Indian J.L.Sci. 5(1): 117-120, 2015 ISSN: 2277-1743 (Print)
ISSN: 2278-7879 (Online)

SCREENING OF ANTIMICROBIAL ACTIVITY OF SOME MEDICINAL PLANTS

RACHANA CHOUDHARY[a1] AND SONIA BAJAJ[b]

[a]Department of Microbiology, Shri Shankaracharya Mahavidyalaya Junwani, Bhiali, Chhattisgarh, India
[b]Department of Zoology, Shri Shankaracharya Mahavidyalaya Junwani, Bhiali, Chhattisgarh, India

ABSTRACT

The study and use of medicinal properties of plant is called herbal medicine. Plants have the ability to synthesize a wide variety of chemical compound that are used to perform importance biological functions and to defense against attack from insect, fungi, bacteria etc. Several plants are commonly used as herbal medicine for the treatment of infectious diseases. Eight plants *Emblica officinalis, Aegle marmelous, Ocimum sanctum, Mentha pipertia, Lawsennia iermis Aloe Verra,Vincea rosea/ Catharanthus roseus* and *Azardirchata indica* commonly used by the people were screened for potential antibacterial activity. Antibacterial activity of aqueous extracts of the plants parts were used for screening. Antibacterial activity was tested against *E.coli* bacteria. The susceptibility of the microorganism to the extracts of these plants was compared with each other. The result showed that, aqueous extracts of *Emblica officinalis, Ocimum sanctum* and *Azardirchata indica* plants exhibited activity against the tested organism.

KEYWORDS: Medicinal Plant, Antimicrobial Activity, *E. coli*

Herbal medicine is widely used in traditional healthcare system such as Ayurvedic, Unani, Hekimi and other form of folk treatments (Ghani, 2006). Almost 80% of rural population is dependent on medicinal plants for their primary health care. Now medicinal plants are gaining more importance in pharmaceutical industries for the preparation of new phytomedicines (Sule *et al.,* 2010). Antimicrobial screening is the first stage of antimicrobial drug research to ascertain the susceptibility of pathogenic microorganisms to any plant agent.

Nowadays, multiple drug resistance has developed due to the indiscriminate use of commercial drugs commonly used in the treatment of infectious disease (Service RF, 1995). In addition to this problem, antibiotics are sometimes associated with adverse effects on the host, including hypersensitivity, immune suppression and allergic reactions (Ahmad *et al.,* 1998), there is a constant need for new and effective therapeutic agents (Bhavnani and Ballow, 2000). Therefore, there is a need to develop alternative antimicrobial drugs for the treatment of Infectious diseases from medicinal plants (Cordell, 2000).

In less developed states of India and particularly in Chhattisgarh, low income people such as rural farmers, people of small isolate villages and native communities use herbal medicine for the treatment of common infections. It is necessary to evaluate, in a scientific base, the potential use of herbal medicine for the treatment of infectious diseases produced by common pathogens. In the present study we have chosen some plants used in herbal medicine to determine their antibacterial property (Kirbag *et al.,*2009). This study looks into the in vitro antimicrobial activity of these plants against gram negative *(E.coli*) microorganism (Ojala *et al.,* 2000).

MATERIALS AND METHODS

Selection of medicinal plants for this study

In the present work a few selected medicinal plants were screened for potential antibacterial activity. These are as follows:

[1]Corresponding author

S No.	Common Name	Botanical Name	Name of Family	Medicinal Us	Parts Used
1	Amla	*Emblica officinalis*	Euphorbiaceac	Cough, Diabetes, cold, Laxativ, hyper acidity.	Leaves
2	Bael	*Aegle marmelous*	Rutaccac	Diarrhoea, Dysentery, Constipation.	Leaves
3	Tulsi	*Ocimum sanctum*	Lamiaccac	Cough, Cold, bronchitis, expectorand.	Leaves
4	Mint	*Mentha pipertia*	Lamiaccac	Digestive, Pain killer.	Leaves
5	Henna	*Lawsennia iermis*	Lytharaceae	Burning, Steam, Anti Imflamatary.	Leaves
6	Gritkumari	*Aloe Verra*	Liliaceae	Laxative, Wound healing, Skin burns & care, Ulcer.	Leaves
7	Sada Bahar	*Vincea rosea/ Catharanthus roseus*	Apocyanace	Leaukamia, Hypotensiv, Antispasmodic , Atidot.	Leaves
8	Neem	Azardirchata indica	Mahaceae	Sdedative, analgesic, epilepsy, hypertensive	Leaves

Sterilization of Plant material

Fresh plants leaves were collected from garden of Shri Shankaracharya Mahavidyalaya Bhilai These explants (leaves) were washed with distilled water and sterilized by 0.1% solution of mercuric chloride for 1 minutes. After sterilization the explants (leaves) were thoroughly washed with distilled water.

Preparation of extracts

The collected materials were grinded to fine power with the help of pistal-moltel. Then these powered materials were used for the preparation aqueous (1gm/ml) extracts. The final concentration of the each extracts was20 mg/ml.

Microorganisms used

The gram negative (*E. coli*) bacterial sample was sub-cultured in nutrient broth and nutrient agar for use in experiment.

In vitro Antibacterial Study

The bacteria (*E.coli)* used for the antibacterial assay were sub-cultured.

Preparation of medium and sub-culture

To prepare required volume of this medium, calculated amount of each of the constituents (DIFCO, India; Bactopeptone-0.5 g, Bacto beef extract -0.3g, Nacl-0.5 g, Bacto agar-2.0 g, Distilled water-100ml of the medium was then transferred to prepare plates and slants. In an aseptic condition under laminar air cabinet, the test organisms were transferred from the pure cultures to the agar slants with the help of a transfer loop to have fresh pure cultures. The inoculated strains were then incubated for 24 hours at 37 °C for their optimum.

