



A Review on Antibacterial Properties of Natural Plants

Mr. Shopnil Akash

Department of Pharmacy, Daffodil International University, Dhaka, Bangladesh

E-mail: shopnil29-059@diu.edu.bd

Abstract

Natural plant products have been used against various disease from generation to generation for various purposes. In the last two decades scientist of all over the world focus on medicinal plant and trying to produce drug from nature. So, scientists of all over the world have aimed to identify and use the plant derivative drug for treatment of various disease, Mostly, they are trying to find out the plant which contains antibacterial properties. Because, over the last decades, the antibiotic resistance is increasing gradually. A report was shown by world health organization that 700,000 people die each year due to drug-resistant diseases. But, the main concern of scientists is that no new antibiotic is not come and if it is continuing, the world may face another pandemic like covid-19. This review article will be shown aims to compile medicinal values (antibacterial) of some plant generated through the research activity using modern scientific approaches and innovative scientific tools. Although progress in development of antibacterial agents, there are still special needs to find new antibacterial agents due to development of multidrug resistant bacteria

So, this article will be beneficial for them who are trying to discover new antibiotics from nature

Keywords: Bacteria, Anti-microbial activity, Natural plants, MIC, Disc diffusion method

Introduction

There are many kinds of plants in our environment. In daily life we use these plants and their products in many ways. We depend on huge vegetation to meet all the needs of life including traditional medicine, food, clothing, shelter etc.

Until the discovery of the bactericidal penicillin in 1928, almost a century ago, people around the world used natural ingredients or nature's antibiotics to protect themselves from the bacterial infections. Even Islamic scholars and physicians have mentioned about these natural antibiotics in various ways.

The use of herbal or natural ingredients in medicine is not today. Many natural ingredients have been used as a medicine since ancient times. We all know that malaria medicine is made from quinine bark.

Painkiller morphine is made from opium. Digitalis which is used to treat various heart disease is also comes from a kind of plant. But there are some differences between medicines and such herbal or natural products. A drug, regardless of its source, is approved only after passing various stages of scientific testing. There are specific dosages, side effects labels and instructions on how to use it in any disease. No one has the to take that medicine without a doctor's prescription.

According to the World Health Organization, 75 percent of the world's people use a variety of herbal or natural remedies to treat the disease. Not only that, but these alternative or herbal products are also popular in the western world as 'over the counter medicine'. Twenty-five percent of people in the United States regularly use them for various physical problems.[1]

Important of different Natural plants

From time immemorial, various types of medicinal plants have been playing an effective role in curing diseases. The importance of medicinal plants in the development of modern medicine is immense. Natural plants are very popular in all over the world. This is because the medical system of natural plants is readily available, healthy and has no side effects. Due to this, Ayurvedic and Unani medical system with medicinal properties has also gained a lot of popularity in our country.

Although the heyday of modern medicine has reached its peak, people are once again realizing the need for medical treatment with the help of those ancient natural plants. Many countries around the world have started extensive research to improve herbal medicine. The potential for pharmaceutical industry and economic development through extensive cultivation and care of medicinal plants is very bright.

Materials and Method

We have selected Eight species of plants (Table 1), which have been widely used as a traditional medicine in the different areas of the world for the treatment of various diseases. And then we searched through the Google Scholar, PubMed, ResearchGate and some other online Journal using relevant keywords with local names, used parts and the detection techniques to identify the antibacterial properties of that Plants. We found the reported specific bacteria against which these plants possess effective anti-bacterial features.

Results

Several articles and many online resources were included in this systematic review. Antimicrobial susceptibility testing was performed by disk diffusion method in 50% of studies, while the minimum inhibitory concentration was performed 37.5% studies and other studies was performed Zone of inhibition 12.5%.

Discussion

Garlic adds unique flavor to cooking. Due to the powerful aroma, vegetables, meat, raw, curry cooked garlic cannot be thought of. Garlic has been used in cooking in the subcontinent for a long time. And its recognition in the outside world is not less. Many scientists call garlic

‘Power House of Medicine and Flavor’. Because eating raw or boiled garlic part keeps the body healthy. And regular consumption can get rid of many diseases.

