al. (1975)

$$\text{i.e. OSI} = \frac{\text{Oleic acid \%}}{\text{Linoleic acid \%}}$$

9. Nutritional Quality Index (NQI)

It is also calculated by the method given by Carpenter et al. (1976)

$$\text{N.Q.I.} = \frac{\text{Linoleic acid \%}}{\text{Saturated fatty acid \%}}$$

10.Statistical Analysis

For determining the significance of differences caused by different treatments, data were subjected to statistical analysis. Critical differences (C.D.) have been worked out for comparison fo mean values for various treatments and their effects. Standard error and critical differences values were calculated by the method suggested by fisher (1947) as given below:

(1) Correction factor (C.F) = $\frac{(GT)2}{Nr}$

(2) Total sum of square (TSS) = (X1 2+ X2 2+…………………..X24 2) – CF

(3) SS due to blocks [SS (BL)] = $\frac{[\ K2 = L2+M2+N2]}{n}$ – CF

(4) SS due to varieties [SS (V)] = $\frac{[O\ 2 + P2 + Q2 + R2+S2+T2]}{r}$ – CF

(5) SS due to error = TSS -SS(BL) – SS (V)

Table of Analysis of Variance

Source of Variance	D.F	S.S.	M.S. = SS/DF	F observed	F calculated		
					5%	1%	0.1%
Block	r-1	S.S. (Bl.)	SS (Bl.) / D.F.	BB/VE=F			
Varieties	n-1	S.S.(V)	SS(V) / D.F	VT/VE=F	2.71	4.10	6.46
Error	n-1 r-1		SS (Error)=VB / D.F.				

Total-1

Where

R=Number of blocks or replication

n=Number of treatment

(6) Standard Error S.E. (diff.) = $\frac{(2 \times V\ \ E}{DF(v)}$

(7) Critical difference (CD) = SE (Diff) x t% at (15 D.F. error)

11. Correlation Studies: Correlation coefficients were calculated with the help of the following

$$R = \frac{d\,xdy - \frac{(dx)\ .\ (dy)}{N}}{(\ (\ dx2 - \frac{(dx)2}{n}\ (dy2 - \frac{(dy)2}{n}\ ]}$$

Test of significance

$$(t= \frac{r((n-2)}{(l\ -r2}$$

D.F. N-2 at 5% level of significance

Where

N= Number of observation

dxdy = Sum of product of dx.dy

dx = Sum of dx

dy= Sum of dy

dx2 = Sum of square of dx2

dy2= Sum of square of dy2

RESULT & DISCUSSION

The experiment " Quality Evaluation of seed f Some Sesame (Sesamum Indicum L.) Genotypes" was conducted for on season and the relevant findings are presented and described here.

Test weight: The data on test weight of different sesame genotypes have been presented in Table 1. A variation of 2.70 – 3.27 g among the genotypes was observed but the differences were statistically non-significant. However, highest test weight was recorded with the entry RS – 166 and the lowest by OS-10 and the mean value was 2.99g.

Table 1 : Variability in test weight (g) of some sesame genotypes.

S.No	Genotypes	Test Weight (g)
1	RT-274	3.00
2.	TKG-21	3.16
3.	RS-160	3.27
4.	OS-10	2.70
5.	OS-18	2.82
6.	ORM-17	2.72
7.	JTS-8	3.25
8.	TC-25	3.25
	Mean	2.99
	N.S	

A variability in test weight (2-3.5) in different genotypes has been reported (Wealth of India, 1968).

2. Moisture Content: The data pertaining to moisture content have been presented in Table 2. Moisture content varied significantly among the sesame genotype, the range of variation being 1.91 – 5.04% with a mean value of 3.23%. The highest moisture content was present in the genotype TKG-21 and the lowest in OS-10. It is further seen that the genotypes RT-274 and RS-160 were at par with each other. A variability in moisture content of sesame varieties has also been reported by several workers.

Table 2: Variability in moisture content (%) of some sesame genotypes.

