

Ethnomedicinal plants as immuno booster

Editor

Sarita Ghanghat



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**पहले पहल
प्रकाशन**

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From the desk of Editor



Ethnomedicinal plants are the fundamental unit of traditional medicine system of our country. This knowledge is being used by our people since centuries. The use of medicinal plants and their products have increased during the Covid 19 pandemic not only in India but also throughout the world .This knowledge of our ancient medicines is not only used to fight the various viruses but also used to boost the immunity among human beings as a shield against various diseases .

In order to create awareness among students and faculty members , Department of Botany and IQAC of our college decided to organise a webinar on “ Ethnomedicinal plants as immuno boosters. “ in the month of 22 January 2021. It was very enriching in the sense that two of our eminent speakers – Prof. Anurag Titov (Ujjain , M.P.) and Dr. Yugandhara M. Rajgure-Gulhane (Amravati, Maharashtra) presented the aforesaid topic in a very excellent manner . This book includes the articles of both these speakers as well as other scholars and teaching fraternity.

Present book ethnomedicinal plants has booster , 17 chapters covering holistic information on medicinal plants there utilisations and disease with special reference to the Indian scenario.

Article’s on ethnomedicinal plants have been included a comprehensive account of current advance in herbal based contraceptive Research and plants with antioxidant properties in radio protection have added to the value of the book excellent

account of intellectual property rights growth and competence of Indian pharmaceutical industries have been given in the book

I am sincerely acknowledge my indebtedness towards my Patron and Principal Dr.Rekha Barethia, IQAC Incharge Prof. Naina Kanswa , Rusa Incharge Prof. Suman Lata Gupta , World Bank Project Incharge Prof.Dr.M .M. Mehta , Dr.R.D .Jatav botany department and all faculty members of Govt. S .G. S. P.G College for their kind support and motivation to bring this book in the present form.

Dr. Sarita Ghanghat

From the desk of Principal



It's a matter of great pleasure to know that IQAC and Department of Botany is going to publish a book

"Ethnomedicinal plants as immuno boosters". In the present pandemic scenario the publication of this book is definitely going to be beneficial for all stakeholders including Teaching Faculty , Research Scholars , Students as well as the common readers .

My best wishes to all the learned contributors ;IQAC incharge Prof Naina Kanswa , Editor Dr. Sarita Ghanghat and Prof Mani Mohan Mehta for bringing this book into reality .

My heartiest wishes to all family members of S G S College , Ganj Basoda who directly or indirectly endeavoured to bring this book to final shape.

Dr. Rekha Barethia
Principal
Govt. SGS PG College
Ganj Basoda (M.P.)

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CHAPTER 1

Evaluation Of *Curcuma Longa* Rhizomeasa Crude Drug From TheirEthanolic Extract



Sabiha Mansoori

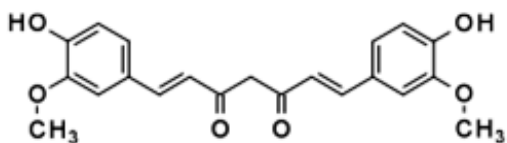
ABSTRACT

Curcuma longa has a lot of potential in terms of medicinal properties. Crude drug rhizome comprises of the family, Zingiberaceae. Plants based medicaments are the sources for modern pharmaceuticals as they contain phytochemical constituents. Phytochemicals differ from traditional indigenous herbal medicines by employing industrialised extraction and manufacturing methods and by be cosmopolitan in scope. Hence phytomedicines made from *Curcuma longa* crude drug rhizomes are available in most industrialised countries around the globe. The present work aimed at phytochemical analysis and quantitave as well as qualitative investigations, characterized by TLC and UV-Vis spectroscopy. The determined R_f value for curcumin is 0.52 respectively, where as the spectrophotometric detection for curcumin is carried out at the absorption maxima of 425.6 nm.

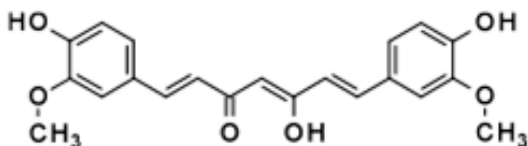
KEYWORDS: *Curcuma longa*, Curcumin, Ethanolic extracts, TLC, UV-Vis spectroscopy.

INTRODUCTION

A Crude drug is an unrefined state of pharmacologically active ingredients and requires no additional processing for use. According to the Morphological Classification of natural products, the dried parts of the plants such as barks, rhizomes, stems, leaves and fruits have been used for crude drug from ancient time. A rhizome is a modified subterranean stem of a plant that is usually found underground. Rhizomes may also called as creeping rootstalks¹. *Curcuma longa* (Family- Zingiberaceae), a perennial herb is another rhizome, cultivated extensively in South and South-East tropical Asia. The characteristic yellow color is due to the curcuminoids, first isolated by Vogel in 1842². It was used as an anti inflammatory agent to treat gas, toothaches and chest pains in Indian medicines. Curcumin is the phytochemical that is now recognized as being responsible for most of the threuptic effects³.



CURCUMIN KETO



CURCUMIN ENOL

MATERIALS & METHODS

Materials

Curcuma longa (Zingiberaceae)

Methods

Collection and authentication of crude drug rhizomes

Curcuma longa rhizomes were purchased from the local market of Raisen, M.P. India. They were identified by Dr. Jagrati Tripathi, HOD, Department of Botany, Unique College, Bhopal, M.P.

Preparation of sample

Curcuma longa rhizomes were dried in shade and ground to fine powder⁵.

Extraction of plant material

About 100 gm of ground *Curcuma longa* rhizomes material were extracted with ethanol using soxhlet apparatus for 18 hours and solvent was evaporated to dryness at constant temperature of 72°C at reduced pressure⁶.

Evaluation of crude drug rhizomes

Curcuma longa was analysed⁷ for crude protein determination, crude fiber determination, ash content, moisture content, phosphorus and iron determination. The presence of various phytochemicals i.e. carbohydrates, amino acids, flavinoids, glycosides, steroids, terpenoids, mucilage, alkaloids, proteins, tannins detected by following methods⁸.

- (i) Test for Alkaloids-To extract, add dilute HCl and filter. Perform Mayer's and Wagner's tests.
- (ii) Test for Amino acids-To ethanolic extract add ninhydrin solution(0.1% in acetone) and heat for few minutes.
- (iii) Test for Flavonoids-By alkaline reagent test, addition of increasing amount of NaOH to the extract shows yellow

coloration, which decolorizes after addition of acid.

- (iv) Test for Glycosides-By Keller-Kilani test, to 2 ml. extract, add glacial acetic acid, one drop 5% FeCl_3 and concentrated H_2SO_4 .
- (v) Test for Steroids-By Salkowski's reaction, to 2 ml. of extract add 2ml. chloroform and 2 ml. concentrated H_2SO_4 .
- (vi) Test for Terpenoids-2 ml. chloroform added to extract and evaporate to dryness. To this, 2 ml. concentrated H_2SO_4 added and heated to about 2 minutes.
- (vii) Test for Mucilage-Powdered drug swells in water or aqueous KOH.
- (viii) Test for Carbohydrates-Add 1 ml. of each Fehling A and B solution, heat for few minutes. Brick red precipitate is observed.
- (ix) Test for Proteins- By Ninhydrin test, extract when boiled with 2ml of 0.2% solution of Ninhydrin, violet colour appeared.
- (x) Test for Tannins- To 2 ml. of alcoholic extract add few drops of 5% FeCl_3 solution for deep blue color.

Qualitative Profile

The qualitative analysis is carried out by TLC (IP 2010)⁹and UV Spectroscopy^{2,10,11}. TLC and UV Spectroscopy are the suitable methods to show the qualitative profile of curcumin in the ethanolic extracts.

Detection of curcumin by UV Spectroscopy

For stock solution, pipette out 2 ml. of filtered *Curcuma longa* extract and dilute to 25 ml. by ethanol. From stock solution pipette out 1 ml. and dilute to 25 ml. , further dilute this solution to four times. The absorbance of the resultant solution was measured at 425.6 nm against ethanol as blank.

RESULTS & DISCUSSION

The Characterization of the isolated Curcumin was done by TLC and UV spectroscopy. The R_f values came out were matched with the standards and the results came were found to be with in the standard range. The R_f value for curcumin(1:50) is found to be 0.52 respectively. The UV absorption maxima of isolated compound, curcumin were recorded using ethanol as a solvent. UV spectra of the isolated compounds show peaks of curcumin at 425.6 nm. To determine the presence of various elements quantitative experiments were performed. Thus based on the results of the test carried out and spectral studies, the observed data for curcumin was found to match well with that of standard data.

Table-1: Organoleptic & physical evaluation of *C. longa*.

S. No.	Tests	Results of <i>Curcuma longa</i>
1	Color	Yellow
2	Odor	Mustardy smell
3	Taste	Bitter
4	Melting Point	182.5 ⁰ C
5	Moisture	7.84%
6	Ash Content	6.5%
7	Acid Insoluble Ash	1.43%
8	Water Soluble Ash	16.66%

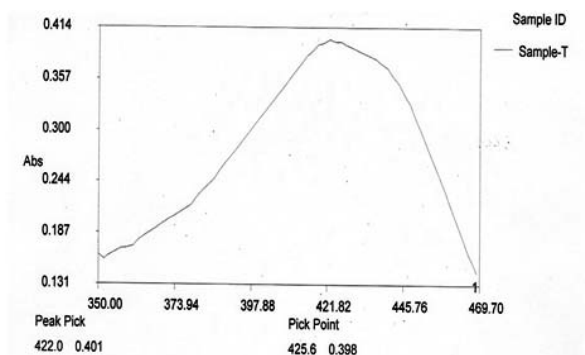
Table-2: Chemical evaluation of *C. longa*.

S. No.	Tests	Results of <i>Curcuma longa</i>
1	% Starch	59.22%
2	% Protein	10.5%
3	% Ca	-
4	% Mg	190 mg/100 gm
5	P (mg /100gm powder)	258mg/100gm
6	Fe(mg /100gm powder)	44 mg/100gm
7	% Crude Fiber	9.0%

Table 3: Results showing phyto-chemical analysis.

S. No	Phyto-chemical Constituents	<i>Curcuma longa</i>
1	Alkaloids	+
2	Amino acids	-
3	Flavinoids	-
4	Glycosides	+
5	Steroids	-
6	Terpenoids	+
7	Mucilage	-
8.	Carbohydrates	+
9	Proteins	+
10	Tannins	+
+ = present, - = absent		

Figure 1: UV scan of *Curcuma longa* extract



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CHAPTER -2

Effect of parathion on physio-biological aspects of *N. notopterus* (Pallas, 1769)



Manoj Kumar Ahirwar

INTRODUCTION

Fish live closely with their aquatic environment; living epidermal cell membranes have direct contact with all materials carried by water. This intimate contact eases the movement of chemicals into and through the mucous, skin and other external layers and becomes a disadvantage to the fish when nefarious chemicals, pollutants and contaminants enter the aquatic environment. These chemicals can have adverse effects on the fishes' physiological pathways, including those imported mechanism that help protect the fish against disease; the non-specific defense mechanism and the specific immune response, which may be assessed through the haemo-biochemical alteration. As a result of irrigation and rain runoff, the pesticide or pesticide residues are added continuously to the aquatic environment, thereby polluting fish and water bodies. Fish and water bodies around the world offer not only food to people but also act as a means of generating employment and money for

thousands. Unfortunately, fish and water bodies are in grave danger because of bioaccumulation of pesticides. Many types of fish and different aquatic ecosystems have been adversely affected by pesticides which end up being suspended in water and binding with soil particles thereby making the water and soil particles unavailable to aquatic life.

Blood analysis is crucial in many fields of ichthyological research and fish farming and in the area of toxicology and environmental monitoring as possible indicator of physiological or pathological changes in fishery management and diseases investigation (Adedeji *et al.*, 2000). Many workers have assessed the effect of various pesticides on the behaviors and haematological responses of various species of fish, (Anees, 1978; Benarji and Rajendranath, 1990; Svoboda *et al.*, 2001) and have found varying responses after exposing the fish to varying sublethal concentrations using the 96 hours acute toxicity tests. As a matter of fact, the present research work on the effect of parathion on the blood profile of fish *Notopterusnotopterus* Pallas" will be an engender in the field of fish toxicology and a value addition to the haematobiochemical profiles of fish exposed naturally and artificially to sub lethal/lethal concentrations of different pesticides.

KEY WORDS : Parathion, toxicity, lethal dose, haematology

MATERIALS AND METHODS:

Original healthy *Notopterusnotopterus* (Pallas) fish were acclimatized for two weeks prior to experimentation. The fishes were fed with balanced diet/pelleted feed with 35% crude protein diet at 2% biomass.

Parathion (C₁₀H₁₄NO₅S) is manufactured by Shivalic Agro Chemical Industries. The parathion is broad spectrum organophosphate pesticides used to control many insects pests. It has non-systematic, contract stomach and fumigant action.

Parathion is highly toxic by all routes of exposure. The lethal concentration (0.1 ppm) of the pesticide was prepared by dissolving 1 ml of original concentration of pesticide individually in 10 liter of chlorine free water. 30 L of the diluent water was used as control. The fishes (n = 30) were kept in each aquarium in triplicates for each treatment. The stock solution of 0.1 ppm of the solution was introduced separately in each tank. The fishes were observed for 1-5 hours for any mortality during the exposure time.

Opercular beat frequency (OBF) was calculated by observing the opercular beats before and after the exposure to assess the impact of pesticides on the physiological requirement of oxygen. The OBF was measured using the stop watch, analyzed for one minute after every 20 minutes post exposure. Tail beat frequency (TBF) is an index of calculating the frequency (no. of times) of tail movements of the fish before and after the exposure to pesticides. TBF gives an index about the physiological imbalance/ abnormal behavior a fish shows post exposure, owing to the damage to the central nervous system or other physiological processes.

The blood samples from the challenged fishes were taken after every 10, 20 and 30 min. in fishes exposed to mixed solution of the pesticides. Blood samples were collected from the caudal tail vessels with 21 or 23 gauge needles and 1 or 3 cc syringes before ventilatory response was noticeably depressed. PCV (%) was determined by centrifuging the blood for three minutes (3000 rpm). The hemoglobin content (Hb) of erythrocytes was determined by the hemoglobin cyanide method. After standardization of haemoglobin estimation with the standard cyanmethemoglobin solution of "VEB Berlin-Chemie" or Berlin Chemicals, the hemoglobin content was determined in g/100 ml. RBC value was determined by counting all the cells lying to the left and below the demarcation line of counting chamber.

MCV, MCH and MCHC were calculated by the standard formula's (Blaxhall and Daisley, 2006).

For leucocyte counting, the blood was drawn in to the 0.5 mark in the erythrocyte pipette. After shaking, the counting chamber was filled in the large squares which are present at the four angular points of the Neubauer counting chamber and demarcated by triple lines (1 mm²). Differential leucocyte count (DLC) included different cell counts. Unna-Ziehl staining was used for differentiating small and large lymphocytes. • granulation staining was used for differentiating neutrophils by the standard method of Romeis (1968). “-granulation staining was used for differentiating monocytes as per the standard methods of Romeis (1968). Unna Ziehl staining was done for differentiation of thrombocytes as per the methods of Romeis, (1968). The total serum protein was determined by Gornall's biuret method (Ryan and Chopra, 1976).

RESULTS: The pesticide parathion was observed to have adverse effect on the physio-biological activities of *N. notopterus*, as depicted in the tables 1 and 2. The results of the opercular beat frequency (OBF) for parathion are presented as mean±SE in table 1. In case of 0.1 ppm parathion exposure to *N. notopterus*, the OBF decreased from 90.0±0.6 (0 minutes) to 58.3±2.9 (20 minutes post parathion exposure). The OBF showed further increase to 102.7±3.8 (40 minutes post parathion exposure) and again decreased to 30.0±0.5 (60 minutes post parathion exposure). Same was the case with tail beat frequency (TBF). In case of 0.1 ppm parathion exposure to *N. notopterus*, the TBF reduced from 7.3±0.6 (0 minutes) to 4.7±0.6 (20 minutes post parathion exposure). The TBF showed further increase to 5.0±2.0 (40 minutes post parathion exposure) and again decreased to 2.0±0.1 (60 minutes post parathion exposure).

For investigation into the effect of pesticides on the

hematological indices, fifteen blood parameters were studied. The mean±SD value of normal PCV (%) was 25.0±0.83, which reduced after 60 min. of exposure, ranging from 16.8-19.2 with a mean±SD of 18.0±0.98, showing 'variance', 'regression equation' and 'correlation coefficient of 308.9, $Y = -0.115 X + 25.2$ and 0.99 respectively. The normal haemoglobin (Hb) expressed in g/dL was 8.3±0.23, which decreased after 60 min. of exposure, ranging from 5.8-6.8 with a mean±SD of 6.3±0.25, with 'variance', 'regression equation' and 'correlation coefficient of 435.2, $Y = -0.032 X + 8.11$ and 0.97 respectively.

The RBC count ($\times 10^6/\mu\text{L}$) was 2.61±0.06, which decreased after 60 min. of exposure, ranging from 1.5-1.7 with a mean±SD of 1.6±0.69 showing 'variance', 'regression equation' and 'correlation coefficient of 507.7, $Y = -0.016 X + 2.627$ and 0.99 respectively. Likewise MCV (fL) was 95.8±1.25, which showed a decrease after 60 min of exposure, ranging from 86.3-90.5 with a mean±SD of 88.4±0.45 showing 'variance', 'regression equation' and 'correlation coefficient of 1324.4, $Y = -0.176 X + 95.03$ and 0.68 respectively. The normal MCH (pg) was 31.8±0.92, which reduced after 60 min of exposure, ranging from 21.8-25.6 with a mean±SD of 23.7±1.10 with 'variance', 'regression equation' and 'correlation coefficient of 296.8, $Y = -0.152 X + 31.3$ and 0.90 respectively. The MCHC (g/dL) was 33.2±1.37, which showed a decrease after 60 min of exposure, ranging from 25.3-28.3 with a mean±SD of 26.8±1.21 showing 'variance', 'regression equation' and 'correlation coefficient of 289.18, $Y = -0.104 X + 32.51$ and 0.96 respectively.

The normal WBC ($\times 10^3/\mu\text{L}$) was 6.06±0.24 which showed an increase after 60 min. of exposure, ranging from 7.3-8.3 with a mean±SD of 7.8±0.10 with 'variance', 'regression equation' and 'correlation coefficient of 437.79, $Y = 0.030 X + 6.023$ and 0.98 respectively. The small lymphocytes count ($\times 10^3/\mu\text{L}$) was 25.3±0.02, which showed an increase after 60 min. of exposure,

ranging from 34.7-37.3 with a mean±SD of 36.0±0.08 with 'variance', 'regression equation' and 'correlation coefficient of 294.13, $Y= 0.168 X + 25.36$ and 0.98 respectively. The large lymphocyte count ($\times 10^3/\mu\text{L}$) was 1.5±0.02, which later showed an increase after 60 min of exposure, ranging from 2.1-2.5 with a mean±SD of 2.3±0.018, with 'variance', 'regression equation' and 'correlation coefficient of 512.9, $Y= 0.013 X + 1.41$ and 0.94 respectively. The normal neutrophil count ($\times 10^3/\mu\text{L}$) was 1.9±0.014 which showed an increase after 60 min. of exposure, ranging from 2.8-3.6 with a mean±SD of 3.2±0.010 with 'variance', 'regression equation' and 'correlation coefficient of 502.3, $Y= 0.021 X + 1.83$ and 0.98 respectively.

The monocytes count ($\times 10^3/\mu\text{L}$) was 1.65±0.002 which later showed an increase after 60 min. of exposure, ranging from 3.2-3.8 with a mean±SD of 3.5±0.010 with 'variance', 'regression equation' and 'correlation coefficient of 502.2, $Y= 0.031 X + 1.535$ and 0.98 respectively. The eosinophils count (0.5±0.02) showed an increase after 60 min. of exposure, ranging from 0.8-1.2 with a mean±SD of 1.0±0.001 with 'variance', 'regression equation' and 'correlation coefficient of 529.13, $Y= 0.008 X + 0.565$ and 0.94 respectively. The thrombocyte like cells (1.8±0.021.) showed an increase after 60 min. of exposure, ranging from 3.0-3.4 with a mean±SD of 3.2±0.014 with 'variance', 'regression equation' and 'correlation coefficient of 508.3, $Y= 0.024 X + 1.38$ and 0.80 respectively. The thrombocytes (34.9±0.02) showed an increase after 60 min. of parathion exposure, ranging from 45.1-46.9 with a mean±SD of 46.0±0.01 with 'variance', 'regression equation' and 'correlation coefficient of 322.9, $Y= 0.216 X + 31.23$ and 0.81 respectively. The normal plasma protein content (g/dL) was 3.8±0.024, which showed a decrease after 60 min. of parathion exposure, ranging from 1.58-1.92 with a mean±SD of 1.75±0.020 with 'variance', 'regression equation' and 'correlation coefficient of 498.4, $Y= -0.035 X + 3.81$ and 0.98 respectively.

