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NOTE

Study of Solublity Behaviour of Some New Varieties of Oil Seeds

SATISH INGALE* and S.K. SHRIVASTAVA†
Department of Applied Chemistry, PVPP College of Engineering, Sion, Mumbai-400 022, India
Fax: (91)(22)24038717; Tel: (91)(22)24070547; 24021526
E-mail: satishingale2007@rediffmail.com

The protein solubilization at different pH ranging from 0.5 to 13.5 were studied on some new varieties of oil seeds, *viz.*, sunflower (*Helianths annus*) LSF-11, sunflower (*Helianths annus*) LSF-8, safflower (*Carthamus tinctorius*) PBNS-12, safflower (*Carthamus tinctorius*) PBNS-40 and groundnut (*Arachis hypogea*) JL-24.

Key Words: Protein solubility of oil seeds, *Helianthus annus* LSF-11 and LSF-8, *Carthamus tinctiorius* PBNS-12, PBNS-40 and *Arachis hypogea* JL-24.

Oil seeds occupy prominent and important position in the Indian dietary. Nutritional and functional qualities of protein are largely determined by its amino acid content and nitrogen solubility[1,2].

Nitrogen solubility is one aspect of hydration which is the most important characteristics in evaluating protein quality since many functional properties of protein depend upon their capacity to go into solution initially. Solubility is affected by many factors such as pH during extraction or solubilization, size of meal particle, temperature and meal solvent ratio, composition of solvent and character of protien[3,4].

The seeds under investigation were procured from oil seeds research station, Latur (Maharashtra), Marathwada Agricultural University, Parbhani and Mahatma Phule Krishi Vidyapeeth, Jalgaon (Maharashtra). The seeds were analyzed for protein solubility at different pH.

In the present investigation all the seeds were analyzed for their protein content and protein solubilization with pH variation in the powdered form, because size of seed powder has been shown to influence the nitrogenous extraction[5,6]. The seeds were sun dried and powdered to 60 mesh[7].

The effect of pH variation of the extractant on the protein solubilization were studied by varying pH of water, ranging from 0.5 to 13.5, brought by the addition of hydrochloric acid or sodium hydroxide solution, 1 g of the seed powder was suspended in 20 mL of extractant of desired pH. The content were shaken in electrical shaker for *ca.* 2 h at room temperature and centrifuged for 20 min at 2000

†Department of Applied Chemistry, Government Engineering College, Jabalpur-482 011, India.

rpm in a centrifuge. The nitrogen solubilized was determined in supernatant so obtained by Micro Kjeldahl method.

The results of protein solubility are given in Table-1.

TABLE-1

pH	*Helianthus annus*		*Carthamus tinctirious*		*Arachis hypogea*
	LSF-11	LSF-8	PBNS-12	PBNS-40	JL-24
0.5	8.25	7.00	4.29	4.64	9.16
1.0	6.85	8.17	5.16	5.72	8.54
1.5	8.97	8.04	5.75	5.82	6.91
2.0	2.77	2.25	2.69	2.02	2.83
2.5	2.81	3.19	1.73	3.67	5.95
3.0	5.67	5.30	3.89	4.13	2.83
3.5	2.85	2.71	2.90	2.90	3.71
4.0	6.21	6.03	3.56	4.07	7.47
4.5	5.56	2.45	2.16	2.83	4.58
5.0	3.46	5.42	3.68	3.78	6.40
5.5	6.25	6.03	3.51	1.90	4.12
6.0	3.85	3.50	1.74	2.94	7.03
6.5	4.96	4.20	2.90	2.07	4.99
7.0	7.05	7.80	5.44	5.17	8.32
7.5	8.00	6.44	4.17	4.86	6.35
8.0	4.54	2.08	1.73	3.06	5.49
8.5	2.81	4.16	1.76	2.04	3.12
9.0	8.45	8.07	5.61	5.93	10.07
9.5	4.51	3.63	2.15	3.04	4.02
10.0	8.00	4.22	4.98	5.34	8.07
10.5	3.83	7.56	2.83	2.56	3.84
11.0	8.44	7.56	2.15	2.65	7.97
11.5	6.91	6.71	4.17	4.73	7.10
12.0	13.90	12.79	9.29	9.60	14.6
12.5	9.68	9.36	5.89	6.08	14.6
13.0	4.90	4.79	3.13	3.53	5.87
13.5	6.88	6.17	3.33	4.07	6.49

The protein contents of *Helianthus annus* LSF-8 and LSF-11, *Carthamus tinctiorious* PBNS-12 and PBNS-40 and *Archis hypogea* JL-24 variety was found to be 25.08, 24.81, 15.91, 16.14 and 25.20 %, respectively.

The solubility of seed protein was found to be maximum *i.e.*, 13.90 % at 12.0 pH in *Helianthus annus* LSF-8, 12.79 % at 12.0 pH in *Helianthus annus* LSF-11, 9.29 % at 12.0 pH in *Carthamus tinctiorious* PBNS-12, 9.60 % at 12.0 pH in *Carthamus tinctiorious* PBNS-40 and 14.60 % at 12.0 pH in *Archis hypogea* JL-24.

The solubility of seed protein was found to be minimum *i.e.*, 2.77 % at 2.0 pH in *Helianthus annus* LSF-11, 2.08 % at 8.0 pH in *Helianthus annus* LSF-8, 1.73 % at 2.5 and 8.0 pH in *Carthamus tinctiorious* PBNS-12, 1.90 % at 5.5 pH in *Carthamus tinctiorious* PBNS-40 and 2.83 % at 2.0 and 3.0 pH in *Archis hypogea* JL-24. These results are in good agreement with other oil seeds[8-13].

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