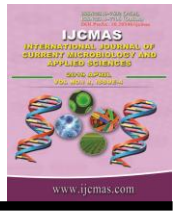
Int.J.Curr.Microbiol.App.Sci (2019) *8*(4): 682-686

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 8 Number 04 (2019)**
Journal homepage: http://www.ijcmas.com



Original Research Article https://doi.org/10.20546/ijcmas.2019.804.073

Phytochemical Screening of *Ocimum sanctum* (Tulsi), *Azadirachta indica* (Neem) and *Phyllanthus emblica* (Amla)

O.P. Verma[1]*, Singh Poonam[1] and Alexander Kamin[2]

[1]Department of Molecular and Cellular Engineering, JIBB, India
[2]Department of Biological Sciences, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj (Allahabad), India

**Corresponding author*

Keywords

APhytochemical screening,
Ocimum sanctum
Azadirachta indica
Phyllanthus emblica

Article Info

Accepted:
07 March 2019
Available Online:
10 April 2019

A B S T R A C T

Plant extracts continues the numerous searches for more effective drugs of plant origin which are less toxic and available for low socio-economic population in the treatment of diseases caused by pathogenic bacteria. The potential for developing antibacterial from higher plants appears rewarding as it will result to the development of a phytomedicine to act against microbes. Plant based antibacterials have enormous therapeutic potentials as they can serve the purpose with lesser side effects that are often associated with synthetic antibacterials. Phytochemical analysis of methanol and aqueous extracts of *O. sanctum, A. indica and P. emblica* demonstrated the presence of phytoconstituents like tannin, saponins, flavonoids, glycosides, reducing sugar, steroids and alkaloids.

Introduction

Plants are the richest resource of drugs of traditional systems of medicine, modern medicines, nutraceuticals, food supplements, folk medicines, pharmaceutical intermediates and chemical entities for synthetic drugs (Hammer *et al.,* 1999). Higher plants, as sources of medicinal compounds, have continued to play a dominant role in the maintenance of human health since ancient times (Farombi, 2003). Over 50% of all modern clinical drugs are of natural product origin (Stuffness and Douros, 1982) and natural products play on important role in drug development programmes in the pharmaceutical industry.

Tulsi extracts were active against many infectious human pathogenic bacteria that cause many dangerous diseases such as vomiting, diarrhea, urinary infections, gastroenteritis etc (Eman *et al.,* 2012). Neem (*azardirachta indica*) has been extensively used in India for the treatment of various diseases like leprosy, respiratory disorder in children, intestinal helminthiasis. It shows hypoglycemic effect (Sharma *et al.,* 2011).

Neem may help in the search for prevention or cure for AIDS which may possibly be treated by ingesting neem leaf extracts or the whole leaf or by drinking a neem tea (Bhowmick *et al.,* 2010). *P. emblica* has been used for the anti-inflammatory and anti-pyretic treatments by the rural population. *P. emblica* has been used for the treatment of several disorders such as the Scurvy, Cancer and Heart diseases. *P. emblica* L contains different class of secondary metabolites (Calixto *et al.,* 1998). In view of the above the present investigation was carried out to perform the phytochemical screening of *Ocimum sanctum* (Tulsi), *Azadirachta indica* (Neem)and *Phyllanthus emblica* (Amla).

Materials and Methods

Collection of plants

The leaves of *Ocimum sanctum, Azadirachta indica and Phyllanthus emblica* were collected from the local area and shade dried, powdered.

Preparation of extracts

Shade dried powder extracted in soxhlet apparatus successively with methanol and aqueous respectively due to their nature of polarity. After extraction, the hexane and aqueous extracts were filtered through Whatman No.1 filter paper and stored for further use.

Phytochemical screening

The leaf extracts of *Ocimum sanctum, Azadirachta indica* and *Phyllanthus emblica* were analysed for the presence of Flavonoids (Harborne, 1973), Alkaloids (Singh *et al.,* 2005), Glycosides (Singh *et al.,* 2005), Steroids (Brinda *et al.,* 1981), Phenols (Singleton *et al.,* 1999), Saponins (Singh *et al.,* 2005), and Tannins (Harborne, 1973).

Results and Discussion

Phytochemical evaluation

Phytochemical analysis of methanol and aqueous extracts of *O. sanctum, A. indica and P. emblica* demonstrated the presence of phytoconstituents like tannin, saponins, flavonoids, glycosides, reducing sugar, steroids and alkaloids. The medicinal value of the plant lies in bioactive phytochemical action on the human body. Some of the most important bioactive phytochemical constituents were alkaloids, flavonoids, tannins, saponins etc compounds reported earlier. Antibacterial properties of several plant extracts have been attributed to some of these secondary metabolites.