DISCUSSION : The observed increase in OBF and TBF during the exposure to various pesticides either solitary or in combinations had been reported earlier by Omoregie (1995). The initial increases in OBF and TBF may be associated with the sudden response to shock. In addition, the behavioral response to pesticides with marked deviation in the rate of OBF and TBF from reference sample (control) imputes an adjustment in physical fitness as a result of the stress condition (Leight and Van Dolah (1999). Grillitschet *al.* (1999) reported that organisms exhibit behavioral responses to chemical stress both at acute and sub lethal toxicity. This elicits the potency and sensitivity of the fish, *N. notopterus* to the test chemical.

During the present experiment the haematological parameters of *N. notopterus* were greatly disturbed on exposure to 0.1 ppm of parathion. Haemoglobin (g/dL) showed a decrease from 8.3 to 6.3; RBC ($\times 10^6/\mu\text{L}$) from 2.61 to 1.6; PCV (%) from 25.0 to 18.0; MCV (fL) from 95.8 to 88.4; MCH (pg) from 31.8 to 23.7; MCHC (g/dL) from 33.2 to 26.8; and plasma proteins (g/dL) from 3.8 to 1.75. The work of Murtyet *al.* (1984) on the toxicity of methyl parathion and fensulfothion to the fish *Mystuscavasius reveals oxygen stressor in fishes subjected to the pesticides because of the decrease in number of RBC's and reduction in haemoglobin titer. Parathion is assessed to inhibit acetylcholinesterase activity in the tissues of the teleost (Tilapia mossambica) as reported by Prasada Rao and Ramana Rao (1984).*

Calumpang et *al.* (1997) studied the mixed toxicity of chlorpyrifos, fenubucarb, monocrotophos, and methyl parathion to fish and frogs after a simulated overflow of paddy water. The authors reported significant ($P < 0.5$) decrease in the values of Hb and RBC after the exposure. The concept regarding the haematological changes and related metabolic dysfunctioning was assessed by De La Vega Salazer et *al.* (1997) who studied

the bioaccumulation of methyl parathion and its toxicology in several species of the freshwater community in Ignacio Ramirez dam in Mexico. The study of De La Vega *et al.* Salazer *et al.* (1997) was further strengthened by the recommendation of ATSDR (2001) who investigated the complete toxicological profile for methyl parathion. Later on Castillo *et al.* (2002) studied the behavioral effects of exposure to endosulfan and methyl parathion in adult rats.

Extensive study on the effect of parathion on haematological parameters in the serum of male Bagrid fish (*Pseudobagrus fulvidraco*) has been carried out by Kyu-Seok Cho *et al.* (2004). The authors reported a significant ($P < 0.1$) decrease in RBC, Hb, PCV, MCV and MCH in the fish. The study was further strengthened by the work of Edwards & Tchounwou (2005), who worked on environmental toxicology and health effects associated with methyl parathion exposure. Our results get complete support from the work of Monteiro *et al.* (2006) who worked on oxidative stress as biomarkers in the freshwater characid fish, *Bryconcephalus*, exposed to organophosphorus insecticide Folisuper 600 (methyl parathion). Janice *et al.* (2007) investigated parathion and methyl parathion toxicity to insecticide resistant and susceptible mosquitofish (*Gambusia affinis*) and observed that the resistant population demonstrates a 1.3 fold greater tolerance of methyl parathion than the susceptible population. This statement justifies the alteration in haematological parameters of the fish exposed to different pesticides.

A significant decrease was observed by Bhat *et al.* (2012) in values of haematological parameters like Hb, Hct, RBC and plasma protein throughout the exposure of methyl parathion. However, leukocyte count was gradually increased up to the 21st day and then recovered suddenly showing a significant decrease at the end of the 35th day. MCV and MCH indices showed a

significant increase during the study period, whereas MCHC value was more or less similar to control group up to the 21st day, and then a significant decrease was observed in the remaining study period. Plasma glucose values increased up to the 28th day (13.37%) and then declined. The observations of the above also stand true for our results. The results are further strengthened by the work of Xiang & He-Qing (2012) who observed the alteration of the kidney membrane proteome of *Mizuhopectenyessoensis* induced by low-level methyl parathion.

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Table 1: Summary of OBF values of *N. notopterus* exposed to 0.01 ppm of three pesticides

Pesticide	Exposure Duration			
	00 min	20 min	40 min	60 min
OBF	90±0.5	58.3±2.9	102.7±3.8	30.0±0.5
	00 min	20 min	40 min	60 min
TBF	7.3±0.6	4.7±0.6	5.0±2.0	2.0±0.1

Table 2: Mean haematological parameters of *Notopterusnotopterus* exposed to five trials of 0.1 ppm Parathion

Parameter	Control	20 min			40 min			60 min		
		Min.	Max	Mean±SE	Min.	Max	Mean±SE	Min.	Max	Mean±SE
PCV (%)	25.0±0.83	21.5	24.5	23.0±0.25 _a	18.8	23.2	21.0±2.11 _b	16.8	19.2	18.0±0.98 ^a
Hemoglobin (g/dL)	8.3±0.23	6.8	7.6	7.20±0.12 _a	6.65	6.95	6.80±1.25 _{ab}	5.8	6.8	6.3±0.25 ^a
RBC (X 10 ⁶ /μL)	2.61±0.06	2.15	2.45	2.30±0.03 _a	1.75	2.25	2.00±0.92 _a	1.5	1.7	1.6±0.69 ^a
MCV (fL)	95.8±1.25	93.3	94.5	93.9±0.75 _{ab}	76.4	85.4	80.9±0.45 _a	86.3	90.5	88.4±0.45 ^a
MCH (pg)	31.8±0.92	28.3	29.3	28.8±1.20 _{ab}	19.6	25.6	22.6±1.11 _a	21.8	25.6	23.7±1.10 _{ab}
MCHC (g/dL)	33.2±1.37	27.2	32	29.6±1.10 _{ab}	26.5	29.3	27.9±0.19 _a	25.3	28.3	26.8±1.21 ^b
WBC (X 10 ³ /μL)	6.06±0.24	6.13	6.85	6.49±0.12 _b	6.99	7.45	7.22±0.05 _b	7.3	8.3	7.8±0.10 ^b
Small lymphocytes (X 10 ³ /μL)	25.3±0.02	28.6	30.2	29.4±0.08 _{ab}	29.7	32.1	30.9±0.02 _b	34.7	37.3	36.0±0.08 ^b
Large lymphocytes (X 10 ³ /μL)	1.5±0.020	1.38	1.82	1.6±0.018 _b	1.65	1.95	1.8±0.010 _{ab}	2.1	2.5	2.3±0.018 ^b
Neutrophils (X 10 ³ /μL)	1.9±0.014	2.05	2.35	2.2±0.010 _a	2.47	2.73	2.6±0.010 _b	2.8	3.6	3.2±0.010 _{ab}
Monocytes (X 10 ³ /μL)	1.65±0.02	1.8	2.2	2.0±0.020 _a	2.67	2.93	2.8±0.20 ^b	3.2	3.8	3.5±0.010 ^a
Eosinophils (X 10 ³ /μL)	0.5±0.020	0.7	0.9	0.8±0.01 ^a	0.88	1.02	0.95±0.02 _b	0.8	1.2	1.0±0.001 _{ab}
Thrombocyte like cells (X 10 ³ /μL)	1.8±0.021	1.24	1.56	1.4±0.014 _a	1.79	2.21	2.0±0.020 _{ab}	3	3.4	3.2±0.014 ^a
Thrombocytes (X 10 ³ /μL)	34.9±0.02	28	32	30.0±0.04 _{ab}	37.9	42.1	40.0±0.15 _a	45.1	46.9	46.0±0.01 ^a
Plasma protein (g/dL)	3.8±0.024	2.95	3.45	3.2±0.010 _b	2.05	2.35	2.2±0.010 _a	1.58	1.92	1.75±0.020 _{ab}

Note: Values are mean±SD of five replications (d.f. 5, 30). Means in the same row having different superscripts are significantly different (P < 0.05) and values in the same row with same superscript are not significantly different (P > 0.05).* The values of the MCV, MCH and MCHC are calculated by the formulae, corresponding to the appropriate values of Hb, PCV and RBC.

CHAPTER -3

Microalgae *Spirulina* as Immuno booster



Dr. Anuradha Dubey

ABSTRACT

The present work encompasses amazing benefit of *Spirulina* to strengthen immune system and its anti viral activity. The study is focusing on reduction in erythrocyte sedimentation rate due to *Spirulina* administration that shows arrest of infection process during any disease. On the basis of facts it can be suggested as Immunobooster that plays an important role in strengthening the immune system and reduction in infectious status of blood.

KEY WORDS : *Spirulina*, Immunity, Health, ESR, Infection.

INTRODUCTION:

In the present scenario of COVID-19 and after that now the immunity and health issues are of prime importance. The whole world faced & even still is facing the pandemic situation and became aware to the fact that strong immunity of an individual can only help him to overcome from the infection of Corona virus.

In the same concern people in India are moving toward indigenous system of Indian tradition and became interested in different herbs and plant extracts to strengthen their immunity.

Use of herbs as medicine is mentioned in Rigveda. A detailed account of use of herbs for their curative properties is available in Atharvaveda. The present paper is about the microalgae *Spirulina* and its role to strengthen immune system.

***Spirulina* as Food:**

Spirulina is well known as the super-food. Richness and vastness of the treasure hidden in this tiny plant is very well studied and even its consistent use for a longer period has also scientifically proven to be safe (Feverier&Seve 1975, Chamorro 1980, UNIDO 1980, Becker & Venkataraman 1984, Krishnakumari *et al.* 1981, NIN 1988 ,Henrikson 1989 and Doshi 1996).

The dawn of the last century attracted the attention of scientists on account of its innumerable potentials. It is a treasure of bio-available nutrients. *Spirulina* was stated as the nature's highest source of super nutrition (Doshi 1996), without any toxic effects (Fevrier&Seve 1975, Chamorro 1980, UNIDO Report 1980, Krishnakumari *et al.* 1981, Becker & Venkataraman 1984 NIN 1988 and Dubey 2014).

Antiviral Activity of *Spirulina* and its role in Improving Immunity:

Today's world has witnessed a swing in healthconscious people towards natural foods and herbal medicines. People can rely on *Spirulina* as it has amazing health improving nutrients package. Not only it is helpful in improving general health but its therapeutic and chemo-preventive aspects have also been identified. It works as a powerful tonic for the immune system. Research work from all over the world on feeding trials with mice, hamsters, chicken, cats and fish confirmed that *Spirulina* improves immune system function. Immunoenhancing property of *Spirulina* was recorded by Bounouset *et al.* (1988), Hayashi *et al.* (1994), Qureshi *et al.* (1995) and Qureshi & Ali (1996). It increases antioxidant protection.

Activities of *Spirulina* against viral action were observed by Hayashi *et al.* (1993), Cardellina (1994), Hayashi *et al.* (1996a and b), Hayakawa *et al.* (1997) and Aychunieet *al.* (1998)

Spirulina is being consumed by the people since the early 1970s and there were no reports of allergies or sensitivities. *Spirulina* inhibits sensitivities by suppressing the release of histamine. In 1994, a Russian patent (Evets *et al.* 1994) was awarded for *Spirulina* to normalize allergic sensitivities in children of Chernobyl. He observed that children of Chernobyl, highly radioactive area showed normalized IgE levels due to the administration of *Spirulina*.

Erythrocyte Sedimentation Rate

For evaluating infections, inflammatory and malignant diseases, ESR is used as an important laboratory tool (Brigden 1999 & Altergott *et al.* 2003). The rate of sedimentation of erythrocyte in one hour is called ESR. It is a common hematologic he cells & non-specific indicator of inflammation (Brigden 1999) that may be due to the infection in body.

Blood is a suspension of Red blood cells in the colloid of plasma. The RBCs are heavier than the plasma. In the body the blood circulates and the cells and plasma get mixed up. When the blood is taken out and is allowed to stand in a tube, the cells tended to settle down at the bottom. Outside the body RBCs precipitate due to their higher density than the plasma, in normal state these cells reject each other because of their negative surface charges and prevent RBC formation (Hammed and Waqas 2006).

The rate of sedimentation estimated under standard conditions is recorded as ESR. Generally Westergren method is used for the determination of ESR. Results are measured in units of mm/h.

ESR Reduction as sign of Immunity Booster quality of *Spirulina*:

Spirulina administration showed great reduction in ESR of human beings. A study conducted on hyperscholesterolemic patients revealed that *Spirulina* worked more effectively in females of 40-49 yrs. & male of 50-59 yrs. against any acute or chronic infections than the other sequence of age groups (Dubey 2015). Researchers also stated that ESR levels increases with age and higher in women (Brigden 1999, Plebani&Piva 2002, Hameed & Waqas 2006). ESR reflected changes in plasma proteins (globulin pattern & concentration) which were accompanied by most of the acute or chronic infections and allergic reactions. Increase in ESR indicated the continuous or increased activity of the disease process, while a decrease should be taken as a sign of arrest of the process. Animal studies showed that *Spirulina* phycocyanin regulate bone marrow cells. These cells produce WBC and stimulate healthy immune system (Baojiang 1994)

Conclusion:

In the light of above facts it is concluded that *Spirulina* plays an important role in strengthening the immune system and reduction in infectious status of blood. So the microalgae can be suggested as Immunobooster. In the present scenario need of the hour is to popularize *Spirulina* and its amazing benefits to build immunity in human being. It has a bright and enthusiastic future for the benefits of mankind.

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CHAPTER -4

Industrial utility of Medicinal and Aromatic plants



Suman Vishwakarma

ABSTRACT

Medicinal and Aromatic plants constitute a major segment of the flora, which provides raw materials for use in the pharmaceuticals, cosmetics and drug industries. Medicinal and Aromatic plants are grown from the time immemorial and possess high social, religious, cultural, and economical value in this world. Various parts of these plants have been used as medicines, perfumes, cosmetics and food. Medicinal and aromatic plants contain the chemical constituents first used by humans as medicines for healing, as flavoring agents for food and drink, and as mental stimulants for mystic interactions with super natural gods. These plant materials continue to play positive roles in human life, as sources of modern pharmaceuticals to treat medical problems, as herbs and spices to tempt the palate, and in a multitude of other applications. The main purpose of this paper is to provide basic knowledge related to the industrial utility of essences and extracts from medicinal and aromatic plants. The objective of this paper is to describe industrial utility of aromatic and medicinal plant; to identify the useful application of this kind of plant in cosmetic, perfumery and pharma industries.

KEYWORDS: Aromatic Plants, Ethnobotanical, Medicinal Plants, Pharma industries.

INTRODUCTION

Plants are a very important source of many products considered as useful for human bodies. Many plant species are used as a source of treatment of various disorders, so these plants are also known as Medicinal and Aromatic plants. Plants have been used since ancient times of all civilizations and cultures, mostly as home remedies for treating seasonal flu viruses, cough, cold, stomach-ache, sore throat and headaches. Besides, the aromatic plants are still used in making perfumes, because of their pleasant-smelling flowers, in cooking because of their strong flavours, and liquor industries. At the present there are used many herbal treatments that are becoming very popular in the society because of their efficiency and less side effects. Of course, the medicinal and aromatic plants are less expensive, more available and have potential to control disorders. The utility of these plants is also a potential material for maintaining good health and conditions, not only for a remedy for specific diseases. Of course, the role of medicinal and aromatic plants in national economy is also enormous. Medicinal aromatic plants constitute a huge group of plants group with a great interest due to its pharmaceutical, cosmetic and nutritional applications, among others. They are also an alternative to traditional crop with species in high demand at the current international market. These plants can be used in parts (roots, stems, leaves, etc.) or processed to extract their essential oils or extracts. They are used in the food industry, pharmaceutical, perfumery and cosmetics, among others. The plant kingdom includes a high number of species, producing a diversity of bioactive molecules with different chemical scaffolds. Over the centuries, the use of medicinal and aromatic plants has become an important part of daily life despite the progress in modern medical and

pharmaceutical industry. They are now being progressively cosmetics, foods and teas, as well as alternative medicines. The growing interest in herbs and their ability to offer economical uses is a part of the movement towards greener economics and life styles. This movement is based on the belief that the plants have a vast potential for their use as a curative medicine. Medicinal and aromatic plants will also maintain their importance in the search for new, valuable sources of drugs and lead compounds. In view of the steadily rising demands on these important natural resources, attention should be paid to the sustainable forms of production and utilization. The indigenous systems of medicines, developed in India for centuries, make use of many medicinal herbs. These systems include Ayurveda, Siddha, Unani, and many other indigenous practices. More than 9,000 native plants have established and recorded curative properties and about 1500 species are known for their aroma and flavour.

Utility of Medicinal and Aromatic Plants (MAPs) in Pharma-

Historically, the importance of Medicinal and Aromatic plants as a source of drugs can be implied from close plantings of medicinal plant materials beside the home within easy reach of the homemaker for use in treatment of ailments. Indeed, plantings of medicinal herbs were fairly commonplace near homes and medical facilities. Ever since ancient times, in search for rescue for their disease, the people looked for drugs in nature. The beginnings of the medicinal plants' use were instinctive, as is the case with animals. The oldest written evidence of medicinal plants' usage for preparation of drugs has been found on a Sumerian clay slab from Nagpur, approximately 5000 years old. It comprised 12 recipes for drug preparation referring to over 250 various plants, some of them alkaloid such as poppy, henbane, and mandrake. In view of the fact that at the time there

was not sufficient information either concerning the reasons for the illnesses or concerning which plant and how it could be utilized as a cure, everything was based on experience. In time, the reasons for the usage of specific medicinal plants for treatment of certain diseases were being discovered; thus, the medicinal plants' usage gradually abandoned the empiric framework and became founded on explicatory facts. Until the advent of iatrochemistry in 16th century, plants had been the source of treatment and prophylaxis. Nonetheless, the decreasing efficacy of synthetic drugs and the increasing contraindications of their usage make the usage of natural drugs topical again. In one of the studies by the World Health Organization, it is estimated that 80 per cent of the population of developing countries relies on traditional plant-based medicines for their health requirements (WHO, 1991). Even in many of the modern medicines, the basic composition is derived from medicinal plants and these have become acceptable medicines for many reasons that include easy availability, least side effects, low prices, environmental friendliness and lasting curative property. The aromatic plants are the important economical source of a number of well-established and important drugs; in addition, they are the source of some chemical intermediates needed for the production of a number of drugs. India has been considered a treasure house of valuable medicinal and aromatic plant species. The Indian System of Medicine uses over 1,100 medicinal plants and most of them are collected from forests regularly, and over 60 species among them are particularly in demands. On account of the fact that derivatives of medicinal and aromatic plants have no side effects and deal curatively, the demand for these plants is on the increase in both developing and developed countries. As a result, the trade of medicinal plants is increasing fast. India has been considered a treasure house of valuable medicinal and aromatic plant species. The Indian System of Medicine uses over

1,100 medicinal plants and most of them are collected from forests regularly, and over 60 species among them are particularly in demands. On account of the fact that derivatives of medicinal and aromatic plants have no side effects and deal curatively, the demand for these plants is on the increase in both developing and developed countries. As a result, the trade of medicinal plants is increasing fast. From the trade data available, it is clear that the global market for medicinal plants has always been large and has been on increase in the recent past. In the report commissioned by the World Wide Fund for Nature, it is pointed out that, the total import in 1980 of “vegetable materials used in pharmacy” by the European Economic Community was 80,738 tons. India was the largest supplier with 10.05 tons of plants and 14 tons of vegetable alkaloid and their derivatives. India, Brazil and China are the largest exporters of medicinal plants. Trade of medicinal plants from India is estimated to be worth Rs. 550 crore. Herbal treatment of various disorders is now a day’s going popular because it’s potential application and effect, less side effect. Each one Medicinal and Aromatic plants includes a specific type and concentration of chemical compounds and are differ as per variation in plant species and also concentration changes by the age of plants. The utility of the Medicinal and Aromatic plants is depending on their presence as well as by the active treatment potential to control specific disorders. The magical compound of medicinal and aromatic plants keeps saving human until present, such as medicine, food, healing, and recreation. One of the huge benefits from medicinal and aromatic plants was to overcome many difficult illnesses, such as contagious disease, cancer, and AIDS/HIV. The National Cancer Institute (NCI) screens plants for the possibility of new drugs and active plant chemicals for cancer and AIDS/HIV in several ongoing collaborative programs.

