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Antioxidant and antimicrobial properties of five medicinal plants: A Review

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Abstract

World is endowed with a rich wealth of medicinal plants. Medicinal plants are the local heritage with global importance. In India herbs have always been principal form of medicine and presently they became popular throughout the developed world, as people strive to stay healthy in the face of chronic stress and pollution, and to treat illness with medicines that works to increase the body's own defence. People in Europe, America and Australia are consulting trained herbal professionals and are using the plants as medicines. Medicinal plants also play an important role lives of rural people, particularly in remote parts of developing countries with few health facilities. The variety and sheer number of plants with therapeutic properties of quite astonishing. It is estimated that around 70000 plant species, from lichens to flowering trees, have been used at one time or another form of medicinal purpose. The herbs provide the standing material for the isolation or synthesis of conventional drugs. In Ayurveda about 2000 plant species are considered to have medicinal value, while in the Chinese Pharmacopoeia, over 5700 traditional medicines are presented, most of them are of plant origin. About 500 herbs are still employed within conventional medicines, although whole plant is rarely used.
Keywords: antioxidants, medicinal plants, pollution, antimicrobial.

Introduction

The rich Indian plants wealth has made a good contribution to the development of ancient Indian material medica. One of the earliest treatises on Indian medicines, the Charak Samhita (1000 B.C.), recorded the use of 340 drugs of vegetable origin. Most of these continue to be gathered from wild plants to meet the demand of medicinal profession. Thus, despite the rich heritage of knowledge on the use of plant drugs, little attention had been paid to grow them as field crop in the country till the later part of the nineteenth century anonymous, 2001. In India, during the past one century there has been a rapid extension of the allopathic system of medicinal treatment. It generated commercial demand for pharmacopeial drugs and their products. For this, the farmers have made efforts to produce many of these drug plants and also several research institutes have undertaken studies on the cultivation practices of medicinal plants, which were found suitable and remunerative for commercial cultivation.

The world health organization (WHO) has an inventory of medicinal plants listing over 20000 species. As per of the strategy to reduce burden on developing countries, WHO currently encourages, recommends and promotes the inclusion of herbal drugs in national healthcare programmes. Today the global market of herbal products is estimated to be around US $40 billion and growing at a rate of 15- 20 % annually. In current age, modern medicine offers an unparalleled opportunity to relieve disease symptoms and save lives. Modern surgical techniques, such as keyhole surgery and plastic surgery, and the whole range of diagnostic and life support machinery now available can all be used to improve the chances of recovery from serious illness of injury. Since ancient time, orthodox pharmaceutical medicines were the only solution to sustain life and counter infection. Despite of the dramatic advantages of conventional medicine or biomedicine it has been established that herbal medicine has offered a great solution to cure diseases of human being.

Today, the exhaustive use of allopathic medicines and their side effects is well known. Many allopathic drugs are affecting resistance and immunity in human beings. In order to minimize the effects of allopathic

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medicines on human body, herbal medicines are gaining popularity. There is a great deal of interest in Ayurveda system of medicine for the reason that many chronic disorders which are not easily cured by allopathic medicines are being recovered by herbal treatment. Thus, the demand for various commonly used medicinal plants in the production of Ayurveda medicines is ever increasing. In view of this, the present study has been undertaken to exploit the potential of some medicinal plants of the region as a cure for various human disorders. Also, the cultivation of this group of plants will help in diversifying our agriculture for new cash crop. These plants have a large potential for all occasions. It was therefore though worthwhile to undertake such a study.

A lot of work done on this matter before, such as, Gopi (2000) observed that which plant utilized by animals, when they are sick. Prajapati et al (2003) listed dozens of medicinal plants, their uses and related spells and incantations. Arjun (1879) has categorized certain medicinal plants which are used in fresh state rather than dried form while Chopra (1947) made the first attempt to bring out a compilation on references on Indian medicinal and poisonous plants. Joshi (1947) had initiated the regular pharmacognostic work and wrote a monograph on Himalayan drugs. Aiyer et al (1966) have attempted the studies on pharmacognosy of Ayurvedic drugs of Kerala, while Deshmukh et al (1957) studied some other Indian medicinal plants as well. Chopra et al (1952) reported that Nem possessed anti- bacterial spectrum against gram positive as well as gram negative bacteria. Renu et al (2003) and Saini (2004) studied the Neem leaf extract on E. coli infection in broiler chicken. Prakash and Gupta (2005) described the Anti-asthematic and antipathic properties of Ocimum sanctum on the basis of his studies.

Observations:

1. **Azadirachta indica:**

It is commonly known as Margosa tree (hindi= Neem) belongs to family Meliaceae.

