



REVIEW ARTICLE

# A COMPREHENSIVE STUDY ON THE NATURAL PLANT PHENOLS: PERCEPTION TO CURRENT SCENARIO

Pankaj Jain<sup>1</sup>, Sonika Jain<sup>2</sup>, Ashutosh Pareek<sup>1</sup> and Swapnil Sharma<sup>1\*</sup>

<sup>1</sup>Department of Pharmacy, Banasthali University, Banasthali-304 022, Tonk, Rajasthan, India

<sup>2</sup>Department of Chemistry, Banasthali University, Banasthali-304 022, Tonk, Rajasthan, India

\*E-mail: swapnilsharma1978@gmail.com

Tel.: +91 9214661099.

Received: July 03, 2013 / Revised: August 30, 2013 / Accepted: August 31, 2013

**Phenolic compounds are secondary metabolites of plants that are widely distributed throughout the plant kingdom. Secondary metabolites possess structural diversity that provide flavor and color to fruits, vegetables, and grains. They precipitate various pharmacological and toxicological effects on living beings. Extraction of the bioactive plant constituents has always been a challenging task for the researchers. In the present study, an attempt has been made to give an overview on chemistry, distribution, extraction and isolation techniques of various plant phenolics.**

**Key words:** Polyphenols, Plant kingdom, Plant phenolics, Distribution, Extraction techniques.

## INTRODUCTION

All plants create numerous organic amalgams that are always not related to the basic metabolism like progress, growth and development and the functions of these natural compounds in plants have only been noticed recently in a diagnostic perspective. Although these organic amalgam produced by the plants do not help in growth, they are effective in other ways. While some of these protect plants from predators and pathogens, others help in the reproductive process by fascinating pollinating agents or scattering the seeds. Many of them are also useful as they help to produce poisons that protect the plants. Most of the organic products found in plants may be grossly put into three broad categories-alkaloids, phenylpropanoids and terpenoids. While phenylpropanoids are mostly phenolic amalgams, terpenoids are made up of five carbon elements that are blended through the acetate or mevalonate method or the glyceraldehydes 3-phosphate/pyruvate process (Robbins, 2003). Many of the terpenoids produced by the plants are a sort of contaminants that protect the plants from being devoured by herbivores creatures or functionally attractants for pests and animals.

Basically, all phenols and phenolic amalgams are widely found in nature and can also be blended artificially. They form a separate group of chemical substances that comprises a member of hydroxyl cluster linked to an element of hydrocarbon set. Phenolics are compounds possessing one or more aromatic rings with one or more hydroxyl groups. They are broadly distributed in the plant kingdom and are the most abundant secondary metabolites of plants, with more than 8,000 phenolic structures currently known, ranging from simple molecules such as phenolic acids to highly polymerized substances such as tannins. Phenolic substances tend to be water soluble, since they most frequently occur in combined form with sugar, as glycosides and they are usually located in the cell vacuole (Anonymous, 1992; Madaan *et al* 2011). Among the natural phenolic compounds, of which several thousand structures are known, the flavonoids form the largest group but simple monocyclic phenols, phenylpropanoids and phenolic quinones all exits in considerable numbers. A number of vital vegetation ingredients including tannins, phenolic amalgams, flavones, coumarins, anthraquinones and all their glycosides comprise of phenolic