Utility of Medicinal and Aromatic Plants (MAPs) in Cosmetics

The concept of beauty and cosmetics is as ancient as mankind and civilization. Women are obsessed with looking beautiful. So, they use various beauty products that have herbs to look charming and young. Indian herbs and its significance are popular worldwide. Herbal Cosmetics have growing demand in the world market and is an invaluable gift of nature. Herbal formulations always have attracted considerable attention because of their good activity and comparatively lesser or nil side effects with synthetic drugs. Herbs and spices have been used in maintaining and enhancing human beauty since time immemorial. Indian women have long used herbs such as Sandalwood and Turmeric for skin care; Henna to color the hair, palms and soles. Medicinal and Aromatic plants play a vital role in cosmetic industry. The use of aromatic and medicinal plants in developing countries has been widely observed. Aromatic and medicinal plants possess odorous substances and the characteristic aroma is due to a variety of complex chemical compounds. Plants generate a considerable amount of antioxidants, preservatives, and synthetic colours. There is much demand for these in the cosmetics industry. The perfume sector also uses important quantities of aromatic plants. The dermatological properties of plants are many and varied: tonics, astringents, anti-inflammatory, antiseptics, anti-scarring, cleansers, moisturisers, relaxants, emulsifiers, decongestant, refreshing, etc. The utility of different plants is determined by their physiological activity, which varies from plant to plant, so it is possible to find a plant for nearly all our aesthetic needs. We can find preparations of plant extracts in creams, emulsions, lotions, gels, oils, soaps, deodorants, etc. Regulations regarding these products apply to raw materials for use in cosmetics. They also refer to the vegetable extracts used in the manufacture of cosmetic products. It is very beneficial to use of medicinal and aromatic plants in cosmetic preparations, due to their low

mammalian toxicity, with a brief description of the major use, plant parts used, the actives responsible for effect and the benefits of such products. Their use in skin care; such as dryness, eczema, acne, free-radical scavenging, anti-inflammatory, antiaging and skin protection effects are explained, and also the use in hair care as hair growth stimulants, hair colorants, and for hair and scalp complaints such as dandruff. Essential oils when incorporated into finished products impart many benefits such as a pleasant aroma in perfumery, shine or conditioning effects in hair care products, emollience and improving the elasticity of the skin. Natural ingredients are everywhere and are continually gaining popularity, and the use of plant extracts in cosmetic formulation is on the rise. A cosmetic formulation including active principles of natural origin can protect the skin against exogenous or endogenous harmful agents, and help to remedy many skin conditions. In addition, natural products can be used in hair care, and as hair colorants or dyes. Aromatic plants and oils have been used for thousands of years, as incense, perfumes, cosmetics, and for their medicinal and culinary applications. Essential oils impart many benefits, such as a pleasant aroma, especially in perfumes and to impart shine or conditioning in a hair care product, and for emolliency or improving the elasticity of the skin.

Utility of Medicinal and Aromatic Plants (MAPs) in Perfumery

Since ancient times, aromatic plants of all types have been utilized as sources for both essential oils and aromatic mixtures. Even today, they represent the largest resource for fragrant compounds used in perfumery. The plants produce organic amalgams known as secondary metabolites that protect them from infections and attract pollinators. Parts of each plant can offer more than one source for aromatics as defined below.

Bark-Cinnamon, cascarilla and sassafras root are three

commonly used dried barks used in the manufacture of fine scents. Some other common bark aromatics include: sandalwood; rosewood; agar wood; cedar; birch; pine and juniper.

Flowers and Blossoms:

Flowers and blossoms are the most common sources of fragrance for perfumes. One of the most valuable elements of a fine perfume is the ubiquitous rose, which is also known as the “queen of all flowers.” Its inclusion in fragrance dates back to the civilizations of ancient Rome and Greece.

Jasmine is considered another pure essence, which renders a finished quality to any perfume. Both the Victoria and the Parma Violet varieties have been used in perfumes and medicines down through the centuries because of their varied aromas.

The aromatic orange flower is traditionally associated with brides all over the world. Orange flower oil, which is known as neroli, was named after the Italian Princess of Neroli, who was known to scent her gloves with this precious scent. Plumeria flowers are used to make Hawaiian leis and they are treasured by Polynesians for their colour and fragrance.

Leaves and Twigs :

The leaves and twigs of some plants render the ‘green’ aroma present in many perfumes. Some of the more popular ones include: lavender leaf; patchouli sage; violets; rosemary, and citrus.

Aromatic plants possess odorous volatile substances which occur as essential oil, gum exudate, balsam and oleoresin in one or more parts, namely, root, wood, bark, stem, foliage, flower and fruit. The characteristic aroma is due to a variety of complex chemical compounds. The term essential oil is concomitant to fragrance or perfumes because these fragrances are oily in nature and they represent the essence or the active constituents of the

plants. They are called volatile or ethereal oils as they evaporate when exposed to air at ordinary temperatures. Essential oils are highly concentrated, low volume, high value products. The world of essential oils has since then come out from the narrow field of definition to a wide variety of applications in flavours, disinfectants, oral hygiene, tobacco, pharmaceuticals and in almost all spheres of human activity. In the worldwide flavour and fragrance market, essential oils constitute about 17 per cent. The estimate of world production of essential oils varies from 40,000 to 60,000 tonnes per annum. The demand for spice oils is placed at 2,000 tonnes per annum. The perfume plants are mainly cultivated for their use in perfumery as absolutes, concretes, essential oils, oral water. Their essence does not always diffuse naturally, and may require some preparations. The essences extracted come from leaves, stems, roots, flowers or even bulbs.

RESULTS AND DISCUSSION

Medicinal & Aromatic Plants (MAPs) are botanical raw materials, also known as herbal drugs, that are primarily used for therapeutic, aromatic and/or culinary purposes as components of cosmetics, perfume, medicinal products, health foods and other natural health products. They are also the starting materials for value-added processed natural ingredients such as essential oils, dry and liquid extracts and oleoresins. There is a clear industrial demand for MAPs thanks to the increased production of herbal health care formulations; herbal based cosmetic products and herbal nutritional supplements. In addition, traditional health care practitioners, traditional healers and consumption at the household level have all contributed to the demand for herbal medicinal products. Finished products made from medicinal and aromatic plants are increasingly prescribed and bought over the counter. An increasing number of market

surveys and studies aiming to provide analysis of the total trade value and volume of medicinal and aromatic plants (MAPs) and extracts (natural botanical ingredients made from MAPs) are being carried out or commissioned by a wide range of stakeholders globally. These include studies for natural product companies, herbal trade associations, nature conservation organisations, governmental agencies (departments of commerce; export and import promotion organisations; ministries of health; technical cooperation, international development and aid agencies), international governmental organisations (IGOs) and non-governmental organisations (NGOs), among other market analysts. For the industrial development it is needed to promote the cultivation of those medicinal and aromatic plants with a large market potential and have industrial utility. Essential oils and aroma chemicals constitute a major group of industrial products. These oils form indispensable ingredients of the necessities in many spheres of human activity. They are adjuncts of cosmetics, soaps, pharmaceuticals, perfumery, confectionery, ice-creams, aerated waters disinfectants, tobacco, agarbathis and a host of related products. The spices and essential oil industry traditionally was only a cottage industry in India. Since 1947 a number of industrial organizations have been established for large scale processing and production of spices, oleoresins, essential oils, their pure constituents and perfumes. The essential oils which are being produced in India are oils of ajwain, cedar wood, celery seed, citronella, eucalyptus, lemon grass, mentha, spearmints, Palmarosa, patchouli, turpentine and votive. Some of these products are the raw materials for the production of important industrial chemical like α -ionone from lemongrass oil for the production of vitamin A. India produces turpentine oil in the order of 10,000 to 35,000 tons annually and this oil is used for the production of a number of chemicals. The essential oils are used in every-day human-life in various ways and their

consumption is rapidly increasing. A few of the common uses to which essential oils and their derivatives are put to, are in the manufacture of soaps, cosmetics, pharmaceutical preparation, confectionary, aerated waters, disinfectants, detergents, incenses, etc. India was at one time famous for the manufacture and distillation of highquality perfumes and scents. According to an estimate, 1000 different aromatic plants out of a total of 1500 varieties used in perfumery throughout the world are found in India. The extraction of essential oils is carried throughout India, but in an unorganized way. This industry needs to be built up on scientific lines if all the raw materials available or which can be produced, are to be exploited for the economic benefit of the country. The economic importance of both these groups of medicinal and aromatic plant can be gauged from the fact than 25 years ago vegetable drugs worth millions of rupees were used to be exported from India. This trade dwindled later because of exporting unstandardized and adulterated material. The trade can be revived if steps are taken to produce and export material of standard quality. On other hand, a considerable quantity of crude drugs is imported from foreign countries for the use of Pharmaceutical industry, therefore, will bring great economic advantage to the country. These plants are now being utilized in the practice of medicine in this country and are also exported to foreign countries. Medicinal and Aromatic Plants (MAPs) have the common characteristic of having a high content in substances called active principles, with very specific chemical, biochemical or organoleptic properties, which suit them for therapeutic, aromatic and gastronomic uses. The principal industrial sectors that consume MAPs are in order of importance: the medicinal one and herbalist's, food and perfumer - cosmetic. Inside these sectors, there are the pharmaceutical industries and herbalist's, food, conditioning, manufacturers of essential oils and extraction and formulation. According to the above discussion, it's clear

that, For the industrial and economic development it is needed to promote the cultivation of those medicinal and aromatic plants, have a large market **potential and industrial utility.**

CONCLUSION

Medicinal and Aromatic plants have various industrial utilities, which helps in industrial development and economic development. The role of medicinal and aromatic plants is changing continuously in accord to a period and the role expands such as cure of disease to prevention of disease. The accumulated massive knowledge, information, and materials should be shared in the whole world and go down to generation to generation. The blessings of medicinal and aromatic plants are treasures that belong to all lives. The medicinal and aromatic plants provide the raw material for the production of flavours, condiments, herbal cosmetics, perfumery, scented soaps, hair oils, aerated water, drugs and etc. demand for these herbs is increasing progressively with increase in number of star hotels and multinationals establishing consumer-oriented cosmetics, biscuits and pharmaceutical units. Medicinal and Aromatic plants are important source as a primary health care among the human society. The cultivation of medicinal and aromatic plants in their original habitat represents the most suitable means to comply with the increasing demand for medicinal and aromatic plants and to avoid the depletion of natural sources. . The Medicinal and Aromatic plants are very useful in human society due to less expensive, easily availability and rich potential to control disorders. Focusing of above facts such Medicinal and Aromatic plants urgently needs for conservation by all means for future generation.

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CHAPTER -5

Some Ethno Medicinal Plant Used Tribes in Sheore District Madhya Pradesh



Mahendra Singh Choudhary

ABSTRACT

This paper deals with the various wild and cultivated plants play a key role among tribal cultures in primary health care and this relationship has been continuing from one generation to another since last several centuries. The herbal healers of these region use plant/plant parts of their suitable preparation for treating various ailment. Information collected from traditional tribal healers, medicine men etc has revealed that plant/plant parts of 36 species from Sheore district of forest origin are utilized as, powder, juice, decoction and paste for the treatment of various diseases of local people of the area. Medicinal plants are often, the only accessible health care alternative for most of the population and traditional medicines are integral part of tribal health care.

KEY WORDS: Herbal healers, medicinal plants, disease.

INTRODUCTION

The knowledge acquired by forest dwellers, folk-healers, vaidys, etc. in understanding the properties of roots, stems,

leaves, flowers and fruits of these plants have immense value in traditional folk medicines. Plants and plants based medicaments have been employed since the dawn of civilization for prolonging life of man by combating various ailments. Ancient ethnic communities around the world have learnt to utilize their neighborhood herbal wealth for curative purpose. Indigenous people have been using with a historical continuity of resource use, often possess a broad knowledge base of the complex ecological system in their own localities. They comprises of one of the unique treasure and rich source of diversified ethnobotanical wealth. In remote tribal villages of Sehore districts, traditional medicines are of great importance in the primary healthcare of indigenous people due to their strong faith on these systems and up to some extent the lack of sufficient and reliable health facilities and modern medicines. The local plant resources are the principal source of medicine and are used by the traditional herbal healers. Hundreds of plants growing in forests are used as source of medicines throughout the world. Some of the plants have pharmacological properties while the others are used in indigenous medicine. Most of these plants has occupied an important place in the past and shall continue in the coming days in traditional as well as in modern medicine system.

Ayurveda is the basis and foundation of ancient medicinal system of drugs derived from plant species. The system like Arurveda, Unani, Siddha and Homeopathy have been utilizing about more than 200 plant species for medicinal purposes. These medicinal systems have attained a great importance these days owing to side effects caused by synthetic drugs. In Indian Materia Medica, 2000 drugs have been extracted from 1800 plants of forest origin.

The active principles found in medicinal plants are alkaloids, glucosides and other complex compounds. The active ingredients

are found in one or more parts of the plants in varying proportions. It may be found in root, bark, stem, leaf, fruit, flower or seeds.

In Madhya Pradesh tribes and local people from a considerable part of the population. The state is strategically located and occupies a place almost in the heart of the country. A large number of tribal communities live in remote and inaccessible parts of the forests. Most of these tribal communities are largely dependent on plant species for curing their ailments. Living close to the nature, these tribal's have acquired unique knowledge about the use of wild flora.

MATERIALS AND METHODS

The study was made in the district of Sehore district of Madhya Pradesh state of India. The survey was conducted to collect the information regarding tribal belt of Sehore district from Tribal Welfare Office and Divisional Forest Office. Four tribal villages were visited through field visit. The information recorded in field was as per the methodology recorded by Chopra *et al.* (1965, 1982); Nadkarni (1982); Kapur (1990); Jain (1981, 1991, 1996).

STUDY AREA

Sehorea Districts of Madhya Pradesh, India are located on region of 'Vindhya Range of Mountains'. Sehore is spread from 23.19 North (longitude) and 77.09 East (latitude). The survey was conducted to collect the information regarding tribal belt of Sehore district from Tribal Welfare Office and Divisional Forest Office. Four blocks viz. Budhni, Ichhawar, Rehti and Nasrullaganj of Sehore district have been identified as rich tribal belt. The details of leading traditional herbal healers and their localities have been collected from above tribal blocks. Fourteen leading traditional herbal healers practicing in different localities of Sehore district have been contacted to document their traditional knowledge.

RESULTS AND DISCUSSION

Study in tribal villages of four tribal belts of Sehore districts has been conducted. The details are as follows: the enumeration of 36 medicinal plants being used by the traditional Vaidyas, Ojhas, Guniyashave been documented from Sehore district. The tribal uses different parts of plants which are locally available, in curing various types of diseases (Table 2). In case of any illness, village people contact their local medicine practitioner to whom they call *vaidhya*. *Vaidhyais* a person who has inherited the knowledge of curing various diseases from his fore fathers and others by using only plants. There is one or two such type of person in the village community. Traditionally, local knowledge is transferred from one generation to other generation within family of the *vaidhya* and in this way *vaidhyas* system survives. The traditional herbal healing properties contain much medicine for a single ailment out of the various medicines; one is selected by the herbal healer for curing a particular disease according to symptoms and secondary effects. Several plants are used in case of one disease according to their availability in the region. Some of the plants commonly used by tribals in Central India for prominent disease have been recorded during the present study. The remedial measures have been recorded from tribes of Sehore district of Madhya Pradesh, India. The plants and its parts being used by the traditional herbal healers against the diseases prevailing among tribal and local peoples of the area have been documented and given in Table 2. It is interesting to note that the rural communities still dependent on herbal medicines and they used to take herbal medicine from herbal healers of their local area. The plant parts used and formulations of the medicine prepared by traditional herbal healers have been documented for the first time from these regions and presented in this paper. India is blessed with rich and diverse heritage of cultural traditions. These traditions are associated with use of wild plants. Shanker (1998) has reported

the traditional folk healers in India. Ethno-botanical studies in context to Bharia tribe of Madhya Pradesh, India include those by Jain (1963, 1971, 1975), Prasad et al. (1990), Rai et al. (2001) and Saxena and Shukla (1971), Rai and Nath (2005). The survey of literature shows these people have conducted studies on use of medicinal plants by Bharia tribes. The present study has been undertaken for documentation of information on flora of Sehore district prevalent in the region of study. Jain (1963, 1965) has concluded similar study on the plants used in medicine by tribals of Mandla and Baster region of Madhya Pradesh. Oomachan and Masih (1992) have also studied the ethno-botany of Pachmarhi region of Madhya Pradesh. However, such documentation work in Sehore districts of Madhya Pradesh, India has so far not been published in detail. Maximum numbers of plant species being used in preparation of herbal medicines are documented from 10 herbal healers of Sehore district.

CONCLUSION

The data recorded from herbal healers indicates that the tribals of these regions possess good knowledge of herbal drugs. The collective efforts of ethnobotanists, phytochemists, pharmacognostists and pharmacologists are needed to document and evaluate the efficacy and safety of the claims. Majority of plant species used are belonging to family Caesalpiniaceae, Euphorbiaceae and Liliaceae in district of Sehore. The preparations are made from leaves, bark and underground parts (like root, rhizome etc). Most of the patients are found fully satisfied and having full faith with the treatment given by herbal healers for cure of various diseases prevailing among tribal communities. The duration of the treatment in general was from 20 to 30 days as documented from the herbal healers. The formulation of the medicine prepared from a particular plant and plant parts have also been documented from the traditional herbal healers and presented in the tables.

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Table 1. Tribal blocks selected for the study.

S.N.	Place (District)	Tribal blocks	No. of traditional herbal healers contacted
1	Sehore	Budhni	4
		Ichhawar	1
		Rehti	3
		Nasrullaganj	2

Table 2. Plants with local name, parts used in medicine by the traditional herbal healers of Sehoredistrict.

S.N.	Plant name	Botanical name	Family	Habit	Plant part used/formulation	diseases
1	Nirgundi	<i>Vitex negundo</i> Linn	Verbenaceae	Shrub	Leaf	Rheumatism
2	Ratanjot	<i>Jatropha curcas</i> Linn	Euphorbiaceae	Shrub	Seed	Rheumatism
3	Malkangni	<i>Celastruspaniculatus</i> Willd	Celastraceae	Shrub	Seed	Rheumatism
4	Arandi	<i>Ricinus communis</i> Linn	Euphorbiaceae	Small tree	Leaf	Rheumatism
5	Harshigar	<i>Nyctanthesarbortristis</i> Linn	Oleaceae	Small tree	Leaf	Rheumatism
6	Gurhal	<i>Hibiscusrosasinensis</i> Linn.	Malvaceae	Flower ,bud	Powder	diarrhoea
7	Tikhur	<i>Curcuma angustifolia</i> Roxb.	Zingiberaceae	Tuber	Decoction	diarrhoea
8	Jangalipodina	<i>Mentha piperita</i> Linn.	Lamiaceae	Leaves	Oil	diarrhoea
9	Bach	<i>Acorus calamus</i> Linn.	Araceae	Root	Extract	diarrhoea
10	Dhawa	<i>Anogeissuslatifolia</i> Roxb.	Combretaceae	Bark	Powder	diarrhoea
11	Jangalibhindi	<i>Abelmoschus esculentus</i> (Linn.) Moench	Malvaceae	Roots, seed	Powder	weakness
12	Kantibel	<i>Sidaspinosia</i> Linn	Malvaceae	Root	Powder	weakness
13	Kalimusli	<i>Curculigoorchioides</i> Gaertn	Hypoxidaceae	Root	Powder	sexual impotency
14	Semal	<i>Bombax ceiba</i>	Bombaceae	Root	Powder	sexual impotency
15	Kalihari	<i>Gloriosa superb</i> Linn.	Liliaceae	Climber	Root	Pregnancy
16	Sagoun	<i>Tectonagrandis</i> L.	Verbenaceae	Tree	Leaf	Skin disease
17	Amaltas	<i>Cassia fistula</i> Linn.	Caesalpiniaceae	Tree	Flower	Rheumatism

18	Tulsi	<i>Ocimum sanctum</i> Linn	Lamiaceae	Herb	Leaf	throat infection
19	Ledi piper	<i>Piper longum</i> L.	Piperaceae	Climber	Root	throat infection
20	Gurvel	<i>Tinosporacordifolia</i> Willd	Menispermaceae	Climber	Root	Anemia
21	Neem	<i>Azadirachta indica</i> A.Juss.	Meliaceae	Tree	Bark	fever
22	Bahera	<i>Terminalia bellirica</i> Roxb.	Combretaceae	Tree	Fruit	cough
23	Chhoti dudhi	<i>Euphorbia thymifolia</i> Linn	Euphorbiaceae	Herb	Whole plant	Gastric problem
24	Gataran	<i>Caesalpinia crista</i> Linn	Caesalpinaceae	Climbing shrub	Seed	Intestinal worms
25	Babul	<i>Acacia nilotica</i> Linn	Mimosaceae	Tree	Bark	Cough and cold
26	Pipal	<i>Ficus religiosa</i> Linn.	Moraceae	Tree	Latex	skin diseases
27	Bad	<i>Ficus bengalensis</i> Linn.	Moraceae	Tree	Latex	skin diseases
28	Harra	<i>Terminalia chebula</i> Retz.	Combretaceae	Tree	Fruit	Cough
29	Kevti	<i>Flacourtiaindica</i> Merr	Flacourtiaceae	Shrub	Bark	Dysentery
30	Aam	<i>Mangifera indica</i> Linn	Anacardiaceae	Tree	Flower	Skin disease
31	Mahaneem	<i>Melia azedarach</i> Linn.	Meliaceae	Tree	Bark	Piles
32	Karanj	<i>Pongamiapinnata</i> Pierre.	Fabaceae	Tree	Seed	Piles
33	Satawar	<i>Asparagus racemosus</i> Willd.	Asparagaceae	Under shrub	Root	Weakness
34	Jamun	<i>Syzygiumcumini</i> Linn.	Myrtaceae	Tree	Seed	Diabetes
35	Khair	<i>Acacia catechu</i> Willd	Mimosaceae	Tree	Bark	Cough and cold
36	Bhoorak umhda	<i>Benincasahispida</i> Thunb.	Cucurbitaceae	Climber	Seed	Urinary problem

CHAPTER-6

Potential Attributes of Ethnomedicinal Plants of Vidarbha region.



Dr. Yugandhara Rajgure-Gulhane.

