Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 5, Issue, 03, pp.487-489, March, 2013

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

REVIEW ARTICLE

A REVIEW PAPER ON ANTI-MICROBIAL ACTIVITY OF MEDICINAL PLANT TULSI (*Ocimum spp.*) AND PUDINA (*Mentha spp.*)

***,[1]Ankita Sharma, [1]Naresh Kumar, [1]Deep Kumar, [2]Vandna Kumari, [2]Shilpa Sarswati and [2] Kalpana Chandel**

[1]Department of Biotechnology, Abhilashi Institute of Life Sciences, Tanda, Distt. Mandi, Himachal Pradesh, India
[2]Depatment of Microbiology, Abhilashi Institute of Life Sciences, Tanda, Distt. Mandi, Himachal Pradesh, India

ARTICLE INFO

Article History:
Received 19th December, 2012
Received in revised form
08th January, 2013
Accepted 14th February, 2013
Published online 19th March, 2013

Key words:
Toxicity, Tulsi and Pudina.

ABSTRACT

Antibiotics are chemicals that are produced by living organisms inhibit the growth or kill another organism. Most are not useful medically because of undesirable toxicity or side effects. Natural products of higher plants may be a new source of antimicrobial agents possibly with novel mechanisms of action. Tulsi *(Ocimum sanctum L.)* has been well documented for its therapeutic potentials. Pudina (*Mentha arvensis* L.) is used as a carminative, anti-spasmodic, anti peptic ulcer agent, and has been given to treat indigestion, skin diseases, coughs and colds in folk medicine.

INTRODUCTION

Antibiotics are chemicals that are produced by living organisms which, even in minute amounts, inhibit the growth of or kill another organism. While thousands of them have been discovered since Sir Alexander Fleming observed the inhibitory activity of Penicillium on Staphylococcus in 1929, most are not useful medically because of undesirable toxicity or side effects. In recent years, multiple drug resistance has developed due to indiscriminate use of existing antimicrobial drugs in the treatment of infectious diseases (Service, 1995; Iwu *et al*., 1999). In addition to this, antibiotics are sometimes associated with adverse effects. Therefore, there is a need to develop alternative antimicrobial medicines for the treatment of infectious diseases from other sources such as plants (Cordell, 2000). Natural products of higher plants may be a new source of antimicrobial agents possibly with novel mechanisms of action (Barbour *et al*., 2004). To reduce the risk in modern era these chemical based antibiotics are less attempted and the uses of medicinal herbs are promoted. This interest primarily stems from the belief that medicines derived from plant are safe and dependable, compared with costly synthetic drugs that have adverse effects (Iwu *et al*., 1999; Gordon and David, 2001). Medical plants are natural resources yielding valuable herbal products which are often used in the treatment of various ailments.

In Ayurveda Tulsi (*Ocimum sanctum L.*) has been well documented for its therapeutic potentials and described as Dashemani Shwasaharni (anti asthmatic) and antikaphic drugs (Kaphaghna). Although the traditional medical practitioners in India have been widely using this medicinal plant for management of various disease conditions from ancient time, not much is known about the mode of action of Tulsi, and a rational approach to this traditional medical practice with modern system of medicine is also not available. In last few decades several studies have been done on pudina mint is very beneficialand important plant. It is widely used in food, cosmetics and medicines (Scavroni *et al*., 2005). It is chemo preventive and antimutagenic (Samarth *et al*., 2006). It is mosquito repellent (Tunon *et al*., 1994) and has antinematodal (Walker and Melin, 1996), antiviral (Herrmann and Kucera, 1967), antifungal (Janssen *et al*.,1986). WHO reported that 70% of the population of developing countries depends on natural product drugs for health care. *Mentha arvensis* L. (Lamiaceaea) is distributed throughout the western Himalayas and is cultivated throughout world for use as a vegetable. It is an erect aromatic herb that grows up to 60 cm in height with suckers; the stem is cylindrical and the leaves are simple and opposing type. *Mentha arvensis* L. is used as a carminative, anti-spasmodic, anti peptic ulcer agent, and has been given to treat indigestion, skin diseases, coughs and colds in folk medicine. Despite ever increasing advancement in the field of medicine and molecular diagnosis it is estimated that 80% of the world population is still dependant on the plant derived pharmaceuticals. WHO report depicts that plant based products or its derivatives accounts for nearly 28% of drugs available in the market (Newman *et al*., 2003). Natural products as such and their derivatives have historically been exploited as a valuable source of novel therapeutic agents (Koehn and Carter, 2005).

