



In vitro antioxidant activity of methanolic extract of *Andrographis paniculata* leaves

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Abstract

In vitro antioxidant effects of methanolic extracts of *Andrographis paniculata* leaves were determined both enzymic activity (catalases, superoxide dismutase, Glutathione reductase, Glutathione-s-transferase and Glutathione peroxidases) and non enzymic activity (ascorbic acid, -tocopherol, polyphenol, Reduced Glutathione, Flavonoid and Carotenoids methods). Preliminary phytochemicals screening revealed that the extracts leaves of *Andrographis paniculata* possess Tannin, Terpenoids, Alkaloids, and Flavonoids materials. The result obtained in the present study indicated that the *Andrographis paniculata* might be good sources of natural antioxidant.

Keywords: ascorbic acid, -tocopherol, polyphenol, Reduced Glutathione.

1. Introduction

A phytochemical is a natural bioactive compound found in plant foods that works with nutrients and dietary fiber to protect against disease. Research suggests that phytochemicals, working together with nutrients found in fruits, vegetables and nuts, may help slow the aging process and reduce the risk of many diseases, including cancer, heart disease, stroke, high blood pressure, cataracts, osteoporosis, and urinary tract infections. Pronounced "fight-o-chemicals," phytochemicals fight to protect your health. . Jonathan, S.G. and I.O. Fasidi, (2003). They can have complementary and overlapping mechanisms of action in the body, including antioxidant effects, modulation of detoxification enzymes, stimulation of the immune system, modulation of hormone metabolism, and antibacterial and antiviral effect."Phyto" is a Greek word that means plant and phytochemicals are usually related to plant pigments. N.R. Biology and phytochemical screening of plants. Pharm. Sci. (1966). Free radicals are unstable chemical species naturally occur in the body as a result of exogenous chemical and endogenous metabolic process in the human body .Recent report indicated that there is an inverse relationship between dietary intake of antioxidant

rich food and the incidence of human diseases (Pieroni et al., 2002). Antioxidant thus plays an important role to protect the human body against damage by reactive oxygen species (Tutour, 1990).

There are several species of plants in nature that are growing in wild but need to be subjected for systematic investigation for the estimation of antioxidant and pharmacological activities as many of them are used in traditional medicines. In addition, there is also a great interest in detecting molecules from plant sources that can interact at site in a specific way and with less toxicity to DNA than many of the natural, synthetic, or chemosynthetic bioactive agents currently (Liscovitch and Lavie, 2002). In modern day the antioxidants and antimicrobial activities of plant extract have formed the basis of many applications in pharmaceuticals, alternative medicine and natural therapy. Abi, et al., (2005). Some of the active principles of bioactive compounds are preferred for their therapeutic purposes either singly or in combination to inhibit the life processes of microbes. Braca A, et al., (2003)

2. Materials and Methods

Sample collection

The *Aandrographis paniculata* leaves were collected from the nearby village, Coimbatore and dried in shade. They were then powdered and stored in airtight container at room temperature until use.

Qualitative determination of phytochemicals

Qualitative analysis of the leaves of *Aandrographis paniculata* was carried out systematically to identify the phytochemicals like tannin (Thenmozhi et al., 2011), steroids (Khan et al., 2010), terpenoids (Siddiqui et al., 2009), alkaloids (Santhi, et al., 2011), phenols (Benze and Schmid, 1954) and flavonoids (Beknal et al., 2010).

Assessment of the activities of Enzymic and non Enzymic antioxidants

The leaf samples of *Aandrographis paniculata* were analysed for the Enzymic and non Enzymic antioxidants such as catalase (Luck, 1974), superoxide dismutase (Misra and Fridovich, 1972), glutathione reductase (David and Richard, 1983), glutathione-S-transferase (Habig et al., 1974), glutathione peroxidase (Rotruck et al., 1973), ascorbic acid (Roe and Kuether, 1953), - Tocopherol (Rosenberg, 1992), reduced glutathione (Moron et al., 1979), flavonoids (Cameron et al., 1943) and carotenoids (Zakaria et al., 1979).

3. Results and Discussion

Assessment of antioxidant status of *Aandrographis paniculata*

Enzymic antioxidants

Activities of the Enzymic antioxidants namely catalase, superoxide dismutase, glutathione peroxidase, glutathione reductase and glutathione-S-transferase in *Andrographis paniculata* were assessed. They are depicted in Table 1. The leaves of *Aandrographis paniculata* were screened qualitatively for the presence of various phytochemicals, the observation and results are depicted in Table I

Table 1: Identification of the phytochemicals in the leaves of *Aandrographis paniculata*

Components	<i>Aandrographis paniculata</i>
Flavanoids	Present
Tannins	Present
Steroids	Present
Alkaloids	Present
Saponins	Present
Glycosides	Present

Table 2: Enzymic Antioxidant in *Andrographis paniculata* Leaves

Enzymic antioxidants U/g	<i>Andrographis paniculata</i>
Catalase ¹	0.70±0.1
Superoxide dismutase ²	15.2 ±0.12
Glutathione reductase ³	26.02±0.06
Glutathione-S transferase ⁴	0.3±0.01
Glutathione peroxidase ⁵	1.2±0.01

Values are mean± SD of triplicates

1. Amount of enzyme that brings about decrease in absorbance of 0.05 at 240nm
2. Amount of SOD that cause 50% reduced in the extent of NBT oxidation
3. Millimoles of NADPH oxidized/min/g sample
4. Millimoles of CDNB-GSH conjugates/min/g sample
5. Millimoles of GSH utilized/minute

Table 3: Non Enzymic Antioxidants in *A. paniculata* leaves

Non enzymic antioxidants mg/g	Methanolic extract of <i>A. paniculata</i> leaves
Ascorbic acid	3.46±0.12
– Tocopherol	11.06±0.32
Carotenoids	196.66±40.41
Polyphenols	1.46±0.17
Reduced glutathione	6.43±0.28
Flavonoids	243.81±0.56

Values are mean± SD of triplicate

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