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Nutritional Profile and Medicinal Properties of *Cucumis melo var Agrestis*: A Non- Conventional Vegetable

M. N. MEMON, A. B. GHANGHRO*, A. R. MEMON**, G. USMAN, A. M. SHAH, A. ABRO***

Department of Community Medicine, LUMHS, Jamshoro

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Abstract: The research study was design to determine the nutritional profile and medicinal properties of non-conventional vegetable *Cucumis melo var Agrestis* of district Tharparkar, for sake to take a little step for overcoming the situation of malnutrition and to alleviate the nutritional and health status of the community as well. *Cucumis melo var Agrestis* fruits sample were collected from the vicinity of Mithi, district Tharparkar, Sindh, Pakistan. Biochemical and phytochemical screening via different standard methods was performed to assess the nutritional value of the plant. The outcomes of experimental work were estimate ash content with 3.8%, moisture 80.9%, carbohydrate content 31.2%, moreover protein content of *Cucumis melo var Agrestis* was detected 18.9% in fruit part. However, the presence of Phenolic compounds alike total alkaloids and total Tannis was also observed, beside this the heavy metals was found available and analysis shows presence of Cu, Fe, Zn, Co with 138, 141, 17.6 and 0.03 of ppm concentration were found respectively, although very minute concentration of Mn, Pb and Cd perceived below the limit of detection. Hence it was concluded from present study that *Cucumis melo var Agrestis* (Fruit) was found nutritious that can be used as food to overwhelm the situation of malnutrition.

Keywords: *Cucumis melo var Agrestis*, Phytochemical, Fruits, Nutritional, Medicinal.

1. INTRODUCTION

In rural population to sustaining the healthy life the non-conventional vegetables performing important role as the non-traditional food having rich substance of variety of macro and micro nutrients availability and many medicinal qualities. Around the world bioactive compounds present in plants kingdom enhances the pharmaceutical property along nutritional substances (Lim, 2012). Traditional medicinal plants have been used to treat many types of diseases since decades around the whole world. In recent times the medicinal plants are attaining focus in research community due to their significancein protection from variety of health hazardous ailments. Phytochemicals are secondary metabolites present in the medicinal plants which have curative medical properties and is using from ancient times as a therapeutic drugs or as herbal medicine. Besides this there is range of several scientifically identified phytochemicals that are non-nutritive in property but having diseases protective assets available in plants (Lanjawani *et al.*, 2015).

The *Cucumis melo var Agrestis* (wild melon in English) or kachari (in Hindi), Chibbar/Mitero (in Sindhi), small gourd, wild musk melon, miniature melon) from Conomon group and Cucurbitaceous family, consumed as vegetable at premature stage although use as fruit when whereas as a fruit in mature phase in most of the rural areas of Pakistan, India, Afghanistan, Iran, Malaya and in China, economically cheaper consecutively used in managements of many diseases (Folador *et al*., 2007). The fruits of this plant having importance in treating of burns and abrasions while Seeds are known as antitussive, antioxidant, digestive, febrifuge and vermifugtive, the oil extracted from seed was reported for anti-fungal action (Kaur *et al*., 2011)

Keeping in the view an effort has been taken to explore the nutritional profile and medicinal properties evaluation of *Cucumis melo var Agrestis* vegetable from District Tharparkar. The present research study is therefore being intended to investigate the excellence of plant in their nutraceutical quality.

2. MATERIALS AND METHODS

2.1 Collection, identifications and Sample preparation of plants:

*Cucumis melo var Agrestis*was collected from District Tharparkar, Sindh Pakistan and brought in laboratory of Institute of Biochemistry, University of Sindh, Jamshoro. The samples were wrapped in paper bags to avoid moisture and temperature retention. Before starting laboratory analysis plants samples were initially conformed by efficient botanist from Institute of Plants Science, University of Sindh, Jamshoro. After

++Corresponding AuthorEmail: allah.bux@usindh.edu.pk
*Institute of Biochemistry, University of Sindh, Jamshoro.
**Department of Biochemistry, LUMHS, Jamshoro.
**Sir C.J Institute of Psychiatry, Hyderabad

identification plant washed with distilled water and dried under shade for about 15-30 days. Subsequently when drying completed, fine powder of dried plant was made via pestle mortar and stored in airtight plastic bags at cool and dry place.

