

## Evaluation of antioxidants from *Tinospora cordifolia*

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### ABSTRACT

*Tinospora cordifolia* grown in wild in Melghat. It is known in Sanskrit as "Amrita", in Hindi "Gulbel" or "Biloe" and in Marathi "Gulvel". It is bitter, astringent, sweet, thermogenic, digestive etc. the present investigation was undertaken to estimate antioxidants from this species is only due to its multipurpose therapeutic values. The plants were collected from Melghat (Dist. Amravati). Identification were done with the help of standard floras. Fresh as well as shade dried plant material, leaves and fruit was used for moisture content and estimation of ascorbic acid, anthocyanin, iron, phenol, lycopene and carotene. Fresh leaves contain 360 mg ascorbic acid, 10.43 mg lycopene, 5.24 mg carotene, 20.296 mg anthocyanin, 400 mg phenol and dry leaves contain 290 mg ascorbic acid, 125 mg iron, 21.234 mg anthocyanin, 1240 mg phenol/100g. Fresh fruit shows 40 mg ascorbic acid, 0.6709 mg lycopene, 6.36 mg carotene, 19.355 mg anthocyanin, 560 mg phenol and dry fruit shows 3660 mg ascorbic acid, 37.5 mg iron, 19.061 mg anthocyanin, 2600 mg phenol/100 g.

**Key words:** *Tinospora cordifolia*, Antioxidant.

### INTRODUCTION

In recent years there is an upsurge in the areas related to new development in prevention of disease especially the role of free radicals and antioxidants. So it will be pertinent to examine the possible role of 'free radicals' in disease and 'antioxidant' in its prevention<sup>1</sup>. Oxidation and production free radicals and reactive oxygen containing species (ROS) are an integral part of life and our metabolism<sup>2</sup>. The ROS may play a causative role in a variety of disease including heart diseases, cancer and ageing, the role of antioxidants has received increasing attention. When mechanism of antioxidant protection becomes unbalanced by factors such as ageing, deterioration physiological functions may occur resulting in disease and accelerating ageing. However antioxidant supplements may be used to help the human body to reduce oxidative damage<sup>3</sup>.

Addition of natural antioxidants can increase shelf life of food products containing fats and oils. In addition, natural antioxidants are safe and impart health benefits to the consumer<sup>4</sup>.

Vitamin C chain breaking antioxidant competitively protects the lipoproteins from peroxy radicals and also recycles vitamin-E<sup>5</sup>. Carotene mainly present as colouring pigments in plants also function as potent antioxidants at a various levels. Anthocyanins display a wide range of biological activities including antioxidant, anti-inflammatory, antimicrobial and anti-carcinogenic activities<sup>6</sup>. The total iron content of the normal adult is about 4 to 5g. Iron need increases during pregnancy, growth and lactation<sup>7</sup>. Antioxidant based drugs formulations for prevention and treatment of complex diseases like atherosclerosis, stroke diabetes, Alzheimer's disease cancer etc<sup>8</sup>. Therefore our aim in this study is to evaluate antioxidant.

## MATERIAL AND METHODS

Extensive survey and collection of Plant material in Melghat was carried out during time when the temperature was around 25°C at altitude 822 feet. Plant material was collected in air tight zip-lock polythene bags. Plants material deposited to laboratory. Identification was done by using standard flora. For Antioxidant evaluation and for counting percentage of moisture content fresh as well as shade dried plant material (Leaves, fruit) was used. Evaluation was done by standard methods given by Thimmaiah<sup>9</sup>.

## RESULTS AND DISCUSSION

The estimated values of antioxidants were converted into 100 g presented in Table 1. The antioxidant activity varies considerably from plant to plant and also in fresh and dry material of same plant. The value of some antioxidants per 100 g increases after drying while the value of some decrease. Fresh leaves contain 360 mg ascorbic acid and fresh fruit contain 40 mg ascorbic acid, where as dry leaves and fruit shows 290 mg, 360 mg ascorbic acid per 100g respectively (Graph 1, Table 1). The Recommended Dietary Allowance in

