Journal of Advances and Scholarly Researches in Allied Education
Vol. 17, Issue No. 2, October-2020, ISSN 2230-7540

Ethnobotanical Studies of Some Selected Medicinal Plant

Swarn Tiwari[1]*, Dr. Sachin Singh[2]

[1] Research scholar, Shri Krishna University, Chhatarpur M.P.

[2] Professor, Shri Krishna University, Chhatarpur M.P.

Abstract - In the past, humans had to rely more on natural resources. They relied so heavily on plants for food and medicine that they tapped into the commercial and medicinal possibilities of many different kinds of plants. The earliest references to the use of plants for medicinal reasons in Hindu culture may be found in the "Rig Veda," often regarded as the oldest reservoir of human knowledge. Many studies on India's unique flora have been published by ethnobotanists from different parts of the nation. However, this is why Chhatarpur is so understudied. Therefore, the present study has included many field surveys in various locations throughout the state of Chhatarpur, 2020–2021, to examine and record ethnobotanical data.

Keywords - Ethnobotanists, Natural resources, Medicinal plants.

----------X----------

INRODUCTION

Ethnobotany is a branch of interdisciplinary study that examines the dynamic relationship between humans and their flora and fauna. In 1895, J.W. Harshberger coined the word "Ethnobotany" to describe the study of native plants and their uses. Humans have long relied on plants for a wide variety of cultural and practical purposes, including but not limited to the provision of food, clothing, and shelter as well as for religious ceremonies, decorative purposes, and medical purposes. Traditional tribal and Western ethnobotany has traditionally focused on the ways in which plants and humans interact. As an alternative to conventional medicine, the use of plants in folk medicine or traditional techniques is commonplace in all modern cultures. Herbal remedies derived from plants have been utilized by humans for thousands of years to remedy a wide range of medical conditions. [1]

The ancient Indian holy Grantha, the "Rigveda," makes brief mention of some of the plants found in nature that might be utilized to treat various ailments. Chrak-Sanhita and Susruta-Sanhita, two foundational texts of Indian traditional clinical practice "Ayurveda," describe about 700 different medicinal herbs. The ancients had knowledge of medicinal herbs. In reality, the history of the narcotic plants is inextricably intertwined with that of these ancient cultures. The Assyrians, the Babylonians, and the Egyptians all understood a lot about narcotic plants by approximately 1600 B.C., and the Chinese have claimed that they started using drugs and plants about the year 5000 or 4000. Many modern medications are mentioned in the writings of ancient Greeks including Aristotle (384-322B.C.), Hippocrates, and Theophratus (370-287B.C.). The Roman physician Dioscorides wrote "De Government Medica" in 77 B.C.E., detailing the properties of 500 different medicinal plants. For the following 1600 years, his book dominated the field of literature on medicinal herbs. When printing was introduced to Europe in the 15th century, various authors began publishing works called "Herbals." These works often combined factual knowledge with fiction.[2-3]

When compared to earlier studies on beneficial plants, present ethnobotanical studies often include information about cultural groupings, active ingredients, or other uses of the plants being studied. Research into the ethnobotany of modern medicine should focus on four main areas: I traditional healing practices, (ii) the ecological relations and status of medicinal plants in the Greater Society, and (iii) ritual, formal, and other uses of medicinal plants. (iv) traditional healer, Shaman's Garden, and other ritual specialist, which uses therapeutic plants in rituals. There is also evidence from current medical ethnobotanical research that they are beneficial in the treatment of sickness and have healing benefits on the human body.[4]

Nature, put humans together, and bestows them with an abundance of preferences. Strangely, the rate of growth of health problems such diseases,

disorders, complications, disputes, and illnesses has been rather modest. It is impossible for God to have sanctioned the existence of an illness that is not curable. It rescued him and bestowed upon him the ground's abundance of medicinal plants. The desire of man led to the discovery of the natural remedy. Herbal medicine is in high demand because of its secure place in both fundamental and/or everyday health care in both developing and developed nations. Traditional medicines play an important role in the lives of the vast majority of Indians, who either have access to them or use them regularly for preventative care and medical care. [5-6]

When it comes to preventing and treating mental, physical, or social inequality, traditional medicine is a synthesis of all applicable knowledge and techniques. Practical reality and observation passed down from one generation to the next are the only sources of information. Herbs fall under this category, and they may be used either alone or in combination with other treatments. The absence of standardization, identification, and pharmacopeial standards presents the greatest obstacles for these preparations. Because of this, it makes sense to have uniform standards for herbal medicines utilized throughout healthcare systems. In addition, medicines are often made from unrefined, naturally occurring ingredients that might be altered in their composition or contaminated throughout the preparation process. Therefore, there is an immediate need for the testing and analysis of herbal medical items utilizing cutting-edge methods.[7]