2.2 Sample preparation

Sample for the total protein was prepared as method applied by Sawhney and Randhir (2006) whereas for the phenolic comounds, flavonoids and tannis samples were extracted and prepered by the methods reported by Malini *et al.* (2013).

2.3 Wet acid digestion method for Metal analysis:

Mixture of concentrated HNO_3 and 0.5mg powdered plant sample in conical flask was left for three hours, after completion of desired time the mixture was heated till the solution become clear then again 5 ml of HNO_3 was added along with 2 ml of H_2O_2 and heated as the transparent solution was attained. Followed by heating solution was filtered through Whatman No. 42 filter paper and 25 ml of final volume was make upby the addition of deionized water (Kazi *et al*., 1999). Atomic absorption spectrophotometer was used to analyze for metal detection from digested sample (Perkin Elmer).

2.4 Phytochemical determination Methods

Total moisture content and total ash content was determined by the method given by (Umadevi *et al.,* 2012). Phytochemical was quantify by different spectrophotometric (Lanjwani *et al.,* 2015) methods such as Total protein by Lowry's method Lowry 1951, Total Carbohydrate by Anthrone method, Hodge and Hofreiter, 1962, Total Phenolic Compound by folin ciocalteu reagent method (Sunita& Singh, 2010), Total flavonoid by Aluminium Chloride Colorimetric Method (Damodar *et al.,* 2011), Total tannin by modified Prussian method and Total alkaloids by Dragen dorff's reagent method (Sreevidia, 2003).

3. RESULT AND DISCUSSION

The screening and analysis of phytochemical and biochemical Cucumis melo var argestis (Chibbar) fruit results showed the presence and absence of various types of phytochemicals such as phenolic compounds, flavonoids, tannins, alkaloids, saponins, glycosides, carbohydrates, proteins and amino acids) were prominently present and results are depicted in **(Table 1)**. Test was performed by using of some organic solvent such as, Ethanol, methanol, chloroform and aqueous extract respectively. The various extracts of the Cucumis melo var argestis (Chibbar) fruit were subjected to phytochemical analysis which reveals the presence of various types of phytochemical components. Ethanol, methanol and Aqueous extract shows presence of phytochemicals such as phenolic compounds, tannins, alkaloids, carbohydrates, proteins. Chloroform extract for above plants shows presence of carbohydrates, protein, alkaloids, phenolic and tannins compounds

Table. 1. Screening of phytochemicals and biochemical constituents in Cucumis melo var argestis (Chibbar) fruit

S.No:	Phytochemicals	Test Name	Cucumis melo var argestis (Chibherr) fruit			
			Aqueous Extract	Methanol Extract	Ethanol Extract	Chloroform Extract
1	Alkaloids	Mayer's test	-	++	+++	-
		Wagner's test	-	++	+	-
		Hager's test	-	++	+++	-
2	Phenolic Compounds	Ferric chlorides test	+	++	+++	+++
3	Tannins	Lead acetate test	+	++	+++	++
4	Flavonoids	Alkaline reagent test	+	++	_	++
5	Saponins	Foam test	+++	+++	+++	++
6	Protein	Biuret test	+	_	+++	+
7	Aminoacid	Ninhydrin test	+++	+	+++	+++
8	Carbohydrates	Molisch's test	+++	+	+++	+++
		Benedict's test	+++	+++	+++	+++
9	Steroids and Triterpenoids	Libermann- burchard test:	+++	+++	+++	+++
		Salkowski test:	+++	_	+++	+++
10	Glycosides	Legal's test	_	++	++	+
11	Vitamin C	Dinitrophenyl hadrazine test	_	_	_	_