Chasteberry is a type of small deciduous tree or plant. Scientific name: *Vitex negundo*. This tree can grow up to five meters in height. The flowers of Nishinda tree are bluish purple in color. This tree grows in all countries of the world. The leaves, stems, flowers and fruits of Nishinda tree are all used for various purposes.

The leaves of Nishinda tree are soaked in hot water and used as medicine for chronic pain, arthritis, headaches and various ailments.

Chasteberry is also used to treat asthma, skin diseases and colds. Chasteberry leaves can be warmed and any swelling, sprains or any pain in the body can be left on the wound and tied with a cloth and used 4/5 times a day.

If a tumor appears anywhere in the body, apply it daily by heating Nishinda leaves in a beet and the tumor will get better in a few days. Chasteberry leaves have special parasite-killing and anti-tuberculosis and anti-cancer properties.

Ginger (Scientific name: *Zingiber officinale*.) Is a plant of the Zingiberaceae family? Ginger is cultivated mostly Bangladesh, India, Pakistan. Ginger has many medicinal uses such as stomach problems, heart diseases, coughs, headaches.

Turmeric contains a substance called curcumin, which alone can cure more than a hundred diseases. For more than a thousand years, turmeric has been used in Asia not only as a spice but also as a medicine. Curcumin, an antioxidant that is five to eight times more effective than vitamin E or vitamin C, boosts the body's immune system and regulates cholesterol levels. Ayurvedic doctors claim that the beneficial properties of curcumin are useful in the prevention of arthritis, asthma, heart disease, even cancer and effective against bacterial infections. It is said to eat turmeric for liver disease because it contains curcumin. From 5 drops of raw turmeric juice mixed with sugar or honey up to one teaspoon in proportion to age, it is beneficial for liver problems. Raw turmeric juice mixed with a little salt in the morning on an empty stomach cures worm.

Table 1: Result

Scientific Name	Plant Family	Local Name	Part Used	Type of assay	Used bacteria	Active Compounds	Reference
<i>Allium sativum</i>	Amaryllidaceae	Garlic	Stem	Minimum inhibitory concentration (MIC)	<i>Staphylococcus aureus</i> bacteria	allicin, alliin, diallyl sulfide, diallyl disulfide, diallyl trisulfide, ajoene, and S-allyl-cysteine.	1,2&3
<i>Vitex Negundo</i>	Verbenaceae	Chasteberry	Leaves	Disc diffusion method	<i>Staphylococcus aureus</i> , <i>Bacillus subtilis</i> and Gram(-) <i>Escherichia coli</i> , <i>Pseudomonas aeruginosa</i>	casticin, isoorientin, chrysophenol D, luteolin, p-hydroxybenzoic acid and D-fructose.	4,5 and 6
<i>Zingiber officinale</i>	Zingiberaceae	Ginger	Stem	disk and well agar diffusion	<i>E coli</i> , <i>Salmonella typhi</i> and <i>Bacillus subtilis</i>	carbohydrates (50–70%), lipids (3–8%), terpenes, and phenolic compounds. Terpenes include zingiberene, -bisabolene, -farnesene, -sesquifelenolene, and -curcumene	7 & 8
<i>Curcuma longa</i>	Zingiberaceae	turmeric	Stem	disc diffusion method	<i>Staphylococcus aureus</i>	curcuminoids. Polyphenol	9 ,10
<i>Echinacea purpurea</i>	Daisy family	Echinacea	Roots and stems/leaves	cross-streak method	<i>Pseudomonas</i> and <i>Staphylococcus</i>	caffeic acid derivatives(phenolic compounds), aklomides and polysaccharides.	11
<i>Trifolium</i>	Fabaceae	Clove	Roots	minimum inhibitory concentration (MIC)	<i>Staphylococcus aureus</i>	flavonoids, saponins, clovamides and phenolic acids.	12,13

