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Research Paper :

Antioxidant activity in piper betel and nicotiania tabaum

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ABSTRACT

The aqueous extract of *Piper betel* L. and *Nicotiania tabaum* were studied for antioxidant activity on different *in vitro* models namely 1, 1-diphenyl, 2-picryl hydrazyl (DPPH) assay, nitric oxide assay and trichloroacetic acid based reducing power method. Ascorbic acid was also evaluated for comparison. The extracts showed free radical scavenging property in the tested models. *Piper betel* L. showed 98.06% inhibition of DPPH at 1000 µg and its activity at 500 µg (*i.e.* 94.35%)was comparable to that of ascorbic acid at 30µg (93.58%). While the maximum percentage inhibition by *Piper betel* L. and *Nicotiania tabaum* in the nitric oxide model was found to be only 62.14% and 33.36%, respectively, the activity of 1024 µg of *Nicotiania tabaum* and 128µg of *Piper betel* L. of compares favorably with that of 30 µg ascorbic acid. *Piper betel* L. showed high reductive ability. This study demonstrates the higher anti oxidant activity is present in the leaves of *Piper betel* L. when compared to *Nicotiania tabaum.*

Key words : Antioxidant, *Piper betel* L. and Nicotiania tabaum, Free radicals, Reductive ability

The deep green heart shaped leaves of Betel vine are popularly known as "PAAN" in India. The scientific name of Betel vine is *Piper betel* L. It belongs to the family Piperaceae, the black pepper family. Significance of the leaves has been explained in relation to every sphere of human life including social, cultural, religious, and even day to day life (Guha, 2006)

The *Piper betel* plant is found widely growing in the tropical humid climate of South East Asia and its leaves, with a strong pungent and aromatic flavour are widely consumed as a mouth freshener. The leaves have digestive and pancreatic lipase stimulant activities. Gastro protective properties of leaf extract on experimentally induced gastric lesions is reported (Bhattacharya, 2007)

A material present in the betel leaf is Chavicol (Kochhar, 1999) Betel leaf is traditionally known to be useful for the treatment of various diseases like bad breath, boils, and abscesses, conjunctivitis, Constipation, headache, hysteria, swelling of gums, rheumatism, abrasion, cuts, injuries, etc. (Guha, 2006)Chewing tobacco is smokeless tobacco, where ever smokeless tobacco products have been studied, they have found increase the risk of oral cancer. In India, known to increase of cancer belonging to upper aero- digestive tract. Also less fatal diseases such as recession of gums and oral mucosal lesions many of which are pre cancerous (Gupta, 2001)

Tobacco plant contains over 2200 compounds of which nitrogenous compounds comprise 30%. Nicotine is one important alkaloid contained in tobacco leaves. The primary commercial source of nicotine is by extraction from dried leaves of tobacco plant (*Nicotiania tabaum* and *Nicotiania rustica*) (Cooper, 2006). Reactive oxygen species are an entire class of highly reactive molecules derived from the metabolism of oxygen (Farrukh Aquil, 2006)

Reactive oxygen species are generated in plant cells during normal metabolic processes. The photosynthetic electron transport is the major source of active oxygen in the plant tissues having potential to generate singlet oxygen and super oxide (O_2-) that is the production of active oxygen (Arora, 2002)

Plants possess very efficient scavenging systems for reactive oxygen species that protects them from destructive oxidative reactions (Arora, 2002). The antioxidant defense system of the plant comprises a variety of antioxidant molecules and enzymes (Arora, 2002). There fore this study was entitled to accesses the Free radical scavenging activity of fresh betel leaves extracts and dried tobacco leaves extract was experimented for free radical scavenging activity, comparison of properties of betel leaves and dried tobacco leaves.

MATERIALS AND METHODS

All chemicals and solvents used were of analytical grade and obtained from Ranbaxy Fine Chemicals and SD Fine Chem. Ltd., Mumbai, India. Ascorbic acid was obtained from Merck Ltd., Mumbai and 1, 1-diphenyl, 2-picryl hydrazyl (DPPH) was obtained from Sigma chemicals, USA. The other chemicals used were N-(1-naphthyl) ethylene Diamine Dihydrochloride (NED), trichloro acetic acid (TCA), Sodium nitoprusside, sulphanilamide, O-phosphoric acid, sodium chloride