S.No.	Genotypes	Moisture content (%)
1.	RT-274	3.31
2.	TKG-21	5.01
3.	RS-160	3.32
4.	OS-10	1.91
5.	OS-18	3.88
6.	ORM-17	2.54
7.	JTS-8	3.08
8.	TC-25	2.76
	Mean	3.23
	S.E. at 5%	0.036
	C.D. at 5%	0.064

3. Husk percentage: The data in Table 3 revealed a great and significant variation in husk percentage of different sesame genotypes. The genotypes varied from 8.12 to 11.76% in husk percentage. The highest husk percentage was present in the genotype ORM – 17. It is seen that black seed coat containing genotypes had higher husk (%) than the white ones (Wealth of India, 1962). A variability of 9.8 – 10.2% in husk or hull percentage has been reported in sesame (Wealth of India, 1968).

Table 3: Variability in Husk percentage (%) of some sesame genotypes.

S.No.	***Genotypes***	***Husk Percentage (%)***
1.	RT-274	9.95
2.	TKG-21	9.30
3.	RS-160	9.17
4.	OS-10	11.27
5.	OS-18	11.24
6.	ORM-17	11.76
7.	JTS-8	9.40
8.	TC-25	8.12
	Mean	10.026
	S.E. at 5%	0.0247
	C.D. at 5%	0.0531

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4.Oil Content : The data on oil content have been presented in Table 4. A perusal of data revealed a significant variation in oil content of different sesame genotypes. The variation in oil content was observed from 46.12 – 56.23% with the mean value of 51.67%. The lowest and the highest values were recorded by the entries OS-10 and JTS-8, respectively. The genotype TC-25 was at par with JTS-8. These two genotype were significantly superior over all other genotypes in respect of oil content. A variation in the oil content in sesame seeds has been reported by several workers (Amin and Kothari, 1989; Tashiro et al. 1990; Rajeswari Ramaswamy, 1994; Patil et al. 1994). It is further seen that the genotypes which had white seed coat contained significantly higher oil content than the black seeded ones. Krishnamurthy et al. (1960) also reported that white variety seeds showed higher oil content as compared to black variety seeds. Sesame oil possesses a high degree of resistance to oxidative rancidity. The reason for this is that the sesame oil has a high percentage of unsaponifiables. The unsaponifiable fraction contains certain minor components viz. sesamin, sesamolin and traces of sesamol which confer on the oil certain unusual properties like, resistance to oxidative rancidity. (Wealth of India, 1968).

Table 4: Variability in Oil content(%) of some sesame genotypes.

S.No.	*Genotypes*	*Oil content(%)*
1.	RT-274	53.94
2.	TKG-21	53.55
3.	RS-160	53.19
4.	OS-10	46.12
5.	OS-18	47.97
6.	ORM-17	46.31
7.	JTS-8	56.23
8.	TC-25	56.11
	Mean	51.67
	S.E.(diff.)	0.717
	C.D. at 5%	1.537

5. Fatty acid composition : The data pertaining to fatty acid composition of the oil have been presented in Table-5.

Table 5: variability in Fatty acid composition (%) of some sesame genotypes.

S.No.	Genotypes	Plamitic	Stearic	Oleic	Linoleic
1.	RT-274	11.16	6.98	44.65	37.21
2.	TKG-21	6.21	2.13	50.00	41.67
3.	RS-160	15.28	5.95.	42.86	35.90
4.	OS-10	11.47	3.24	44.71	40.59
5.	OS-18	15.92	2.65	43.21	38.22
6.	ORM-17	9.18	3.06	44.90	42.86
7.	JTS-8	17.05	10.10	36.49	36.36
8.	TC-25	17.54	3.90	40.55	38.01
	Mean	12.97	4.75	43.42	38.85
	S.E. at 5 %	0.845	0.200	1.23	0.782
	C.D. at 5 %	1.812	0.429	2.65	1.675