ABSTRACT

Since generations, wild plant species are exploited by human for medicine and food. Ethnobotanical studies are mainly concentrated around documentation of these species. An ethnobiological project conducted by Ministry of Environment and Forests, New Delhi, resulted in reporting 3900 wild plant species used as edibles. This same can act as immune booster in this Covid-19 pandemic. However, negligible information is available regarding their nutritional potential. The present study was undertaken to know wild edible and medicinal potential of some plants like *Oxalis corniculata*, *Celosia digera* and *Moringa oleifera* are which were found to be used by tribal and rural people of Vidarbha region of Maharashtra, India.

KEY WORDS: immune booster, Potential, Medicinal plants

INTRODUCTION

Plant-based traditional knowledge has become a recognized tool in search for new sources of drugs and nutraceuticals.

Several wild plants are consumed as food as well as for medicinal purpose by tribals and other villagers. Present study deals with inventorization and documentation of wild edibles used by rural and tribal people from Vidarbha. For this, some villages were selected so as to represent a cross section of the region. Among many plants some plants selected and presented in details.

List of some Ethnomedicinal plants

S.no	Name of plant	Family	Part used
1	<i>Oxalis corniculata</i> L.	Oxalidaceae	Leaves
2	<i>Celosia argentea</i> L.	Amaranthaceae	Leaves
3	<i>Digera muricata</i> (L.) Mart.	Amaranthaceae	Leaves
4	<i>Moringa oleifera</i> Lam.	Moringaceae	Leaves, Flowers and Fruits
5	<i>Argyreia nervosa</i> (Burm.f.) Boj.	Convolvulaceae	Leaves
6	<i>Commelinabenghalensis</i> L.	Commelinaceae	Leaves
7	<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Leaves
8	<i>Cassia fistula</i> L.	Caesalpiniaceae	Flower

Oxalis corniculata

L. Commonly known by the name Tinpatti, Ambushi and Ambuti by locals. The plant is Small perennial herbs; stems creeping and rooting at nodes; branches erect or ascending. Leaves digitately 3-foliolate; leaflets sessile, obovate, cuneate at base, hairy. Flowers 2-8, in umbellate cymes, bracteate, pedicellate. Petals yellow, oblanceolate; stamens in two whorls of 5 each, long and short alternating, connate at base. Shows flowering and fruiting during the months of Almost through-out the year. Common in shaded and wet localities. Young leaves used throughout Vidarbha. Leaves cooked into vegetable

, also consumed as chutney. Children prefer to eat them raw as it tastes sour. Medicinal importance of whole plant shows astringent activity also used as antiseptic, used in dyspepsia, diarrhoea, dysentery, piles, indigestion; skin diseases, cuts, anaemia, scurvy, headache, bilious headache, to improve physical weakness, diabetes, paediatric diseases, jaundice, liver tonic, on eye complaints, tooth ache. Leaves are antiscorbutic, astringent, cooling, Refrigerant, appetizing, in stomachache, dysentery, diarrhoea, piles, for curing infants cold, fever, scurvy, warts, on itching eye lids, opacity of the cornea, menstrual disorders, helps to enhance fertility, snake bite antidote.

Celosia argentea

L. Commonly known as Kurdu, Komda and Kaddu throughout the region. Erect annual herb; stem ribbed, green, reddish in moist places. Leaves green or with reddish tinge, linear-lanceolate, acute. Inflorescence a compact spike. Perianth papery, initially pink, later turning white. Achenes globose, rounded at apex. Seeds minute, shining black, slightly tubercled. Shows flowering and fruiting during the months of February - April its very Common throughout Vidarbha. Young leaves are cooked into vegetable. Medicinal importance of whole plant shows effective on renal calculi and gonorrhoea. Root are diuretic, anthelmintic, useful in kidney stone, urinary disorders; stomach disorders, fever, malaria, on wounds and to treat anorexia. Leaves shows Diuretic property and useful in urinary disorders, stomach disorders and applied on scorpion sting. Flowers are used on diarrhoea, blood dysentery, spitting of blood. Seeds- On diseases of blood and mouth sores, efficacious in diarrhoea, dysentery, tumors, in eye diseases, in painful micturation, cough, ovarian and uterine diseases, aphrodisiac. Tender shoots, leaves and inflorescence are edible and cooked in to vegetable by local people.

Digeramuricata

(L.) Mart. Commonly known as Kunjar and TandulKundra among local people. Plant are erect herb; stem glabrous or pubescent. Leaves alternate, ovate, obtuse, rounded or subcordate at base, margin entire or crenulate. Flowers in axillary to subaxillary, simple, lax spikes. Bracts ovate; bracteoles with scarious margins; tepals ovate, unequal. Fruit globose, 2-horned at apex. Seeds compressed. Shows flowering and fruiting during the months of June -February Common throughout. Young leaves and spike are cooked into vegetable. Medicinal importance of whole plant shows laxative property. Leaves- are useful on intestinal worms. Flowers and seeds are used to treat urinary complaints and are laxative.

Moringa oleifera

Lam. Commonly known as Shevgaand Maungna. Plants are middle sized trees with corky bark; leaves 3-4 pinnate; rachis thickened and articulated at base; pinnae and pinnules opposite; leaflets orbicular to obovate. Flowers in large; lax, terminal, puberulous panicles; petals white; pods linear, obtusely triangular; seeds 3-angled and winged on angles. Shows flowering and fruiting during the months of Almost throughout the year. Planted in kitchen gardens, also naturalized around villages.

Leaves, flowers, pods, cooked into vegetable. Leaves used as salad especially. Medicinal importance of plant as follows whole plant possesses Antiviral and antibacterial property and are used in jaundice, hepatitis, ascites, rheumatism, cardiac and circulatory problems. Roots are stimulant, astringent, rubefacient; digestive, useful on dropsy, toothache, dental caries, rheumatic pain, quick delivery and snake bite. Bark- Anti-fertility, abortifacient, anti-inflammatory, to increase lactation, emollient, on fever, stomachache, rheumatic pain, typhoid, gout, swelling,

warts, dog bite. Leaves -Purgative, acrid, emetic, used in dyspepsia, flatulence, colic, cholera, diarrhoea; on redness of eyes, catarrhal affection, headache, tumors, sores, scurvy, wounds, cold, cough, high blood pressure, for heart ailment, menstruation, scorpion and snake bite. Flowers are stimulant and useful to promote sexual desire, as tonic, and on tumors. Fruits are used on various joint diseases and for heart ailments. Seeds are antipyretic, purgative and useful to reduce joint pain, headache and acute rheumatism.

Argyrea nervosa

(Burm.f.) Boj. Commonly known as Samundra Shok, Samindar Sokh, Samindar Sofh, Sundar Sok. An extensive, perennial, silky-hairy, woody climber. Leaves ovate-cordate, glabrous above, white tomentose beneath. Flowers rose-purple, in axillary, capitate cymes. Fruit a globose, apiculate, brown capsule. Shows flowering and fruiting during the months of August-December and frequently found on bushes. Local people use leaves to make into pakodas. Medicinally roots show cooling activity and used in rheumatism, urinary disorders and for fertility. Leaf also shows cooling activity and used on boils, skin diseases, rheumatism and wounds. Seeds are useful on treatment of debility.

Commelinabenghalensis

L. Commonly known as Kena. It's a trailing herb, rooting at the nodes; leaves suborbicular, margin entire or undulating. Spathes axillary; funnel shaped; cymes one-two flowered. Petals blue-violet or purple. Fruit a capsule. Shows flowering and fruiting during the months of September-December. Very commonly found on wastelands and near cultivated lands. Young leaves are edible. Young leaves are cooked into vegetable and Pakodas by local people. Socio-economic importance of this herb is very special as leaves are used in 'pooja' (worship) on specific

occasions like Teej, Hartalika and Mahalaxmi pooja. Medicinal importance are the whole plant is Laxative, tonic, cooling, on sores, pimples, cough, muscular sprain, and scorpion sting. Leaves are purgative and useful on diarrhoea, boils, burns, urinary problems, menorrhagia, leprosy and scabies.

Plumbago zeylanica

L. *Plumbago* can be very well identified by their white flowers and commonly known by the name Chitrak and Chitur. This undershrub with ovate–oblong leaves are glabrous above and punctate below. Flowers in axillary and terminal racemes; calyx glandular, hairy outside; corolla tube narrow, white. Fruit capsular, oblong, enclosed in calyx. Shows flowering and fruiting during the months of August–November. Frequent in fields. Young leaves cooked into vegetable by the folk people.

Medicinal importance of plants are roots used as appetizer, used in piles, diarrhoea, indigestion, chronic constipation, stomach disorders, ringworms, antiseptic, skin diseases, scabies, abortifacient, induces sterilization; to cure paralytic effect, dropsy, leucoderma, rheumatism, arrest frequent urination, hydrocele, general debility, measles, jaundice, headache, cough and cold, swelling and pain, antipyretic, snake bite. Leaves are very much useful in rheumatism, swellings, cures pimples, itching, scabies, jaundice, stomach pain. Seeds are Analgesic .

Cassia fistula

L. This plant with beautiful yellow drooping inflorescence known commonly by the name of Bahava, Amlatash, Bala Ramdanda and Koredanda. They are moderate sized deciduous trees. Leaves pinnate; leaflets in 4-8 pairs, opposite, ovate, acute, glabrous above. Inflorescence lax, drooping, long raceme. Corolla bright yellow; petals unequal, obovate, feebly clawed. Fruit a long cylindrical, pendulous, indehiscent pod. Shows flowering

and fruiting during the months of May-June . Availability of *Cassia fistula* plants are commonly found in field and along road sides. Local people used tender leaves, flowers and fruits as their food. They cooked them into vegetable.

Medicinal importance of the various plant parts are different like Root shows febrifuge activity, strong purgative, used in blood dysentery, joint pains, chest pain, migraine, skin diseases, leprosy, liver disorders, jaundice, as tonic.

Bark act as tonic, digestive, antidysenteric, antiinflammatory, on pustules, paralysis, brain affections, ringworms, skin complaints, leprosy, jaundice, syphilis, heart disease , headache and insect bites. Leaves are effective on ringworms, constipation, on facial paralysis and rheumatism, brain affection, throat swelling, skin diseases, eczema, pruritis, on snake bite. Flowers are Astringent, purgative, febrifugal and anti-bilious, on stomach troubles, to cure scabies. Fruits are also Purgative, laxative, antipyretic, cooling, antidysenteric, in bowel complaints, constipation, rheumatism , leprosy, skin diseases, asthma , cough, muscular and joint pains, diabetes, to cure boils, jaundice, biliousness, swollen throat, pimples, on snake bite. Seeds are laxative, given in dysentery, constipation, toothache, on throat-ache, jaundice.

Discussion

Traditional people have fare knowledge on medicinal value of wild plantsin subtle sense as proven by available scientific literature. In recent years there is a growing interest in nutraceuticals which provide health benefits and are alternative to modern medicine. Nutraceuticals hold great potential for the future because they are convenient for today's life style. Importance of ethnic plants are as they shows high nutritive values-rich in minerals and Vitamins.This plants possesses Medicinal Values and provides low cost Agriculture expenditure.

All herbal as well as wild edible plants have potential to protect biological diversity and also helps in providing adequate food as well as plays major role in contributing rural economy.

Conclusion

Concept of traditional medicinal plants is age old in India. Time demands more exhaustive studies on these medicinal plants to regain their dignity which is to some extent preserved by tribals and rural folk. Presence of various bioactive molecules in the wild edibles , herbal plants studied suggests their potential as nutraceuticals and also as immune booster in this Covid -19 pandemic and forever.

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CHAPTER -7

Ethno-Medicinal Plants as Immuno-Boosters



Dr. Anurag Titov

The study of plants of a region and their practical uses through the traditional knowledge of a local culture and people is known as Ethnobotany. An ethno-botanist thus strives to document the practical uses of local flora for many aspects of life, such as plants as medicines, foods, intoxicants and clothing. Richard Evans Schultes, often referred to as the “father of ethnobotany”. The idea of ethnobotany was first proposed in early 20th century by botanist John William Harshberger. The practice of ethnobotany originated in the first century AD when a Greek physician Pedanius Dioscorides wrote a botanical text with medical and culinary properties of “over 600 mediterranean plants” named “De Materia Medica”. Dioscorides wrote about traveling often throughout the Roman empire, including regions such as “Greece, Crete, Egypt, and Petra”, and in doing so obtained substantial knowledge about the local plants and their useful properties.

We will discuss some ethno-botanical plants which have been used by our forefathers to treat different ailments and to boost the immunity to fight against different infections.

Tulsi

Tulsi (*Ocimum sanctum*, Holy Basil) a medicinal herb native to India and Southeast Asia used in Ayurveda. It's an adaptogenic herb, can help adapt the body to stress and boost energy. In alternative medicine, tulsi is typically used for anxiety, stress, and fatigue, and may be used in herbal formulations to help treat asthma, bronchitis, colds, and the flu. Tulsi contains **Eugenol**: A terpene with pain-relieving properties, **Ursolic and rosmarinic acid**: Compounds with antioxidant, anti-inflammatory, and anti-aging properties. **Apigenin**: A flavonoid that helps the body removes waste at the cellular level. **Lutein**: An antioxidant carotenoid important for eye health. **Ocimumosides A and B**: Compounds that reduce stress and balance the neurotransmitters serotonin and dopamine. As an adaptogen, research suggests Tulsi may relieve anxiety and improve moods & also reported to lower levels of stress and depression.

Tulsi may help keep cholesterol in check, tulsi has significant cholesterol-lowering and antioxidant effects.

Tulsi shows promise in preventing and treating lifestyle-related chronic diseases, including diabetes, metabolic syndrome, and psychological stress.

A 2002 study suggests that treatment with tulsi may provide protection against mercury-induced toxicity, which is known to damage the central nervous system, endocrine system, kidneys, and other organs.

There are some possible side effects applies to all individuals such as; Women who are pregnant or trying to get pregnant should not take tulsi as it may affect reproductive capacity, possibly due to its ursolic acid content. Tulsi may increase testosterone levels.

Tulsi may lower blood sugar and should be used with caution in people who have diabetes and are on blood-sugar-lowering medication.

Tulsi contains eugenol, a substance also found in the essential oil of cloves and balsam of Peru. While small amounts of eugenol may actually prevent toxin-induced damage to the liver, greater amounts of eugenol may cause liver damage, nausea, diarrhea, rapid heartbeat, or convulsions.

Turmeric

Turmeric (*Curcuma longa*) is the spice that has been used in India for thousands of years as a spice and medicinal herb. Indians have known for a long time, that turmeric really does contain compounds with medicinal properties. These compounds are called curcuminoids, the most important of which is curcumin.

Curcumin is the main active ingredient in turmeric. It has powerful anti-inflammatory effects and is a very strong antioxidant.

However, the curcumin content of turmeric is not that high. It's around 3%, by weight. Most of the studies on this herb are using turmeric extracts that contain curcumin with dosages usually exceeding 1 gram per day.

It would be very difficult to reach these levels just using the turmeric spice in our foods. Therefore, if you want to experience the full effects, you need to take a supplement that contains significant amounts of curcumin. Unfortunately, curcumin is poorly absorbed into the bloodstream. It helps to consume black pepper with it, which contains piperine, a natural substance that enhances the absorption of curcumin by 2,000%. The best curcumin supplements contain piperine, substantially increasing their effectiveness. Curcumin is also fat soluble, so it may be a good idea to take it with a fatty meal.

Curcumin is a natural anti-inflammatory compound. Inflammation helps body fight foreign invaders and also a role in repairing damage. Without inflammation, pathogens like bacteria could easily take over your body and kill you. Although acute, short-term inflammation is beneficial, it can become a major problem when it becomes chronic and inappropriately attacks your body's own tissues.

Scientists now believe that chronic, low-level inflammation plays a major role in almost every chronic, Western disease. This includes heart disease, cancer, metabolic syndrome, Alzheimer's and various degenerative conditions. Therefore, anything that can help fight chronic inflammation is of potential importance in preventing and even treating these diseases.

Curcumin is strongly anti-inflammatory. In fact, it's so powerful that it matches the effectiveness of some anti-inflammatory drugs, without the side effects.

It blocks NF-kB, a molecule that travels into the nuclei of our cells and turns on genes related to inflammation. NF-kB is believed to play a major role in many chronic diseases.

Turmeric dramatically increases the antioxidant Capacity of the Body. Oxidative damage is believed to be one of the mechanisms behind aging and many diseases. It involves free radicals, highly reactive molecules with unpaired electrons. Free radicals tend to react with important organic substances, such as fatty acids, proteins or DNA.

The main reason antioxidants are so beneficial is that they protect our body from free radicals.

Curcumin is a potent antioxidant that can neutralize free radicals due to its chemical structure. In addition, curcumin boosts the activity of your body's own antioxidant enzymes.

In that way, curcumin delivers a one-two punch against free

radicals. It blocks them directly, then stimulates your body's own antioxidant defenses.

Curcumin boosts Brain-Derived Neurotrophic Factor, linked to improved brain function and a lower risk of brain diseases.

Previously it was believed that neurons weren't able to divide and multiply after early childhood.

However, it's now known that this does happen. Neurons are capable of forming new connections, but in certain areas of the brain they can also multiply and increase in number.

One of the main drivers of this process is brain-derived neurotrophic factor (BDNF), which is a type of growth hormone that functions in your brain. Many common brain disorders have been linked to decreased levels of this hormone, including depression and Alzheimer's disease. Interestingly, curcumin can increase brain levels of BDNF. It may be effective in delaying or even reversing many brain diseases and age-related decreases in brain function.

Curcumin should lower risk of Heart Disease, which is the number 1 cause of death in the world.

Curcumin may help reverse many steps in the heart disease process. The main benefit of curcumin is improving the function of the endothelium, which is the lining of your blood vessels. It's well known that endothelial dysfunction is a major driver of heart disease and involves an inability of your endothelium to regulate blood pressure, blood clotting and various other factors.

Studies suggest that curcumin leads to improvements in endothelial function & reduces inflammation and oxidation, which play a role in heart disease as well.

Turmeric can help prevent cancer, which is a terrible disease, characterized by uncontrolled cell growth. Curcumin has been studied as a beneficial herb in cancer treatment and been found

to affect cancer growth, development and spread at the molecular level. It can contribute to the death of cancerous cells and reduce angiogenesis (growth of new blood vessels in tumors) and metastasis (spread of cancer).

Curcumin has incredible benefits against depression. Curcumin has shown some promise in treating depression & is an effective antidepressant. Depression is also linked to reduced levels of brain-derived neurotrophic factor (BDNF) and a shrinking hippocampus, a brain area with a role in learning and memory. Curcumin boosts BDNF levels, potentially reversing some of these changes.

Black Pepper

Black Pepper has been a staple ingredient all over the world for thousands of years. Often referred to as the “king of spices,” it comes from the dried, unripe fruit of the native Indian plant *Piper nigrum*. Both whole black peppercorns and ground black pepper are commonly used in cooking.

In addition to adding flavor to foods, black pepper may act as an antioxidant and offer a variety of health benefits. Compounds in black pepper, especially its active ingredient piperine may protect against cell damage, improve nutrient absorption, and aid digestive issues.

Black pepper acts as an antioxidant, which are compounds that fight cellular damage caused by unstable molecules called free radicals. Free radicals form as a result of poor diet, sun exposure, smoking, pollutants.

According to one study black pepper extracts were able to resist over 93% of the free radical damage that scientists stimulated in a fat preparation.

A study in human cancer cells noted that black pepper extracts were able to stop up to 85% of cellular damage

associated with cancer development.

Along with piperine, black pepper contains other anti-inflammatory compounds including the essential oils limonene and beta-caryophyllene that may protect against inflammation, cellular damage, and disease.

Black pepper can enhance the absorption and function of certain nutrients and beneficial compounds. In particular, it may improve the absorption of curcumin, the active ingredient in turmeric.

Black pepper may improve the absorption of beta-carotene, a compound found in vegetables and fruits that your body converts to vitamin A. Beta-carotene functions as a powerful antioxidant that may combat cellular damage, thus preventing conditions like heart disease.

Ginger

Ginger (*Zingiber officinale*) is a flowering plant that originated in Southeast Asia. It's among the healthiest (and most delicious) spices on the planet.

The rhizome (underground part of the stem) is the part commonly used as a spice. It's often called ginger root or, simply, ginger.

Ginger can be used fresh, dried, powdered, or as an oil or juice. It's a very common ingredient in recipes. It's sometimes added to processed foods and cosmetics.

Ginger has a very long history of use in various forms of traditional and alternative medicine. It has been used to aid digestion, reduce nausea, and help fight the flu and common cold.

The unique fragrance and flavor of ginger come from its natural oils, the most important of which is gingerol. Gingerol is the main bioactive compound in ginger. It's responsible for much

of ginger's medicinal properties.

Gingerol has powerful anti-inflammatory and antioxidant effects, according to research. For instance, it may help reduce oxidative stress, which is the result of an excess amount of free radicals in the body. Ginger may drastically lower blood sugars and may have powerful anti-diabetic properties. It also dramatically improved hemoglobin A1c (HbA1c), a marker for long-term blood sugar levels. HbA1c was reduced by 10% over a period of 12 weeks.

There was also a 28% reduction in the Apolipoprotein B/ ApolipoproteinA-I ratio and a 23% reduction in malondialdehyde (MDA), which is a byproduct of oxidative stress. A high ApoB/ ApoA-I ratio and high MDA levels are both major risk factors for heart disease.

Ginger may help lower cholesterol levels. High levels of LDL (bad) cholesterol are linked to an increased risk of heart disease. The foods you eat can have a strong influence on LDL levels.