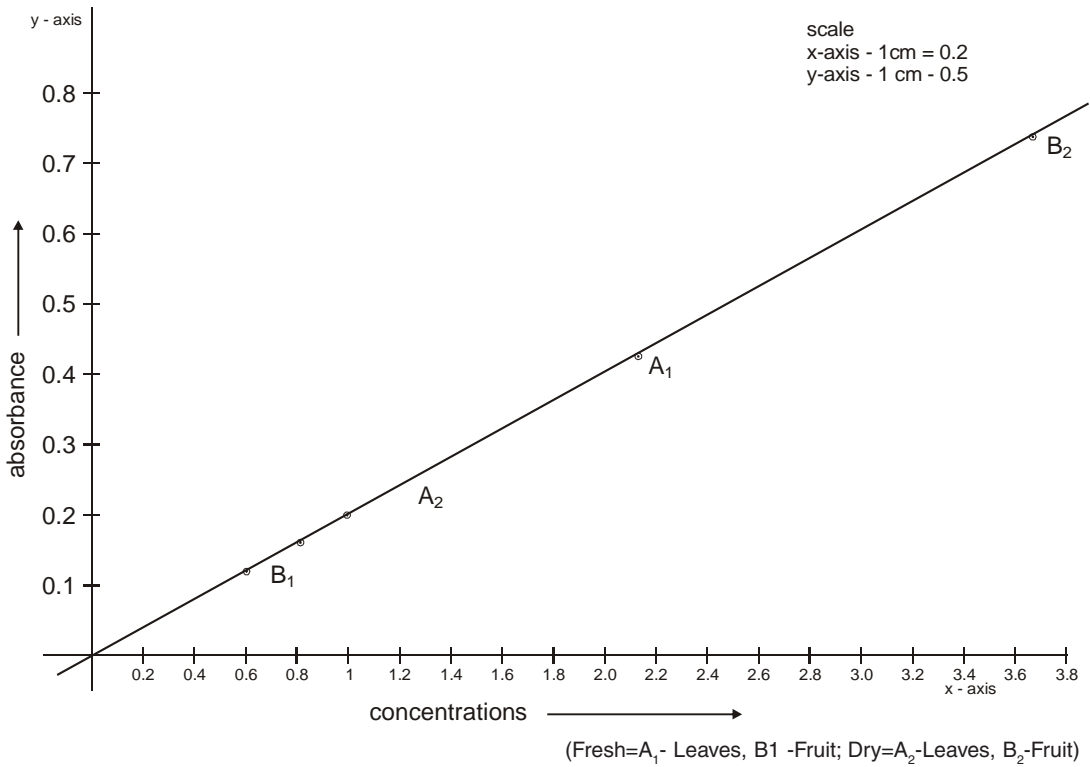
children is 40 mg, in adult 45 mg and in pregnant and lactating women are 60 mg and 80 mg respectively<sup>10</sup>.

Dry leaves and fruit contain 125 mg, and 37.5 mg iron / 100 g sample respectively (Graph 2, Table 1) The daily requirement of iron for children is nearly 15mg, adult males 18mg, and females during pregnancy and lactation requires 18mg and after the age of 51 years, females requires 10 mg. Fresh leaves and fruit contain 400 mg, 560 mg phenol, where as dry leaves and fruit shows 1240 mg, 2600 mg phenols / 100 g sample (Graph 3, Table 1). Polyphenols are the most abundant antioxidant in the diet. Their total dietary intake could be as high as 1g per day<sup>11-12</sup>.

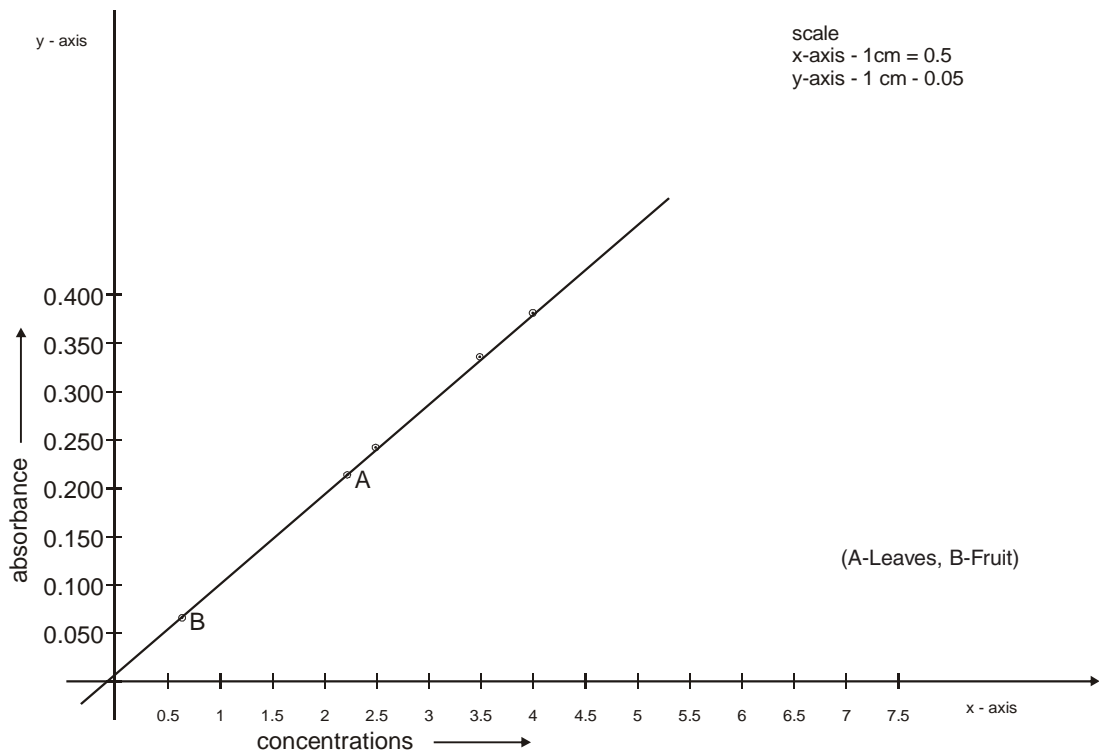
Fresh leaves and fruit contain 20.296 mg, 19.355 mg anthocyanin ,where as dry leaves and fruit contain 21.234 mg, 19.061/ mg anthocyanin per 100 g sample (Table 1). The daily intake of anthocyanins in humans has been estimated at 180 - 215 mg/d in USA<sup>13</sup>. The fresh leaves contain 10.43 mg lycopene and 5.24 mg carotene, where as the dry leaves contain 0.6709 mg lycopene and 6.36 mg carotene.