Respected Traditional Medicine

Traditional medicine, also known as ethnomedicine, is being studied by both medical experts and anthropologists in places like Africa, Russia, and several European regions. Many efforts have been made in post-revolutionary Russia to do practical research on herbal and natural medicines. If a Russian home remedy is shown to be effective against a certain condition, it receives widespread publicity and praise there. There is no such movement in any other country. When caring for its people, the Chinese government combined traditional and modern medicine. Having less access to healthcare as a result of living in poverty has a major impact on the health of people in developing nations. Due to budgetary constraints, the current healthcare system is unjust, and the vast majority of people lack access to competent medical treatment.[8-9]

Propositions Made By Conventional Medicine

The medicinal claims and recommendations of traditional Indian and African healers for conditions including herpes zoster (for which conventional medicine offers no treatment), hypertension, psoriasis, rheumatism, and bronchial asthma have been subjected to rigorous laboratory testing. Domestic remedy development for common ailments is active in several regions of India. The World Health Organization's (WHO) efforts to preserve the world's supply of useful medicinal plants have been accepted for primary health care as a technique used by people everywhere, but especially in poor countries. [10-11]

Historical Plant Products Of Significance

Clinical and pharmacological research are used to support the use of most existing medical medicines based on traditional treatments. For example, aspirin (accetylsalicyclic acid) is an anti-inflammatory substance derived from salicin extracted from the bark of the Willow tree. The extraction of the alkaloids (morphine) from the Papaver somniferum L. plant, a commercially useful medicine, was studied in 1803. Codeine, a painkiller, was developed in 1970 by boiling morphine with acetic anhydride to get heroin, which is then readily transformed into codeine. Arabs investigated opium addiction, whereas the Sumerians and Greeks described the poppy as a medical substance. Digitalis purpurea L. has an active element called digitoxin that improves the efficiency of the heart's electrical conduction system and, in turn, strengthens the heart's ability to contract. However, different medical medicines with similar effects to digitoxin are used to treat cardiac problems now that researchers have discovered its long-term side effects. [12-13]

Historically, quinone, which is extracted from the Cinchona pubescens tree, has been used to cure malaria. Also, for over a century, Pilocarpus jaborandi's L-histide alkaloids have been utilized to treat open-angle and acute angle-closure glaucoma. In 1994, the Food and Drug Administration authorized an oral version of pilocarpine for the treatment of dry mouth (xerostomia), a side effect of radiation therapy for head and neck cancer. Oral preparations were first approved for use in 1998 for the treatment of Sjogren's syndrome. Salivary and tear glands might be affected by this autoimmune disease. [14-15]

MATERIAL AND METHODS

This research included doing many field surveys in several different parts of Chhatarpur, India, at varying times over the years 2018 and 2019. The plants were chosen for their potential uses in traditional medicine. The ethnobotanical and ethnoveterinary data gathered through several conversations with local herbalists, traditional healers, Hakims, Vaidhyas, elderly rural residents, and other experts in the field. For the purpose of identifying medicinal plants, we asked the resource individuals to come along on our field trips.

Evaluating antibacterial efficacy using agar well

diffusion:

The agar well diffusion assay (AWDA) was used to evaluate the antibacterial activity of crude solvent extracts (methanol, ethanol, and water) of different plant materials against gram-positive or gram-negative bacteria (Parekh and Chanda, 2007; Kumar and Gitka, 2014). To do this, a well (6mm in diameter) was drilled using a borer into a chilled plate of nutritional agar, which was then covered with soft agar (5ml) and inoculated with the desired strain (106 cfum-1). Overnight at 37 degrees Celsius, 100-milliliter dilutions of the test samples were placed on well-and plates.

DeterminationofMIC

Briefly, the MIC was calculated by adding one milliliter of a reconstituted extract sample at a concentration of 200 milligrams per milliliter to one milliliter of sterile broth in a separate test tube. Each successive test tube received 1 ml of this dilution until the seventh test tube was filled. As a negative-control, eight tubes were prepared without any extract sample.

DeterminatiionOfMBC

After taking 100 l of bacterial suspension from the MIC positive tube, as well as one from each of the tubes above and below the MIC, plating the bacteria on nutrient agar, and incubating the plates at 37 °C for 18 hours, the MBC values were determined. After incubation, the plates were checked for colony development, and MBCs were recorded.

