

## NOTE

## Studies on Fatty Acid Composition of Seeds of Improved Varieties of *Cicer arietinum*

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Five hybrid varieties of *Cicer arietinum*, viz., JGG-1, JG-218, JG-322, SAKI-93130 and JG-11 have been studied for their fatty acid composition by gas chromatography. The *Cicer arietinum* variety JGG-1 has highest (39.48%) total saturated fatty acids content and variety JG-322 has a rich (79.01%) total unsaturated fatty acids content with better storage quality.

**Key words:** Fatty acid, Composition, Gas chromatography, Leguminous seeds, *Cicer arietinum* varieties.

Legumes constitute some 10 per cent of the total food grains consumed in India, daily intake per head<sup>1</sup> averaging 34 g. They represent an important source of dietary protein, which being rich in lysine and threonine complements cereal diets<sup>2</sup>. For a major food-stuff like legumes, the nature of the lipids present is therefore also of importance. The cholesterol-lowering effects shown by the black gram<sup>3</sup> and the chick pea<sup>4-7</sup> have indeed been attributed in part to the high content of linoleic and linolenic acids present in the constituent lipids.

The seed samples of *Cicer arietinum* variety JGG-1, JG-218, JG-322, SAKI-93130 and JG-11 were collected from Department of Plant Breeding and Genetics, Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur.

The oil was extracted from the whole seeds powder in the Soxhlet apparatus for 20 h, using petroleum ether 40–60°C as a solvent and estimated gravimetrically by the following procedure reported by Colowick and Kaplan<sup>8</sup>. Methyl esters of the lipids were prepared by the method of Chowdhury *et. al.*<sup>9</sup> and analysed by gas chromatography, using flame ionization detector from “Sophisticated instrumentation Centre for Applied Research and Testing”, Anand (Gujarat).

The saturated and unsaturated fatty acids composition of *Cicer arietinum* seed samples, along with their weight percentage are reported in Table-1 and Table-2, respectively.

The distribution of fatty acids showed variability amongst different varieties of *Cicer arietinum*, viz., JGG-1, JG-218, JG-322, SAKI-93130 and JG-11. Palmitic acid content was found to be highest (11.35%) in variety JG-322 and

lowest content (2.17%) in variety JG-218. *Cicer arietinum* variety JGG-1 contains maximum content (26.96%) of stearic acid and lowest content (6.77%) in variety JG-322. Arachidic acid content was highest (2.87 per cent) in variety JG-322 and in rest of the varieties of *Cicer arietinum*. It ranges from 1.04% to 1.82%. Butyric acid was reported only In variety JG-218 (3.71%). Total saturated fatty acid content was found to be maximum (39.48%) in variety JGG-1 (Table-1).

TABLE-1  
SATURATED FATTY ACID COMPOSITION OF *CICER ARIETINUM*  
SEEDS UNDER INVESTIGATION

Seeds	Saturated fatty acids (%)					Total saturated fatty acids (%)
	Butyric acid (4 : 0)	Lauric acid (12 : 0)	Palmitic acid (16 : 0)	Stearic acid (18 : 0)	Arachidic acid (20 : 0)	
<i>Cicer arietinum</i> JGG-1	—	2.19	9.29	26.96	1.04	39.48
<i>Cicer arietinum</i> JG-218	3.71	—	2.17	21.00	1.82	28.70
<i>Cicer arietinum</i> JG-322	—	—	11.35	6.77	2.87	20.99
<i>Cicer arietinum</i> SAKI-93130	—	2.99	9.34	25.30	1.22	38.85
<i>Cicer arietinum</i> JG-11	—	2.83	10.25	20.23	1.21	34.52

TABLE-2  
UNSATURATED FATTY ACID COMPOSITION OF *CICER ARIETINUM*  
SEEDS UNDER INVESTIGATION

Seeds	Unsaturated fatty acids (%)				Total unsaturated fatty acids (%)
	Palmitoleic acid (16 : 1)	Oleic acid (18 : 1)	Linoleic acid (18 : 2)	Linolenic acid (18 : 3)	
<i>Cicer arietinum</i> JGG-1	—	56.81	2.80	0.92	60.53
<i>Cicer arietinum</i> JG-218	8.53	57.98	4.08	0.71	71.30
<i>Cicer arietinum</i> JG-322	—	72.83	5.24	0.94	70.01
<i>Cicer arietinum</i> SAKI-93130	—	57.31	2.92	0.93	61.16
<i>Cicer arietinum</i> JG-11	—	60.97	3.64	0.87	65.48

Oleic acid content was found to be highest (72.83%) in variety JG-322 and lowest (56.81%) in variety JGG-1. Linoleic acid was highest (5.24%) in variety

JG-322. Lowest content (0.71%) of linolenic acid was found to be in variety JG-218. Palmitoleic acid was reported only in variety JG-218 (8.53%). Total unsaturated fatty acid content was found to be highest (79.0%) in variety JG-322 (Table-2).

*Cicer arietinum* variety JG-322 found to be superior than the other varieties of *Cicer arietinum* under study, as it contains highest percentage of linoleic acid and linolenic acid, because both acids are the most important essential fatty acids required for growth, physiological functions, and maintenance which cannot be synthesized by the human body and we have to depend on dietary sources for their adequate supply<sup>10</sup>.

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