In a 2018 study of 60 people with hyperlipidemia, the 30 people who received 5 grams of ginger-pasted powder each day saw their LDL (bad) cholesterol levels drop by 17.4% over a 3-month period (28).

While the drop in LDL is impressive, it's important to consider that study participants received very high doses of ginger.

Ginger Contains a substance that may help prevent cancer and has been studied as an alternative remedy for several forms of cancer. The anti-cancer properties are attributed to gingerol, which is found in large amounts in raw ginger.

Gingerol can help lower the risk of infections. In fact, ginger extract can inhibit the growth of many different types of bacteria. It is very effective against the oral bacteria linked to gingivitis

and periodontitis. These are both inflammatory gum diseases.

Fresh ginger may also be effective against the respiratory syncytial virus (RSV), a common cause of respiratory infections.

Cloves

Cloves are the flower buds of the clove tree, an evergreen also known as *Syzygium aromaticum*.

Found in both whole and ground forms, this versatile spice can be used to season pot roasts, add flavor to hot beverages, and bring spicy warmth to cookies and cakes.

Animal studies have found that the compounds in cloves may have several health benefits, including supporting liver health and helping stabilize blood sugar levels.

Cloves contain fiber, vitamins, and minerals, so using whole or ground cloves to add flavor to your food can provide some important nutrients.

One teaspoon (2 grams) of ground cloves contains **Calories, Carbohydrates, Fiber, Manganese and Vitamin K**. Manganese is an essential mineral for maintaining brain function and building strong bones. Apart from being a rich source of manganese, cloves are only used in small amounts and do not provide significant amounts of nutrients.

In addition to several important vitamins and minerals, cloves are rich in antioxidants.

Cloves also contain a compound called eugenol, which act as a natural antioxidant and eugenol can stop oxidative damage five times more effectively than vitamin E.

According to one study clove extract helped in stopping the growth of tumors and promoted cell death in cancer cells. The eugenol has also been shown to have anticancer properties.

Eugenol is toxic in high amounts and overdosing on clove

oil may cause liver damage, especially in children. Cloves have been shown to have antimicrobial properties, meaning they can help stop the growth of microorganisms like bacteria.

In one study clove's essential oil killed three common types of bacteria, including *E. coli*, which is a strain of bacteria that can cause food poisoning. Antibacterial properties of cloves can even help promote oral health.

In one study, the compounds extracted from cloves were found to stop the growth of two types of bacteria that contribute to gum disease.

Eugenol may be beneficial for the liver.

One study showed that the eugenol found in cloves helped reverse signs of liver cirrhosis, or scarring of the liver. Unfortunately, research on the liver-protecting effects of cloves and eugenol in humans is limited.

One study found that taking eugenol supplements for 1 week decreased levels of glutathione-S-transferases (GSTs), a group of enzymes involved in detoxification that is a marker of liver disease.

Cloves are also high in antioxidants, which may help prevent liver disease due to their ability to help decrease oxidative stress.

Cloves and nigericin were found to increase the uptake of sugar from the blood into cells, increase the secretion of insulin, and improve the function of cells that produce insulin.

Insulin is a hormone responsible for transporting sugar from your blood into your cells. The proper functioning of insulin is essential for maintaining steady blood sugar levels.

In combination with a balanced diet, cloves could help keep your blood sugar levels in check.

Cinnamon

Cinnamon (*Cinnamomumzeylanicum*) has anti-viral, anti-

bacterial and anti-fungal properties.

The distinctive smell and flavour of cinnamon is due to an essential oil in the bark, called cinnamaldehyde. Cinnamaldehyde displays anti-viral, anti-bacterial and anti-fungal properties.

Cinnamon also contains large amounts of polyphenol antioxidants having anti-inflammatory effects.

Cinnamon, have prebiotic properties that promote the growth of beneficial bacteria and help suppress the growth of pathogenic bacteria and improve gut health.

Cinnamon is also a useful source of manganese and contains small amounts of calcium and fibre.

There is some evidence to suggest that the consumption of cinnamon is associated with a short-term reduction in blood pressure.

Cinnamon can also lowers blood sugar and risk of type 2 diabetes.

Cinnamon extract has been used to alleviate gastrointestinal problems in both Eastern and Western medicine for years. It has been described as a carminative, renowned for its digestive, anti-microbial and anti-inflammatory properties. In traditional Ayurvedic medicine, cinnamon bark oil is used for treating flatulence and digestive imbalance. It is believed that the warmth of cinnamon increases blood flow and improves blood oxygen levels to help fight off illness. To alleviate digestive symptoms, cinnamon is taken as part of a hot drink (much like a tea). In this instance, it's easier to use ground cinnamon rather than trying to grate cinnamon sticks yourself.

Garlic

Garlic (*Allium sativum*) is a plant of the onion family. However, throughout ancient history, the main use of garlic was for its health and medicinal properties.

Most of its health benefits are due to sulfur compounds like allicin, diallyl disulfide and s-allyl cysteine formed when a garlic clove is chopped, crushed or chewed.

Garlic is highly nutritious but has very few calories. One clove (3 grams) of raw garlic contains: **Manganese, Vitamin B6, Vitamin C, Selenium, Fiber**, Decent amounts of calcium, copper, potassium, phosphorus, iron and vitamin B1 with 4.5 calories, 0.2 grams of protein and 1 gram of carbohydrates.

Garlic also contains trace amounts of various other nutrients. In fact, it contains a little bit of almost everything you need.

Garlic supplements are known to boost the function of the immune system.

A study found that a high dose of aged garlic extract (2.56 grams per day) reduced the number of days sick with cold or flu by 61%.

Garlic supplements help prevent and reduce the severity of common illnesses like the flu and common cold.

Cardiovascular diseases like heart attacks and strokes are the world's biggest killers & high blood pressure, or hypertension, is one of the most important drivers of these diseases.

Human studies have found garlic supplements to have a significant impact on reducing blood pressure in people with high blood pressure.

In one study, 600–1,500 mg of aged garlic extract was just as effective as the drug Atenolol at reducing blood pressure over a 24-week period.

Garlic can lower total and LDL cholesterol. For those with high cholesterol, garlic supplements appear to reduce total and / or LDL cholesterol by about 10–15%.

Looking at LDL (the “bad”) and HDL (the “good”) cholesterol

specifically, garlic appears to lower LDL but has no reliable effect on HDL.

Oxidative damage from free radicals contributes to the aging process. Garlic contains antioxidants that support the body's protective mechanisms against oxidative damage.

High doses of garlic supplements have been shown to increase antioxidant enzymes in humans, as well as significantly reduce oxidative stress in those with high blood pressure.

The combined effects on reducing cholesterol and blood pressure, as well as the antioxidant properties, may reduce the risk of common brain diseases like Alzheimer's disease and dementia.

Indian Gooseberry (*Phyllanthus emblica* and *Emblica officinalis*)

Indian gooseberry, or amla, is a fruit tree that grows natively in parts of Asia. It has several

culinary and herbal medicine uses, particularly in its native India. The fruit is rich in vitamin C

and often purported to have potential antioxidant and heart-health benefits.

Indian gooseberry is known by two scientific names, *Phyllanthus emblica* and *Emblica officinalis*.

The fruits are about the size of a golf ball with a pit and thin peel. Their taste has been described as sour, bitter, and astringent.

The fruit is used in cooking in India, and most supplements on the market today are made only from the powdered, dried fruit or fruit extracts.

However, the whole plant including the fruit, leaves, and seeds is utilized in traditional Indian medicine.

Indian gooseberry has several potential benefits. Due to its

high vitamin C content, Indian gooseberry may have some promising anti-aging benefits. Vitamin C is an antioxidant that can help prevent cellular damage, which may help slow your body's natural aging process.

In addition to its antioxidant activity, Indian gooseberry may help prevent the breakdown of collagen, which forms the firm but flexible protein matrix in your skin and soft tissues.

Indian gooseberry extract is commonly used in Thailand to promote hair growth, and some evidence shows that it may inhibit an enzyme that contributes to hair loss.

In test-tube studies, Indian gooseberry extract protected against age-related macular degeneration (AMD) by improving the mitochondrial health of eye cells.

In a study indian gooseberry extracts have killed certain types of cancer cells, including breast, cervical, ovarian, and lung cancers.

Additionally, Indian gooseberry extracts may play a role in cancer prevention due to their antioxidant activity. It appears that Indian gooseberry may also help prevent cell mutations that lead to tumor growth and cancer development.

It's thought that the many phytochemicals, such as tannins and flavonoids, in Indian gooseberries play a role in cancer prevention, along with its vitamin C and antioxidant content.

One of the most common uses of Indian gooseberry is to promote heart health. There are many ways in which Indian gooseberry may decrease your risk of heart disease, including:

Indian gooseberry extracts may protect against oxidative damage that's associated with heart injury. This has been noted in several animal studies.

A study in people with type 2 diabetes found taking 1,000 mg of Indian gooseberry daily improved endothelial function to

the same extent as the drug atorvastatin.

Human studies have noted that Indian gooseberry can significantly reduce inflammation, which is considered a key factor in the development of heart disease.

Human studies have observed improved blood fat profiles after supplementing with Indian gooseberry, including lower triglyceride and total and LDL (bad) cholesterol, as well as increased HDL (good) cholesterol.

Indian gooseberry may help reduce high blood pressure levels by acting as a vasodilator, or by widening the blood vessels. High blood pressure is a risk factor for heart disease.

Finally, supplementing with Indian gooseberry may help prevent the formation of blood clots, which may cause a heart attack or stroke if they block an artery.

Finally, Indian gooseberry may have some immune-strengthening effects due to its vitamin C content. A single Indian gooseberry contains approximately 600–800% of the Daily Value (DV) for this vitamin. Vitamin C can optimize immune health in several ways. It's an antioxidant, so it works to decrease cellular damage and inflammation.

Lemon

Scientifically known as *Citrus limon*, lemons are high in vitamin C, fiber, and various beneficial plant compounds. These nutrients are responsible for several health benefits.

In fact, lemons may support heart health, weight control, and digestive health.

Lemons are a good source of vitamin C. One lemon provides about 31 mg of vitamin C, which is 51% of the reference daily intake (RDI).

Research shows that eating fruits and vegetables rich in vitamin C reduces your risk of heart disease and stroke. However,

it's not only the vitamin C that is thought to be good for your heart. The fiber and plant compounds in lemons could also significantly lower some risk factors for heart disease.

Plant compounds found in lemons namely hesperidin and diosmin have also been found to lower cholesterol.

Lemons are often promoted as a weight loss food, and there are a few theories as to why this is. One common theory is that the soluble pectin fiber in them expands in your stomach, helping you feel full for longer but not many people eat whole lemons and because lemon juice contains no pectin, lemon juice drinks will not promote fullness in the same way.

Another theory suggests that drinking hot water with lemon will help you lose weight. However, drinking water is known to temporarily increase the number of calories you burn, so it may be the water itself that is helping with weight loss not the lemon.

Other theories suggest that the plant compounds in lemons may aid weight loss. However, no studies confirm the weight loss effects of lemon compounds in humans.

Citric acid may help prevent kidney stones by increasing urine volume and increasing urine pH, creating a less favorable environment for kidney stone formation. Lemon juice may help prevent kidney stones. However, more quality research is needed.

Iron deficiency anemia is quite common. It occurs when you don't get enough iron from the foods you eat. Lemons contain some iron, but they primarily prevent anemia by improving your absorption of iron from plant foods. Your gut absorbs iron from meat, chicken, and fish (known as heme iron) very easily, while iron from plant sources (non-heme iron) not as easily. However, this absorption can be improved by consuming vitamin C and citric acid. Because lemons contain both vitamin C and citric acid, they may protect against anemia

by ensuring that you absorb as much iron as possible from your diet.

Lemons are made up of about 10% carbohydrates, mostly in the form of soluble fiber and simple sugars. The main fiber in lemons is pectin, a form of soluble fiber linked to multiple health benefits. Soluble fiber can improve gut health and slow the digestion of sugars and starches. These effects may result in reduced blood sugar levels.

However, to get the benefits of fiber from lemons, you need to eat the pulp. People who drink lemon juice, without the fiber found in the pulp, will miss out on the benefits of the fiber.

Ashwagandha

Ashwagandha (*Withaniasomnifera*) is an ancient medicinal herb and it is also known by several other names, including Indian ginseng and winter cherry, classified as an adaptogen, meaning that it can help your body to manage stress. Ashwagandha also provides numerous other benefits for your body and brain; for example, it can boost brain function, lower blood sugar and cortisol levels, and help fight symptoms of anxiety and depression.

Ashwagandha is one of the most important herbs in Ayurveda, and has been used for over 3,000 years to relieve stress, increase energy levels, and improve concentration.

Ashwagandha is Sanskrit for smell of the horse, which refers to both its unique smell and ability to increase strength. Many of its health benefits are attributed to its high concentration of withanolides, which have been shown to fight inflammation and tumor growth.

In several studies, ashwagandha has been shown to lower blood sugar levels. One study found that it increased insulin secretion and improved insulin sensitivity in muscle cells.

Some studies have found that withaferin a compound in ashwagandha helps induce apoptosis, which is the programmed death of cancer cells. It also impedes the growth of new cancer cells in several ways. First, withaferin is believed to promote the formation of reactive oxygen species (ROS) inside cancer cells, disrupting their function. Second, it may cause cancer cells to become less resistant to apoptosis.

Cortisol is known as a stress hormone given that your adrenal glands release it in response to stress, as well as when your blood sugar levels get too low. Unfortunately, in some cases, cortisol levels may become chronically elevated, which can lead to high blood sugar levels and increased fat storage in the abdomen. Studies have shown that ashwagandha may help reduce cortisol levels.

Ashwagandha is perhaps best known for its ability to reduce stress. Also, several controlled human studies have shown that it can reduce symptoms in people with stress and anxiety disorders.

Although it hasn't been thoroughly studied, a few studies suggest ashwagandha may help alleviate depression. The limited research available suggests that ashwagandha may help reduce depression.

It increases the activity of natural killer cells, which are immune cells that fight infection. It also decreases markers of inflammation, such as C-reactive protein (CRP) upto 36%. This marker is linked to an increased risk of heart disease.

In addition ashwagandha may help improve heart health by reducing cholesterol and triglyceride levels. It promotes antioxidant activity that protects nerve cells from harmful free radicals.

It may also decrease blood sugar and blood pressure levels, so medication dosages may need to be adjusted if you take it.

Shatavari

Shatavari (*Asparagus racemosus*) is a member of the asparagus family. It's an adaptogenic herb help your body cope with physical and emotional stress. Shatavari is a health tonic to improve vitality. Antioxidants prevent cell damage by free-radicals. They also battle oxidative stress, which causes disease.

Shatavari is high in saponins with antioxidant abilities. In 2004a new antioxidant called racemofuran was identified in shatavari root. Two known antioxidants asparagine-A and racemosol were also found.

Racemofuran, also has significant anti-inflammatory capabilities. Racemofuran acts similarly in the body as anti-inflammatory drugs known as COX-2 inhibitors.

Shatavari is used in ayurveda as an immunity booster.

Ulcers are sores in your stomach, small intestine, or esophagus. They may be very painful. They can cause serious complications, such as bleeding or perforation. According to a study shatavari was effective at treating medication-induced gastric ulcers.

Type 2 diabetes is on the rise, shatavari may help maintain blood sugar levels. It's thought compounds within the herb stimulate insulin production. Shatavari may be one of nature's best kept anti-aging secrets. The saponins in shatavari root reduce the free-radical skin damage that leads to wrinkles. Shatavari also prevent collagen breakdown. Collagen helps maintain your skin's elasticity.

Shatavari is used in ayurveda to treat depression. Antioxidants in shatavari have strong antidepressant abilities. They also impacted neurotransmitters in the brain. Neurotransmitters communicate information throughout our brain. Some are associated with depression.



CHAPTER -8

Importance and Uses of Medicinal Plants and Alternative Medicine



Dr. Rekha Janshal

ABSTRACT

Medicinal plants have been used in healthcare since time immemorial. Studies have been carried out globally to verify their efficacy and some of the findings have led to the production of plant-based medicines. Owing to fast paced world that we are living in, we are getting far from the nature. While the lifestyle that we live can have adverse effect on us, it is important to know that by introducing small changes in our daily life can go a long way in keeping us healthy and energetic. Therefore, the importance of Ayurveda holds true in today's life as it is based on the principal of bringing us close to nature and relying on its natural powers to cure us and keep us healthy without any side effects.

One way of understanding the basic fundamentals of Indian Ayurved is to spend more time with nature and observe the plants and herbs. Each plant or herb has a specific quality and can be used to treat multitude of ailments and diseases. Medicinal plants like aloe, turmeric, tulsi, pepper, elachi and ginger are commonly

used in a number of Ayurvedic home remedies and are considered to be the best aid among fighting ailments related to throat and skin. As a rich source of nutrients, anti-bacterial and antioxidant properties, ayurvedic herbs are non-toxic in nature.

KEYWORDS

Medicinal Plants, Prevention, Strategy, Primary Health Care.

INTRODUCTION

A medicinal plant is any plant which, in one or more of its organs, contains substances that can be used for therapeutic purposes or which are precursors for the synthesis of useful drugs. This description makes it possible to distinguish between medicinal plants whose therapeutic properties and constituents have been established scientifically, and plants that are regarded as medicinal but which have not yet been subjected to a thorough scientific study.

Before the introduction of chemical medicines, man relied on the healing properties of medicinal plants. Some people value these plants due to the ancient belief which says plants are created to supply man with food, medical treatment, and other effects. It is thought that about 80% of the 5.2 billion people of the world live in the less developed countries and the World Health Organization estimates that about 80% of these people rely almost exclusively on traditional medicine for their primary healthcare needs. Medicinal plants are the “backbone” of traditional medicine, which means more than 3.3 billion people in the less developed countries utilize medicinal plants on a regular basis.

Over 90% of traditional medicine recipes/remedies contain medicinal plants but this paper will address, specifically, the medicinal plants that have been implicated with preventive measures in disease control strategies. However, it must be noted that only a very thin divide exists between treatment and

prevention in some cases. A quick example is the fact that by treating mild elevation of blood pressure renal disease can be prevented.

Importance of some herbs with their medicinal values:

- Herbs such as black pepper, cinnamon, myrrh, aloe, sandalwood, ginseng, red clover, burdock, bayberry, and safflower are used to heal wounds, sores and boils.
- Basil, Fennel, Chives, Cilantro, Apple Mint, Thyme, Golden Oregano, Variegated Lemon Balm, Rosemary, Variegated Sage are some important medicinal herbs and can be planted in kitchen garden. These herbs are easy to grow, look good, taste and smell amazing and many of them are magnets for bees and butterflies.
- Many herbs are used as blood purifiers to alter or change a long-standing condition by eliminating the metabolic toxins. These are also known as 'blood cleansers'. Certain herbs improve the immunity of the person, thereby reducing conditions such as fever.
- Some herbs are also having antibiotic properties. Turmeric is useful in inhibiting the growth of germs, harmful microbes and bacteria. Turmeric is widely used as a home remedy to heal cut and wounds.
- To reduce fever and the production of heat caused by the condition, certain antipyretic herbs such as *Chirayta*, black pepper, sandal wood and safflower are recommended by traditional Indian medicine practitioners.
- Sandalwood and Cinnamon are great astringents apart from being aromatic. Sandalwood is especially used in arresting the discharge of blood, mucus etc.
- Some herbs are used to neutralize the acid produced by the stomach. Herbs such as marshmallow root and leaf. They

serve as antacids. The healthy gastric acid needed for proper digestion is retained by such herbs.

- Indian sages were known to have remedies from plants which act against poisons from animals and snake bites.
- Herbs like Cardamom and Coriander are renowned for their appetizing qualities. Other aromatic herbs such as peppermint, cloves and turmeric add a pleasant aroma to the food, thereby increasing the taste of the meal.
- Some herbs like aloe, sandalwood, turmeric, sheetrojhi and kharekhasak are commonly used as antiseptic and are very high in their medicinal values.
- Ginger and cloves are used in certain cough syrups. They are known for their expectorant property, which promotes the thinning and ejection of mucus from the lungs, trachea and bronchi. Eucalyptus, Cardamom, Wild cherry and cloves are also expectorants.
- Certain herbs are used as stimulants to increase the activity of a system or an organ, for example herbs like Cayenne (Lal Mirch, Myrrh, Camphor and Guggul).
- A wide variety of herbs including Giloe, Golden seal, Aloe and Barberry are used as tonics. They can also be nutritive and rejuvenate a healthy as well as diseased individual.
- Honey, turmeric, marshmallow and liquorice can effectively treat a fresh cut and wound. They are termed as vulnerary herbs.

Characteristics of Medicinal Plants:

Medicinal plants have many characteristics when used as a treatment, as follow:

- **Synergic medicine-** The ingredients of plants all interact simultaneously, so their uses can complement or damage others or neutralize their possible negative effects.

