

Varietal variations of oil and fatty acids in rapeseed mustard

Abstract

The present paper deals with the study of variations of oil and fatty acids in mustard. The oil content of seed samples of different of different mustard varieties has been found to show a wide variation between 30.00% to 39.00%. PC-5 variety of seed has been found to have the maximum content of oil i.e. 39.26% The major component of fatty acid Erucic acid is varied 35.00% to 60.70%.PC-5 variety is at the top with the 60.20% value of Erucic Acid.

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Introduction

Rapeseed mustard, family cruciferae and genus Brassica, is very important oilseed crop of the world as it is the world's third leading source of vegetable oil. Mustard seed, in India, is widely used as source of edible oil and animal feed. The nutritional value of oil largely depends upon its fatty acid composition The Rapeseed mustard produces industrial oil on account of high erucic acid content. The presence of high erucic acid content in Rapeseed mustard oil valued as oleo chemicals. The high erucic materials being grown in this country have proven agronomic value. The high erucic acid content is equally desirable for the use of mustard oil for technical purposes. In industry the erucic acid is put to several uses. It is used for manufacture of certain chemicals, antifoaming agents, various types of resins, plasticizers and surfactants. Therefore ten varieties were screened for chemical compositions to find out the variability for oil content and fatty acid to select out superior ones for breeding and industrial purposes.

Materials and methods

10 varieties were collected maintained and grown in bulk by senior breeders under uniform fertility conditions. They were evaluated for agronomic values and promising materials were passed on for

biochemical analysis.

Oil content was estimated by Soxhlet extraction using petroleum Ether in cold as a solvent. The solvent was removed and oil was subjected to methylation. The methyl esters were prepared from the oil by Tran's methylation with sodium methoxide methanol reagent as proposed by Luddy. Fatty acid composition is determined by gas liquid chromatography

Results and discussion

Variety k1 and CSR 8709 occupied second and third rank in respect of Oil content Tables 1 & 2. Different fatty acids present in oil indicated wild and significant variability. However the oil appeared to be dominated by erucic acid to the extent of 60.20%, while remaining six fatty acid formed only about 40% of the glyceride composition of rapeseed mustard oil. Palmitic acid (C16:0) varied significantly from 1.90 % to 3.90% while stearic acid C18:0 ranged from 1.90-3.90 while stearic acid C18:0 ranged from .18 to 2.52% concentration of linoleic acid C18: 2 is higher than palmitic stearic and oleic acid. Concentration of Eicosenoic acid C20:1 ranges from 2.52 to 7% Erucic Acid C22:1 the major component of fatty acid of Rapeseed mustard oil exhibited wide and significant variations from 35.00 - 60.20%. Variety PC-5 ,K-1 and CSR-8709 were identified to possess higher level of Erucic acid.¹⁻⁶

Table 1 Results on oil content of different varieties showed wide and significant variations from 29.50-39.26

S.No.	Varieties	Oil contents	Sap value(mg-KOH/g Oil) (mg KOH/g-Oil)	Iodine value (gl/100g Oil)	Total sugar %	Total amino acid
1	T-151	30.1	12	97	4.2	1.78
2	CSR-8709	39	14	99.2	4.15	1.9
3	Rohini	35.22	10	101.2	3.61	2.25
4	Vaibhav	34.15	10.5	100	3.5	2.2
5	RLM-619	30	11.2	89.2	3.75	1.85
6	RH-30	31.8	11.5	88	4	1.05
7	PR-8802	32.56	10.2	91.5	4.15	1.95
8	PC-5	39.26	14.2	90.2	3.75	2.05
9	T-151	29.5	11	80.5	3.25	2
10	K-1	39.08	14	89	3.5	2

Table 2 Variety PC-5 was formed to exhibit maximum oil content 39.26%

S. No.	Varieties	Palmitic acid	Stearic acid	Ollic acid	Linoleic acid	Linoleic acid	Eicosenoic acid	Erucic acid
1	T-151	3.28	0.98	9	30.20	4.12	3.6	40.1
2	CSR-8709	3.12	2.52	10.2	25	0.95	3.25	55.1
3	Rohini	4	1	9.5	40.32	3	4	39.25
4	Vaibhav	3.9	0.9	8	39	8.75	3.95	35
5	RLM-619	3	0.85	7.95	24.25	10	4.1	38.25
6	RH-30	1.95	0.7	12	25.1	10.5	5.1	42
7	PR-8802	1.9	0.18	11.25	28.2	9.8	7	41.29
8	PC-5	3.1	2.3	12.25	14.6	2.85	3.95	60.2
9	T-151	2.2	0.22	11.3	23	10	4.5	38
10	K-1	2.15	2.4	7.4	20.85	9.7	2.53	59.15

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Conflict of interest

The author declares no conflict of interest.

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