A perusal of the data showed that the fatty acids present in the sesame oil samples were palmitic, stearic, oleic and linoleic. Palmitic acid ranged from 6.21 to 17.54%, stearic from 2.13 to 10.10% , oleic from 36.49 to 50.00% and linoleic from 35.90 to 42.86%. The data of fatty acid composition were found to be significant. It is visible that all the genotypes exhibited high content of oleic and linoleic acids. The data are in agreement with the literature. Sesame oil was in general found to be rich in oleic and linoleic acids, which together account for 85 percent of the total fatty acids (Wealth of India 1968). Oleic and linoleic acids were present in almost equal proportion in the genotypes under investigation. The same trend was reported by Lee and Kang (1980).

Sesame is nutritionally important as it contains high content of linoleic acid which is a desirable fatty acid. In the present study the genotypes ORM-17, OS-10 and TKG-21 were nutritionally better than the rest of the genotypes as they contained more than 40% linoleic acid. The best genotypes found was ORM-17, where as TKG-21 was the best in containing highest percentage of oleic acid (50.0%). A variability in fatty acid content has been reported by several worker (Nagraj, 1991 ; Rahiza et al. 1989; Kamal et al. 1992; Muralidharaudn; 1994 Lee at al. 1995 and Baydor, 1996.)

6.Iodine Value:

The data on Iodine value have been presented in Table 6. Great variability was observed in Iodine value of different genotypes. The range of variation was 94-115. The lowest and the highest values were given by the genotypes JTS-8 and TKG-21, respectively. A variability in Iodine value has also been reported by Menenzes et al. , 1950.

Table 6: Variability in Iodine value of some sesame genotypes.

S.No.	Genotypes	Iodine value
1.	RT-274	103
2.	TKG-21	115
3.	RS-160	99
4.	OS-10	109
5.	OS-18	103
6.	ORM-17	113
7.	JTS-8	94
8.	TC-25	101
	Mean	104.62
	S.E.(diff.)	0.908
	C.D. (diff.) at 5%	1.948

7.Oil Stability Index (OSI)

The data on oil stability index have been presented in Table 7. A variability in OSI was observed and the range of variation was 1.003 to 1.199, the lowest and the highest values were recorded by the genotyeps JTS-8 and TKG-21, respectively.

Therefore the most stable oil was found to be from the genotype TKG-21.

Table 7: Variability in Oil Stability Index of some sesame genotypes.

S.No.	Genotypes	Oil Stability Index
1.	RT-274	1.199
2.	TKG-21	1.199
3.	RS-160	1.193
4.	OS-10	1.101
5.	OS-18	1.130
6.	ORM-17	1.047
7.	JTS-8	1.003
8.	TC-25	1.066
	Mean	1.117
	S.E. at 5%	0.001
	C.D. at 5%	0.003

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8. Nutritional Quality Index (NQI)

The data on NQI have been presented in Table 8. It was observed that the NQI varied from 1.33 to 4.99, the lowest and the highest values being given by the genotypes JTS-8 and TKG-21, respectively. The best oil from nutrition point of view was found to be from the genotype TKT-21, followed by ORM-17 (3.50 NQI) It is clear from the Table 6,7,8 that although the genotypes TKG-21 recorded highest Iodine value but it has greatest stability and best nutritive value.

Table 8: Variability in Nutritional Quality Index of some sesame genotypes.

S.No	Genotypes	Nutritional Quality Index
1.	RT-274	2.05
2.	TKG-21	4.99
3.	RS-160	1.69
4.	OS-10	2.75
5.	OS-18	2.05
6.	ORM-17	3.50
7.	JTS-8	1.33
8.	TC-25	1.77
	Mean	2.51

S.E. at 5%	0.043
C.D. at 5%	0.092

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Protein Content (%)

Data on protein content of the defatted meal have been presented in Table 9. A persusal of the data showed that the values vary significantly and the highest value was given by the genotype ORM-17 (42.03%) and the lowest by TC-25 (41.05%). A variability in protein content has also been reported by Several workers (Patil et al. 1994; Lee et al. 1995 and Rajeswari and Ramaswamy, 1994)

Table 9: Variability in Protein Content (%) of some sesame genotypes.