- **Support of official medicine-** In the treatment of complex cases like cancer diseases the components of the plants proved to be very effective.
- **Preventive medicine-** It has been proven that the component of the plants also characterize by their ability to prevent the appearance of some diseases. This will help to reduce the use of the chemical remedies which will be used when the disease is already present i.e., reduce the side effect of synthetic treatment. Conclusion Therefore it is a very important point for the open access journals to encourage researchers and clinicians to work hard in order to clarify the main active ingredients which

Alternative Medicine:

These days the term “Alternative Medicine” became very common in western culture, it focus on the idea of using the plants for medicinal purpose. But the current belief that medicines which come in capsules or pills are the only medicines that we can trust and use. Even so most of these pills and capsules we take and use during our daily life came from plants. Medicinal plants frequently used as raw materials for extraction of active ingredients which used in the synthesis of different drugs. Like in case of laxatives, blood thinners, antibiotics and antimalaria medications, contain ingredients from plants.

On the other hand, there remain strong arguments for the use of alternatives. Despite the lack of scientific proof, there is a lot of anecdotal evidence to suggest that these therapies work. In addition, far from being dangerous, they often have few or no side effects, so the worst outcome would be no change. One of the strongest arguments for the effectiveness of alternative therapies in the West is that, whilst conventional medicine is available without charge, many people are prepared to pay considerable sums for alternatives. If they were totally unhelpful,

it would be surprising if this continued.

I strongly believe that conventional medicine and alternative therapies can and should coexist. They have different strengths, and can both be used effectively to target particular medical problems. The best situation would be for alternative therapies to be used to support and complement conventional medicine.

Conclusion

As our lifestyle is now getting techno-savvy, we are moving away from nature. While we cannot escape from nature because we are part of nature. As herbs are natural products they are free from side effects, they are comparatively safe, eco-friendly and locally available. Traditionally there are lot of herbs used for the ailments related to different seasons. There is a need to promote them to save the human lives.

These herbal products are today are the symbol of safety in contrast to the synthetic drugs, that are regarded as unsafe to human being and environment. Although herbs had been priced for their medicinal, flavoring and aromatic qualities for centuries, the synthetic products of the modern age surpassed their importance, for a while. However, the blind dependence on synthetics is over and people are returning to the naturals with hope of safety and security. It's time to promote them globally.

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CHAPTER -9

Some therapeutics plant in Patalkot, Tamia, Chhindwara , District Madhya-Pradesh.



**Omkar Bawistale
&
Brajesh Kumar Sahu.**

ABSTRACT

Extensive ethno-medicinal survey was carried out to document the precious indigenous healthcare practices prevalent among the different ethnic groups of Patalkot, Tamia, Chhindwara District, Madhya-Pradesh, India. These people belonging to primitive or aboriginal culture possess a good deal of information about medicinal utility of plant species. During the survey, it was noted that plant parts, used by the tribals to cure various diseases and disorders. Indigenous healthcare practices, provide low cost alternatives, where western healthcare services are not available or are too expensive. A list of plant species along with their parts used and the mode of administration for effective control in different ailments are given.

KEYWORDS

Therapeutics Plant, Patakot, Chhindwara District, M.P.

INTRODUCTION

“Patakot” situated in the hilly block ‘Tamia’ of Chhindwara district, has acquired great importance because of its Geographical and Scenic beauty. Patakot is a lovely land scape located at a depth of 1200-1500 feet in a valley. Because of the great depth at which it is located this place is christened as ‘Patakot’ (Patal means very deep, in Sanskrit). When one looks down the place sitting at the top of the valley, the place looks like a horse shoe in shape. People believe it as the entrance to ‘Patal’. There is one more belief that after worshipping ‘Lord Shiva’ Prince ‘Meghnath’ had gone to Patalok through this place only.

People say that this place was ruled by in 18th and 19th century and that there was a long tunnel connecting this place to ‘Pachmarhi’ in Hoshngabad District. The place is spread over an area from 22.24Ú to 22.29Ú North. 78.43Ú to 78.50Ú East. The place is located at a distance of 62 Km. from the district headquarters in the North-West direction, and 23 km. from Tamia in North-East direction.

METHODOLOGY

Present work is based on the result of intensive survey, collection, and study of plant species of Patakot, Chhindwara District. The field work has been conducted following the suggestion of Santapau (1955). The field trips were arranged 4-6 times in a month, in such a way so as to cover all parts of the areas and to collect all plants in flowering and fruiting stages. Field observations were recorded in note book. Observation includes information on habitat, habit, size of the

plant, leaf, colour, variation of the flowers, scent of the flower association etc. Local name were also noted. To illustrate the range of variation of the plants, 5-6 specimens from different localities have been collected, for each species. During collection following precautions have been taken. As far as possible specimens were collected on a clear dry day and were studied and examined as early as possible at the end of the day of collection. Whole plants were collected in case of plant, small piece of twig with leaves; flowers were taken for the preparation of herbarium specimens.

Considerable work has been done various ailments by of Madhya Pradesh Omkar Bawistale, T. R. Sahu, Pankaj Sahu and BrajeshSahu (2007); Omkar Bawistale, BrajeshSahu and Pankaj Sahu (2010); Omkar Bawistale, T. R. Sahu, Pankaj Sahu and BrajeshSahu (2010); Omkar Bawistale, T. R. Sahu (2011); Omkar Bawistale, T. R. Sahu (2012); Bawistale Omkar, Dua V.K. &Sahu T. R. (2014) Omkar Bawistale, Pankaj Sahu, T. R. Sahu, Dev Nandini Sonekar& V.K. Dua (2015); Omkar Bawistale(2015); Omkar Bawistale, Omkar Solunke& T. R. Sahu (2018); Sharma Vikas, Rao, Sudhakar V, Diwan, R.K. Saxena, R.C. and Shrivastava, D.N. (2010); Rai M.K., Pandey A.K. and Deepak Achrya (2000); Pandey A.K. and Shukla P.K. (2008); Pandey A.K., Patra A.K. and Shukla P.K. (2005); Rai R, Nath V (2005); Rai R, Nath V, Shukla PK (2002); Mukta Shrivastava (1994).

RESULTS AND DISCUSSION

The present work in PatalkotChhindwara district of 30 plant species belonging to 21 families have been documented for their therapeutic properties for curing various ailments such as sexual diseases, rickets, urinary diseases, skin diseases and ailments related to easy delivery, scorpion bite, digestive system, respiratory system, asthma and liver complaints.

Species enumeration of study area -

S.N.	Name of Species	Local Name	Therapeutics use	Status
	<i>Cissampelospareira</i> L. var. <i>hirsuta</i> Buch-Ham. ex DC. Family - Menispermaceae	Akandi, Kadu patha.	Powder of root and leaves of Kadu patha used to treat fever, diabetes, wound and also used for easy delivery.	Rare
	<i>Tinosporacordifolia</i> (Willd.) Miers. ex Hook. f.&Thoms Family - Menispermaceae	Gulancha, Gulel, Gurbel	The stem, root and leaves of Gulancha is used in the form of juice and decoction to treat irregular fever, chronic fever, jaundice, vomiting, acidity and skin diseases.	Rare
	<i>Argemone mexicana</i> L.Family- Papaveraceae	Bharband, Pili katari	The root in the form of powder and latex of Bharband is used against small pox, skin diseases, gonorrhea and rabies.	Rare
	<i>Capparis zeylanical</i> L. Family - Capparaceae	Ardanda	Root and bark decoction is given to treat fever, stomach pain.	Rare
	<i>Cleome viscosa</i> L. Family - Capparaceae	Hulhul	The seeds, leaves and root are used in the form of juice and powder to treat earache, arthritis, indigestion, abdominal pain, and fever.	Common
	<i>Hybanthusenneaspermus</i> (L.)F. V. Muell. Family-Violaceae	Ratanpuras, Varuna.	The root is used to treat urinary affection and bowel complaints of children.	Rare
	<i>Achyranthes aspera</i> Linn. Family - Amaranthaceae	Ulta kata	Root use antidote in scorpion bite.	Common
	Aloe vera Linn. Family - Liliaceae	Gawarpatha	Leaf use in fractured bone. Leaves used for skin diseases, and digestion.	Rare
	<i>Asparagus racemosus</i> Willd. Family - Liliaceae	Satawari	Tuber is given orally to nursing mothers for seven days early in the morning for lactation.	Rare

<i>Biophytumsensitivum</i> Linn. Family –Oxalidaceae	BadiLajwanti	Plant extract is given to children orally in dysentery.	Rare
<i>Boerhaviadiffusa</i> Linn. Family - Nyctaginaceae	Vishpatti	Leaves are chewed by the in scorpion bite.	Rare
<i>Butea monosperma</i> Lam. Family - Fabaceae	Dhauk, Palas	Seed is used cure asthma	Common
<i>Annona squamosa</i> L Family- Annonaceae.	Sitaphal.	Leafpaste is applied to treat tumors and boils. Bark juice is given as an antidote for snakebite.	Common
<i>Calotropis procera</i> R. Br. Family - Asclepiadaceae	Aak, Madar	Latex is used antidote in scorpion bite.	Common
<i>Curculigoorchioides</i> Gaertn . Family - Hypoxidaceae	Kali musli	Tuber powder is used to leucorrhoea, and rickets.	Rare
<i>Curcumaamada</i> Roxb. Family -Zingiberaceae	Janglihaldi	Tuber powder is given orally to cure rickets, infertility for men.	Endange -red
<i>Cynodactylon</i> Linn. Family - Poaceae	Doob	Whole plant extract is taken orally by the tribal's indigestion.	Common
<i>Dalbergialatifolia</i> Roxb. Family - Fabaceae	Kala sisam	Leaf extract is taken orally by the tribals in dysentery.	Endange -red
<i>Dioscoreabulbifera</i> Linn. Family -Dioscoreaceae	Janglimataru	Boil and made a powder of tubers use for child patient suffering from typhoid.	Rare
<i>Euphorbia hirta</i> Linn. Family - Euphorbiaceae	Dudhi, Choti dudhi	Plant paste is taken with water to cure dysentery and liver dieses.	Rare
<i>Holopteleategrifolia</i> Planch. Family -Ulmaceae	Bander buti	Leaf paste is applied locally to cure eczema.	Rare
<i>Leucas aspera</i> (Willd.) Link. Family - Lamiaceae	Bhodaki, Chotahalkush ra	Whole plant is placed in hot water and the vapour is inhaled to treat migraine	Common

<i>Melia azedarach</i> Linn. Family - Meliaceae	Bakain	Leaf paste is massaged on the body of children to cure rickets.	Common
<i>Phyllanthus emblica</i> Linn. Family - Euphorbiaceae	Aonla, Aonwala	The fruit and seeds are used in the form of powder and juice to treat fever, loss of appetite, piles, worms, jaundice, cough, fainting, heart diseases and vomiting.	Rare
<i>Phyllanthus fraternus</i> Webst. Family - Euphorbiaceae	Bhui – amla	Plant extract is given orally once or twice in a day to children as febrifuge.	Rare
<i>Solanum nigrum</i> Linn. Family - Solanaceae	Bhuttakateeli	Fruit cut in lengthwise, filled with purified butter is eaten in cough and cold.	Rare
<i>Sterculia urens</i> Roxb. Family - Sterculiaceae	Kullu	Gum paste is applied locally in eczema and taken orally urinary diseases	Common
<i>Phyllanthus urinaria</i> L. Family - Euphorbiaceae	Lal bhuin	Whole plant extract is given to treat liver diseases.	Rare
<i>Cocculushirsutus</i> (L.) Diels Family - Menispermaceae	Jamtiki bel, Tildhara	The root is used in the form of decoction to treat snake-poisoning.	Rare
<i>Costusspeciosus</i> (J.Koenig) Sm.Family - Costaceae	Keo – kanda	The rhizome of Keokanda is used in the form of juice and powder to treat worms and paralysis.	Rare

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CHAPTER – 10

Ethnomedicinal treatments of various disorders in Renapur tehsil of Latur District in the Marathwada region of Maharashtra.



S.G. Yadav & R.M. Kadam

ABSTRACT

In India, the main traditional systems of medicine include *Ayurveda*, *Unani* and *Siddha*. The traditional healers provide considerable information about the use of many plants or plant parts as medicine. The present study deals with an ethno-botanical research work to collect the information on the uses of the medicinal plants for the treatments of various disorders like cough, cold and fever by the rurals of Renapur tehsil, Latur district in the Marathwada region of Maharashtra. The rurals of this area have the authentic information about the medicinal values of plants. They have been using different plant parts like roots, stem, bark, leaves, bulbs, and rhizomes, fruits seeds in the form of juice, paste, powder, infusion, and decoction and in crude form. The indigenous knowledge of local traditional healers about the native plants used for medicinal purposes was collected by personal interviews during the field visits. In the present investigation, 73 plant species, belonging to different

40 families used by the rurals in the treatments of various disorders are documented.

KEYWORDS

Ethano-botany, Ayurveda, Renapur tehsil, Marathwada.

INTRODUCTION

India inherits a rich herbal heritage. Our environment is characterized by richly diversified plant forms. The medicinal plants have been crucial in sustaining the health and well-being of mankind. Plants constitute a vital component and play a key role in maintaining Earth's equilibrium and ecological balance. Generally it is believed that major portion of the population especially in the developing and under developing countries seek healthcare from sources other than conventional medicines, they also seek helps of some organized systems of medicines like Ayurveda, Unani, and Siddha. Ethan botanical information from India estimates that more than 40% of the vegetation is used in its codified and folk health care tradition. In India Ayurvedic system of medicine has existed for over five thousand years. Our ancestors possessed a profound understanding of healing powers of plants. According to Siddiqui (1995), the drug obtained from plant is believed to be much safer and exhibits remarkable efficacy in the treatment of various ailments. Extensive work has been done on medicinal plants of India (Kirtikar and Basu, 1935, Nadkarni 1954, Rastogi 1993) but very few reports were reported from Maharashtra, hence to fulfill this lacuna the present investigation has set its objective to record various medicinal plants available in the tehsil area of Renapur and to trace out their significance.

MATERIALS AND METHODS

The present survey was carried out among the rural used for treatments on cough, cold and fever as peoples of Renapur tehsil to collect the information on plant species practiced by them commonly. An efforts have been made to collect the plants

which were in flowering and fruiting conditions and were identified with the help of Cook (1958), Hooker (1872), Razi (1952), Santapau ((1957), Varadpande (1966), Shirke (1983). The information regarding the medicinal uses of plants was gathered from rural peoples of the tehsil to gather information on plant species used for cough, cold and fever by them, this information is collected by following Jain (1991). The medicinal uses were confirmed by following Nadkarni (1972).

RESULTS: Table.1.

Sr No	Botanical Name	Common Name	Family	Parts used	Use to cure
1	<i>Abutilon indicum</i>	Petari	Malvaceae	Leaves, roots	Infusion to fever
2	<i>Acalyphaindica</i>	Khokali	Euphorbiaceae	Leaf	Drycough, bronchitis
3	<i>Achyranthus aspera</i>	Aghada	Amaranthaceae	Whole plant	Diuretic, used in piles
4	<i>Adhatodazeylanica</i>	Adulsa	Acanthaceae	Root, leaves	Bronchitis, asthma, fever, jaundice
5	<i>Aegle marmelos</i>	Bel	Rutaceae	Fruit, leaves	Diabetes, leprosy, intestinal disorders, cooling agent, fever
6	<i>Aervalanata</i>	Kapuri	Amaranthaceae	Whole plant	cough
7	<i>Allium cepa</i>	kanda	Liliaceae	bulb	cough
8	<i>Alstoniascholoris</i>	satvin	Apocynaceae	Stem, bark	Fever, ulcer of mouth
9	<i>Amaranthus spinosus</i>	Kantemath	Amaranthaceae	Whole plant	Fever,
10	<i>Aristolachiaindica</i>	Sapsund	Aristolachiaceae	Leaves, seed	cough
11	<i>Ailanthus excelsa</i>	Maharukh	Simarubaceae	Leaf, bark	Antiasthmatic, antispasmodic
12	<i>Annona squamosa</i>	Sitaphal	Annonaceae	Whole plant	Purgative, suppurative
13	<i>Andrographis paniculata</i>	Klmegh	Acanthaceae	Whole plant	Wounds, ulcers, chronic fever, cough, bronchitis, skin diseases, dysentery
14	<i>Argemone mexicana</i>	Pivladhotra	Papavaraceae	Root, stem, latex	Laxative, purgative, chronic skin diseases
15	<i>Azardiractaindica</i>	Neem	Meliaceae	Leaves, bark, fruits	Antiseptic, astringent, purgative, leprosy, toothache, skin diseases
16	<i>Bauhinia racemosa</i>	Apta	Caesalpinaceae	Leaves, bark	Pains from stomach, bowels, boil.
17	<i>Barleriaprionitis</i>	Katakorahti	Acanthaceae	Whole plant	Cough, stomach complaints, ring worms
18	<i>Butea monosperma</i>	Palas	Fabaceae	Bark, leaves, flower	Aphrodisiac, tumors, piles, diarrhea, fractures of bones

19	<i>Calotropis gigantea</i>	Ruchik	Asclepiadiaceae	Roots,leaves	Cold,cough,asthama,expectorant,indigestion
20	<i>Carissa carandus</i>	Karvand	Apocynaceae	Root,ripeandunripe fruits	Laxative,appetizer,cooling,antipyretic, aphrodisiac
21	<i>Cassia fistula</i>	Bahawa	Caesalpinaceae	Fruit,leaf,seeds	Blood purifier,cough,jaundice
22	<i>Cassia occidentalis</i>	Tarwad	Caesalpinaceae	Leaf	Fever, ringworm
23	<i>Centellaasiatica</i>	Brahmi	Apiaceae	Root,leaves	Diuretic, tonic to hair growth, skindiseases, piles
24	<i>Cinnamomum zeylanicum</i>	Dalchini	Lauraceae	Stem,bark	Cough
25	<i>Citrus aurantifolia</i>	Narangi	Rutaceae	Leaves	Cold
26	<i>Citrus limon</i>	Limboo	Rutaceae	Fruit	Stomach ache,dysentery,diarrhea
27	<i>Coccinea indica</i>	Tondli	Cucurbitaceae	Leaves,Fruits	Fever, mouth infections
28	<i>Coleus aromaticus</i>	Patherachur	Lamiaceae	Leaves	Cough
29	<i>Coriandrum sativum</i>	Dhana	Apiaceae	Leaves	Fever
30	<i>Costus speciosus</i>	Kosht	Costaceae	Rhizome	Rhizome juice in Fever
31	<i>Cynadondactylon</i>	Durva	Poaceae	Leaf, seed, roots	Cough,asthama,bronchial troubles
32	<i>Cuscuta reflexa</i>	Amarvel	Cuscutaceae	Stem	Hair problem, intestinalworms, jaundice
33	<i>Datura metel</i>	Dhotra	Solanaceae	Root, stem, leaf, seed	Cough,asthama,ringworm,skindiseases,leprosy,bronchial troubles
34	<i>Echinopsechianthus</i>	Uktara	Asteraceae	Root,seed	Hair tonic, skin diseases,jaundice
35	<i>Eclipta prostrata</i>	Maka	Asteraceae	Root,leaves	Asthama,bronchitis,cooling,fever,jaundice
36	<i>Erythrina variegata</i>	Pangara	Fabaceae	Stem,bark	Bark juice in fever
37	<i>Euphorbia hirta</i>	Dudhi	Euphorbiaceae	Leaves	Leaf juice in fever
38	<i>Emblia officinalis</i>	Awala	Euohorbiaceae	Fruit,seeds	Antioxidants,diabetes,anemia,bronchitis,laxative
39	<i>Ficus benghalensis</i>	Vad	Moraceae	Stem,root,leaves	Diabetes,improvescomplexion,dysentery,rheumatism
40	<i>Ficus religiosa</i>	Peepal	Moraceae	Bark,leaves,fruits,roots	Seeds refrigerant,asthama,skindisease,diarrhea,dysentery
41	<i>Ficus glomerata</i>	Umbar	Moraceae	Fruit, latex, root, bark	Cough,diabetes,honorrhea, wounds
42	<i>Gloriosa superba</i>	Kallavi	Liliaceae	Underground tubers	Chronic,ulcer,skin disease

43	<i>Gymnemasylvestre</i>	Gudmari	Asclepiadaceae	Leaf,Root	Eye disorder,stomachache, carminative,expectorant,heart stimulant
44	<i>Helicterisora</i>	Murudsheng	Sterculiaceae	Bark, pod, root	Stomach ache, cuts, diarrhoea,dysentery
45	<i>Hemidesmus indicus</i>	Anantmul	Asclepiadaceae	Root,latex,	Fever, urinary troubles,leucoderma,inflamedeye,epileptic fits in children
46	<i>Lawsoniainermis</i>	Mehandi	Lythraceae	Leaves	Jaundice, weakness,cough
47	<i>Mentha longifolia</i>	Janglipudina	Lamiaceae	Whole plant	Fever
48	<i>Madhucalongifolia</i>	Moh	Sapotaceae	Leaf,flowers	Toothache,tonsil,ulcer,cough,throat swelling
49	<i>Mangiferaindica</i>	Aamba	Anacardiaceae	Bark	Stomach ache,jaundice
50	<i>Mimosa pudica</i>	Lajalu	Mimosaceae	Root,leaves,fruits	Purgative,constipation
51	<i>Micheliachampaca</i>	Sonchapha	Magnoliaceae	Stem,bark	Cough,fever
52	<i>Morus alba</i>	Tut	Moraceae	Leaves	Cold
53	<i>Moringa oleifera</i>	Shevaga	Fabaceae	Root,leaves,bark,gum,pods	Cardiac stimulant,scurvy,diuretic,eye diseases,
54	<i>Oscimum sanctum</i>	Tulsi	Lamiaceae	Root,stem,leaves,seeds	Expectorant,cough,bronchitis,gastri disorders,,cold, cough,
55	<i>Oscimum basilicum</i>	Sabja	Lamiaceae	Leaves	Cough,cold,fever
56	<i>Oxalis corniculata</i>	Ambashi	Oxalidaceae	Leaves	Stomach ache,antiscorbic,kidney stone
57	<i>Petrocarpum marsupium</i>	Bibba	Fabaceae	Wood,fruit,leaf	Body pain,skindiseases,diabetes
57	<i>Pongamiapinnata</i>	Karanji	Papilionaceae	Seeds,leaves, bark	Scabies,eczema,leprosy,ulcersberiberi,cough
58	<i>Phylanthusemblica</i>		Euphorbiaceae	Fruit	Cough and cold
59	<i>Piper nigrum</i>	Kala-miri	Piperaceae	Seed	Cough and cold
60	<i>Quisqualisindica</i>	Lalchameli	Combretaceae	Seed	Fever
61	<i>Rauwolfia serpentina</i>	Sarpagan dha	Apocynaceae	Root	Fever,stomach disorders Laxative
62	<i>Ricinus communis</i>	Erand	Euphorbiaceae	Leaves,seed oil	Jaundice,skin diseases,
63	<i>Solanum nigrum</i>	Kanguani	Solanaceae	Whole plant	Cough
64	<i>Syzygiumcumini</i>	Jambhul	Myrtaceae	Bark, seeds, leaf	Diabetes,diuretic,diarrhea,carminative
65	<i>Tamarindusindica</i>	Chinch	Fabaceae	Seed,leaf	Biols,swell

66	<i>Tectonagrandis</i>	Saagwan	Lamiaceae	Stembark,wood	Eczema,headache,stomach ache
67	<i>Terminalia bellirica</i>	Behada	Combretaceae	Bark,seeds,leaf	Heart,wounds,hemorrhages ,ulcers
68	<i>Terminalia chebulla</i>	Hirda	Combretaceae	Fruits	Expectorant, cardiotonic, ulcers, laxative
69	<i>Tinosporacordifolia</i>	Gulvel	Minispermaceae	Stem,leaves	Fever,cough,diarrhoea
70	<i>Tridaxprocumbens</i>	Dagadipala	Asreraceae	Leaves	Wound haemorrhage,bronchitis,diarrhea,dysentery
71	<i>Withaniasominifera</i>	Ashwagandha	Solanaceae	Root,leaves,seed	Female disorders,bronchitis,skindisease, jointpains,eye complaints
72	<i>Zingiberofficinale</i>	Adrak	Zingibaraceae	Rhizome	Rhizome tea in cough,cold,fever
73	<i>Zizyphusjube</i>	Bor	Zingibaraceae	Fruit	Decoction in cough and cold

CONCLUSION

An attempt has been made to survey and enlist the medicinal plants used in the treatments of various disorders, particularly cough cold and fever with the help of rurals of Renapur tehsil. In this survey 73 medicinal plants belonging to 40 families have been documented in the form of herbarium at the Department of Botany Shivaji MahavidyalayaRenapurDist.Latur in the Marathwada region of Maharashtra.

