

# Phytochemical, Proximate and Antioxidant Analysis of Fruits of *Semicarpus Anacardium* L.f.

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## ABSTRACT

The *Semicarpus anacardium* L.f. commonly known as bhallataka belonging to family Anacardiaceae. The fruit is also known as marking nut. The fruit are edible and it is reported to be astringent, anti-rheumatic, carminative and vesicant. The present paper deals with phytochemical, proximate and antioxidant analysis of mature and ripened fruits was investigated. The mature fruit shows higher content of moisture, ash, crude fiber and dry matter whereas crude fat is higher in ripen fruits. Ash is the inorganic residue remaining after the water and organic matter have been removed. Powder behavior indicated alkaloids, cysteine, xanthoprotein and starch. In preliminary phytochemical screening shows presence of alkaloids, saponins, coumarins, glycosides, tannins, and flavone. In Antioxidant analysis, carotenoids observed in mature fruits is  $13 \pm 0.06$  mg/100gm. whereas, total polyphenol in mature fruits is  $5.08 \pm 0.02$  mg/100gm. Carotenoids and polyphenols have an important antioxidant function of deactivating free radicals. They are the most important antioxidants in human diet.

**Key words:** Phytochemical, proximate, antioxidant, *Semicarpus anacardium* L.f.

## INTRODUCTION

Drugs are the natural products. It is an important role in drug development programs in pharmaceutical industry. All medicinal preparations are derived from plants. Plants are valuable for their active ingredients. It is also important for their glycosides, alkaloids, alcohols, antioxidant and phytochemical properties. According to (Jain and Sharma 2013) the rural people depends upon the forest areas. The forest area supply their needs like medicine, timber, wood, wild vegetables etc. The fruit of *Semicarpus anacardium* L.f. is also called as "Marking nut, Bibba, Bhilwa, Bhallataka, Black nut," (Patwardhan et al. 1988). The pericarp juice is used for marking cotton clothes. According to (Chaoudhari et al. 2012) pericarp oil obtained from nuts is used for commercially in preparation of dyes and medicines.

(Majumdar et al. 2008) concluded that the nut are used in the treatment of tumors and malignant growth. The fruit are useful in the treatment of rheumatism and asthma. The fruit is acrid and anthelmintic (Ramadan *et al.* 2010). Phytochemical studies of the fruit extract observed that flavonoids, phenols and carbohydrates. Anacardium means "Heart shaped marking nut (Jain and Sharma, 2013).

In that Anacardiaceae family contains 700 species and 60 genera. (Bondre and Nathar, 2011). These are cultivated throughout the world. The vernacular name of this plant is **Bibba**. Fruits are edible and medicinally important. It is a dicotyledonous plant. The plants are large trees or shrubs with gummy or milky latex. It is a medium sized deciduous tree. (Jain and Sharma, 2013). The inflorescence is panicle and flowers are greenish white. Flowering occurs in Sept. and then onwards. The fruits are 2-3cm broad, ovoid and smooth with lustrous black. (Jain and Sharma 2013). Fruits are kidney shaped, drupaceous nut with a fleshy pear-shaped receptacle. Fruits are ripe between October to December. The rosette crystals of calcium oxalates are present in parenchymatous tissue. (Jain and Sharma, 2013, Majumdar *et al.* 2008), analyzed bioflavonoids in nut shell.

The Nuts extracts are effective against many diseases such as arthritis, tumours, infections etc. *Semecarpus anacardium* L.f. determines antioxidant property. It has capacity to scavenge the superoxide and hydroxyl radicals at low concentration. In *Semecarpus anacardium* L.f. flavonoid present and determine antifungal activity. The phytochemical studies of the fruit extract show flavonoids, phenols, glycosides and tannin. The most important component of *Semecarpus anacardium* L.f. is bhilawanols, phenolic compounds, bioflavonoids, sterols and glycosides. Bhallataka is sweet and astringent in taste. It is extremely heat generating. The fruits, their oil and seed have great medicinal value. It is used to treat the wide range of diseases. The oil is applied on wounds to prevent pus formation and better healing of wounds. Bhallataka is used for hair care. It is also used for dyeing and promoting hair growth. It is also useful in cognitive decline and improving memory. Parts of the plant touch with the skin causes dermatitis. In dermatitis in which the skin becomes red, sore or inflamed after direct contact with a substance. There are two types of contact dermatitis such as irritant or allergic.

## MATERIALS AND METHODS

The plant material is collected from Ghatnandre from Sangli District. The collection was carried out during flowering and fruiting periods in the month of October and December. The collected plants were identified with the help of flora. The fresh fruits were washed completely until no other material remained. They were blotted when the moisture is completely absorbed, air dried and weighted to obtain fresh weight. Then the plants were cut in to small pieces and put in paper envelop and dried in the oven at 40<sup>o</sup> C until constant weight was obtained. After complete drying the sample was ground to a fine powder by using an electric grinder. The powder of the plant material was used for physicochemical determination. Dry matter, moisture, and total ash were determined by following the method of AOAC (1990). Crude fat and crude fiber content was determined by following the method of Sadashivam and Manikam (1992). The carotenoids were estimated following the method of Krick and Allen (1965). The total polyphenols content determined by the method of Folin and Denis (1915). The fresh plant material 500 mg was homogenized in 30ml 80% acetone and filtered through Buchner funnel. This extraction of plant material was used for the estimation of carotenoids and total polyphenol. Successive extractive values were performed with various solvent like petroleum ether, chloroform, and acetone. The percentage yield of extract, preliminary phytochemical tests of the extract were performed using specific reagent by methods of Trease and Evans (1985), Raman (2006), Kokate *et al.* (1995), Kokate (2002) and Khandewal(2005).