Neem protects against chemically induced carcinogens and liver damage by boosting antioxidant levels. It inhibits the growth of Dengue virus and more of viral diseases such as smallpox and chicken pox etc. Neem and its isolated compounds have shown impressive action against a wide of variety of human cancer cell including colon, stomach, lung, liver, skin, oral, prostrate and breast cancer. Immune stimulating properties of Neem boosts both the lymphocytic and cell- mediated systems including Killer T- cells which are able to destroy microbes, viruses and cancer cells. It helps to protect the liver from damage which in turn helps to cleanse the blood. Antioxidant compounds in neem help to prevent brain damage, who had suffered a stroke by enhancing lipid peroxidation and increasing ascorbic acid (Vitamin C) in the brain. Its sticks used to clean teeth coz its antimicrobial properties help to reduce plaque and cavities, tooth decay, bleeding gums and sore gums etc. neem shows great potential to control sexually transmitted diseases. Low doses of neem leaf extracts have sedative effects, it reduces anxiety and stress.

2. **Ocimum sanctum:**

it is commonly known as holy basil or Tulsi. It is used as antioxidant, anti- carcinogen in medicine world. It is used in nervous diseases such as dementia, alzheimer's etc. the essential oil of Ocimum sanctum L. showed potent anthelmintic activity in the Caenorhabditis elegans. It has anti- ulcerogenic activity. The generation of drug- induced oxygen radicals in heart cells led to cardiac lipid membrane peroxidation.

3. **Aloe vera:**

Aloe vera is a succulent plant species of the genus Aloe. The leaves of Aloe vera contain significant amounts of the polysaccharide gel which can be used for a wide range of medical purposes. There are many products

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containing Aloe vera gel, including skin lotions, cosmetics, ointment sand gel for minor burns and skin abrasions. The bioactive components of Aloe vera anti- inflammatory effect and aid the treatment of gastrointestinal diseases, i.e., inflammations, gastric, duodenal and intestinal ulcers. They aid lipid and carbohydrate metabolism, which helps to maintain normal blood sugar and cholesterol levels as well as normal body weight. Due to aloin, the daily intake of aloe juice should not exceed 30- 40 ml, because excessive consumption may not only have a strong laxative effect but also toxic effects. When Aloe is applied externally, it helps to regenerate burnt or frostbitten skin. It should be noted that hydroxyanthracene derivatives occurring naturally in Aloe have a strong purgative action, which may pose a threat to the health of humans.

4. Phyllanthus emblica:

The Indian gooseberry (Emblica officinalis or Phyllanthus emblica) is a deciduous tree of Euphorbiaceae family. It is a potent source of Vitamin C and low molecular weight hydrolysable tannins. It contains high levels of the free- radical scavenger, superoxide dismutase. Amla reduced UV induced erytherma and showed free radical quenching ability. Amla berry is good for the brain. It is supportive for mindand enhance coordination. It sharpens the intellect and helps in mental functioning. It supports the nervous system and strengthens the senses. Powder of amla produced a dose- dependent improvement in memory of young and aged rats. It has cardioprotective activity, hepatoprotective activity, anti- inflammatory, antipyretic and analgesic effects, hypo- cholesterolemic and hypo- lipidemic properties. It supports blood circulation. It protects the cardiovascular system and sometimes act as cardiac stimulant. In antimicrobial study, it was observed that the extract of Amla showed high activity against all gram- positive, gram-negative and resistant bacteria. Amla modulates the immune system.

5. Curcuma longa:

Turmeric or Curcuma longa is a flowering plant of the ginger family Zingiberaceaea. It was used as a dye first and then later it supposed to use for folk medicines. In India it spread to southeast Asia along with Hinduism and Buddhism, as the yellow dye is used to colour robes of monks and priest. It increases the antioxidants in body. Oxidative damage is one of the mechanisms which are responsible for aging and many kinds of disease. The free radicals involved in this mechanism react highly with organic substances in our body which can harm. Curcuma doesn't only block the free radicals; it also stimulates the antioxidant mechanism in our body. Recently it has been observed that curcumin prevents oxidants damage during indomethacin induced gastric lesion not only by blocking inactivation of gastric peroxidase, but also by direct scavenging of H_2O_2 and OH. There has been a great deal of research on turmeric's anticancer properties, but results are still very early. A lot of studies have shown that curcumin can be very beneficial in the treatment of cancer. Recently, interesting observations were made regarding curcumin- induced apoptosis in human colon cancer cell and roll of heat shock proteins. Studies have shown and proven that the simple act of adding turmeric to season your food can significantly lower blood cholesterol levels. Early studies suggested that turmeric may help prevent atherosclerosis, the buildup of plaque that can block arteries and lead to heart attack or stroke. Curcumin stimulates the gallbladder to produce bile, which some people may help improve digestion. People who would like to lose a couple of pounds or treat obesity and other similar conditions can take benefits of turmeric powder which can be very helpful in keeping one's ideal body. Turmeric boosts glucose and augments the effects of the medicarion which are used in the treatment of diabeties. It also lowers the body's resistance to insulin which can prevent type 2 diabeties from developing. Turmeric has anti-inflammatory properties as well as the antioxidant properties which eliminate free radicals which are responsible for damaging the cell in

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the body. Ether, cholesterol and oil mixture if turmeric have antifungal effects. Turmeric has lots of benefits for the skin including speeding up the process of healing wounds, calming pores on the face to reduce acne.