Corresponding author: mailankita19@gmail.com

Historical Prospective

Tulsi and Pudina has been found described in writings in many different cultures and as far back as the Greek, Egyptians, and Roman eras. References have also been found in writings from the Indian and Chinese early cultures. Ancient records show that the benefits of tulsi and pudina have been known for centuries, with its therapeutic advantages and healing properties surviving for over 4000 years (Ahmed and Beg, 2001). Scientific experiments on the antimicrobial properties of plant components were first documented in the late 19th century (Zaika, 1975). Different parts of tulsi as well as pudina have been used to cure specific ailments. There is widespread interest in drugs derived from plants (Iwu *et al*., 1999). Tulsi has been used for thousands of years in Ayurveda for its diverse healing properties. It is mentioned in the Charaka Samhita (Puri, 2002) an ancient Ayurvedic text. Tulsi is considered to be an adaptogen, balancing different processes in the body, and helpful for adapting to stress. Marked by its strong aroma and astringent taste, it is regarded in Ayurveda as a kind

of "elixir of life" and believed to promote longevity (Winston, 2007). Recent studies on tulsi proved to be a useful medication for people living with Human Immuno deficiency virus (HIV), and Acquired Immune Deficiency virus AIDs (Elujoba, 2000). Today in Japan and many asian countries pudina is commonly used as an ingredient in commercially available yogurt and food beverages. There are also many companies which produce pudina beverages and flavours. People in North India, often prepare chutney by taking its leaves.Essential oils and extracts from pudina plant species are able to control microorganisms related to skin, dental caries and food spoilage, including Gramnegative and Gram-positive bacteria (Sartoratto *et al*., 2004). Pudina was widely acclaimed as carminative, digestive, aromatic and an anti-emetic agent (that allays nausea and vomiting), pudina is valued as a stimulant, expectorant, anti-spasmodic killer of intestinal worms and a mildly analgesic herb. (Samarth *et al*., 2006). Recently it is proved that. It is mosquito repellent (Tunon *et al*., 1994) and has antinematodal (Walker and Melin, 1996), antiviral (Herrmann and Kucera, 1967), antifungal (Janssen *et al.*, 1986)

Applications

Pudina

Fresh pudina leaves, on chemical analysis, are found to have moisture, protein, carbohydrates and minerals like calcium, phosphorus, iron and a volatile oil. Different varieties of pudina contain different active substances. Menthol and peppermint which give a tingling cool sensation are its popular derivatives which are extensively used in the modern pharmaceutical industry. Pudina is famous for its use in digestive upsets like nausea, vomiting, distension and diarrhoea. Here are some of its simple and remedial uses (Wilson, 1989).

Widely acclaimed as carminative, digestive, aromatic and an anti-emetic agent (that allays nausea and vomiting), pudina is valued as a stimulant, expectorant, anti-spasmodic killer of intestinal worms and a mildly analgesic herb (Huxley, 1992).

Pudina comes very handy to cure itchy skin rashes or urticaria originated due to food allergies. Take a few leaves of pudina by mashing it with a few pieces of black pepper and a pinch of ajwain. It also immediately neutralises the incompatibility of any food article. Simply chewing a few leaves of fresh pudina helps in controlling bad odour of the mouth. “Sat pudina” or peppermint is an essential ingredient of many popular tooth powders also. Another of its kind can be made at home by finely crushing together ash of almond shell 250 gm, nagarmotha, bark of moulsiri, kattha and hararh 50 gm each and clove, ash of phitkari and dalchini each 25 gm. Just add and crush 10 gm of peppermint to this powder. To fight bad breath and conditions like spongy gums, this makes an excellent tooth powder. Equal quantities of “sat pudina” and “sat ajwain”, if put in a small glass bottle, and kept in the sun with a closed cap for an hour get liquefied. By this method a unique combination is achieved which can be used both internally and externally in a number of ailments. A few drops of it in a cup of warm water act as a good digestive and anti-spasmodic aid, whereas if applied externally it is an effective pain balm. Old timers will recall the famous “amritdhara” drops of the pre-Partition era. This is the exact formula of once very popular and effective medicine (Newman, 2003).

