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Anti-oxidant potential of Unripe Fruits of Baccaurea Courtallensis (Wight) Mull. Arg., (Phyllanthaceae)

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ABSTRACT

The aqueous extract of unripe fruit of *Baccuarea courtallensis* were assessed for its anti-oxidant potential. The aqueous extract was subjected to *in-vitro* anti-oxidant screening by reduction of ferric ions. Ascorbic acid was used as standard. The study reveals that the aqueous extract of the unripe fruit has potent anti-oxidant activity. The activity exhibited by the fruit extract was comparable with the reference standard used in the evaluation. The anti-oxidant activity was found to be concentration dependent and may be attributed to the presence of flavonoid content in the fruits.

Keywords: Aqueous extract, *Baccaurea courtallensis*, ferric ions, anti-oxidant screening

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INTRODUCTION

The *Baccaurea courtallensis*, commonly known as Moottipazham in Malayalam and belonging to the Phyllanthaceae family, is a medium-sized endemic tree found in the Western Ghats region of India. It has been traditionally utilized by various ethnic communities, particularly the Paniya, Kani, and Kurichya tribal groups, for its nutritional and medicinal properties. Traditional healers have long used different parts of the *Baccaurea courtallensis* tree to treat various ailments such as stomach and mouth ulcers, diarrhea, piles, and dysentery. In recent years, scientific analysis has been conducted to validate these traditional claims [(1)].

To counteract oxidative damage, natural products containing anti-oxidants have been utilized for their ability to scavenge excess free radicals from the body. Many plants contain significant amounts of anti-oxidants such as vitamin C and E, carotenoids, flavonoids, and tannins. These compounds can help to prevent and, in some cases, aid in the treatment of oxidative-related disorders by either scavenging free radicals directly or enhancing the body's own anti-oxidant defense mechanisms [(2)]. The anti-oxidants which mostly come from the fresh fruits and vegetables that we eat may prohibits the oxidation of the molecules in the body.

MATERIALS AND METHOD

Plant material

The unripe fruits of Baccaurea courtallensis were collected from the cultivated species from Idukki district of Kerala state during the month of April and its botanical identity was confirmed by Dr. Sreeja P, Assistant Professor, Department of Botany, Sir Syed College, Thaliparamba in Kannur district of Kerala. A voucher specimen bearing No.9953 has been deposited at the PG Department of Botany and Research Centre herbarium, Sir Syed College, Thaliparamba, Kannur district, Kerala

Preparation of the Extract

The unripe fruits collected are subjected to shade drying and then crushed and soaked in water with occasional stirring to allow the soluble compounds to dissolve into water. After maceration, the liquid is strained to obtain the aqueous extract [(3)].

Anti-oxidant activity (*Invitro*)

Reduction of ferric ions by ortho-phenanthroline color method

Ortho substituted phenolic compounds are found more active than unsubstituted phenol. Hence, these compounds may exert pro-oxidant effect by interacting with iron. In the presence of scavenger, reduction of ferric ions will occur which is measured at 510 nm [(4)] A reaction mixture containing 1ml ortho-Phenanthroline (0.005g in 10 ml methanol), 2 ml ferric chloride 200 M (3.24

mg in 100 ml distilled water) and 2 ml of various concentrations of the extracts were incubated at ambient temperature for 10 min, then the absorbance was measured at 510 nm[2]. The percentage scavenging has been calculated from the following formula;

$$\% \text{ scavenging} = \frac{\text{control} - \text{test}}{\text{control}} \times 100$$

Table 1: Effect of aqueous extract of unripe fruits of *Baccaurea courtallensis* on reduction of ferric ions

Sl. No.	Conc.in µg/ml	Aqueous extract		Ascorbic acid (Standard)	
		Absorbance	% Scavenging.	Absorbance	% Scavenging.
1	50	0.612	51.22	0.671	69.15
2	100	0.599	59.35	0.499	71.22
3	250	0.510	67.50	0.327	84.66
5	500	0.374	84.69	0.219	99.19
6	1000	0.225	102.27	0.099	116.58
	Control	0.798		0.818	