References:-

1. Atal, C.K. & Kapur, B.M. (1989): Cultivation and utilization of medicinal plants. United printing press, New Delhi, India.
2. Ayyer, K.L. and Kolammal, M. (1966): Pharmacognosy of Ayurvedic Drugs (Kerala), complete, series 1, number 1-12. University of Kerala, Trivendram.
3. Ayyer, K.N., Namboodari, A.N. and Kolammal, M. (1957- 1960): Pharmacognosy of Ayurvedic Drugs of Travancore.
4. Arya, T.P., Yogi, S., Peronica, E., Karosekali, N.E., Syahputra, R.A. and Situmorang, F.N. (2023): Phyllanthus emblica: A comprehensive review of its phytochemical composition and pharmacological properties.
5. Arjun (1879): "Catalogue of the Bombay Drugs", Examiner Press, Bombay.
6. Adil, M.D., Kaiser, P., Satti, N.K., Zargar, A.M., Vishwakarma, R.A. and Tasduq, S.A. (2010): Effect of Emblica officinalis fruit against UV-B induced photoaging in human skin fibroblast J. ethanopharmacol. 132
7. Broline, D. (2002): Evolution of Neem tree (Azadirachta indica) as an alternative anthelmintic for Helminth control in ruminants in Malysia. Minor field studies international office, Swedish university of agriculture science, 196.
8. Chopra, T.C., Gupta, K.C., and Nazir, B.N. (): Preliminary studies of antimicrobial substances from Azadirachta indica, J. Med. Res. 511- 515.
9. Chopra, R.N. (1947): "Indian medicinal and poisonous plants ", Indian Council of Medical Research, New Delhi.
10. Deshmukh, V.K., Godbole, S.R. and Mahabali, T.S. (1957): The Indian Drug Research Association, Poona.
11. Firoz, F.P. and Mohammad, S.I. (2019): Phyllanthus emblica Linn. (Amla). A nature gift to human: An overview. Journal of diseases and medicinal plants. 3-7
12. Gopi, K.S. (2000): "Encyclopaedia of Medicinal Plant used in Homoeopathy" Vol. I (1).
13. Joshi, P. (1947): "Monographs of Himalayan Drugs".
14. Karkala, M. and Bhushan, B. (2016): Aloe vera: A wonderful plant its history, cultivation and medicinal uses. Journal of pharmacognosy and phytochemistry, ISSN: 2278-4136 88
15. Lather, D., Mishra, S.K., Prasad, M., Gera, S. and Agrwal, V.K. (2002): Effect of Neem seed cake feeding on immunological response of broiler chicken. Journal of Immunology. 47- 50
16. Mitra, R. (1985): Bibliography on pharmacognosy of medicinal plants," NBRI, Lucknow, India.
17. Khurshid, M.D., Shukla, V., Kumar, B. and Amandeep (2020): A review paper on medicinal properties of Phyllanthus emblica. International journal of pharmacy and biological science. 102
18. Prakash, P. and Gupta, K. (2005): Theraputic uses of Ocimum sanctum Linn. (Tulsi) with a note on eugenol and its pharmacological action. A review: Indian J. physiology and pharmacology.
19. Verma, R.K., Kumari, P., Maurya, R.K., Kumar, V., Verma, R.B. and Singh, R.K. (2018): Medicinal properties of Turmeric: A review. International journal of chemical studies. 1354- 1356.
20. Rahman, S., Islam, R., Kamruzzaman, M. and Jamal, A.H.M. (2011): Ocimum sanctum: A review of phytochemical and pharmacology profile. American Journal of Drug Discovery and Development. 1(3), 5- 10

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21. Sharma, V. and Vaquil (2018): The Pharma innovation journal: A review of medicinal property of Neem.648- 650.
22. Singh, L., Sharma, A., Jindal, A., Goyal, D. and Goyal, P. (2010): Fruit extract of Emblica officinalis (Amla) protects radiation induced biochemical lesions in the brain of Swiss mice. Ann Neuroscience, 13
23. Vasavada, K., Hedge Prakash, L. and Harini, A. (): Pharmacological activities of Turmeric: A review. Journal of Homeopathy and Ayurvedic Medicine. 2-4