

### **Biochemical profile of Cashew nut**

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#### **Abstract**

Cashew is a kidney-shaped nut that commercially grows on a tropical evergreen tree. In recent times, the commercial importance of cashew nut and apple in terms of human health is gaining great momentum. The kernels of 75 promising cashew germplasms were taken from different soils of West Bengal, for bio-chemical quantification. Out of which 10 promising commercial germplasms were taken for experimental study. The study indicates that nutritional content Iron (0.08%), Calcium (0.96%), magnesium (0.75%), potassium (2.18%), sodium (0.22%), phosphorus (1.21%), neutral lipid (98.54%), phospholipid (3.12%), protein (49.63%), starch (33.5%), amino acid (53.37%), phenol (53.4%), total sugar (21.27%). It also contains a huge amount of lipids that promote good cardiovascular health. Often high triglyceride levels are associated with an increased risk for heart disorders and mono-unsaturated fats reduce triglyceride levels. The cashew nuts high magnesium content also takes the credit for its healthy heart quality and so daily recommended for the heart-healthy mineral. It also protects against high blood pressure, muscle spasms, migraine headaches, tension, soreness, and fatigue.

**Keywords:** Cashew nut, chromatography, germplasm, kernel, quantification.

#### **Introduction**

Cashew (*Anacardium occidentale* L.) is a native of Brazil and was introduced in India in the early 16th century. Portuguese discovered cashew in Brazil & spread in India considering its medicinal and commercial value to human beings. In this context, an attempt has been made for the selection of superior germplasm in terms of the evaluation of quality characters (physico – chemical characters) of cashew kernel.

#### **Material and Methods**

The kernels of cashew germplasm were dried immediately after harvest and stored at ambient temperature (37 – 40°C). After 90 days, the nuts were shelled and kernels were dried at room temperature for 5 - 6 hours. With the help of mortar & pestle, the kernels were powdered. Extractions were made with the help of chloroform and methanol (2: 1 v/v) over 60 hours. Now, this lipid-free kernel flour

(LFKF) was used for the quantification (extraction and estimation) of different following physico-chemical traits.

#### **Mineral content**

Prepared lipid-free cashew kernel powder (5 gm) was digested first with nitrate acid (5 ml) followed by perchloric acid (5 ml) and the digest was used for the estimation of iron and magnesium by following Colorimetric Method (AOAC, 1980; Brumbay and Massey, 1967; Nagaraja and Krishna, 1982). Estimation of calcium was done by following Spectrophotometry Method (AOAC, 1980; Nagaraja, 1987). Quantification of sodium, potassium, and phosphorus was done by following the procedure proposed by the Flame photometry method (AOAC, 1980; Nagaraja and Krishna, 1982) and Micro – colorometric method (Tausky and Shrove, 1953) respectively.

#### **Lipid content**

The prepared kernel flour powder was extracted in a soxhlet apparatus with a mixture of chloroform and methanol (2:1 v/v). After concentration under vacuum, their lipid extract was differentiated into neutral lipid phospholipid, Glyco-lipid by following Silicic Acid Chromatography (Nagaraja and Krishna, 1982; AOAC, 1980; Tausky and Shrove, 1953; Ito and Fujinoy, 1972).

The prepared LFKF was used for quantification of N<sub>2</sub> by following Micro-Kjeldahl's method (Nagaraja and Krishna, 1982; AOAC, 1980) for quantification of starch by following the Anthrone Reagent method (Hodge, 1962; Nagaraja and Krishna, 1982;

AOAC, 1980) for quantification of starch by following Phenol Sulphuric acid method (AOAC, 1980) for quantification of Amino acid by following Ninhydrin method (Yemn and Cocking, 1953; AOAC, 1980) for quantification of phenol by following Folin-Ciocalteu Reagent method (Mallick, 1980) for quantification of reducing the sugar by following Alkaline Copper Tartarate Arcenomolybdate reagent method (Nagaraja and Krishna, 1982; AOAC, 1980).

