

A Review Of Phytochemical Studies Of Plants

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Abstract:-

Plants are very important in our life. Many basic needs of our life are fulfilled by plants. Plants are always useful for humans and other consumers. Plants have provided us with food, fuel, clothing, medicine and all other basic needs. Lot of work has been done in the field of medicinal plant use. The earliest mention of the medicinal use of plants is found in the "Rig Veda", which is probably the oldest repository of human knowledge and is believed to have been composed between 4500 and 1500 BC. Later, the "Ayurveda" also mentions many plants for the treatment of various diseases. The real medicinal science began with the development of "Ayurveda" (2500 to 900 BC).

Keywords- Plant, Medicine, Benefits.

Introduction:-

Since time immemorial human population has been dependent on plant resources for many benefits but their other properties can harm the human body if they are not used properly (Choubey & Khare. 2011). Plant products have been a part of phytomedicine since time immemorial. They can be obtained from bark, leaves, flowers, roots, fruits and seeds [8].

Plants contain certain chemicals that are formed as a result of metabolism, including saponins, glycosides, tannins, proteins, and alkaloids, although most toxic substances are thought to be secondary metabolism or byproducts of the plant's essential functions.

The importance of plants is known to us well. The plant kingdom is a treasure house of potential drugs and in the recent years there has been an increasing awareness about the importance of medicinal plants. Drugs from the plants are easily available, less expensive, safe, and efficient and rarely have side effects. The plants which have been selected for medicinal use over thousands of years constitute the most obvious choice of examining the current search for therapeutically effective new drugs such as anticancer drugs [1], antimicrobial drugs [2], antihepatotoxic compounds. According to World Health Organization (WHO), medicinal plants would be the best source to obtain variety of drugs. About 80% of individuals from developed countries use traditional medicines, which has compounds derived from medicinal plants. However, such plants should be investigated to better understand their properties, safety, and efficiency. [3]

Materials and methods:-

Collection of Plant Material

The plants selected for the present phytochemical study were collected from different local regions during their appropriate growing season. Healthy and disease-free plant parts such as leaves, stems, bark, roots, flowers, fruits, and seeds were selected. The collected plant materials were washed thoroughly with tap water followed by distilled water to remove dust and impurities. Botanical identification and authentication of the plant materials were carried out with the help of standard floras and taxonomists.

Preparation of Plant Extracts

The cleaned plant materials were shade-dried at room temperature for several days until a constant weight was obtained. The dried materials were powdered using a mechanical grinder and stored in airtight containers for further analysis.

The powdered plant material was extracted using different solvents such as water, methanol, ethanol, acetone, or chloroform by maceration or Soxhlet extraction method. The extracts were filtered using Whatman No.1 filter paper and concentrated under reduced pressure using a rotary evaporator. The crude extracts were stored at 4°C until further use.

Phytochemical Screening

Preliminary qualitative phytochemical screening of the plant extracts was carried out to detect the presence of various bioactive compounds using standard procedures described by Harborne (1973), Sofowora (1993), and Trease and Evans (1989). The extracts were tested for the presence of major phytochemicals such as:

Alkaloids (Mayer's, Wagner's and Dragendorff's tests)

Flavonoids (Alkaline reagent test, Lead acetate test)

Phenols and Tannins (Ferric chloride test)

Saponins (Froth test)

Glycosides (Keller–Killiani test)

Steroids and Terpenoids (Liebermann–Burchard test)

Proteins and Amino Acids (Biuret and Ninhydrin tests)

The appearance of characteristic colour changes or precipitate formation indicated the presence of specific phytochemical constituents.

Results and discussion: -

Analysis of the plant literature revealed the presence of constituents that are known to exhibit medicinal as well as physiological activities [12]. Analysis of the plant literature revealed the presence of phytochemicals such as phenols, tannins, flavonoids, saponins, glycosides, steroids, terpenoids and alkaloids. Phenolic compounds are one of the largest and most ubiquitous groups of plant metabolites [16]. They have biological properties such as anti-apoptosis, antiaging, anticarcinogen, antiinflammation, antiatherosclerosis, cardiovascular protection and improvement of endothelial function as well as inhibition of angiogenesis and cell proliferation activities [17]. Several studies have described the antioxidant properties of medicinal plants that are rich in phenolic compounds [18,19]. Natural antioxidants come from plants mainly in the form of phenolic compounds such as flavonoids, phenolic acids, tocopherols, etc. [20] Tannins bind to proline-rich proteins and interfere with protein synthesis. Their activity is probably due to their ability to complex with extracellular and soluble proteins and to complex with bacterial cell walls [21]. Plant extracts also contain saponins which are known to produce inhibitory effects on inflammation [25]. Saponins have the property of precipitating and coagulating red blood cells. Some of the characteristics of saponins include foam formation in aqueous solution, hemolytic activity, cholesterol binding properties and bitterness [26,24]. Steroids have been found to have antibacterial properties [27] and they are very important compounds especially due to their association with compounds such as sex hormones [28]. Alkaloids have been associated with medicinal uses for centuries and one of their common biological properties is their cytotoxicity [29]. Many workers have reported analgesic properties of alkaloids [30,14]. The results obtained in this study suggest that the identified phytochemical compounds may be bioactive components

and these plants are proving to be a valuable storehouse of bioactive compounds with substantial medicinal properties.

Conclusion:-

The results revealed the presence of medicinally important components in the studied plants. Several evidences collected in earlier studies have confirmed the bioactive nature of the identified phytochemicals. Several studies have confirmed that the presence of these phytochemicals contributes to the pharmacological and physiological properties of the studied plants in the treatment of various diseases. Therefore, the extracts of these plants can be considered as a good source of useful drugs. These plants are highly recommended for traditional medicine and it is suggested that more work should be done to isolate, purify and characterize the active components responsible for the activity of these plants. Also, additional work is encouraged to elucidate the possible mechanism of action of these extracts.

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