## RESULTS AND DISCUSSION

The photo plate showing plant habit, fruits and flower twig of *Semecarpus anacardium* L.f. The different extraction of the *S. anacardium* L. f. of fruit determines the presence of metabolites like phenols, flavones, tannins, saponins, alkaloids, xanthoprotein, glycosides, caumarins (Bagwewadi *et al.* 2012). The values of total ash are tabulated in table no.5. The fluorescence study of powder with different chemical reagent was also studied under U. V. light (254 and 366nm). The visibility of varying colors which are as tabulated in the table no.2. In fruits the ash content is ranged from 10-20 % (table 5) which indicates the high ash content. (Pednekar and Raman, 2012). The ash contents determine the all minerals present in the fruit sample.



**Plate-1** Habit **Plate-2** Fruits **Plate-3** Plant twig with fruits

**Table : 1 Powder behavior**

Number	Reagent	Colour / behavior	Inference
1	Powder as such	Orange brown	_____
2	Powder + 5% FeCl <sub>3</sub>	Olive drab green	Tannin present
3	Powder + Picric acid	Sunglow yellow	Alkaloids present
4	Powder + 5% iodine	Apple green	Starch present
5	Powder + 40% NaOH + Lead acetate	Brown	Cysteine present
6	Powder+conc.HNO <sub>3</sub> +Ammonia	Orange yellow	Xanthoprotein
8	Powder + 5%KOH	Rose wood red	glycosides

**Table no. 2 Fluorescence study of powder with different chemical reagent in visible and U. V. Light**

Sr. No.	Powder with chemical reagent	Visible light	Short wavelength (245)	Long wavelength (366)
1	Powder as such	Orange brown	Asparagus green	Black
2	Powder + D.W.	Buff brown	Kelly green	Grey
3	Powder+ 1N NaOH in D. W.	Chocolate brown	Hunter green	Slate grey
4	Powder + 1N NaOH in Alcohol	Chestnut brown	Seal green	Black
5	Powder +10% HCl	Copper brown	Kelly green	Slate grey
6	Powder + conc. HCl	Chocolate brown	Olive green	Slate grey
7	Powder + conc. HNO <sub>3</sub>	Marigold yellow	Juniper green	Black
8	Powder + conc. H <sub>2</sub> SO <sub>4</sub>	Tortilla brown	Fern green	Slate grey
9	Powder + Acetone	Peanut brown	Olive green	Slate grey
10	Powder +5%KOH	Peanut brown	Pear green	Black
11	Powder +5% iodine	Tortilla brown	Olive green	Slate grey
12	Powder +5% FeCl <sub>3</sub>	Umber brown	Army green	Slate grey

**Table no. 3 Extractive values**

Extract	Colour	%Yield
Petroleum ether	Chocolate brown	0.4
Acetone	Chocolate brown	0.2
Chloroform	Chocolate brown	0.1

**Table no. 4 Preliminary phytochemical screening of *Semicarpus anacardium* L. f.**

Sr. No.	Content	Petroleum ether	Acetone	Chloroform
1	Phenols	-	++	-
2	Anthroquinones	-	-	-
3	Flavones	-	+	-
4	Tannins	-	++	+++
5	Caumarins	+	++	-
6	Saponins	+	-	+++
7	Alkaloids	-	+	+++
8	Xanthoprotein	-	+	-
9	Glycosides	+	-	-

**Table no. 5 proximate analysis**

Content	MatureFruits(%)	RipenedFruits(%)
Moisture	62	54
Dry matter	46	38
Ash	18.3	14.7
Crude fiber	10	8.5
Crude fat	0.2	0.4

**Table no. 6Antioxidant analysis**

S. N.	Mature Fruits mg/100gm	Ripened Fruits mg/100gm
Carotenoids	13 ±0.06	10.2± 0.03
Total polyphenols	5.08 ± 0.02	3.94±0.08

The extractive values are gives exact idea about the adulteration of drug species (Bohir *et al.* 2013). The fruit sample is a better source of essential, valuable and useful minerals for good body development. The ash content gives an idea about the inorganic composition and other impurities.

The moisture, ash, dry matter and crude fiber is higher in mature fruit as compared to ripen fruit. The crude fat is higher in ripen fruit than the mature fruit. In plants natural antioxidants are present. The *S. anacardium* L. f. gives unique therapeutic properties to the supplement in drug discovery programs. Itis potentially a good source of natural antioxidants.

## CONCLUSION

The phytochemical evaluation would give valuable information for the future studies. The morphology of *Semicarpus anacardium* L. f. was carried out to support proper identification of the drug. The powder behavior and phytochemical analysis indicated presences of flavones, tannins, xanthoprotein and glycosides. The result of the proximate analysis of fruit showed promising nutrient content in fruits. Carotenoids are a class of phytonutrients. These are plant pigments which play important role in plant health. These phytonutrients and phyto constitutes gives protective health benefits to human beings.

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