S.No.	Genotypes	Protein Content (%)
1.	RT-274	41.42
2.	TKG-21	41.30
3.	RS-160	41.74
4.	OS-10	41.91
5.	OS-18	41.58
6.	ORM-17	42.03
7.	JTS-8	41.54
8.	TC-25	41.57
	Mean	41.57
	S.E. at 5%	0.18
	C.D. at 5%	0.386

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Sesame protein in rich in Sulphur containing amino acids, particularly methionine and tryptopan. The main limiting amino acid is lysine. Hence the nutritive value of sesame flour can be enhanced significantly by supplementation with lysine. Sesame protein constitutes a valuable supplement to pulse proteins which contain adequate amount of lysine, but are normally deficient in Sulphur containing amino acids.

However, the seeds of sesame contain two anti nutritional factors namely phytic and oxalic acids which render certain minerals unavailable and they also bind with protein, making it insoluble, thus lower the digestibity of the protein. Oxalic acid content can be minimized by dehulling of the seed. Phytic acid content in meal could be minimized by various treatments with enzymes, heat and chemicals (Han, 1988).

Correlation Studies

Correlation coefficient 'r' between various parameters viz; test weight, oil %; hull%; moisture%; palmitic acid; stearic acid, oleic acid, linoleic acid; iodine value; oil stability index,; nutritional quality index has been worked out and the data have been presented in Table, 10.

Test weight was found to be positively and significantly correlated with oil and positively but non significantly with moisture content, palmitic acid, stearic acid and oil stability index. It was negatively correlated with protein %, hull%; oleic acid; linoleic acid; iodine value and nutritional quality index and only the correlation with hull % was significant.

Among the significant correlations hull percentage was negatively but significantly correlated with test weight and oil content, oil content varied significantly and negatively with palmitic acid, iodine value varied significantly but negatively with palmitic acid and positively with oleic and linolenic acids. Nutritional quality index had significant but negative correlation with palmitic and stearic acid and significant but positive correlation with oleic and linoleic acids. All other correlations were non significant. `

Table: Correlation between the some genotypes of sesame

	Test Weight	Oil	Protein	Hull	Moisture	Palmitic	Stearic	Oleic	Linoleic	I.V.	Q.S.I	N.Q.T
Test		.8425	-0.7043	-0.9397	0.4478	0.2561	0.2296	-0.0940	-0.5130	-0.3647	0.2049	-0.1434
Weight												
Oil			-0.7820	-0.9277	0.3448	0.3583	0.5925	-0.3870	-0.6198	-0.5682	-0.0566	-0.3145
Protein				0.8059	-0.4715	-0.2427	-0.0738	0.0873	0.3351	0.2492	0.0115	0.0782
Hull					-0.2934	-0.3606	-0.3462	0.2725	0.5338	0.4611	0.0369	0.2380
Moisture						-0.3130	-0.1707	0.4505	0.0002	0.2118	0.5591	0.4536
Palmitic							-0.4716	-0.8784	-0.7729	-0.8947	-0.4868	-0.9100
Stearic								-0.7261	-0.7222	-0.7916	-0.2124	0.6608
Oleic									0.6655	0.8848	0.6923	0.8625
Linoleic										0.9367	-0.0440	0.8511
I.Value											0.2972	0.9374
Q.S.I.												0.3393
N.Q.I.												

SUMMARY AND CONCLUSION

In conclusion it may be said that the genotype TKG-21 performed the best in most of the quality characters. From the point of view of oil content JTS-8 and TC-25 genotypes were the best but best quality oil was given by the genotype TKG-21. This genotype also yielded stable and nutritionally best quality oil. However, from the point of view of protein the genotype ORM-17 proved to be the best as it yielded highest protein content in its cake.

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