Int. J. Chem. Sci.: 7(4), 2009, 2253-2258

CHEMICAL COMPOSITION OF SOME NEW VARIETIES OF OIL SEEDS

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ABSTRACT

Some new varieties of oil seeds (Helianthus annus LSF–11, Helianthus annus LSF–8, Carthamus tinctiorius PBNS–12, Carthamus tinctiorius PBNS–40, Arachis hypogea JL–24) were studied for their moisture, total ash (and its analysis), Arachis crude protein, lipids, total carbohydrate, reducing sugar and non reducing sugar, phosphorus, calcium, crude fibre and energy contents.

Key word: Chemical composition, Oil seeds.

INTRODUCTION

Oil seeds occupy very prominent and important position in the Indian dietary. In India, one fourth of the population is suffering for good quality of food. They are not getting proper nutrition and are deficient in protective food stuff. There is greater prevalence of deficiency for diseases related with vitamins, proteins and fats among the low income group.

In addition to this, the problem is further aggravated by the fact that the majority of the people are not aware about the desirable food stuff to meet the dietary requirements. Therefore, efficient strategy for diet should be developed for the well being of the poor population. However, oil seeds contain high fat, proteins and carbohydrate contents, beside a substantial calorific value due to significant amount of lipids and carbohydrate, which can serve as potential source of nutrient for quality food.

The seeds under investigation were procured from Oil Seeds Research Station, Latur (Maharashtra), All India Co-ordinate Research Project on Safflower, Marathwada Agricultural University, Parbhani (Maharashtra) and Mahatma Phule Krishi Vidyapeeth,

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Jalgaon (Maharashtra). The seeds were analyzed for moisture, total ash, (acid soluble and acid insoluble ash, water soluble and water insoluble ash, and alkalinity), crude protein, total lipid, total carbohydrate, reducing sugar and non reducing sugar, phosphorus, calcium and crude fibre content.

EXPERIMENTAL

The oil seeds were cleaned and stored properly at room temperature prior to their use in actual experiment.

Moisture, ash (its analysis) and calcium contents were determined by the methods as described by Pearson[1]. Crude fibre content was determined by the method recommended in the Fertilizer and feeding stuff regulations[2].

Phosphorus was determined according to the procedure of Sumner[3]. Total lipid was determined by the methods of Colowick and Kaplan[4]. Carbohydrate, reducing and non reducing sugar were estimated by the method of Nelson[5]. Crude protein was estimated by "Micro Kjeldhal'' method (N X 6.25)

RESULTS AND DISCUSSION

The results are shown in Tables 1, 2, and 3.

Moisture content of *Helianthus annus* LSF-11 (4.613 percent) and LSF-8 (3.627 percent) was found to be in close proximity with each other and with other oil seeds.[6-15]

Moisture content of *Carthamus tinctiorius* PBNS–12 (6.326 percent) and PBNS-40 (7.393 percent) was found to be in close resemblance to each other and also with other varieties of *Carthamus tinctiorius*.[6- 9] where as, *Archis hypogea* JL-24 (5.529 percent) have comparatively low moisture content.

Helianthus annus LSF–11 and LSF– 8 have crude fibre content (3.411 percent) and (2.585 percent), respectively, which is in accordance with other varieties of other oil seeds [6, 8-10]. Crude fibre was found to be (1.196 percent) in PBNS -12, which is greater than (0.488 percent) in PBNS-40 of *Carthamus tinctiorius* and *Archis hypogea* JL-24 have crude fibre content (1.149 percent). However, these values lie in close accordance with other oil seeds[7,11].

The total lipid content of *Helianthus annus* LSF-11 (36.855 percent) and *Helianthus annus* LSF-8 (30.985 percent), *Carthamus tinctiorius* PBNS-12 (25.699 percent) and *Carthamus tinctiorius* PBNS-40 (28.989 percent) was found to be in close proximity with each other and with other varieties of oil seeds[6, 8-10].

The seed of *Archis hypogea* JL-24 has high (46.224 percent) lipid content, which is in close proximity with other oil seeds [9-13].

The crude protein content was estimated to be (25.08 percent) and (24.81 percent) of *Helianthus annus* LSF-11 and LSF-8, respectively and were found to be in close proximity with each other and with other oil seeds [6,8,10]. *Carthamus tinctiorius* PBNS-12 and *Carthamus tinctiorius* PBNS-40 have (15.91 percent) and (16.14 percent) crude protein content, respectively, which resemble with each other and also with other varieties of *Carthamus tinctiorius*[7-11].

