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Antioxidant potential of *Ficus carica* by the DPPH free radical method: *In vitro* analysis

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ABSTRACT

As plants produce a huge amount of antioxidants they can represent a source of new compounds with antioxidant activities. From this point of view, the main goal of this research was to study the antioxidant activities of the *Ficus* carica through the 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical-scavenging method. Since DPPH assay has been largely used as a quick, reliable, and reproducible parameter to search the *in vitro* general antioxidant activity of pure compounds as well as plant extracts. The antioxidant activity of *Ficus carica* extracts was compared with standard *Ginkgo biloba*. Free radical scavenging effects of *Ficus carica* on DPPH were tested and the extract of *Ficus carica* indicated potencies of antioxidant.

Key words: *Ficus* carica, antioxidant**,** DPPH free radical method, *Ginkgo biloba.*

INTRODUCTION

Free radicals have aroused significant interest among scientist in the past decade. Their broad range of effects in biological systems has drawn on the attention of many experimental works. There are many plants have antioxidant activity, the plant *Ficus carica* is one of them. It has been shown that in addition to the delightful edible fruits, *Ficus carica* (Fig) are used to lower glucose levels in diabetics and lower the levels of total cholesterol. It has been also used as stomachache. The leaves are added to boiling water and used as a steam bath for painful or swollen piles[1]. The latex from the stems is used to treat corns, warts and piles.[1, 2, 3] It also has an analgesic effect against insect stings and bites.[4] The fruit is mildly laxative, demulcent, digestive and pectoral.[2, 5, 1] The unripe green fruits are cooked with other foods as a galactogogue and tonic.[1]The roasted fruit is emollient and used as a poultice in the treatment of gumboils, dental abscesses etc.[2] Syrup of figs, made from the fruit, is a well known and effective gentle laxative that is also suitable for the young and very old.[4] A decoction of the young branches is an excellent pectoral.[5] The plant *Ficus carica* has protective action against hepatic dysfunction[6] and anticancer properties.[1] Many synthetic antioxidant compounds have shown toxic or mutagenic effects, which have shifted the attention onto the naturally occurring antioxidants. Their use has mainly centered on prevention and the maintenance of health. Numerous plant constituents have proven to shown free radical scavenging activity.[7] It has been recognized that naturally occurring substances in higher plants have antioxidant activity.[8] Accordingly, attention is been

focused on the protective biochemical functions of naturally occurring antioxidants in the cells of organism containing them.[9] In our screening project of antioxidative agents from natural sources, we studied the DPPH (1,1-diphenyl-2-picrylhydrazyl) radical photometric assay in a process guided by its discoloration. The antioxidant activity of these extracts was compared with standard solution of *Ginkgo biloba.* [8] There is extensive evidence to implicate free radical damage to cells leads to pathological changes associated with aging. Free radicals may also be a contributory factor in a progressive decline in the function of immune system. [10]

MATERIALS AND METHODS

General

1, 1 -diphenyl-2-picrylhydrazyl (DPPH) was purchased from sigma. Recordings were made in a UV-VIS Spectrometer Shimadzu UV-1601. All reagents were of analytical grade and obtained from Merck.

Plant material

50% methanolic leaf extract of *Ficus* carica, was prepared by the method of, (Suffness and douros, 1979). [11] Aliquots of the extract were solubilized in ethanol (1.0 mg/ml).

DPPH photometric assay

Sample stock solutions (1.0mg/ml) were diluted to a final concentration 50,100,150,200 and 250 mg/ml in ethanol.1 ml of 0.3mM DPPH, ethanol solution was added to 2.5ml of sample solutions of different concentration, and allowed to react at room temperature. After 30min. the absorbance values were measured at 518nm and converted in to the percentage antioxidant activity (%AA) using the following formula –

$$AA\% = \{100-[(Abs_{sample} - Abs_{blank}) \times 100]/ Abs_{control}\}$$ [8]

Ethanol (1.0ml) plus plant extract solution (2.5 ml) was used as a blank. DPPH solution (1.0 ml; 0.3mM) plus ethanol 2.5 ml of sample solutions was used as negative control. The positive control were those using the standard solutions (*Ginkgo biloba*). The concentration required to inhibit the absorbance at 50% (IC_{50}) was also calculated.

Statistical analysis

All the in vitro experiments were done in triplicate.[8]The results are given as mean ±S.D. *P* value was regarded as significant.

RESULTS

Since DPPH assay has been largely used

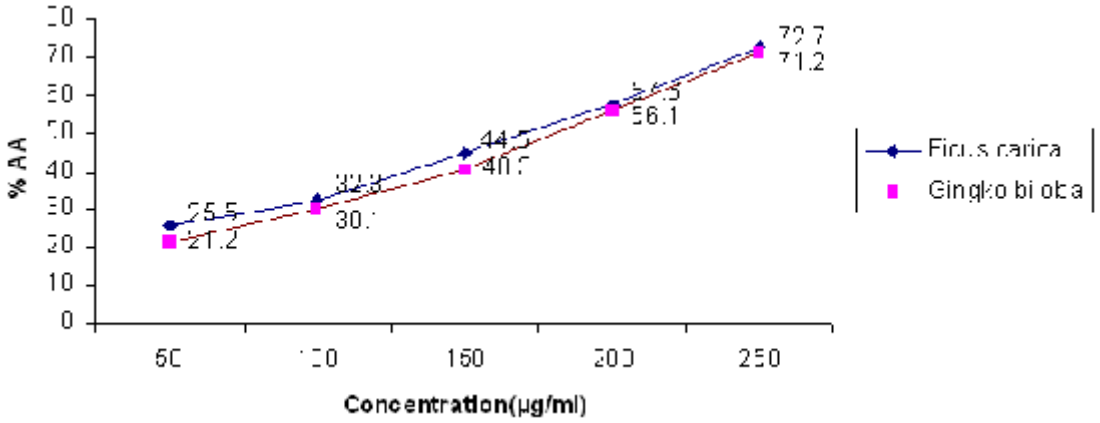
Table 1: Free radical scavenging effect of *Ficus* carica by DPPH assay

Treatment	Concentration (µg/ml)	% A A	IC50
Ginkgo biloba	50	25.5± 0.86	183.7 µg/ml
	100	32.3± 0.44	
	150	44.5 ±0.49	
	200	57.6 ±1.50	
	250	72.7 ±1.59	
Ficus carica	50	21.2±0.91	203.8 µg/ml
	100	30.1 ±0.54	
	150	40.3±0.82	
	200	56.1 ±1.45	
	250	71.2 ±1.68	

Results are mean ± SD of three parallel measurements.

%AA- Percentage of antioxidant activity.

IC_{50} -50 % inhibitory concentration.



Graph 1: Graph showing the antioxidant effect of *Ficus* carica

as a quick, reliable, and reproducible parameter to search the in vitro general antioxidant activity of pure compounds as well as plant extracts. [12,13] Free radical scavenging effects of *Ficus carica* on DPPH were tested and the results are indicated in Table & Graph. DPPH was reduced in the addition of the extract in concentration dependent manner. The extract of *Ficus carica* indicated potencies of antioxidant by the discoloration of solution.

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