The phytochemical screening of methanolic and aqueous leaf extract of *O. sanctum,* revealed the presence and absence of alkaloids, steroids, and tannin compounds (Table 1).

Table 2 shows that the methanolic and aqueous leaf extract of *Azadirachta indica* which contains, alkaloids, flavonoids, tannins, and saponinns. The presence of these phytochemical components may be responsible for the observed antibacterial activity of the plant leaf extract. Flavonoid has also been reported to have greater potential benefit to human Health.

Table 3 shows that *Azadirachta indica* methanolic and aqueous leaf extract contains glycosides, flavonoids, tannins, reducing sugars, and saponins, but aqueous extract were not show the presence of flavonoids. The beneficial medicinal effects of plant materials typically result from the secondary products present in the plant although, it is usually not attributed to a single compound but a combination of the metabolites.

Table.1 Qualitative determination of phytochemical groups of methanolic and aqueous leaf extract of *O. sunctum*

Active chemical constituents in plants	Presence or absence in methanolic leaf extract	Presence or absence in aqueous leaf extract
Alkaloids	+	+
Glycosides	_	_
Steroids	+	+
Flavonoids	_	_
Tannins	+	_
Reducing sugar	_	_
Saponins	_	_

+ = presence - =absent

Table.2 Qualitative determination of Phytochemical groups of methanolic and aqueous leaf extract of P. emblica

Active chemical constituents in plants	Presence or absence in methanolic leaf extract	Presence or absence in aqueous leaf extract
Alkaloids	+	+
Glycosides	_	_
Steroids	_	_
Flavonoids	+	+
Tannins	+	_
Reducing sugar	_	_
Saponins	+	_

+ = presence - = absent

Table 2 shows that the methanolic and aqueous leaf extract of *Azadirachta indica* which contains, alkaloids, flavonoids, tannins, and saponinns. The presence of these phytochemical components may be responsible for the observed antibacterial activity of the plant leaf extract. Flavonoid has also been reported to have greater potential benefit to human Health.

Table.3 Qualitative determination of phytochemical groups of methanolic and aqueous leaf extract of *A. indica*

Active chemical constituents in plants	Presence or absence in methanolic leaf extract	Presence or absence in aqueous leaf extract
Alkaloids	_	_
Glycosides	+	+
Steroids	_	_
Flavonoids	+	_
Tannins	+	+
Reducing sugar	+	+
Saponins	+	+

+ = presence - = absent

The medicinal actions of plants are unique to a particular plant species or group, consistent with the concept that the combination of secondary products in a particular plant is taxonomically distinct (Parekh *et al.,* 2005). The screening of plants usually involves several approach; ethno botanical approach is one of the common methods that are employed in choosing the plant for pharmacological study. Plant essential oils and extracts have been used for many thousands of years, in food preservation, pharmaceuticals, alternative medicine and natural therapies. It is necessary to investigate those plants scientifically which have been used in traditional medicine to improve the quality of healthcare. Plant extracts are potential sources of novel antibacterial compounds especially against bacterial pathogens. *In vitro* studies in this work showed that the plant extracts inhibited bacterial growth but their effectiveness varied. The antibacterial activity has been attributed to the presence of some active constituents in the extracts. The phytochemical analysis of *A. indica* extract had earlier been reported (Kraus *et al.,* 1981). Phytochemical screening of the laefextract of *A. indica* in the present study also revealed presence of glycosides.

However, a glycoside appeared to be the major bioactive component that offers anti-secretory and antiulcer effects (Bandyopadhyay *et al.,* 1998, 2002). Plant glycosides, which are not normally toxic when ingested orally, are known to inhibit chloride transport in the stomach (Machen *et al.,* 1979) neem oil, also known as oil of Margosa, is believed to have medicinal properties, such as antibacterial (Singh *et al.,* 1981) antifungal (Kher *et al.,* 1977) and anti-diabetic.An important characteristic of plant extracts and their components is their hydrophobicity, which enable them to partition the lipids of the bacterial cell membrane and mitochondria, disturbing the cell structures and rendering them more permeable (Sikkema *et al.,* 1994).

References

Bandyopadhyay, U., Biswas, K., Chatterjee, R., Bandyopadhyay, D., Chattopadhyay, I., Ganguly, C.K., Chakraborty, T., Bhattacharyya, K. and Banerjee, R.K. 2002. Gastroprotective effect of neem (*Azadirachta indica*) bark extract: possible involvement of H+-K+ -ATPase inhibition and scavenging of hydroxyl radical. *Life Science.,* 71: 2845– 2865.