**Table 1: Antioxidants in *Tinospora cordifolia***

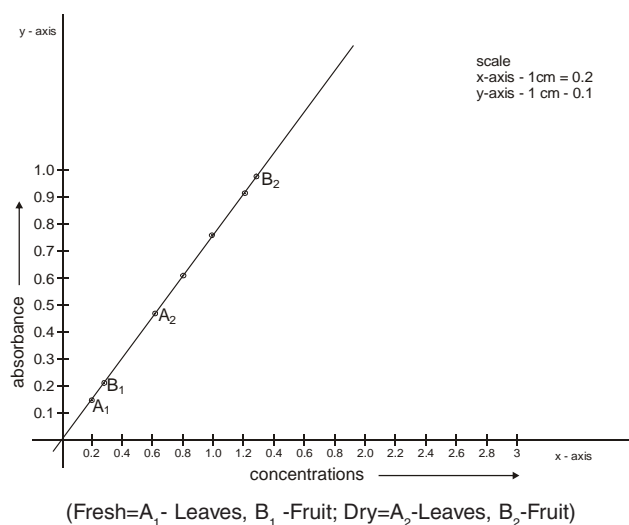
S. No	Antioxidants	Plant part taken for Analysis Dry/Fresh	Weight of Plant part	Vol. of Extract	Vol. of extract taken for analysis	Absorbance		Antioxidants mg/100 g	
						Fresh	Dry	Fresh	Dry
I	Iron	Leaves	0.5 g	50 ml	4 ml	-	0.239	-	11.75mg
		Fruit	0.5 g	50 ml	4 ml	-	0.053	-	25.15mg
II	Phenol	Leaves	0.5 g	10 ml	0.5 ml	0.152	0.479	400 mg	1240 mg
		Fruit	0.5 g	10 ml	0.5 ml	0.218	0.982	560 mg	2560 mg
III	Ascorbic acid	Leaves	1.g	10 ml	1 ml	0.257	0.435	1220 mg	21.40mg
		Fruit	1 g	10 ml	1 ml	0.082	0.743	400 mg	3700mg
IV	Anthocyanin	Leaves	1 g	10 ml	1 ml	0.822	0.860	20.396mg	21.234mg
		Fruit	1 g	10 ml	1 ml	0.784	0.722	19.353mg	19.061mg
V	Lycopene	Leaves	2 g	20 ml	20 ml	0.669	-	10.43mg	-
		Fruit	2 g	20 ml	20 ml	0.043	-	0.6709mg	-
VI	Carotene	Leaves	1 g	10 ml	10 ml	0.131	-	5.24 mg	-
		Fruit	1 g	10 ml	10 ml	0.159	-	6.36 mg	-



**Graph 1: Estimation of ascorbic acid**



**Graph 2: Estimation of iron**



**Graph 3: Estimation of phenol**

### CONCLUSION

The result suggests that plant taken for analysis contain significant levels of antioxidants and may serve as dietary sources of natural antioxidants for disease prevention and health promotion. Such analysis can confirm that plants can use as medicine in cosmetics, against cancer, heart diseases.

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