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CHAPTER-11

Ethno botanical Study of Traditional Medicinal Plants Used by Peoples of Marathwada Area, Maharashtra



R. M. Kadam & S.G. Yadav

ABSTRACT

India inherits a rich herbal heritage. Our environment is characterized by richly diversified plant forms. The medicinal plants have been crucial in sustaining the health and well-being of mankind. The present survey expresses an ethnobotanical research work to collect information on the use of medicinal plants for the treatments of various disorders by the rural peoples of Sonpeth tehsil, Parbhani District, in the Marathwada region of Maharashtra. The rural peoples including Medicine men, vaidus, poojari and also senior men and women's from the study area have the authentic information about to cure various disorders by using their own remedies. They have been using different plant parts like roots, stems, leaves, stembark, bulb, rhizome, fruits and seeds in the form of juice, paste, infusion, and decoction. The peoples of these areas have a strong belief in their practice than that of allopathic treatments.

This survey gives information of 48 plants species belonging to 33 families, which are commonly found here and being used

for various treatments by the rurals. The peoples of these areas have a strong belief in their practice than that of allopathic treatments

KEYWORDS

Ethnomedicine, Medicinal plants, Maharashtra, Traditional Knowledge

INTRODUCTION

In recent years, interest in ethnobotanical explorations has been increased enormously. Ancient ethnobotanical literature on global level suggests that the tribal aboriginal people have been using wild plants from hundreds of years for various purposes viz. food, medicinal, fodder, healthcare needs etc. It has been found that almost all the plants were in use by the traditional healers and ethnic societies of world either as a food or as a plant based drug. Therefore all these wild plants should be scientifically investigated. From last three to four decades considerable progress has been made in the field of ethnobotany and Ethnomedicine due to recent ethnobotanical explorations.

METHODOLOGY

The present ethno botanical survey was carried out among the rural peoples of Sonpeth tehsil by visiting different villages to collect information of plant species used for various disorders. Different communities of people were interviewed, local herbal practitioners like the Medicine men, vaidus, and poojari and also with senior men and women using questionnaire (Jain *et. al.*, 1995). These people have been using various plants for the treatments in the rural areas. The information regarding mode of use, parts used, amount and periodicity of dosage and local name was collected from them. The voucher specimens were processed into mounted herbarium sheets following the conventional methodology (Jain *et. al.*, 1977) and were deposited in the Herbarium of Department of Botany Mahatma Gandhi

Mahavidyalaya Ahmadpur, Dist. Latur in the Marathwada region of Maharashtra.

The collected plant specimens were identified by using standard floras, such as Flora of Presidency of Bombay (Cooke, 1967), Flora of Maharashtra (Santapau, 1953; Almeida, 1990; Almeida 1996; N.P Singh and Karthikeyan, 2000), Flora of Maharashtra (Singh, 2000a; Singh et al, 2000b), Hooker (1903), Patil, (2003), Naik (1998), etc

ENUMERATION

1. Botanical Name: *Achyranthes aspera* Linn.

Family: Amaranthaceae,

Local Name: Aghada

Plant part used: Leaf

Ethnobotanical Uses: Leaf extract in water along with common salt (NaCl) is applied externally in order to cure pain from scorpion stings.

2. Botanical Name: *Adhatodavasica* Nees.

Family: Acanthaceae,

Local Name: Adulsa

Plant part used: Ethnobotanical Uses: Leaf juice is consumed as cough syrup twice for 2-3 days to cure throat infection.

3. Botanical Name: *Abrus precatorius* Linn.

Family: Fabaceae,

Local Name: Gunj

Plant part used: Leaf

Ethnobotanical Uses: Leaves are eaten as raw in smoothening of throat prior to singing songs.

4. **Botanical Name:** *Actinopteris radiata* (Sw.) Link.
Family: Polypodiaceae,
Local Name: Dagad-Chatri
Plant part used: Leaf
Ethnobotanical Uses: 6-9 fresh leaves are crushed in half cup of water and filtrate obtained is taken orally along with 1 tsp sugar against mouth ulcer.
5. **Botanical Name:** *Ailanthus excelsa* Roxb.
Family: Simaroubaceae,
Local Name: Maharukh
Plant part used: Stem bark
Ethnobotanical Uses: Fresh bark pieces are crushed in cup of water and taken orally along with honey twice for 2-3 days.
6. **Botanical Name:** *Aristolochiabracteata* Lamk.
Family: Aristolochiaceae,
Local Name: Aswali
Plant part used: Leaf
Ethnobotanical Uses: Leaf extract is consumed 1-2 times in a day for expel of intestinal worms
7. **Botanical Name:** *Asparagus racemosus* Willd.
Family: Liliaceae,
Local Name: Shatavari
Plant part used: Root
Ethnobotanical Uses: Dried root powder is given to cattle for improving lactation quality and duration.

- 8. Botanical Name: *Aervalanata***
Family: *Amaranthaceae*,
Local Name: Kapuri
Plant part used: Whole plant
Ethnobotanical Uses: Whole plant juice taken to cure cough.
- 9. Botanical Name: *Allium cepa***
Family: Liliaceae,
Local Name: Kanda
Plant part used: Bulb
Ethnobotanical Uses: Juice of bulb is used in cough.
- 10. Botanical Name: *Alstoniascholaris***
Family: Apocynaceae
Local Name: Satvin
Plant part used: Stem bark
Ethnobotanical Uses: Juice made from bark is used in fever.
- 11. Botanical Name: *Amranthus spinosus***
Family: Amaranthanaceae,
Local Name: Kante-math
Plant part used: Whole plant
Ethnobotanical Uses: Plant juice used in fever.
- 12. Botanical Name: *Biophytumsensitivum***
Family: Oxalidaceae
Local Name: Lajalu
Plant part used: Leaves
Ethnobotanical Uses: 10-15 gms of leaves ground with few seeds of *Piper nigrum* .Two spoon of juice daily twice for 10 days

- 13. Botanical Name: *Balanitesaegyptiaca* (Linn.)Diels.**
Family:Balanitaceae,
Local Name: Hingani
Plant part used: Fruit
Ethnobotanical Uses: Pulp from 3-4 fresh fruits is mixed in a bucket containing about one litre of water and used for cleaning the clothes.
- 14. Botanical Name: *Boerhaaviadiffusa* Linn.**
Family: Nyctaginaceae,
Local Name: Punarnawa
Plant part used: Leaf
Ethnobotanical Uses: 3-4 fresh leaves are eaten as a raw along with Adrak against urinary tract infection.
- 15. Botanical Name: *Butea monosperma* (Lamk.) Taub.**
Family: Fabaceae,
Local Name: Palas
Plant part used: Flower petals
Ethnobotanical Uses: Flowers petal extract in water is used as dye for coloration of clothes during Holi and Rang-Panchami festival.
- 16. Botanical Name: *Cassia siamea*,Lamk.**
Family: Fabaceae,
Local Name:Kashid
Plant part used: Stem
Ethnobotanical Uses: Agricultural implements are prepared from the wood of same plant.
- 17. Botanical Name: *Cuscutareflexa*, Roxb.**
Family: Convolvulaceae,
Local Name:Amarvel

Plant part used: Stem

Ethnobotanical Uses: Fresh stem bark (about 2-3gm) is crushed in goat milk and taken orally for expel out the tapeworms.

18. Botanical Name: *Cynodondactylon* (L.)Pers.

Family: Poaceae,

Local Name:Harali

Plant part used: Stem and leaves

Ethnobotanical Uses: Fresh stem and leaves are crushed in cup of water and consumed orally to get relief from dysentery and diarrhoea.

19. Botanical Name: *Cinnamonaunzeylanicum*

Family: Lauraceae,

Local Name: Dalchini

Plant part used: Stem bark

Ethnobotanical Uses: The decoction of stem bark is taken internally to cure cough.

20. Botanical Name: *Citrus aurantifolia*

Family: Rutaceae

Local Name: Narangi

Plant part used: Leaves

Ethnobotanical Uses: Decoction of leaves is used to cure cold.

21. Botanical Name: *Coccinea indica*.

Family: Cucurbitaceae

Local Name: Tondli

Plant part used: Leaves and fruit

Ethnobotanical Uses: Taken young leaves vegetable to cure fever. And fruit is used in mouth ulcers.

- 22. Botanical Name: *Clerodendrum inerme***
Family: Verbanaceae
Local Name: Vanjai
Plant part used: Leaves
Ethnobotanical Uses: Leaves ground in water and the juice is taken orally to treat fever.
- 23. Botanical Name: *Coleus aromaticus***
Family: Lamiaceae
Local Name: Patherarchur
Plant part used: Leaves
Ethnobotanical Uses: leaves juice is used to cure cough.
- 24. Botanical Name: *Costus speciosus***
Family: Costaceae
Local Name: Kosht
Plant part used: Rhizome
Ethnobotanical Uses: Juice of rhizome is taken in fever.
- 25. Botanical Name: *Coriandrum sativum***
Family: Umbelliferae
Local Name: Dhane
Plant part used: Leaves
Ethnobotanical Uses: Juice of herb is used in fever.
- 26. Botanical Name: *Cleome gynandra*, Linn.**
Family: Capparidaceae,
Local Name: Pandhari Tilwan
Plant part used: Seeds
Ethnobotanical Uses: Seeds are crushed in coconut oil and are used as anthelmintic
-

- 27. Botanical Name: *Dilleniaindica*.**
Family: Dilleniaceae
Local Name: Karmal
Plant part used: fruit
Ethnobotanical Uses: Fruit juice with sugar and water is useful in fever.
- 28. Botanical Name: *Ecliptaprostrata* (L.) Linn.**
Family: Asteraceae,
Local Name: Bhringraj
Plant part used: Seed
Ethnobotanical Uses: Seed are soaked in warm coconut oil for 12 – 18 hours and applied externally on hairs for attaining maximum strength.
- 29. Botanical Name: *Erythrina variegata***
Family:Fabaceae
Local Name:Pangara
Plant part used: Stem bark.
Ethnobotanical Uses: Bark juice is taken in fever.
- 30. Botanical Name: *Euphorbia pulcherrima*,Willd.**
Family:Euphorbiaceae,
Local Name: Lal-Dudhi
Plant part used: Leaf
Ethnobotanical Uses: Leaf latex is used curing urinogenital disorders.
- 31. Botanical Name: *Helitropiumindicum*.**
Family: Boraginaceae
Local Name:Bhurunda
Plant part used: Leaves
Ethnobotanical Uses: Leaves decoction used in fever and cough.
-

32. Botanical Name: *Jatropha gossypifolia* Linn.

Family:Euphorbiaceae,

Local Name: ParshiErand

Plant part used: Seed

Ethnobotanical Uses: Seeds are crushed in oil meal along with coconut and consumed orally (about 1 tsp) by the elders in order to cure dysentery.

33. Botanical Name:*Lawsoniainnermis*

Family: Lythraceae

Local Name: Mehandi

Plant part used: Leaves

Ethnobotanical Uses: Leaves are used in cough.

34. Botanical Name: *Leucas aspera*

Family:Lamiaceae

Local Name: Seetadron

Plant part used: Leaves

Ethnobotanical Uses:Young leaves juicein fever and a bunch of leaves is boiled and vapour is inhaled to cure fever and asthma.

35. Botanical Name: *Mentha longifolia*

Family: Lamiaceae,

Local Name: Junglee pudina

Plant part used: Whole plant

Ethnobotanical Uses: Infusion of whole plant is used in fever, cold.and cough.

36. Botanical Name: *Morus alba*

Family:Moraceae

Local Name: Tut

Plant part used: Leaves

Ethnobotanical Uses: Leaves are used in cold.

37. Botanical Name:*Oscimum sanctum*

Family: Lamiaceae

Local Name: Tulsi

Plant part used: Leaves

Ethnobotanical Uses: Juice of young leaves to cure cough and cold. Dried powder with honey is used to cure dry cough, Leaves are crushed with onion bulb and the juice is taken orally to treat cough and cold.

38. Botanical Name: *Phyllanthus fraternus Webster*

Family: Euphorbiaceae,

Local Name: BhuiAwla

Plant part used: Whole aerial plant part

Ethnobotanical Uses: Whole aerial plant parts i.e. stem and leaves are eaten as a raw are taken orally along with sucrose to cure jaundice

39. Botanical Name:*Phyllanthusemblica*

Family:Euphorbiaceae

Local Name:Awala

Plant part used: Fruit

Ethnobotanical Uses: Fruit powder is mixed with milk of cow and goat and taken orally to treat cough and cold.

40. Botanical Name: *Quisqualisindica*

Family:Combretaceae

Local Name: Lalchameli

Plant part used: Seeds

Ethnobotanical Uses: Ripe seeds are roasted and given in fever.

- 41. Botanical Name:** *Tephrosia purpurea* Pers.
Family: Fabaceae,
Local Name: Shurp-nakha
Plant part used: Root
Ethnobotanical Uses: Root decoction in warm water is used against toothache effectively
- 42. Botanical Name:** *Tinospora cordifolia* Miers
Family: Menispermaceae,
Local Name: Gulwel
Plant part used: Stem
Ethnobotanical Uses: Fresh stem and leaf extract is used against malaria fever.
- 43. Botanical Name:** *Tribulus terrestris* Linn.
Family: Zygophyllaceae,
Local Name: Sarata
Plant part used: Leaf and young stem
Ethnobotanical Uses: Plant leaves and tender stem segments are eaten as a raw in order to cure urinary and kidney troubles
- 44. Botanical Name:** *Vernonia cineraria*, Linn..
Family: Asteraceae,
Local Name: Shahadevi
Plant part used: Leaf
Ethnobotanical Uses: 3-4 Fresh leaves are crushed in a cup of water and the filtrate obtained is taken twice a day for 5-7 days along with jire in order to get relief from piles
- 45. Botanical Name:** *Vitex negundo*
Family: Verbenaceae,
Local Name: Nirgudi
-

Plant part used: Leaf

Ethnobotanical Uses: Leaves are soaked in cow dung, Jaggery and human urine for 3-4 days and spread over vegetable crops as an insecticide.

46. Botanical Name: *Withaniasomnifera*

Family: Solanaceae,

Local Name: Dhor-Gunj

Plant part used: Root tubers

Ethnobotanical Uses: Root tubers are eaten as a raw along with khajur in order to achieve muscular strength.

47. Botanical Name: *Zingiber officinale*

Family:Zingiberaceae

Local Name: Adrak

Plant part used: Rhizome

Ethnobotanical Uses: Rhizome tea is used for cough cold and fever.

48. Botanical Name: *Zizipusjujuba*

Family: Zingiberaceae

Local Name:Bor

Plant part used: Fruit

Ethnobotanical Uses: The decoction of dried fruits is given to cure cold cough and fever.

RESULTS AND DISCUSSION

In all total 48 plant species under 33 families have been reported. These plants are consumed by the rural peoples in cure of certain human ailments. Out of these plant species, *Actinopteris radiata* (Dagad-Chatrī) belongs to Pteridophytes group, while all other plant species belong to Angiosperms group families. Few plants of this locality possess potential of better

economic exploitation. Some of the important plant species among them are *Achyranthes aspera* (Aghada), *Adhatodavasica* (Adulsa), *Aristolochiabracteata* (Gindhan), *Asparagus racemosus* (Shatavari), *Boerhaaviadiffusa* (Punarnawa), *Butea monosperma* (Palas), *Ecliptaprostrata* (Bhringraj), *Euphorbia pulcherrima* (Lal-dudhi), *Phyllanthus fraternus* (Bhui-amla), *Vitex negundo* (Nirgudi) and *Withaniasomnifera* (Dhor-gunj). Since all these plant species were used in more or less proportion throughout the world by the man, for completing his basic need, it is our prime duty protect and conserve and maintain them in a proper way for future use.

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CHAPTER -12

Mosquito Larvicidal And Chemosterilant Activity of Flavonoids of Annona Squamosa



Dr. Jyoti Uikey

ABSTRACT

The flavonoids isolated from *Annona squamosa* at 4 different concentrations ranging from 22 to 50 ppm showed considerable reduction in the growth index of the *Culex quinquefasciatus*. It was also noticed that the isolated compound showed 86% mortality within 24 hrs duration at 50 ppm concentration. When these concentrations were applied on the larval treated adult mosquitoes, it was noticed that fecundity and fertility were found to be affected adversely in the insect group consisting of treated females. Percentage of fertility and metamorphosis of the insect were also found to be affected.

KEYWORDS

Chemosterilant, Fecundity, Fertility, Flavonoids, Annona.

INTRODUCTION

The mounting concern in recent years about the use of chemical pesticides to control pest of public health importance has led to the restrictions in many cases to complete ban. Therefore, efforts have been made to develop and encourage the use of ecofriendly insecticides that pose minimum risk to the man and environment. Botanical insecticidal and relents are less persistence in ecosystem and have minimum mammalian toxicity and are relatively safe. Suryadevara and Khanam (2002) have reported the mosquito larvicidal activity in three Indian medicinal plants which gave LC_{50} value of 0.072 in *Acorus calamus*. Latha *et al.* (1999) have reported the mosquito larvicidal activity in plants of which two plants *Piper longum* and *Zingiverwhgtiamum* were found to be quite effective against early fourth instar larvae. Sharma (1996) and Saxena *et al.* (1993) have reported the larvicidal, Ovicidal and growth disrupting activity of *Spheranthus indicus* and *Annona squamosa* extract. Supavaran *et al.* (1974) have reported biologically active plant extract for mosquito control. Sharma and Saxena (1994) have reported the loss of fecundity and fertility by *Spheranthus indicus* plant extract. Similarly Sukumaran *et al* (1994) have reported the anatijuvenile hormone activity in plant extracts. Recently, a serious mosquito borne epidemic Chikungunya has gained momentum in India. Due to lack of awareness toxicity of synthetic insecticides and bioaccumulation and malignancy in non target organism have led to the new methods for vector control by using plant insecticides.

Madhumathy *et al.* (2007) have isolated Capasaicin active principle from a plant *Capsicum annum* as mosquito larvicidal compound. Looking to the importance of botanical pesticides. It was proposed to investigate the larvicidal and Chemosterilent activity in analkaloid compound from *Annona squamosa* of family Annonaceae against filarial vector.