Table 1: Proximate principles of air dried seeds (g/100 g)

S. No	Seeds	Moisture	Crude fibre	Total lipid	Crude protein	Total carbohy-drate	Reducimg sugar	Non-reducing sugar
1	*Helianthus annus* LSF-11	4.613	3.411	36.855	25.08	27.76	4.40	23.36
2	*Helianthus annus* LSF-8	3.627	2.585	30.985	24.81	33.50	5.50	28.00
3	*Carthamus tinctiorius* PBNS-12	6.326	1.196	25.699	15.91	48.93	7.40	41.53
4	*Carthamus Tinctiorus* PBNS-40	7.393	0.488	28.989	16.14	45.56	6.80	38.76
5	*Arachis hypogea* JL-24	5.529	1.149	46.224	25.20	21.26	2.90	18.36

Table 2: Minerals and ash content of air dride seeds (g/100 g)

S. No.	Seeds	Ash	Water insoluble ash	Water soluble ash	Alkalinity of water soluble ash (%meq)	Acid insoluble ash	Acid soluble ash	Calcium content	Phosphorus content
1	*Helianthus annus* LSF-11	4.823	1.757	3.066	9.676	0.891	3.556	0.107	0.40
2	*Helianthus annus* LSF-8	4.866	1.754	3.112	10.707	0.964	3.326	0.150	0.39
3	*Carthamus tinctiorius* PBNS-12	3.497	1.737	2.054	6.215	0.699	2.478	0.122	0.15
4	*Carthamus tinctiorus* PBNS-40	3.495	1.228	2.401	5.748	0.903	2.844	0.092	0.41
5	*Arachis hypogea* JL-24	2.577	0.325	2.252	8.821	0.997	1.638	0.087	0.29

Table 3: Energy of oil seeds in Kcal

Helianthus annus **LSF-11**	***Helianthus annus*** **LSF-8**	***Carthamus tinctirous*** **PBNS-12**	***Carthamus tinctiorius*** **PBNS-40**	***Archis hypogea*** **JL-24**
543. 055	512. 105	490. 651	507 .701	601 .856

The total carbohydrate content of *Helianthus annus* LSF-11 (27.76 percent) and LSF-8 (33.50 percent) was found to be in close proximity with each other and with other oil seeds[6,8,10]. *Carthamus tinctiorius* PBNS-12 (48.93 percent) and PBNS-40 (45.56 percent), respectively having high carbohydrate content. While *Archis hypogea* JL-24 (21.20 percent) has low carbohydrate content, which is in general accordance with other varieties of *Archis*

hypogae[6,9,12,13]. The major portion of carbohydrate of the seed under study were present in non reducing form.

Ash content of *Helianthus annus* LS-11 (4.823 percent) and LS-8 (4.866 percent) was found to be in close proximity with each other. However, they are in general agreement with other oil seeds [6, 8-10]. The seeds of *Carthamus tinctiorius* PBNS-12 and PBNS-40 have ash content 3.497 percent and 3.495 percent, respectively, which are in close proximity with each and also with other variety of *Carthamus tinctiorius*[6,9,13]. While *Archis hypogea* JL-24 has (2.577 percent) of ash, which resembles with other varieties of *Archis hypogea* and also with other oil seeds[6-13].

Calcium content of *Helianthus annus* LSF–11 (0.107 percent) and LSF–8 (0.150 percent) are in general accordance with each other and also with other varieties of *Helianthus annus*[6, 8-10]. *Carthamus tinctiorius* PBNS-12 (0.122 percent) and PBNS–40 (0.092 percent) have calcium content, respectively. The variety PBNS-12 has higher calcium content than other varieties of PBNS-40. However, these are in general agreement with other oil seeds[6,7,11]. While *Archis hypogea* JL-24 have (0.087 percent) calcium content, which resemble with other varieties of *Archis hypogea*[6,8,13].

Phosphorus content of *Helianthus annus* LSF–11 and LSF–8 have (0.4 percent) and (0.39 percent), respectively, which is in close proximity with each other and also with other varieties of *Helianthus annus*[6, 8-10]. *Carthamus tinctiorius* PBNS -12 and PBNS - 40 have (0.15 percent) and (0.41 percent) phosphorus, respectively, where variety PBNS-40 has higher phosphorus content than other varieties of PBNS -12. However, these values are in general agreement with other oil seeds [6, 9]. Phosphorus content of *Archis hypogea* JL-24 (0.29 percent) is in general accordance with other varieties of *Archis hypoge*a and also with other oil seeds [6-11].

Energy content of *Helianthus annus* LSF–11(543.055 Kcal) and LSF–8 (512.105 Kcal) was found to be in close proximity with each other. However, they are in general agreement with other oil seeds [6, 8-10].The seeds of *Carthamus tinctiorius* PBNS–12 and PBNS–40 have (490.651 Kcal) and (507.701 Kcal) energy content, respectively, which are in close proximity with each and also with other variety of *Carthamus tinctiorius*[6,9,13]. While *Archis hypogea* JL-24 have (601.856 Kcal) energy, which resemble with other varieties of *Archis hypogea* and also with other oil seeds [6-13].

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Accepted: 31.07.2009