

CULTIVATION TRIALS OF BUFFALO GOURD – A POTENTIAL OILSEED CROP AT THE PCSIR LABORATORIES LAHORE

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INTRODUCTION

Cucurbita foetidissima (Buffalo gourd) is a wild perennial plant with large fleshy roots and dull green or grey stems and leaves which are harsh to touch, and is native to the great plains of the South Western United States and Mexico. The trailing vines generally grow to a length of 8 to 10 ft. and a single plant in a good location can occupy 300 sq. ft. of land area. It bears flowers which are unisexual (Pistillate or Staminate) and are borne singly at most nodes of the vine. The fruits (Pepos) are usually round with a dia of 5.7 cm. The plants' primary mode of reproduction is asexual by development of adventitious roots produced at the nodes of the vines. The plants are, thus, extensive trailers covering considerable ground area.

The plant family Cucurbitaceae, to which B. gourd belongs is large containing about 100 genera and 850 species, which are mainly tropical or sub-tropical in distribution with a few species extending in the temperate climates [1]. A number of species are native to Pakistan and many are cultivated to provide green vegetables, particularly in summer months. Buffalo gourd *Cucurbita foetidissima* being a member of this plant family, it was decided to introduce it under Pakistani conditions as it has been recognized by several authors as a potential source of oil and protein which can be cultivated on arid and semi-arid lands [2-4].

The potential of this wild plant has now been recognized for about 30 yrs. Cultivation of such plants, particularly in the summer months when large tracts of vacant land are available in Pakistan, is expected to help shorten the oil and protein gap that has continued to exist in Pakistan. With a view to studying its oil and protein, preliminary cultivation trials of this draught-resistant plant have been carried out at the PCSIR Laboratories, Lahore.

For the purpose of the present note, only the seed oil has been examined. Field trials so far carried out show that the plant can be grown under Pakistani conditions. The chemical composition of the oil suggests that it will have

applications as nutritionally superior cooking medium with over 85% unsaturation. However, further experimentation will be continued in the next sowing season (March-1984) when the root starch and seed protein will also be examined alongwith per acre seed/oil yield.

EXPERIMENTAL

The Buffalo gourd seeds were sown in the middle of March. These seeds germinated after ten days and germination percentage was observed to be 66%. Yellow-coloured flowers started appearing after 60 days and fruiting was observed 30 days later. The ratio of male and female flowers on the vines was noted to be almost equal.

The oval fruit, about the size of a tennis ball (dia 7.5 cm) was yellowish green with stripes of pale yellow colour at maturity. It was very hard to be cut by the ordinary knife for the recovery of seeds. The lemon-coloured fibrous pulp of the fruit was bitter to taste. The number of seeds per fruit was found to be varying from 250-300.

However, due to excessive rain-fall this year, very few fruits (30%) reached maturity in four months (120 days). The vines at maturity had a length of 10-12 ft.

The amount of oil in the seed, with and without seed coat was determined by extraction with hexane and is given below:

The content of oil with seed coat	= 35.85%
The content of oil without seed coat	= 48.80%

The physical and chemical properties and the fatty acid composition of the oil were determined by the standard methods [5] and are given in Table 1 & 2 respectively.

Table 1. Physical and chemical properties of the oil
of Buffalo gourd seeds

1. Oil %	35.85%
2. Colour	Yellowish green
3. Appearance	Clear liquid
4. F.F.A. %	1.28%

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5. Iodine value	122.4
6. Saponification value	177.19
7. Unsaponifiable matter	2.12
8. Ref. Index	1.465

Table 2. Fatty acid composition of Buffalo gourd seed oil

C _{12:0}	0.06%
C _{14:0}	0.09%
C _{16:0}	10.39%
C _{18:0}	2.89%
C _{18:1}	31.75%
C _{18:2}	54.82%

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