Bandyopadhyay, U., Chatterjee, R. and Bandyopadhyay, R.K. 1998. Process for the isolation of an active principle from *Azadirachta indica* useful for controlling gastric hyperacidity and gastric ulceration. US patent No. p. 5730986.

Bhowmick, D., Jitender, C., Yadav, K.K., Tripathi, K.P., and Kumar, S. 2010. Herbal remedies of *Azadirachta indica* and its Medicinal application, *Journal Chemical and Pharmaceutical Research.,* 2(1): 62-72.

Bokhari, M.H., and Aslam, K.M. 1985. Neem (*Melia azadirachta* A. Juss). A useful tree in Northern Nigeria. *Annals of Borno*, 5; 2: 83-86.

Brinda, P., Sasikala, B. and Purushothaman, K.K. 1981. Pharmacognostic studies on *Merugan kilzhangu*, BMEBR, 3(1) 84 – 96.

Calixto, J.B., Santos, A.R.S., Filho, V.C., and Tunes, R.A. 1998. A review of the plants of the genus *Phyllanthus*: Their chemistry, pharmacology, and therapeutic potential. *Journal Medicinal Biology Research.* 31: 225–258.

Eman, A. and Alam. 2012. Initiation of Pharmaceutical factories depending on more Application of Biotechnology on some Medicinal plants Review article (In Vitro production of some Antioxidant, Analgesic, Antibacterial, Antidiabetic Agents), *Research Journal Recent Science*, 1: 398-404.

Farambi, E.O. 2003. African Indigenous Plant with Chemotherapeutic Potential and Biotechnological approach to the Production of Bioactive prophylactic agents. *African J. Biotech*. 2:662-671.

Hammer, K.A., Carson, C.F., and Riley, T.V. 1998. Antimicrobial activity of essential oils and other plant extracts. *Journal Applied Microbiology*, 86(6): 985.

Harborne, J.B. 1977. Phytochemical Methods London Chapman and Hall, Ltd. 49-188.

Kher, A. and Chaurasia, S.C. 1977. Anti-fungal activity of essential oils of three medicinal plants. *Indian Drugs*, 15: 41–42.

Kraus, W., Cramer, R. and Sawitzki, G. 1981. Tetranotripenoids from seeds of *Azardirachta indica. Phytochemistry*, 20: 117-120.

Machen, T.E., and Forte, J.G. 1979. Gastric Secretion. In: Guibischil, G; Tasteson, D.C, Using H.H (Eds), Handbook of transport organs springer, Berlin, 693-747.

Parekh, J., Jadeja, D., and Chanda, S. 2005. Efficacy of Aqueous and Methanol Extracts of Some Medicinal Plants for Potential Antibacterial Activity. *Turkey Journal Biology*, 29: 203-210.

Sharma, M., Kishore, K., Gupta, S.K., Joshi, S. and Arya, D.S. 2001. Cardioprotective potential of *Ocimum sanctum* in isoproterenol induced myocardial infarction in rats. *Molecular Cell Biology and Biochemistry*. 225: 75-83.

Sikkema, J., De Bont, J.A.M. and Poolman, B.M. 1994. Interaction of cyclic hydrocarbons with biological membranes. *Journal of Biology and Chemistry*, 269(11): 8022–8028.

Singh, N. and Sastri, M.S. 1981. Anti-microbial activity of neem oil. *Indian Journal of Pharmacology*, 13: 102.

Singh, S., Malhotra, M. and Majumdar, D.K. 2005. Antibacterial activity of *Ocimum sanctum* L. fixed oil. Indian J. Exp. Biol., 43: 835-7.

Singleton, V.L., Orthofer, R., Lamuela Raventos, R.M. 1999. Analysis of total phenols and other oxidation substrates and antioxidants by means of Folin-Ciocalteu reagent. Method Enzymol. 299(1): 152-178.

Stiffness, M. and Douros, J. 1982. Current status of the NCL plants and animals product program. Journal Natural Product. 45:1-45.

How to cite this article:

Verma, O.P., Singh Poonam and Alexander Kamin. 2019. Phytochemical Screening of *Ocimum sanctum* (Tulsi), *Azadirachta indica* (Neem) and *Phyllanthus emblica* (Amla). *Int.J.Curr.Microbiol.App.Sci.* 8(04): 682-686. doi: https://doi.org/10.20546/ijcmas.2019.804.073