Short Commuinication

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Lipid Fraction and Fatty Acid Composition of *Chenopodium album* Seed Oil

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Chenopodium album seed oil (7%) has been examined for its physico-chemical characteristics and fatty acid composition. Thin layer charomatography of the oil into lipid classes resulted into polar lipids (0.7%) and neutral lipids (99.3%). The fatty acid composition of various lipids classes ranged from $C_8 - C_{24}$ acids in different amounts.

The present communication deals with the physico-chemical characteristics (Table 1) and fatty acid composition of different neutral fractions (Table 2).

C. album seeds were collected from Jaranwala District, Faisalabad, dried in the shade and sieved to free them from dust and other plant materials. The oil was extracted using chloroform methanol according to the procedure of Folch *et al.* [1]. The physico-chemical characteristics of the oil were determined by the usual methods. [2].

Fractionation of the oil into lipid classes [3-4]. 0.4 Gram of the oil was charged on five 20 x 20 cm. glass plates coated with 1 mm. (Kieselgel 60 G. Art 7731). Chromatograms were developed in hexane/diethylether/acetic acid (80:20:1 v/v/v) and the resulting bands were visualised under UV light by spraying with 0.25 solution of 2', 7'-dichlorofluorescein in ethanol.

Typical R_f's of the lipids classes were hydrocarbons 0.92, wax esters 0.79, triglycerides 0.53, free fatty acids 0.42, diglycerides 0.32, sterol 0.24, monoglycerides 0.18 and polar lipids 0.02, lipids classes were identified by comparision of their R_f's with those of the standard under indentical conditions.

TABLE 1. PHYSICO-CHEMICAL CHARACTERISTICS OF *C. ALBUM* SEED OIL.

Moisture content of the seeds (w/w)	9.2%
Fixed oil (w/w)	7.0%
Specific gravity at 29°	0.91994
Refractive index (Abbe's) at 29°	1.4665
Acid value	28.6
Saponification value	245.9
Iodine value	109.8
Peroxide value	65 m eqs/kg
Unsaponifiable matter (w/w).	5.8%

TABLE 2. FATTY ACID COMPOSITION (WT.%) OF TOTAL LIPIDS AND LIPID CLASSES OF *C. ALBUM* SEED OIL.

Fatty acids	Total lipids	Wax esters	Triglycerides	F.F.A.	Diglycerides	Monoglycerides	Reported by Daun	Reported by Husain
$C_{8:0}$	Trace	4.6	0.8	4.6	1.1	0.8	–	–
$C_{10:0}$	Trace	3.0	0.1	2.3	0.2	–	–	–
$C_{12:0}$	Trace	–	0.2	0.3	1.4	–	–	–
$C_{14:0}$	0.2	–	0.3	0.9	0.7	–	0.3	–
$C_{16:0}$	13.0	6.9	20.8	27.2	22.6	6.0	8.4	15.8
$C_{16:1}$	0.2	–	0.4	–	–	–	0.3	–
$C_{17:0}$	0.2	–	0.7	–	0.5	–	–	–
$C_{18:0}$	2.2	11.8	5.6	5.2	3.6	1.1	0.9	Trace
$C_{18:1}$	40.9	29.9	51.7	32.2	38.2	17.4	20.7	34.8
$C_{18:1}$	1.4	–	1.8	2.2	1.8	0.8	–	–
$C_{18:2}$	35.8	–	9.2	2.4	2.6	26.7	56.3	46.3
$C_{18:3}$	0.2	–	0.7	–	0.9	–	6.5	2.9
$C_{20:0}$	1.0	–	1.1	0.9	1.3	0.4	0.7	-
$C_{20:1}$	1.7	–	2.1	1.5	2.0	0.3	2.3	–
$C_{20:2}$	–	–	–	–	–	–	0.5	–
$C_{22:0}$	0.8	43.5	1.2	16.4	1.2	45.7	0.3	–
$C_{22:1}$	2.2	–	2.7	2.0	18.3	0.8	3.6	–
$C_{22:2}$	0.1	–	–	–	2.5	–	–	–
$C_{24:0}$	0.1	–	0.2	1.0	0.6	–	0.3	–

The polar band having R_f (0.02) did not move and remained at the origin of the chromatogram. The content of each lipid classes is given in Table 3. Methyl esters of the oil and that of neutral lipids were prepared according to standard procedures [5-6].

Analysis. Methyl esters were analysed by GC on Pye-Unicam 104 gas chromatograph equipped with a flame ionization detector. Dimethyl siloxane (bonded phase) column was used. Hydrogen gas was used as carried with a flow velocity of 36 cm./sec and a split ratio 1:60. The column temperature was programmed at 140° for 0 min. with 4°/min. increase to 280°, while detector and injection temperature of 300° and 250°, respectively were maintained.

The results for the crude, neutral and polar lipid determinations are given in the Tables 1 and 3. The oil content of *C. album* seeds is 7%. TLC showed that the oil consisted primarily (99.3%) of neutral lipids (mainly triglycerides but including hydrocarbons, wax esters, sterols free fatty acids, mono and diglycerides and only 0.7% of polar lipids were observed (Table 3).

TABLE 3. WT.% OF LIPID FRACTIONS OF *C. ALBUM* OIL.

Neutral lipids	99.3%
Polar lipids	0.7%
Fractions of the neutral lipids	
Hydrocarbons	0.5%
Wax esters	2.6%
Triglycerides	76.8%
F. F. A.	1.2%
Diglycerides	9.8%
Sterols	3.4%
Monoglycerides	5.0%

The fatty acid composition of total lipids and that of neutral ones of this region, being reported for the first time is given in Table 2. The oil consists mainly of unsaturated fatty acids (82.4%) and its compositions differs markedly from the ones reported by Daun *et al.* [7] and Husain *et al.* [8]. Our variety has a higher precentage of oleic acid (42.3%) as compared to linoleic acid (35.8%) with an iodine value 109.2. The variations can perhaps be attributed to the ecological conditions.

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