Antioxidant Properties of Polyphenols of Nutraceutical Importance in the Fermented and Non-fermented Extract obtained from the Waste and Underutilized parts of Fruits and Vegetables

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The utilization of agro-industrial waste by conversion into value added products may be an innovative solution to the environmental waste problem. Agro-industrial wastes in recent times have been the focus of research in drug design and in treatment a range of ailments1. The aim of the above study is to screen medicinal plants and their waste parts and also under-utilized parts for potential sources of antioxidant and polyphenols.

In order to find newer sources of polyphenols which can act as natural antioxidant, in the present study the main focus is on waste left after harvest, peels of fruits and vegetables, weeds and other agri-wastes etc, which can be economically viable sources. After screening for potential sources of phenols and antioxidant, free radical scavenging and reducing activities was carried out to identify the potential sources and their optimum utilization in the preparation of health care products and nutraceuticals. Samples with high phenolic content and promising functional activity (ies) was subjected for specific phenolic composition through HPLC, with main objective to identify their potential sources.

From the studies it was found that leaves of *Coriandrum sativa*, fruits of *Murayya koenigii* and husk and peel of coconut (*Cocos nucifera*), peels of onion bulbs and potato, have very high concentration of quercetin and kaempferol which generally go as a waste in every house and food outlets. It is also used extensively in Indian society for the preparation of various dishes; hence proper utilization of this waste is extremely necessary. It can be used as a potential source of polyphenols and for the development of nutraceuticals. They are suitable for use as a potent antioxidant in nutraceuticals, functional foods, designer or medical foods, to fortify various formulations for general health care, which can be used in the form of tablets, biscuits, granules, suspension, capsules, syrups, powder, candy, mixed with food products, nutritional supplements and pharmaceutical agents and also to prevent the oxidation, as preservative to stabilize foodstuffs. Therefore, they play an important role in human health care system as nutraceuticals and functional foods

Oxygen is vital for aerobic life processes. However, about 5% or more of the inhaled O2 is converted to reactive oxygen species (ROS). Thus cells under aerobic condition are always threatened with the lethal effects of ROS, which however are efficiently taken care of by the highly powerful antioxidant systems of the cell. When the balance between ROS production and antioxidant defenses is lost, 'oxidative stress' results which through a series of events deregulates the cellular functions leading to various pathological conditions including cardiovascular dysfunction, neurodegenerative diseases, gastroduodenal pathogenesis, metabolic dysfunction of almost all the vital organs, cancer, and premature aging.Natural antioxidant has been repeatedly advised, since the fact than an antioxidant comes from a natural source does not prove its assumed safety. Carotenoids, tocopherols, ascorbates and polyphenols are strong natural antioxidants generally found in plants and foods. Vegetables, fruits, herbs, spices and other plants contain many compounds with antioxidant activity.

Antioxidants have been associated with reduced risk of cardiovascular diseases and several types of cancer. They are known to act to defuse the volatile toxic molecules of free oxygen radicals, a by-product of cell metabolism. Polyphenols are present in the plants, as secondary metabolites have drawn attention for their diversified physiological activities and recently in the field of food and nutraceuticals.

The traditional medicine all over the world is nowadays revalued by an extensive activity of research on different plant species and their therapeutic principles. Plants provide various kinds of medicines besides supplying food for the prevention and treatment of diseases. As plants produce a lot of antioxidants to control the oxidative stress caused by sunbeams and oxygen, they can represent a source of new compounds with antioxidant activity. Even though intensive studies on the phenolic constituents in numerous plant sources have been conducted, the composition data are yet insufficient in medicinal plants. Waste disposal represents a serious problem to many agro industries since it is usually prone to microbial spoilage and causes major environmental problems. The utilization of agro-industrial waste by conversion into value added products may be an innovative solution to the environmental waste problem. Agro-industrial wastes in recent times have been the focus of research in drug design and in treatment a range of ailments1. The aim of the above study is to screen medicinal plants and their waste parts and also under-utilized parts for potential sources of antioxidant and polyphenols.

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Several types of plant materials such as vegetables, fruits, leaves, oilseeds, cereal crops, barks, roots, spices and herbs have been sought out for their potential antioxidants. However, relatively less information is available on the antioxidant principles of the agrowastes which are usually discarded in huge quantities. As a result, in the last few years, increased attention has been focused on the antioxidant prospective of food processing products and agro-industrial .The determination of antioxidants in peels, brans, seed coats and oilseed residues etc. has been gaining importance with the recognition that these parts of the fruits and seeds are often rich sources of natural antioxidants. India being an agricultural country is blessed with medicinally or economically important flora and agricultural crops. There are a number of agro wastes, fruit processing products and cereal residual sources for bioprospecting and screening of antioxidant components. This study was an attempt to investigate different indigenously available agro wastes as potential sources of natural

antioxidants and to appraise their efficacy for stabilizing corn oil..Fruits and vegetable waste is available in abundance. These vegetable and fruit wastes are very promising for the future research to find newer sources of natural antioxidant and for the development of nutraceutical or functional food.