RESULTS

MedicinalPlantsUsedToCureTheHumanDiseases

Collection of medicinal plants belonging from different families wasmade on the basis of their medicinal importance revealed by the various localrespondents. Description of medicinal plants along with their botanical names,local names, hindi names, family, habit, habitat, distribution, description, materialof interest (part used) and therapeutic application (medicinal uses) have beendescribedbelow:

Botanicalname: Tabernaemontana divaricata(L.)R.Br.ExRoem. &Schult.

Localname: Chandani

Hindiname: Chandani

Family: Apocynaceae

Habit: Shrub

Habitat: Moistsoil.

Description: Popular among gardeners, this huge shrub reaches a height and width of 1.5 to 1.8 meters and has a grayish green, branching, dichotomous trunk. The leaves are simple and opposite, ranging in size from 5 to 12 centimeters in length and width, and in shape from oblong to elongated oval. Plant blooms in spring, however blooms appear irregularly throughout the year. White flowers with a greenish white corolla tube and snowy white lobes bloom in terminal and axillary cymes and measure 3–5 cm wide. Single blooms have no scent, while the double variety has a pleasant fragrance.

Materialofinterest: Rootbark

Therapeutic application: Urinary discharges, venereal sores, and rheumatic aches may all be treated with the root bark**.**

Botanical name: Thevetia peruviana (Pers.) K. Schum.

Localname: PiliKaner

Hindiname: PiliKanar

Family: Apocynaceae

Habit: Shrub

Habitat: Dryareas.

Description: The plant is a 4.5-6 m high evergreen glabrous shrub. Milky and very toxic juice. Spirally oriented leaves that are between 7.5 and 12.5 by 1.6 and 2 centimeters in size; little petiole. The flower is five centimeters in diameter and is a sunny yellow. The terminal cymes of an inflorescence. The calyx is six millimeters in length and is divided about halfway along its length. The length of the corolla is more than 5 cm and it is tubular all the way to the bottom. The five stamens of a flower all sit in a row at the base of the corolla's neck, with the stigma resting atop their anthers. The ovary is superior, with two independent carpels joined at the styles, a large stigma, and four ovules. Fruit is oblong in cross-section and has four or fewer seeds due to a suppressive mechanism.

Materialofinterest: Barkofrootandstem.

Therapeutic application: Paste of the bark of root and stem is administered to heal the skin boils and ringworms.

MedicinalPlantsUsed ToCureTheLivestocksDiseases

Collection of medicinal plants belonging from different families wasmade on the basis of their medicinal importance revealed by the various

localrespondents. Description of medicinal plants along with their botanical names,local names, hindi names, family, habit, habitat, distribution, description, materialof interest (part used) and therapeutic application (medicinal uses) have beendescribedbelow:

Botanical name: Achyranthes aspera L.

Localname:Chirchita

Hindi name: Chirchra

Family: Amaranthaceae

Habit: Herb

Habitat: Wasteplacesandroadside.

Description: The stem may be upright or subscandent. The leaves are big and oval in shape, with a pointed tip that is either acute or acuminate. In fruit, the terminal spikes of deflexed, greenish-white flowers get much longer. Bracts and bracteoles are sturdy and continue to grow like a spine after the plant has withered. A utricle's shape is characteristically elongated. Sub-cylindrical, brown seeds.

Materialofinterest: Root

Therapeutic application: Animals including cows, buffaloes, oxen, sheep, goats, horses, etc. that have had bone fractures or swelling might benefit from a paste formed from ground up root.

Botanical name: Mangifera indica L.

Localname:Aam

Hindi name: Aam

Family: Anacardiaceae

Habit: Tree

Habitat: Clayeymoistplaces.

Description: The plant is a huge evergreen tree that may grow up to 12–35 m in height and has a thick, dome-shaped crown. The thick main stem is heavily branched as opposed to being untypically simple. The leaves may grow to be 15–18 centimeters long and 3–8 millimeters wide; the petioles are 6–10 millimeters in length. The leaves are hairless and shiny. Nearly three thousand tiny blooms that are white, crimson, or yellowish green make up the inflorescence, which appears as panicles. Although they are all enormous drupes, the fruit shows enough diversity in size and form to be interesting. The seed is oblong or oval in shape, and it is enclosed in a flattened, hard, fibrous endocarp.

