Short Communication

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CULTIVATION CONDITIONS AND PHYSICO-CHEMICAL EVALUATION OF *CUCURBITA MAXIMA* AND *CUCURBITA MOSCHATA* SEED OILS

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The present communication provides data on the cultivation conditions of *Cucurbita maxima* and *Cucurbita moschata* and the physico-chemical evaluation of their seed oils. The study was initiated to utilize cucurbitaceae plants as an oil seed crop, the specific reason for the idea is that the fruits of these plants are almost the size of a football and, therefore, contain large quantity of seeds (*C. maxima* fruit diameter 32 cm. and 250-300 seeds per fruit, *C. moschata* fruit diameter 75 cm. and 400-500 seeds per fruit).

Fig. 1. *Cucurbita maxima* (Mitha Kadu) ripe-fruiting stage.

Fig. 2. *Cucurbita moschata* (Halva Kadu) flowering/immature fruiting stage.

Healthy, authentic seeds of *C. maxima* and *C. moschata*, obtained from agricultural Research Institute, Faisalabad were sown in the last week of March in throughly ploughed vegetable free soil mixed with organic manure in two separate fields having different species in six burrows each, watered immediately, after sowing and 100% germination observed after 10 days. Watering continued till fruiting and harvesting. Flowering occured in middle of May and end of June for both plants respectively. The ecometerological data is given in (Table 1). There were 10-50 flower/fruit per vine in (*C. maxima*) and 20-30 for (*C. mosehata*) Table 2. Ripe fruits were harvested and stored at

Table. 1. Ecometereological data for the cultivation of *Cucurbita maxima* and *Cucurbita moschata*

S. No.	Cultivation stage	Dates	Humidity (%) max.	Humidity (%) min.	Temperature °C max.	Temperature °C min.	irrigation
Cucurbita maxima							
1.	Sowing	24.3.88	55	24	30	13.9	12-15 times
2.	Germination	4.4.88	55	30	34.8	16.9	from sowing
3.	Flowering	2.5.88	38	21	39.6	28.6	till
4.	Fruiting	15.5.88	33	12	45.5	25.5	harvesting
				to			
		15.7.88	75	67	37	26.7	
5.	Harvesting	25.6.88	67	45	39.7	28.1	dates
Cucurbita maschata							
1.	Sowing	24.3.88	55	24	30.0	13.9	15-20 times
2.	Germination	4.4.88	55	30	34.8	16.9	from sowing
3.	Flowering	25.5.88	44	14	45.0	30.5	till
4.	Fruiting	25.6.88	67	45	39.7	28.1	harvesting
5.	Harvesting	25.8.88	87	69	33.0	28.7	dates

Table 2. Flower, fruit and seed data of *Cucurbita maxima* and *Cucurbita moschata*

S. No.	*C. maxima*	*C. moschata*
1. Number of seeds sown	72	72
2. Number of flowers/vine	40-50	20-30
3. Number of fruits produced	50	23
4. Number of seeds/fruits	250-300	400-500
5. Total seed yield	1.38 kg.	2.7 kg

room temperature and their characterization and fatty acid compositions were determined according to earlier reported techniques [2]. The data all given in Table 3.

Table 3. Oil yield, physico-chemical characteristics and fatty acids composition of the seed oils of *Cucurbita maxima* and *Cucurbita maxima.*

S. No.	Characteristic	*C. maxima*	*C. moschata*
1.	Oil yield %	39.1	37.7
2.	Refractive index	1.4592	1.4825
3.	Saponification value	200.7	196.2
4.	Iodine value	98.	157.8
5.	Fatty acid composition %		
	$C_{14:0Z}$	2.27	0.61
	$C_{16:0}$	9.47	23.31
	$C_{18:0}$	4.93	11.50
	$C_{18:1}$	53.0	38.03
	$C_{18:2}$	30.03	25.77
	$C_{18:3}$	–	1.23

The shape and size of leaves, flower's colour (yellow) and vines length (75 am) are similar in both the species. But it was observed that the vine growth of *C. maxima* is more rapid than that of *C. moschata* Another difference is the presence of tendrils in *C. moschata* which were absent in *C. maxima*. The flowering and fruiting dates of two plants are also different. (Table 2).

The oil yield and the fatty acid composition (Table 3) is similar to those of other members of this plant family 1, 3. Slight changes can be explained because of the modern analytical facilities. However, the fatty acid composition of the oils from *C. maxima* and *C.moschata* is different. Saturated acids C_{16} and $C_{18:0}$ are more (23.31% and 11.50%) in *C. moschata* and less (9.47 % and 4.93%) in *C. mdxima.* Conversally the unsaturated acids C_{18}:1 and C_{18}:2 are more in *C. Moschata* but is absent in *C. maxima.*

In general only a limited quantity of the fruits are allowed to ripe. In order, therefore to make an oil seed crop out of these species, there is a clear need to carry out large scale (at farmer's level in the field conditions) cultivation trials.

To increase the number of seeds in the fruit it needs deeper study that is planned and will be carried out in the next years for additional oil seed crop.

Key words: Physico-chemical evaluation, *Cucurbita maxima, Cucurbita moschata.*

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