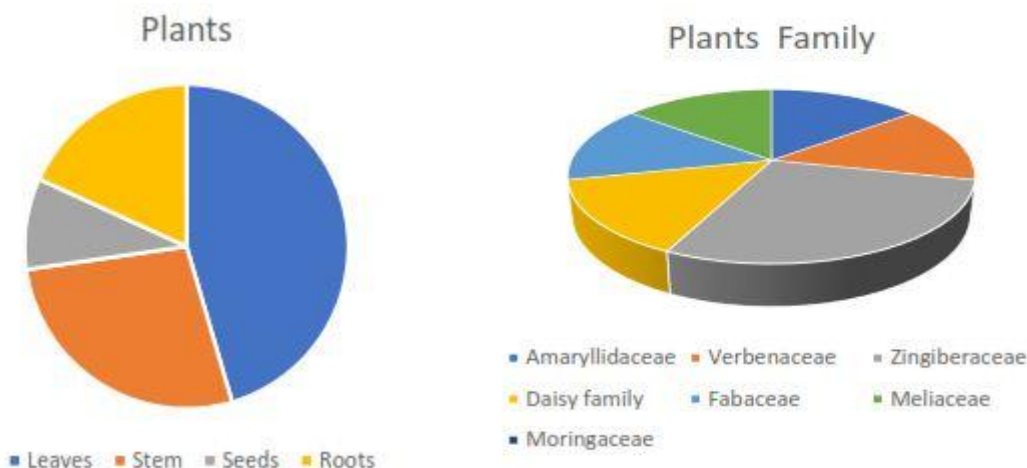


Figure 2: The Natural plants which parts are mostly uses as traditionally and their family (8 plants)

Echinacea is a flowering plant in the daisy family. This plant is widely used against various disease such as coughs and colds bronchitis upper respiratory infections, influenza, canker sores, yeast infections, ear infections, vaginitis, some inflammatory conditions HIV. AIDS

Clove is a familiar spice. However, it has many medicinal properties. Clove has been used as an effective remedy for digestive and respiratory problems for hundreds of years. It contains adequate amounts of vitamins A, C, K and B complex.

It also contains minerals like manganese, iron, selenium, potassium and magnesium which are extremely beneficial for the human body. Clove has strong anti-inflammatory, anti-viral, anti-inflammatory and anti-depressant properties which help in curing many ailments.

Clove is especially beneficial for the digestive tract and plays an effective role in relieving indigestion, flatulence, constipation, flatulence and nausea. Works excellent for relieving muscle cramps, headaches and nerves. Keeps gums, teeth, kidneys, liver etc.

Neem is one of our special beneficial friend trees. The popularity of neem has been going on since time immemorial. Neem leaves to bark, roots to flowers, fruits to seeds are all essential. The beneficial of neem is incomparable.

Neem is an unprecedented medicinal plant. Never before have so many beneficial plants for animals and plants been discovered Considering this quality of neem, the World Health Organization has declared

neem as a 'tree of the 21st century'. Many diseases are cured with this tree. Blood cleansers, disinfectants, dermatitis, bronchitis, worms. Inflammation of the body, allergies and Stops bleeding of teeth and strengthens gums. Moreover, jaundice sedative. At least 50 diseases can be cured with neem.

Moringa oleifera tree has thousands of medicinal properties, this plant can increase hormones in the human body, as well as increase breast milk in mothers, drinking *Moringa oleifera* leaf juice increases physical strength and increases appetite. *Moringa oleifera* contains vitamins A, B, C, nicotinic acid, amino acids, proteins and fats, carbohydrates, etc. Indians make soup and drink it with so many useful *Moringa oleifera* leaves. *Moringa oleifera* can also prevent smallpox. Effective in cold, cough, liver function, worm prevention. Relieves pain in the body, improves digestion, improves circulatory system, reduces high blood pressure, relieves anemia, controls diabetes, cures asthma and also relieves arthritis.