#### **Observations**

The chemical compositions of the kernel were in the following range. The kernel of cashew plants contain iron (0.01- 0.02%), magnesium (0.35- 0.62%), calcium (0.07- 0.17%), potassium (1.20- 1.51%), sodium (0.13- 0.21%) and phosphorus (0.35- 1.05%). Out of 6 analyzed minerals, potassium content is maximum and highest in the plants of A 18/4.

Protein content seed kernel was on the average amount (30.10 – 37.47%). Starch, amino acid, and phenol content were recorded at the range of 16.10 – 21.43%, 33.87 – 42.67%, and 31.47 – 46.53% respectively. Reducing and total sugar of kernel was in the amount of 0.11 – 0.20% and 9.50 – 15.77% respectively.

Neutral lipid was in variable amounts (94.13 – 95.84%). Glycolipid content was noticed in an average range (1.45 – 1.76%). The amount of phospholipids content was in the range of 1.05 – 2.17%. Neutral lipid was accounted for about 90 – 98% of the total lipid. It was maximum and highest in the kernels of the plants of 94.13 – 95.84%.

Table 1. Biochemical parameters of Cashew kernel (10 germplasm).

PARAMETERS	CASHEW GERMPASMS									
	ME4/4	KC 2	VR 3	A 7/2	A18/4	M2	K30	H32	V24	MK55
Potassium	1.49	1.38	1.20	1.45	<b>1.51</b>	1.33	1.48	1.50	1.29	1.28
Calcium	0.11	0.07	0.16	0.11	<b>0.17</b>	0.12	0.08	0.09	0.10	0.16
Magnesium	0.47	0.35	0.44	0.53	<b>0.62</b>	0.49	0.37	0.48	0.47	0.52
Iron	0.01	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.02	0.01
Sodium	0.19	0.13	0.15	<b>0.21</b>	0.13	0.18	0.16	0.20	0.19	0.12
Phosphorus	0.97	<b>01.05</b>	0.35	0.72	1.01	0.99	1.04	0.75	1.03	0.98
Protein	<b>37.47</b>	35.77	30.10	32.27	30.83	36.28	30.87	31.32	31.57	35.23
Phenol	31.47	45.13	31.60	<b>46.53</b>	38.93	32.26	33.56	45.27	42.47	40.59
Starch	17.53	16.57	16.10	<b>21.43</b>	19.83	18.29	16.46	20.26	20.21	18.59
Amino acid	<b>42.67</b>	40.37	33.87	42.50	34.03	42.42	40.32	39.24	33.12	31.25
Total Sugar	9.50	12.55	10.40	09.93	15.77	14.58	10.20	11.27	10.25	<b>15.54</b>
Reducing Sugar	0.12	0.15	0.11	0.20	0.15	0.13	<b>0.18</b>	0.14	0.15	0.17
Neutral lipid	95.15	95.53	94.13	<b>95.84</b>	95.45	95.77	95.51	95.48	95.17	95.18
Glyco-lipid	1.61	1.51	<b>1.76</b>	1.67	1.45	1.74	1.50	1.64	1.59	1.52
Phospho-lipid	2.17	<b>2.33</b>	1.05	1.37	1.15	2.18	2.25	2.31	2.01	1.18

The kernels of the plants of VR 3 show the highest amount of glycol lipid (1.76%). Out of the 10 varieties analyzed, phospholipid was highest in the plants of KC 2.

#### Discussion

Cashew nuts contain ample amounts of lipids that promote cardiovascular health. Often high triglyceride levels are associated with an increased risk for heart disorders and mono-unsaturated fats reduce triglyceride levels. The cashew nuts high magnesium content also takes the credit for its healthy heart quality & so daily recommended for the heart-healthy mineral. It also protects against high blood pressure, muscle spasms, migraine headaches, tension, soreness and fatigue.

#### Conflict of interest

Author declares that there is no conflict of interest.

#### Acknowledgement

Author is grateful to Ministry of Agriculture, Govt. of WB for financial help.

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