(+++) Appreciable amount; (++) Moderate amount; (+) Trace amount and (-) Absent

Table. 2.Quantitative analysis Phytochemical analysis of Cucumis melo var argestis (Chibbar) fruit

Extracts	Total Proteins	Total Carbohydrates	Total Alkaloids	Phenolic Compounds	Total Tannins
	n= 3 Mean= 16. 7	n= 3 Mean= 28.2	n= 3 Mean= 3.4	n= Mean= 1.71	n= Mean= 0.72
Aqueous	18.9±2.9	31.2±0.36	3.3±0.3	1.7±0.5	0.55±0.4
Methanol	8.9±5.7	21.2±5.0	2.3±0.75	0.7±0.2	0.43±0.4
Ethanol	13.9±3.2	18.2±7.7	5.3±0.79	2.7±0.3	0.45±0.2
Chloroform	11.9±3.9	21.2±5.6	2.3±0.65	0.87±0.3	0.39±0.2
Ash	3.8± 0.8				
Moisture	80.9±0.5				

The availability of alkaloids is due to biosynthetic and physiologic reactions due environmental changes. The present results show similarity with hitherto reported data of (Ghanghro *et al.*, 2015) that pollen of Typha Latifolia gives 1,040 cal/kg, 4.9% protein, 18.2% carbohydrates, 6.4% Ash, 1.50% fat and 69% moisture, and suggested typha pllen a rich source of nutrients and phytochemicals and having sufficient medicinal quality to treat Alzheimer's disease and myocardial infarction. Another study conducted I.H Gahnghro in 2015on capris decidua which also shows the good nutritional composition which can be used as non-conventional vegetable to meet with increase nutrient demand. Cucumis melo var argestis (Chibbar) fruit shows presence of important metals Mn, Co, Fe, Zn, Pb and Cu) were analysed and results revealed in Table 3 that Ferrous (141 ppm), Zinc (17.6 ppm), Copper (13.4 mg/kg), Iron (14.3mg/kg) were observed. Iron (Fe) concentration was recorded 3.97ppm and value was within the permissible limits as 10-60mg of iron intake in a day was recommended (Kaplan *et al*., 1993). Chromium (Cr) was noted 259 ppb in acacia flower whereas US National Academy of Sciences has recommended daily intake of Cr 50-200 µg (Waston, 1993). Although, copper concentration (162ppm) is higher in flower although recommended limit of Cu is 20µg/mg body weight per day (FDA, 1993). (Kurzawska, 2013). Hence these elements are believed to have good antioxidant potential. Copper, zinc are essential components of the body's antioxidant defense that play an important role in prevention of free radical-induced damage. This study supports the use of this wild fruits aids some important minerals in diet necessary for body (Ahmed *et al*., 2006).

Table. 3. Mineral Estimation of Cucumis melo var argestis (Chibbar) fruit

Ferrous (Fe)	Cobalt (Co)	Manganese(Mn)	Cadmium (Cd)	Zinc (Zn)	Lead (Pb)	Copper (Cu)
n= 3Mean= 141.0	n= 3Mean= 0.13	n= 3Mean= 0	n= 3Mean= 0	n= 3Mean= 17.1	n= 3Mean= 0	n= 3Mean= 1.35
141±0.1	0.03±0.1	BD	BD	17.6±0.4	BD	1.38±0.6

BD= Below Detection level

4. CONCLUSION

It was concluded from the study that significant quantity of phytochemicals is present in Cucumis melo var argestis (Chibbar) fruitsuch as, alkaloids, saponins, phenolic compounds, flavonoids, tannins, steroids, terpenoids, glycosides, carbohydrates, proteins and amino acids.Therefore, by the end of this research work the fruit of Cucumis melo var argestis (Chibbar) is found a very rich source of nutraceutical which combating malnutrition and can be used to treat various ailments.

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