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Physicochemical Properties of fruit of *Aegle Marmelos* (L.) Corr.

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Abstract
The present study was aimed to study the physicochemical properties on *Aegle marmelos* (L.) Corr. Fruit types (Spherical, flattened and cylindrical) physicochemical values of all the three types showed both similarities and dissimilarities. In ash value except in insoluble value all are more or less similar. Fluorescent behavior of all the three types showed similar and distinct behavior. Qualitative Phytochemical analysis revealed that water extract of all the types shows positive results while 50% and 100% ethnolic extracts showed mixed results of compounds tested. In quantitative Phytochemical analysis there was no much difference found.

Keywords: *Aegle marmelos*, Phytochemicals, Qualitative analysis, Fluorescent analysis.

In the last few decades there has been an exponential growth in the field of herbal medicine. It is getting popularized both in developing and developed countries owing to its natural origin and lesser side effects. Herbal plants are an important in therapeutic uses (Alam *et al.,* 2010). Approximately 119 pure chemical substances extracted from higher plants are used in medicine throughout the world (Fansworth *et al.,* 1985). *A. marmelos*, vilva is an important medicinal plant tree. All parts of the tree are medicinally useful and occupies covetous in Hindus religious rituals. Literature in Indian medicine systems like Ayurveda, Siddha and Folk medicine has potential information on its therapeutic uses. The fruit of *A. marmelos* fruit has been reported to anti diabetic (Kamalakannan *et al.*, 2003) anti ulcer (Dhuley, 2003) anti inflammatory (Arul *et al.,* 2005). Chemical analysis and propagation methods of A. marmelos was reported (Krishnan Nambiar *et al.,* 2000). Fruit pulp contains mucilage, [pectin, sugar, tannin volatile oil, ash (Nadakarani, 1927). Alkaloids, coumarins, fatty acids and steroids from the fruit (Reisch *et al*., 1985) and Amino acids from fruit (Ali and Qadry, 1987). Six types of ripened Bael fruits were analyzed for different physicochemical constituents like weight, length, diameter, total acidity vitamin C, reducing sugars and calcium oxalate (Kumari *et al.,* 1998). Among different population of *A. marmelos* variation in shape and size of the fruits, leaves and spine was observed (Ghosh *et al*., 2001). Though many Phytochemical and pharmacological works were undertaken in *A. marmelos* fruit, but little works have been done among the types with this background the present study was aimed to study the 3 fruit types (Spherical, flattened and cylindrical) of *A. marmelos* fruits in Thanjavur.

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Three types of *Aegle marmelos* fruit (Spherical, flattened and cylindrical) were collected from various places in Thanjavur, Tamil Nadu, India. Then pulps were separated from all the type of *A. marmelos* fruits separately and dried under shade. These dried materials were mechanically powdered and stored in separate containers. These powdered materials were used for further Physicochemical, Fluorescent analysis and phytochemical analysis. These powdered materials were subjected to find total ash, water soluble ash, acid insoluble ash by the methods described in Indian pharmacopoeia (Anonymous,1966;1985;1996). The solubility percentage of powder in Water, ethanol and was also estimated (Kokatae, 1994). Powder analysis was also carried out as mentioned by Key, (1938). Qualitative Phytochemical analysis of fruit pulps was done using the procedures in Kokatae,(1994). Quantitative estimation of total alkaloids, total terpenoid (Fergusan, 1956) Resin (Kokatae, 1994) and ascorbic acid (Gangly,1948) was also determined.

Results and Discussion

Physicochemical values of fruit pulps of *A. marmelos* all the three types show both similarities and dissimilarities. In ash value, except insoluble value all are more or less similar (Table-1). Fluorescent behavior of all the three types *A. marmelos* fruits was examined by using different chemicals and identified in both visible and UV light showed both similar and dissimilar behaviors (Table-2). Qualitative phytochemical studies revealed both similarities and distinct features thus the water extracts of all the three types showed similar values, while 50% and 100% ethanolic extracts showed mixed results in compounds tested. Quantitative phytochemical analysis result reveals that all are more or less equal (Table-3). Further phytochemical studies needed to know their activity profile among these types of fruits.

Table-1: Physicochemical values of fruit pulps of *Aegle marmelos* (L.) Corr.

S. No	Parameters	Spherical (%)	Flattened (%)	Cylindrical (%)
1	Total ash	6.04	6.33	6.30
2	Sulphated ash	7.37	7.47	7.41
3	Water soluble ash	1.42	1.34	1.46
4	Acid insoluble	0.10	0.12	0.03

Table-2: Fluorescent Behavior of Fruit Pulps Powder of *Aegle marmelos* (L.) Corr.

Reagents used	Spherical		Flattened		Cylindrical	
	Visible light	U.V. Light	Visible light	U.V. Light	Visible light	U.V. Light
Powder as such	Sandal	yellow	Yellow	Reddish Brown	Sandal	Yellow
P+ NaOH	Sandal	Light Yellow	Yellow	Green	Sandal	Dark green
P+ H_2SO_4	Maroon	Navy blue	Brick red	Violet	Dark Brown	Black
P+ $FeCl_3$	Brown	Dark Green	Yellowish brown	Dark Brown	Dark Brown	Black
P+ HNO_3	Dark Brown	Dark Green	Brownish Block	Brown	Dark Brown	Green
P+ HCl	Yellowish Brown	Green	Yellowish Brown	Green	Sandal	Light Yellow

Table-3: Preliminary Phytochemical Screening of Fruit Pulps Powder of *Aegle marmelos* (L.) Corr.

Tested for	Reagents Used	Spherical			Flattened			Cylindrical		
		100 %	50%	H_2O	100 %	50%	H_2O	100 %	50%	H_2O
Alkaloids	Dragendroff's	-	+	+	-	+	+	-	+	+
	Mayer	-	+	+	-	+	+	-	-	
	Wagner	+	+	+	+	+	+		+	+
	Hager	-	+	+	-	+	-	-	-	+
Carbohydrates	Fehlings	+	+	+	-	+	+	-	+	
	Benedicts	+	+	+	+	+	+	+	+	+
Tannin and Phenols	Ferric Chloride	-	+	+	-	+	+	-	+	+
	Lead acetate	-	+	+	-	+	+	+	+	+
Phytosterols	Liberman	-	-	+	+	-	+	+	+	+
Gums and mucilage	Ppt. by Alcohol	-	-	-	+	+	+	-	+	+
Fixed oils and fats	Spot test	-	-	+	+	+	+	-	+	+
Saponins	Foam test	-	+	+	-	+	+	-	+	+

Present (+) Absent (-)

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