Preparation of the test plates

The test organisms were transferred from the subculture to the test tubes containing about 10ml of melted and sterilized agar medium with the help of a sterilized transfer loop in an aseptic area. The test tubes were shaken by rotation to get a uniform suspension of the organisms. The bacterial and fungal suspension was immediately transferred to the sterilized petri-dishes. The petri- dishes were rotated several times clockwise and anticlockwise to assure homogenous distribution of the test organisms in the media.

In vitro Antibacterial Study

The modified agar-well diffusion method (Cappuccinno and Sherman, 1999) & disc diffusion method (Killedar and More, 2011, 2012), were employed to study the antibacterial activity of the plant extract. In these method well were poured with the test extracts & discs were placed gently on the agar plate preinoculated with test bacteria (Ahmad *et al.,* 1998). The plates were incubated overnight at 37 °C. Antibacterial activity was determined measuring

the inhibition zones formed around the well (Viswanathan *et al.,* 2005, Farnsworth *et al.,*1966).

RESULTS AND DISCUSSION

The aqueous extract of *Aegle marmelou Mentha pipertia, Lawsennia iermis, Aloe Verra and, Vincea rosea/ Catharanthus roseus* were not found to be active against tested organism(*E.coli*). The aqueous extracts of *Emblica officinalis, Ocimum sanctum and Azardirchata indica* were subjected to a preliminary screening for antimicrobial activity against standard gram negative (*Escherichia coli*) bacteria (fig:1). It many studies it is noted that methanol extract of selected medicinal plants exhibited high activity against the tested organism rather than aqueous extract of those plants. Methanolic extracts of plants generally posses terpines and phenolics which are reported different workers as antimicrobial compounds (Kisangau *et al.,* 2007, Sanches *et al.,* 2005).

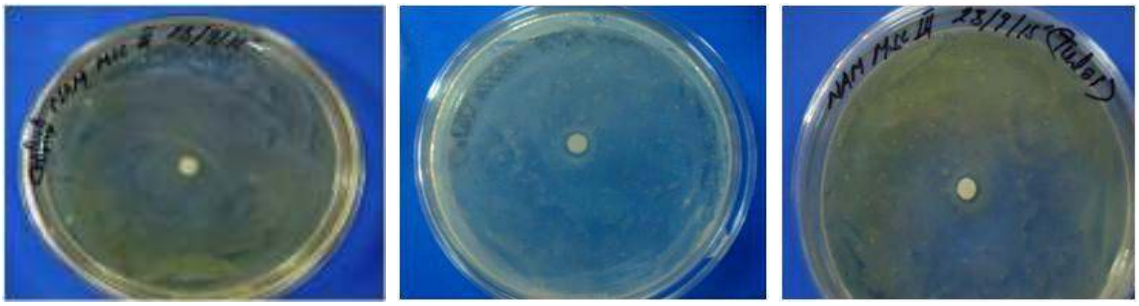

Figure 1 Antibacterial activity of *Emblica officinalis, Ocimum sanctum and Azardirchata indica in aqueous* extracts against gram

REFERENCES

Ahmad I, Mehmood Z and Mohammad F, 1998. Screening of some Indian medicinal plants for their antimicrobial properties. J Ethnopharmacol, 62: 183-193.

Bhavnani SM and Ballow CH, 2000. New agents for Gram-positive bacteria. Curr Opin Microbial, 3: 528-534.

Cappuccinno and Sherman, 1999. Miccro-A laboratory manual. Addison Wesley Longman Inc, 254-256.

Cordell GA, 2000. Biodiversity and drugdiscovery a symbiotic relationship. Phytochemistry 55: 463-480.

Farnsworth N R, 1966. Biological and phytochemical screening of plants, J Pharm. Sci.55 (3): 225-276.

Ghani A, 2006. Medicinal Plants of Bangladesh. Asiatic Soc. Bangladesh, Dhaka, (2nd Edn), pp. 603.

Killedar SG, More HN, 2011. Screening of antimicrobial potential and phytoconsituents for different extractsof Memecylon umbellatum Burm inflorescences. Asian J Pharm Res 1(4): 114-118.

Killedar SG, More HN, 2012. Antimicrobial potential and phytochemical screening of different bark extracts of Memecylon umbellatum Burm. Int J Appl Microbiol Sci 3(2): 50-58.

Kirbag S Zengin F, 2009. Antimicrobial activities of extracts of some plants.Pakistan Journal of Botany. 41(4), p. 2067-2070.

Kisangau D P, Hosea KM, Joseph CC and Lyaruu HVM, 2007. In-vitro antimicrobial assay of plants used in traditional medicine, AfricanJournal of Traditional, Complementary and Alternative Medicines, 4. (4): 510 – 523.

Ojala T, Remes S, 2000. Antimicrobial activity of some coumarin containing herbal plants growing in Finland. J Ethnopharmacol, Vol.-73, (1–2) 299–305.

Sanches NR, Cortez DAG, Schiavini MS, Nakamura CV, Dias Filho BP, 2005. An Evaluation Antibacterial Activities of Psidium guajava (L.).Braz. Arch Biol Tech An Int Jr, 48(3): 429- 436.

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

Sule A, Ahmed QU, Samah OA, Omar MN, 2010. Screening for antibacterial activity of Andrographis paniculatau Used in Malaysian folkloric medicine: A possible alternative for the treatment of skin infections. Ethn Leaflets 14: 445-456.

Viswanathan M B, Ramesh N, Ahilan A and Perumalsamy PL, 2005.Phytochemical constituents and Anti microbial activity from the stems of Jatropha maheshwarii. Medicinal Chemistry Research.13 :(6-7).