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CHEMICAL COMPOSITION OF RAW, ROASTED AND BOILED KULTHI SEEDS

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ABSTRACT

Raw, roasted and boiled Kulthi (*Dolichos biflrus*) seeds of drought prone area of Maharashtra were studied for their moisture, total ash (and its analysis), crude protein, lipid, total carbohydrates, reducing and non reducing sugar, phosphorus, calcium, iron and crude fibre contents.

Key words: Chemical composition, Legume, *Dolichos biflorus*.

INTRODUCTION

The food, that we assimilated in the body, is used in the growth and maintenance of tissues. A well balanced diet should contain all the nutrients in correct proportion and in adequate amount of healthy life. Horse gram (*Dolichos biflorus*) is one of the lesser known legume. It is also known as Gahat, Kulath or Kulthi, in India and is grown here to be used as food and fodder. The traditional healers specialized in the treatment of kidney stone, grow kulthi crop for their patients. Legume are important sources of protein for vegetarian people and hence, it is important to investigate nutritional qualities of legumes in order to combat protein-energy malnutrition.

EXPERIMENTAL

The seeds under investigation were procured from local market of village Hivre of Pune District (Maharashtra). Raw, roasted and boiled seeds were analyzed and studied for their moisture, total ash (and its analysis), crude protein, lipid, Total carbohydrates, reducing and non reducing sugar, phosphorus, calcium, iron and crude fibre contents.

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The seeds were cleaned and stored properly at room temperature prior to their use in actual experiment. The seeds were roasted (sand bath 180^{o}C, 20 mins) and boiled (Pressure cooker, 30 mins with 1:3 v/v water)[1].

The moisture, ash (and its analysis) and calcium content of the seeds were determined by Pearson[2]. Crude fibre content was determined by the method recommended in the fertilizer and feeding stuff regulation[3]. Phosphorus was determined according to the procedure of Sumner[4]. Total lipids were determined by the method of Colowick and Kaplan[5]. Carbohydrate, reducing and non reducing sugar were estimated by the method of Nelson[6]. Crude protein is estimated by "Semi Micro Kjeldahl" method (NX6.25). The iron was estimated according to the procedure of Reis and Chakmakjian[7].

RESULTS AND DISCUSSION

The results are shown in Tables 1 and 2. Moisture content of raw, roasted and boiled seeds was observed to be 10.0.9.35 and 9.23 percent, respectively. These values are found to be in accordance with the other leguminous seeds[8-24].

The total lipid content of raw, roasted and boiled seeds of kulthi was found to be 30.0, 30.10 and 30.0 percent, respectively, which is found to be higher than the values reported for other varieties of kulthi seeds and other legumes[8,10,14,16-18,20,24].

Crude fibre contents of raw, roasted and boiled seeds of kulthi was found to be 3.33, 4.29 and 3.52 percents respectively, which is found to be higher than the values reported for other varieties of legumes.[8,10,14,16-18,20-24].

Crude protein content of raw, roasted and boiled seeds of kulthi was found to be 22.10, 23.50 and 23.20 percent, respectively, which is in close accordance with other variety of kulthi[25]. The values are also in accordance with other leguminous seeds.[8, 10, 14, 24-29] and higher than the other varieties of *Vigna radiate*, *Phaseo lus mungo* and some other legumes[23, 27, 28].

Carbohydrate content of raw, roasted and boiled seeds of kulthi was found to be 59.62, 61.22 and 62.15 percent, respectively. These values are found to be in general accordance with other variety of kulthi [30] and most of the legumes.[8, 10-15, 17-19, 21-24, 26, 29].

Total ash content of raw, roasted and boiled seeds of kulthi was found to be 4.70, 5.0 and 5.19 percent, respectively, Water insoluble ash content was found to be 2.33, 2.50, and 2.25 percent, respectively, while acid insoluble ash, which represents the sandy matter was

Table 1: Proximate principles of kulthi (*dolichos biflorus*) seeds (g/100 g)

Sample	Moisture	Total lipid	Crude fibre	Total carbohydrates	Crude protein	Actual protein	Non Protein nitrogen
Raw seed powder	10.0	30.0	3.33	59.62	22.10	22.0	0.10
Roasted seed powder	9.35	30.10	4.29	61.22	23.50	23.35	0.15
Boiled seed powder	9.23	30.0	3.52	62.15	23.20	23.15	0.05

Table 2: Mineral and ash content of kulthi (*dolichos biflorus*) seeds (g/100 g)

Sample	Total ash content	Wt. of water insoluble ash	Wt. of water soluble ash	Wt of acid soluble ash	Wt. of acid insoluble ash	Alkalinity of water soluble ash	Calcium content	Phosphorus content	Iron content
Raw seed powder	4.70	2.33	2.37	3.92	0.49	4.79	2.75	0.45	**0.67**
Roasted seed powder	5.0	2.50	2.50	4.99	0.38	6.66	2.85	0.48	**0.67**
Boiled seed powder	5.19	2.25	2.94	4.84	0.41	5.17	2.80	0.47	**0.68s**

found to be 0.49, 0.38, and 0.41 percent, respectively. Alkalinity of water soluble ash of raw, roasted and boiled seeds of kulthi was found to be 4.79, 6.66 and 5.17 percent, respectively. These values are found to be in general agreement with the other varieties of legumes.[8-12, 14, 18, 19, 22-24, 26, 27].

The calcium content present in raw, roasted and boiled seeds of kulthi was found to be 2.75, 2.85 and 2.80 percent, respectively. These values are observed to be quite higher than other variety of kulthi [30]and other legumes.[8-10, 12, 14,18,19,22,24,26,31]

Total phosphorus content present in the raw, roasted and boiled seeds of kulthi was found to be 0.45,0.48 and 0.47 percent, respectively, which is in close proximity with the other varieties of legumes.[8-10,12,14,18,19,22,24,31,32] These values also have close proximity with other variety of kulthi[33].

Total iron content in the raw, roasted and boiled seeds of kulthi was found to be 0.67, 0.67, and 0.68 percent, respectively, which is in close accordance with other varieties of legumes[30].

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