Materialofinterest: Fruit

Therapeutic application: Cattle with indigestion are treated with a combination of fruit paste and wheat bread fed to them once or twice a day for up to a week.

MinimumInhibitoryConcentration(MIC)(Mgml^{-1})

Minimum inhibitory concentration (MIC) (mgml^{-1})values determinedonly of thoseextracts which shows the inhibitory potential against the treated various bacterialspeciesconducted by the method of broth dilution as elucidated.

Table1:MIC(mgml^{-1})ofleavesextractsofAchyrantusaspera

MIC (mgml^{-1})							
Extracts	B.s.	M.l.	S.a.	S.sp.	E.c.	P.a.	S.t.
Methanol	12.5	25	50	50	25	50	25
Ethanol	25	25	50	50	50	100	50
Aqueous	25	50	100	100	50	100	50

As shown in Table MIC values of various used solventextracts,methanolshows12.5mgml^{-1}againstB.subtilis;25mgml^{-1}againstM.luteus, E.coli and S. typhimurium; 50mgml^{-1} against S. aureus, Streptococcus sp.andP.aeroginosa.MICvalues25mgml^{-1}againstB.subtilisandM.luteus;50mgml^{-1}for the S. aures, Streptococcus sp., E.colias well as S. typhimurium;100mgml^{-1}againstP.aeroginosaobservedinethanolicextract.In aqueousextract 25mgml^{-1}against B. subtilis; 50mgml^{-1}against M. luteus, E. coli and S.typhimurium; 100mgml^{-1}against S. aureus, Streptococcus sp. and P. aeroginosahasbeenexhibited.

Table2:MIC(mgml^{-1})ofleavesextractsofMangiferaindica

MIC (mgml^{-1})							
Extracts	B.s.	M.l.	S.a.	S.sp.	E.c.	P.a.	S.t.
Methanol	50	50	-	-	50	-	-
Ethanol	50	100	-	-	100	-	-
Aqueous	-	-	-	-	-	-	-

The MIC values were determined for methanol, ethanol and aqueous leavesextracts of M. indica by broth dilution method against seven tested bacterialstrains as shown in Table.Among the used varioussolventextracts,methanolexhibitedtheMICvalues50mgml^{-1}againstB.subtilis,M. luteus, and E. coli. Ethanol possesses the MIC value 50mgml^{-1} against B.subtilis while 100mgml^{-1}againstM. luteus as well E. coli bacterial strains. Theremainingused differentsolventextracts(methanol, ethanolandaqueous)didnot exhibited the antibacterial potential for the tested bacterial species, includingbothtypesofmicroorganisms,so,nottestedfortheirMICvalues.

MinimumBactericidalConcentration(MBC)(Mgml^{-1})

Minimumbactericidalconcentration(MBC)(mgml^{-1})valuesdeliberatedonlythose extracts which shows the repressive action towards the tested bacterialspecies.

Table3 :MBC(mgml^{-1})ofleavesextractsofAchyrantusaspera

MBC (mgml^{-1})							
Extracts	B.s.	M.l.	S.a.	S.sp.	E.c.	P.a.	S.t.
Methanol	25	25	50	50	25	50	50
Ethanol	25	50	100	50	50	100	50
Aqueous	50	50	200	100	50	100	100

As shown in Table, A. asperaplant leaves extracts inmethanol showed MBC values 25mgml^{-1} against B. subtilis, M. luteus and E. coli,whereas, 50mgml^{-1}against S. aureus, Streptococcus sp., P. aeroginosa and S.typhimurium. Ethanol extract showed MBC 25mgml^{-1}against B. subtilis, 50mgml^{-1}againstM.luteus,Streptococcussp.,E.coliandS.typhimuriumwhereas100mgml^{-1}was found against S. aureus and P. aeroginosa. MBC values 50mgml^{-1}wasfoundagainstB.subtilis,M.luteusandE.coli,100mgml^{-1}againstStreptococcus sp.,P. aeroginosa and S. typhimurium, while S.aureus shows200mgml^{-1}when aqueous crudeextract used.