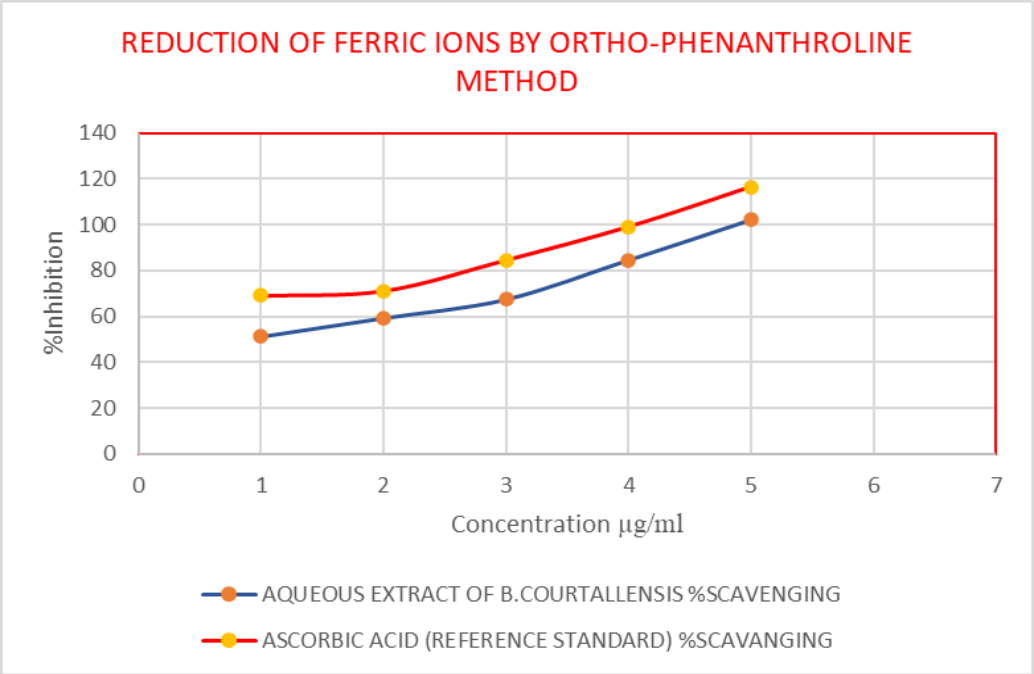

Figure 1: Effect of aqueous extract of unripe fruits of *Baccaurea courtallensis* on reduction of ferric ions

RESULTS AND DISCUSSION

The plant based medicinal agents are in use against many diseases since long time onwards.

The secondary metabolites like alkaloids, flavonoids, terpenoids, saponins, phlobatannins, coumarins, anthocyanins, leucoanthocyanins, phenols and carbohydrates are well documented in the fruit extract of *Baccaurea courtallensis* [5]. A plant or a part of a plant is said to be medicinally active due to the presence of secondary metabolites. However, the concentration of secondary

metabolites in each part may varies. The secondary metabolites or in general the above said active constituents in the fruits of *Baccaurea courtallensis* are reported to have potent anti-oxidant activity against various diseases [6]. The fruits of the plant are reported with flavonoids and these flavonoids possess many medicinal activities like anti-inflammatory, antiallergic, anti-viral and antiaging. The therapeutic effects exhibited by this class of compounds are largely attributed to anti-oxidant properties [7]. Anti-oxidants are capable of preventing the tissue damage induced by free radicals through the formation of radicals, scavenging them or by promoting their decomposition. From the study it is very clear that the unripe fruit of the plant possess potent anti-oxidant activity. Even though many plants have been reported with anti-oxidant potential by *in vitro* assays only few of them are investigated and confirmed through *in vivo* evaluation [8].

CONCLUSION

Phytochemical review of the plant revels many phytochemical principles that have got many therapeutic properties. Further clarifications on the identification and characterization of these principles in the in vivo analysis has to be evaluated. The anti-oxidant potential exhibited in the present study by the fruit extract could be due to its flavonoid content. Hence it is advised that in future an in-vivo anti-oxidant screening of the fruit extract has to be conducted which will definitely results in developing an herbal molecule with promising anti-oxidant activity.

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