The antibacterial activity and chemical composition of the leaf essential oil of *mentha rotundifolia* from morocco. The antimicrobial activities were tested in vitro by in a bioassay on nine bacterial strains: *Escherichia coli, Staphylococcus aureus, Staphylococcus intermedius, Klebsiella pneumonia, Pseudomonas aeruginosa, Bacillus subtilis, Streptococcus mutans, Micrococcus luteus*, and *Proteus mirabilis* and were evaluated. (Derwich, 2010) The composition and antimicrobial properties of essential oil obtained from *Mentha longifolia* and *Mentha arvensis* growing wild in East serbia were examined by Mimica-Dukic., 1997.

Tulsi

Phytochemical analysis of fresh and dried leaf extracts of *Ocimum gratissimum* revealed and presence of antimicrobial principles such as resins, tannins, glycosides, alkaloids, flavonoids saponin, anthraquinone, cardiac glycoside, steroidal ring, steroidal terpens and carbohydrates at different concentrations (Junaid *et al*., 2006). Lokhande and Khogare, 2011 reported effect of *ocimum sanctum* against diabtese mellitus as hypoglycemic effect. Mohamed *et al*., 1999 reported the effect of *ocimum sanctum* and *Azadiracta indica* on the formulation of antidandruff herbal shampoo powder. Ayurvedic texts categorise Tulsi as stimulant, aromatic and antipyretic. While alleviating kapha and vata, it aggravates pitta. It has a wide range of action on the human body mainly as a cough alleviator, a sweat-inducer and a mitigator of indigestion and anorexia (Sen, 1993). Prakash and Gupta (2005) studied that *ocimum sanctum* can be used for the treatment of bronchitis, bronchial asthma, malaria, diarrhea, dysentery,skin diseases, arthritis, painful eye diseases, chronic fever, insect bite etc.

REFERENCES

Ahmed, I. and Beg, A. Z. 2001. Antimicrobial and phytochemical studies on 45 Indian medicinal plants against multidrug resistant human pathogens. Journal of Ethnopharmacolgy, 74: 13-123.

Barbour, E.K., Al-Sharif, M., Sagherian, V.K., Habre, A.N., Talhouk, R.S. and Talhouk, S.N. 2004. Screening of selected indigenous plants of Lebanon for antimicrobial activity. J Ethnopharmacol., 93: 1-7.

Bupesh, G. 2007. Antibacterial activity of Mentha piperita L. (peppermint) from leaf extracts – a medicinal plant. Acta agriculturae Slovenica, 89(1): 73-79.

Cordell, M. M. 2000. Plants Products as Antimicrobial and Antioxidant properties of some essential plant oils. 235-244.

Derwich, E., Benziane, Z. and Boukir, A. 2010. Chemical Composition of Leaf Essential Oil of *Juniperus phoenicea* and Evaluation of its Antibacterial Activity. International Journal of Agriculture and Biology, 12(2): 199-204.

Elujoba, A. A. 2000. Studies on the anti- diarrhea activity of *Ocimum gratissimum*, University Of Ile life press. 4: 24-45.

Gordon, M. C. and David, J.N. 2001. Natural product drug discovery in the next millennium. Pharm. Biol., 139: 8-17.

Herrmann, E.C. and Kucera, L.S. 1967. Antiviral substances in plants of the mint family (Labialtae). Peppermint (*Mentha piperita*) and other plants. Proceeding of the Society for Experimental Biology and Medicine, 124: 876-878.

Huxley, A. 1992. New RHS Dictionary of Gardening Macmillan, 67-89.