Table4 :MBC(mgml^{-1})ofleavesextractsofMangiferaindica

MBC (mgml^{-1})							
Extracts	B.s.	M.l.	S.a.	S.sp.	E.c.	P.a.	S.t.
Methanol	50	100	-	-	50	-	-
Ethanol	100	100	-	-	100	-	-
Aqueous	-	-	-	-	-	-	-

TheMBCvaluesofleavesextractsofM.indicainthevarioussolvents(methanol, ethanol and aqueous) was determined by broth dilution method asdescribed in Materials and Methods, against seven bacterial species, includingboth types of bacterial organisms, shown in Table. Themethanol extract showed MBC values of 50mgml^{-1}towardsB. subtilis andE. coliwhereas 100mgml^{-1}against M. luteus. The ethanol extract exhibited 100mgml^{-1}fortheB.subtilis,M.luteusandE.coli.Theremainingdifferentsolventextracts(methanol, ethanol and aqueous) did not exhibited the antibacterial potentialtowards tested seven bacterial species, including both types of microorganisms, so,not tested for their MBC values.

CONCLUSION

The purpose of this research was to learn more about the antibacterial properties of nature by looking at the background and traditional uses of several medicinal plants with a long history of use in Chhatarpur, India. Each crude extract with a suppressive effect on the given bacterial species had its minimum inhibitory concentration (MIC) and minimum inhibitory concentration (MBC) determined. The studied samples had MIC values between 12.5 and 100 mg ml1 and MBC values between 12.5 and 200 mg ml1, respectively. Therefore, our study justifies the use of these plant crude materials in DIY therapies and their prospective usage against bacteria such as B. subtilis, Micrococcus luteus, S.aureus, E. coli, Salmonella typhimurium, & Proteus mirabilis. Therefore, they may be used as potential antibacterial agents in the development of novel therapies. More study is required before they may be utilized as safe replacements.

REFERENCES

1. Mathabe MC, Nikolova RV, Lall N, Nyazema NZ: Antibacterial activities of medicinal plants used for the treatment of diarrhoea in Limpopo Province. S Afri J Ethnopharmocol. 2016, 105: 286-293. 10.1016/j.jep.2006.01.029.
2. Abbasi AM, Khan MA, Ahmad M, Jahan S, Sultana S: Ethnopharmacological application of medicinal plants to cure skin diseases and in folk cosmetics among the tribal communities of North-West Frontier Province, Pakistan. J Ethnopharmocol. 2019, 128: 322-335. 10.1016/j.jep.2010.01.052.
3. Izzo AA, Ernst E: Interaction between herbal medicines and prescribed drugs. Drugs. 2019, 69: 1777-1798. 10.2165/11317010-000000000-00000.
4. Cragg GM, Newman DJ, Snader KM: Natural Products in Drug Discovery and Development. J Nat Prod. 2017, 60: 52-60. 10.1021/np9604893.
5. Ahameethunisa AR, Hopper W: Antibacterial activity of Artemisia nilagirica leaf extracts against clinical and phytopathogenic bacteria. BMC Compl Alter Med. 2016, 10: 6-10.1186/1472-6882-10-6.
6. Voravuthikunchai SP, Phongpaichit S, Subhadhirasakul S: Evaluation of antibacterial activities of medicinal plants widely used among AIDS patients in Thailand. Pharma Biol. 2015, 43: 701-706. 10.1080/13880200500385194.
7. Rojas JJ, Ochoa VJ, Ocampo SA, Munoz JF: Screening for antimicrobial activity of ten medicinal plants used in Colombian folkloric medicine: A possible alternative in the treatment of non-nosocomial infections. BMC Comp Altern Med. 2016, 6: 1-6. 10.1186/1472-6882-6-1.
8. Arndt W, Mitnik C, Denzler KL, White S, Waters R, Jacobs BL, Rochon Y, Olson VA, Damon IK, Langland JO: In vitro characterization of a nineteenth-century therapy for smallpox. PloS ONE. 2018, 7: e32610-10.1371/journal.pone.0032610.
9. Gupta R, Thakur B, Singh P, Singh HB, Sharma VD, Katoch VM, Chauhan SV: Anti-tuberculosis activity of selected medicinal plants against multi-drug resistant Mycobacterium tuberculosis isolates. Indian J Med Res. 2019, 131: 809-813.
10. Bidault P, Chandad F, Grenier D: Risk of bacterial resistance associated with systemic antibiotic therapy in periodontology. J Canadian Dent Asso. 2017, 73: 721-725.
11. Hancock EW: Mechanisms of action of newer antibiotics for Gram-positive pathogens. Lancet Infect Dis. 2015, 5: 209-218. 10.1016/S1473-3099(05)70051-7.
12. Frey FM, Meyers R: Antibacterial activity of traditional medicinal plants used by Haudenosaunee peoples of New York State. BMC Comp Alter Med. 2019, 6: 10-64.

Corresponding Author

Swarn Tiwari*

Research scholar, Shri Krishna University, Chhatarpur M.P.