Conclusion

The purpose of this studies to increase the awareness about the use of Natural antibiotic which will reduce the rate of antibiotic resistance. Besides, above this article is about eight natural plants are reported which is very useful and effective against bacterial infection. This review article will be of great benefit to those who are working to discover new anti-bacterial medicines from nature. They can collect the reported plants for identification of the active compounds which will facilitate further research.

References

1. Si-Yuan Pan, G. L. (2014). Historical Perspective of Traditional Indigenous Medical Practices: The Current Renaissance and Conservation of Herbal Resources. *Hindawi*.
2. Gebremedhin Romha, B. A. (2018). Antibacterial Activities of Five Medicinal Plants in Ethiopia against Some Human and Animal Pathogens. *Hindawi*.
3. M. Shokrzadeh and A.G. Ebadi (2006). Antibacterial Effect of Garlic (*Allium sativum* L.) on *Staphylococcus aureus*. *Pakistan Journal of Biological Sciences*.
4. Ao Shang, S.-Y. C.-Y.-Y. (2019). Bioactive Compounds and Biological Functions of Garlic (*Allium sativum* L.). *Multidisciplinary Digital Publishing Institute*.
5. Richa Roshni, M. B. (2019). *Vitex negundo*: An Important Traditional Medicinal Herb with Multiple Curative Properties. *International Journal of Pharmaceutical Sciences Review and Research*.
6. S. L. Khokra, O. P. (2008). Essential Oil Composition and Antibacterial Studies of *Vitex negundo* Linn. Extracts. *Indian Journal of Pharmaceutical science*.
7. Wikipedia. (n.d.). *Vitex negundo*. Wikipedia, the free encyclopedia.
8. Amanda Mara Teles, B. A. (2019). *Ginger (Zingiber officinale) Antimicrobial Potential*. London: Intech Open.
9. Azu N, Onyeagba R. Antimicrobial Properties Of Extracts Of *Allium cepa* (Onions) and *Zingiber officinale* (Ginger) On *Escherichia coli*, *Salmonella typhi* and *Bacillus subtilis*. *The Internet Journal of Tropical Medicine*. 2007; 3:1–10. [Google Scholar]
10. Ankur Gupta, S. M. (2015). Evaluation of antimicrobial activity of *Curcuma longa* rhizome extract against *Staphylococcus aureus*. *Elsevier*.
11. Carolina Chiellini, I. M. (2016). Preliminary data on antibacterial activity of *Echinacea purpurea*-associated bacterial communities against *Burkholderia cepacia* complex strains, opportunistic pathogens of Cystic Fibrosis patients. *Elsevier*.
12. Abdul Viqar Khan, Q. U. (2012). Antibacterial activity of leaves extracts of *Trifolium alexandrinum* Linn. against pathogenic bacteria causing tropical diseases. *Elsevier*.
13. Léonel Feugap, I. K.-D.-D. (n.d.). Antimicrobial and Antioxidant Activities of Extracts and Compounds From *Trifolium Baccarinii* With Their Mechanisms of Antibacterial Action. *Research square*.
14. Rupaly Akhter, M. W. (2019). Antimicrobial activity in leaf extract of Neem in broiler. *Bangladesh Journals Online*.
15. Jayakumar Jerobin, P. M. (2015). Antibacterial activity of neem nanoemulsion and its toxicity assessment on human lymphocytes in vitro. *International journal of Nanomedicine*.
16. Ehab Ali Fouad, A. S. (2019). Antibacterial activity of *Moringa oleifera* extracts against some pyogenic bacteria.,. *PubMed*.
17. Nur Zahirah Abd Rani, K. H. (2018). *Moringa* Genus: A Review of Phytochemistry and Pharmacology. *frontiers*.

Access this Article in Online	
	Website: www.ijarbs.com
	Subject: Medicinal Plants
Quick Response Code	
DOI: 10.22192/ijarbs.2021.08.02.002	

How to cite this article:

Shopnil Akash. (2021). A Review on Antibacterial Properties of Natural Plants. *Int. J. Adv. Res. Biol. Sci.* 8(2): 10–14.

DOI: <http://dx.doi.org/10.22192/ijarbs.2021.08.02.002>