Iwu, M.W., Duncan, A.R. and Okunji, C.O. 1999. New antimicrobials of plant origin. In:

Perspectives on New Crops and New Uses. J. Janick ASHS Press, Alexandria, VA: 457-462.

Janssen, A. M., Chin, N.LScheffer,. J.J. and Svendsen, B.A. 1986. Screening for antimicrobialactivity of some essential oils by the agar overlay technique. Pharm. Weekbl. Sci., 8: 289-292.

Junaid, S. 2006. The antimicrobial properties of *Ocimum gratissimum* extracts on some selected bacterial gastrointestinal isolates. African journal of biotechnology, 5(22); 2315-2321.

Koehn, F. E. and Carter, G. T. 2005. The evolving role of natural products in drug discovery. National Review of Drug Discovery, 4(3): 206-20.

Lokhande, S. M. and Khogare, D.T. 2011. Effect of Tulasi (Ocimum Sanctum) on Diabetes mellitus. Indian Streams research Journal, 1(II); 189-191.

Mimica-Dukic, M., Kite, G., Gasic, O., Stajner, D., Pavkov, R., Jancic, R., Fellows, L., Palevitch, D., Putievsky, E. 1993. Comparative study of volatile constituents and antimicrobial activity of *Mentha* species. Acta Horticulturae; 344: 110-115.

Mohamed Halith, S., Abirami, A., Jayaprakash, S., Karthikeyini, C., Kulathuran Pillai, K., Mohamed Firthouse, P.U. 2009. Effects of Ocimum sanctum and Azadiracta indica on the formulation of Antidandruff Herbal Shampoo Powder. Der Pharmacia Lettre, 1(2): 68-76.

Newman, D. J., Cragg G.M. and Snader, K.M. 2003. Natural products as sources of new drugs over the period 1981-2002,. Journal of National production , 66(7): 1022-37.

Prakash, P. and Gupta, N. 2005. Therapeutic use of *Ocimum sanctum* Linn. (Tulsi) with a note on eugenol and its pharmacological actions: A short review. Indian J. Physiol. Pharmacol., 49(2): 125-131.

Puri, H. S. 2002. Rasayana; Ayurvedic Herbs for Longevity and Rejuvenation , CRC Press., 272-280.

Sartoratto, A., Machado, A. L. M. , Delarmelina, C., Figueira, G.M., Duarte, M.C.T. and Rehder, V.L.G. 2004. Composition and antimicrobial activity of essential oils from aromatic plantsused in Brazil. Braz. J. Microbiol., 34(4): 1517-1520.

Samarth, R. M, Panwar, M., Kumar, M. and Kumar, A. 2006. Protective effects of *Mentha piperita* Linn., on benzo[a]pyrene-induced lung carcinogenicity and mutagenicity in Swiss albino mice. Mutagenesis, 21(1): 61-66.

Sen, P. 1993. Therapeutic potential of tulsi: from experience to facts , Drugs News and Views.,1(2): 15-21.

Service, R.F. 1995. Antibiotics that resist resistance. Science, 270: 724-727.

Scavroni, J., Boaro, C.S.F., Marques, M.O.M. and Ferreira, L.C. 2005. Yield and composition of the essential oil of *Mentha piperita* L. (Lamiaceae) grown with biosolid. Brazilian Journal of Plant Physiology, 17(4): 1677-1679.

Tunon, H., Thorsell, W. and Bohlin, L. 1994. Mosquito repelling Activity of Compounds Occurringin *Achillea millefolium*. Economic Botany, 48: 111-120.

Winston D. 2007. Winston and Kuhn's Herbal Therapy and Supplements; A Scientific and Traditional Approach, Lippincott Williams and Wilkins., 260.

Walker, J. T., and Melin, J.B. 1996. *Mentha piperita, Menta spicata* and effects of their essential oils on meloidogyne in soil. Journal of Nematology, 28: 629-635.

Wilson, C. and Blamey , M. 1989. Flora of Britain and Northern Europe.

Zaika, L.L. 1975. Spices and herbs: their antimicrobial activity and its determination. Journal of Food Safety, 9:97-118.

****