MATERIAL AND METHOD

(i) Preparation of alkaloids from plant extract: *Annona squamosa* of family Annonaceae. Which is known as sitaphal in Hindi have been identified in botany department of the institute. Plant leaves are procured in herbarium sheet at serial number 5. The chopped leaves of the plant were shade at room defatted with petroleum ether in Soxhlet apparatus and alkaloids were extracted as per method reported by Harborne (1984). A known quantity of powdered material was extracted with hot acidulated (HCl) water until the alkaloids were completely removed. The acidulated solution was cooled with ice and treated with petroleum ether for the removal of oily substance. The solution was then neutralized with caustic soda, filtered and extract was then concentrated and acidulated with dilute HCL (2N). From this solution the total alkaloids were precipitated with caustic soda. The alkaloids thus obtained were used for the experimental bioassay. 1% stock solution of the compound was prepared in the acetone.

(ii) Test Insects: Laboratory colonized *Culex quinquefasciatus* second and fourth instar larvae were used for the experimental purpose. Larval bioassay was conducted according to standard WHO procedure (1981). Different concentrations ranging from 20 to 50 ppm were used. 1ml of each concentration was mixed thoroughly with 249ml of tap water in 500ml glass beakers. 25 second and early fourth instar larvae were taken in each test concentration. The treatment was observed at 24hrs period and mortality was corrected according to Abbott formula (1925).

Fecundity and fertility experiment was conducted by taking equal number of male and female mosquitoes which have emerged from the treated and untreated sets and mated in cases which were placed into following groups.

1. Treated females with treated males.

2. Treated females with untreated males.
3. Untreated females with treated males.
4. Untreated females with untreated males.

(iii) Statistical analysis: Sterility index and growth index were calculated by following formula:

$$\text{Sterility index} = \frac{\text{Treated no. of eggs} \times \text{Percentage no. eggs hatched}}{\text{Control no. of eggs} \times \text{Percentage of hatched}}$$

$$\text{Growth index} = \frac{\text{Adult emergence}}{\text{Average development period}}$$

Analysis of data was carried out by applying probit analysis method (Finney, 1971).

RESULTS AND DISCUSSION

The plant alkaloids applied in present study against II and IV instar of *Culex quinquefasciatus* showed 24hrs LC₅₀ value as 44.26 and 38.82 ppm and second and fourth instar larvae respectively. This shows that the compound was more toxic to the IV instar than the second instar larva.

The treatment of second instar larvae also indicates that alkaloid compound of this plant possess growth inhibitory activity. When this extract was applied at concentration 20 to 50 ppm to the second instar larvae, it causes 32 to 66% mortality; pupal mortality was 5 to 20%. Due to high mortality at larval and pupal stage a fall in vector population was noticed. The increase in the average development period was also observed. The growth index of the treated mosquito was found to be significantly different ($P < 0.05$) as shown in Table.1.

MOSQUITO LARVICIDAL AND CHEMOSTERILANT ACTIVITY OF FLAVONOIDS

Results on fecundity and fertility of the treated mosquitoes and effects on subsequent larval stage have been presented in Table 2. It was noticed that the eggs obtained from the treated group were not compactly as against the normal eggs laid by the females.

Table:1 Effect of column purified fraction of acetone extract of *Annona squamosa* on development, moulting and metamorphosis of *Culex quinquefasciatus*.

Conc. (ppm)	Larval Mortality (%)	Av. Larval Period (days)	Pupal Mortality (%)	Av. Pupal mortality (days)	Adult Emergence (%)	Av. Development period	Total Mortality	Growth Index (a/b)
20	32	16	5	2.5	63	18.5	37	3.4
30	40	16	14	2.5	46	18.5	54	2.4
40	48	16	16	3.0	36	11.5	64	*1.8
50	66	17	20	3.0	24	20.2	86	*1.2
Control	04	14.5	04	2.5	96	17.0	08	5.6
Untreated	00	15	04	2.5	96	17.5	04	5.4

25 second instars larval were treated with each concentration in an average of four replicates.

*Growth index was significantly different from that for the control and untreated groups ($P < 0.05$)

Fertility of the eggs of the treated groups also falls considerably. Thus exhibiting effect on adult emergence. Some juvenommetic effect was also noticed in treated group. It is quite apparent that the alkaloid compound of *Annona squamosa* shows not only the larvicidal activity but also the growth inhibitory as well as loss in fecundity and fertility. The detailed alkaloid principal is under the process and will be reported latter on.

Table:2 Effect of column purified fraction of acetone extract of *Annona squamosa* on the fecundity and fertility of adults of *Culex quinquefasciatus* treated as larvae.

Treated Group	Percentage of Insect dies	Total no of egg rafts and Av. No. of eggs percentage	%eggs hatched	Effect upon Metamorphosis		
				%LM	%Pupation	%AE
Treated female× treated male	46.8	2.930	67.3	48.0	52.0	39
Treated female× untreated male	39.0	3.110	70.0	42.4	57.6	45
Untreated female× treated male	24.9	5.116	80.5	25.6	74.4	68
Untreated female× untreated male	10.5	8.230	94.0	2.0	98.0	86

LM= Larval Mortality, AE= Adult emergence.

Equal number of adults were taken which emerged from treated larval, i, e. 25 were mated in all the treated groups.

In our previous study of the *Annona squamosa* alkaloids against *Anopheles* species effective concentration found was 178 and 126 ppm for second and fourth instar larvae. The results of the present study showing less LC₅₀ value for *Culex quinquefasciatus* may be due to the purified alkaloid compound, which was not carried out previously.

Saxena *et al.* (1992) have reported an anti-juvenile hormone activity of indigenous plants to *Culex quinquefasciatus* where the plant extract caused precocious metamorphosis. This, results suggest the use of alkaloid compound for the vector control on commercial scale.

Toxic effect of plant derived compound on mosquito development was examined by Spicimen and Skaff (1967). The prolongation of the larval development period and decreased in

growth in growth in *Culex quinquefasciatus* by *Annona squamosa* extract was found to be quite similar as observed by previous worker like Supavaran et al maximum to 1.2 n 15 ppm concentrations. This was against 5.64 growth index noticed in the control. Beside this the total number of eggs hatched has also been found to be reduced significantly in the group of insects consisting treated female and treated male. Beside the reduction of growth index several morphological abrasions in the treated larvae such as darkening of the larval cuticle, larval interval pupation and half ecdysis adult were also seen. Similarly, development defect were also observed by Saxena & Sumithra (1988) and Sharma & Saxena (1994). The results therefore suggest the growth inhibiting activity in *Annona squamosa* extract along with larvicidal activity.

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CHAPTER-13

Review of Ethnomedicinal Plants



Dr.Mukta Saxena

ABSTRACT

The World Health Organization (WHO) has estimated that as many as 80% of the world population is dependent on the traditional medicine for their primary health needs. People living in developing countries rely quite effectively on traditional medicine for primary health care. The art of herbal treatment has very deep root in Indian culture. India is repository of medicinal plants.

INTRODUCTION

Ethnomedicinal plants are plants that have a recognized medical use. These refer to using a plant's seeds, berries, roots, leaves, bark or flowers for medicinal purpose. Ethnomedicines are one of the oldest forms of medical treatment in human history and could be considered one of the forerunners of the modern pharmaceutical trade. India is one of the few countries where almost all the known medicinal plants can be cultivated in some part of the country or other. This is an age-old well-known industry manufacturing plant-based drugs in traditional systems

of medicine such as Ayurveda, Siddha, Homeopathy etc. Treatment with medicinal plants is considered very safe as there is no or minimum side effects and is independent of any age groups and the sexes.

We are gifted with an eminent immune system that is designed specially to keep us fit and fine but sometimes it fails and the germs attack strongly and make us sick. Food plays a major role in Ayurvedic practice by supporting the body's healing processes. Metabolic diseases and diseases of the gastrointestinal tract are directly influenced by the food. It can also indirectly affect diseases of skin, muscles, and joints as well as neurological, gynecological, and psychological diseases.

Ethnomedicines that are also known as traditional medicines are as follows:

1. TULSI

- Blood purifier
- Preventive against malaria & dengue fever.
- Chewing tulsi leaves relieves cold & flu.
- Chewing 12 leaves of basil, twice a day prevent stress.
- The leaves are a nerve tonic & also sharpen memory.
- Decoction of the leaves + honey + ginger effective remedy for bronchitis, asthma, influenza, cough and cold juice of basil leaves + honey (if taken regularly for 6 months) expel renal stone via the urinary tract.

2. NEEM

- Neem inhibits allergic reactions when applied externally or eaten.
- Oral doses of neem leaf extracts.
- Reduced insulin requirements by between 30% and 50% for diabetes.

- Neem extracts give significant protection from discomfort and speed the healing of gastric problems
- Neem quickly kills external parasites and a neem decoction is safer and just as effective as standard treatments for head lice and scabies.

3. **ALOE-VERA** (Gritkumari)

- Green leaves contain aloe gel and a sticky yellow residue called latex.
- Burn healing.
- Wound healing.
- Treat Sunburn.
- Radiation-induced skin reactions.
- Aloe with conditioner for silkier, smoother hair.
- Take orally to reduce cholesterol and triglycerides for a healthy heart.

4. **BHRINGARAJ**

- The main herb for the hair care and cirrhosis.
- Works to rejuvenate kidneys and liver. As oil, it treats graying and balding, makes the hair darker, and promotes deep sleep. It also improves complexion.
- The root powder is used for treating hepatitis, enlarged spleen and skin disorders.
- Anti-inflammatory properties, the herb is also used for treating hyperacidity.

5. **TURMERIC**

- Stimulate digestion
- Boost liver function
- Curcumin a means of reducing breast cancer risk among women

- When paired with vitamin D, curcumin may help protect against Alzheimer’s disease
- Curcumin can protect against liver damage.

6. GINGER

- stomach-soothing effects
- easing post-surgery nausea and vomiting
- Sipping ginger tea can help calm an upset stomach, as well as ease congestion when you’ve got a cold.
- ginger extract may slow the growth of colorectal and ovarian cancer cells.
- useful in treating chronic inflammation because it partially inhibits two important enzymes that play a role in inflammation gone away — cyclooxygenase (COX) and 5-lipoxygenase (LOX).

7. AMLA

- To stimulate appetite (Use pickles and preserves made from the green fruits)
- For hemorrhage, diarrhea and dysentery
- Seed fried in ghee and ground in conjee is applied as Lep to the forehead to stop bleeding from the nose.
- For hiccup and for painful respiration Use juice or extract of the fruit combined with honey and pipili
- Due to vitamin C and polyphenols, is a antioxidant.
- Benefits heart, eyes, and brain

8. LAVENDER

- using unsweetened tea as a hair rinse to help reduce hair loss and dandruff.

- using the dried flowers in sleep and dream pillows, in potpourris, sachets and tucked in drawers to freshen clothing and repel moths.
- putting a few drops of oil into warm bath water for a refreshing and relaxing treat.
- the stems with the leaves stripped can be burned like an incense stick and can also be used in crafts such as basket weaving and making lavender wands.
- A rub down of lavender oil before retiring to bed has been used to relieve night-time leg muscles spasms. A few drops of oil rubbed into the skin has been used traditionally to ease neuralgic pain.
- The straw – stems of dried lavender – have been burned in bundles as a deodorant and disinfectant in sick rooms.

9. BRAHMI

- Anxiety (studies suggest as effective as benzodiazepine drugs), neuroses, irritability and insomnia associated with stress.
- Study, poor memory and concentration, work- related mental fatigue.
- Poor brain function after head trauma.
- Asthma and bronchial spasm and/or inflammation.
- possess anticancer activity.

10. BEAL

- Gastroprotection properties.
- Control of diabetes.
- Cholesterol control.
- Antimicrobial properties.

- Anti-inflammatory properties:
- Constipation
- Dysentery and diarrhea.

BENEFITS

- They cost less – the rising cost of prescription drugs have led the people to look for alternatives. While medicinal herbs may not be as strong or as fast acting as conventional medicine, there is a growing body of scientific evidence that shows their efficacy and in what doses.
- They may have fewer side effects: while the side effects of any herbal medication depend on the drug in question, many have fewer side effects than conventional medicine.
- There is a choice on how to use them – medicinal herbs can be used in a variety of ways, depending on the kind of herb that is to be used. Some herbs can be mixed with food. Some can be made into tea, and there are some that are available in capsule or tablet form.
- They are good for more than one condition – most prescriptive drugs are designed for one specific health problem. By contrast, many herbal medicine acts on several parts of the body at once.

Advantages -Ethnomedicines have following advantages:

- With the growing interest in health and wellness, alternative medicines are becoming increasingly popular worldwide.
- Also, with the increasing prices of prescription medicine, herbal medicines are often cheaper than their conventional medicine counterparts.
- In addition, a growing body of scientific research shows that herbal medicines can be highly effective for certain diseases and conditions. Moreover, as research in this area increases,

the optimum doses for herbal medicines are known to ever greater accuracy.

CONCLUSION

Medicinal herbs can be a good alternative for many diseases and conditions. They are low cost, and tend to have fewer side effects. Moreover, they can be bought in health food shops, pharmacies and on-line without the need for a prescription. However, herbal medicines can still have unwanted health effects, especially when used in combination with other drugs. If you are using more than one herbal medicine, or using them for a serious condition, it's best to consult with a naturopath or established herbalist. It's also important to tell your physician that you are using an alternative medicine to prevent drug interaction.

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CHAPTER-14

Body weight and morphometric studies on honeybees *Apis Cerana Indica*



Dr. Dinesh Prasad Patel

ABSTRACT

In this study body weight and morphometrics characters of the honeybees *A. cerana indica* were studied in Rewa, M.P., India. The studies on selected characters of the species were studied. A total of 125 bees were collected and measurements were observed, body length, tongue length, forewing length, forewing width, number of wings hooks width of hind metatarsus and length of leg were studied. The average weight of the *A. cerana indica* as 54.9 mg. The morphometrics measurements indicated a higher value for the Indian hive bee *A. cerana indica*.

KEYWORDS

Body weight, honeybees, morphometrics and *A. cerana indica*

INTRODUCTION

Honeybees belong to the family Apidae in which other types of social bees are also included. The sub family Apidae comprises single genus, *Apis*. The genus *Apis* comprises *A. florea* (the little

bee), *Apis dorsata* (the giant bee), *Apis cerana* (the eastern bee) and *Apis mellifera* (the western bee). The bees are able to regulate high temperature they are able to survive in temperate as well as tropical countries resulting in many geographic subspecies in each type. The bees originally evolved from hunting wasps during cretaceous period, 146 million years ago. At the time of evolution of honeybees, flowering plants also evolved. Nowadays, several sub species of the honeybees have been recognized and only in recent years, a comprehensive classification has been attempted based on differences in physical characters and their distribution between sub species (Ruttner F et al., 1929, Singh MP et al., 1900, Kastberger G. et al., 2009).

The dwarf bee or the little bee *A. florea* has been distinguished from *Apis cerana* and reniforms by morphometric studies (Radloff et al., 2005). It is important to identify and insect of locality up to subspecies level for a better understanding of its biology. Morphometric studies involving characters of wings and legs of honeybees provided comparison of allied species as suggested by Verma et al., 1995. The well being of a honeybee colony is possible only if annual biological cycle is well adjusted to ecological parameters influencing it. Besides geographic variability, seasonal variations also influence the different morphological features of honeybee (Ruttner F et al., 1929, Andrzej Oleksa, Adam To Iski. 2015).

Bees are important pollinators and are widely known throughout the globe for pollination services they deliver. Bess is a dominant family found mainly under subtropical and sub-temperate regions in India (Avinashchauhan, et al. 2016). Morphometrics has been used widely for identifying honey bees populations, is simple and much more effective than standard morphometrics in discrimination or identification of honey bee

populations in the world (Andrzej Oleksa, et al. 2015 and Kandemir I, Özkan A. 2015). Hence, the present study was undertaken the morphological features of the co-existing honeybees species viz., *A. ceranaindicain* Rewa District, M.P., India.

MATERIALS AND METHODS

The test species were collected from the field, while foraging for nectar and pollen. Once a bee was located, it was capture using a sweep net and carefully transferred into a glass container, without any damage to their body parts. After transferring 10-15 bees, the container was kept in freezer for 5 minutes to immobilize the bees. Each bee was observed using a hand lens for any damage on the parts that were measured and each bee was weighted. One hundred twenty five individuals of *A. ceranaindicawere* measured respectively.

All the parts to be measured were carefully taken out and placed on a clean slide for measurement. All measurements were recorded under stereomicroscope equipped with an ocular micrometer. Total measurements recorded on seven characters were pertaining to body length, tongue length, forewing length, forewing width, number of wings hooks, width of hind metatarsus and length of leg. These measurements were recorded as per the methods followed by Mattu and Verma (1984) and Dayal and Rana (2007) with some modifications.

RESULT AND DISCUSSIONS

The mean of *A. ceranaindicawith* a body weight of 54.96 ± 9.8 there was a wide variation in the weight of the species measured in species since the minimum and maximum body weight were 38 and 75 mg for *A. ceranaindicarespectively*. Wells and Wells (1985) proved that the honeybees could carry a nectar load almost equal to its body weight. Since the bees were collected in the foraging area, there is possibility that the weight recorded for individual bees could also be due to the nectar load in their honey

stomach. Higher body weight as well as the wide variations observed in the body weight of bees was also due to varied state of feeding among the bees.

The length of species was in accordance to their body weight with the mean *A. ceranaindica* with a mean body length of 10.84 ± 0.41 . The body length of *A. ceranaindica* was within the size range reported for the plain variety of *A. ceranaindica* (Mishra RC et al., 1988) and was lesser than the body length of hill variety. The tongue length of species indicated their adaptations to feed nectar of specific plants suitable to their proboscis length. *A. ceranaindica* the tongue length of 2.67 ± 0.41 , accordingly their flower preference also varied. The nectar sources of *A. ceranaindica* has been identified as many Shrubs and trees, e.g, *Datura* with flowers of long corolla tube.

The wing characteristics also showed variations between the species. The length of forewing *A. ceranaindica* were 8.00 ± 0.00 respectively. The little bees being smaller in size has a flying range of few meters for foraging whereas the maximum foraging range of *A. ceranaindica* was few kilometers. Accordingly, the wing size was also adapted in both species.

One of the features measured for subspecies identification is the number of wing hooks (Mattu VK, Verma LR. 1984). In the present result was also In accordance with the findings with the findings (Rinderer TE et al., 1997). The number of wing hooks in *A. ceranaindica* was 17.44 ± 1.17 , which resembled the description given for the plain type as presented by Verma (1994). The wing hooks were more in *A. ceranaindica*.

The hind leg characters such as width of metatarsus and the length of the leg play a vital role in pollen carrying capacity of the honeybees. The width of the metatarsus has been studied in the identification of species. The width of metatarsus decides the quantity of pollen to be brushed from the body parts before

packing into the pollen press. The width of metatarsus of *A. ceranaindicacould* make a pollen pellet of 12 mg the length of hind leg in both species varied according to the differences in other morphomeric features studied. The length of hind leg of *A. ceranaindicawas* 9.00 ± 0.00 , indicating the ability of the latter species to crawl over the petals of larger flowers while feeding on the nectar.

The results of this study clearly showed that measurements of size and angle characters can be sufficient to identify or discriminate honey bee populations Wing shape likely driven by: (1) environmental pressures such as latitude Alpatov WW. 1929, altitude (Hepburn HR, 2000) and climate (Radloff SE et al., 2005, Hepburn HR 2001 Tan K, 2008), (2) sexual selection Kastberger G 2009 abiotic factors such as temperature (Soose E. 1954) and season Mattu VK, Verma LR. 1984). Farshinehet *al.*, (2007) compared *A. mellifera meda* populations of Iran (Orumieh, Tbriz, and Tehran) with populations in different zones of Turkey (Kiseher and Beypazari) and *A. mellifera carnica* of northern Turkey. They found that honeybee populations in Iran were smaller than honeybee populations in Turkey. Morphometrics has been used widely for identifying honey bees populations. Morphometric identification techniques have improved considerably due to new computational techniques (Francoy TM et al., 2008). The results of this study clearly showed that measurements of size and angle characters can be sufficient to identify or discriminate honey bee populations and adaptation of characters.

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CHAPTER-15

Ethnomedicinal Plants use For Immunity Boosting By Tribes Of Vidisha District.



**Dr. Sarita Ghanghat
&
Dr. Mani Mohan Mehta**

ABSTRACT

Vidisha district is rich in ethnomedicinal plants in the present paper 24 plant species belonging to 20 families used in folk medicine have been documented due to poor condition of morder health care facilities and poverty indigenous people of the district fully or partially depend on local medicinal knowledge from the tribes and Vaidya's group Vidisha district on the treatment of various disease enumerated.

KEYWORDS

Ethno medicinal, plants, Vidisha,district, traditional knowledge.

INTRODUCTION

Vidisha district is one of the most important and centrally located district of M.P. The total area of the district is about 7,433sq K.M. which lies between 23°21'and 24°22'N latitude and 77°15.30'and 78°18'E longitude forming eastern part of Malwa region. The forest cover is about two fifth of the total area in the district. (fig.1).



(fig.1)

Vidisha district is inhabited by tribals like Shariya, Bhil, Meena. The area is very rich in indigenous ethno-medicinal plants. These are collected by local inhabitant for the preparation of medicines. Perusal of literature (Ghangat and Sahu 2006,) revealed that no specific study on ethno-medicinal uses of plants in Vidisha district has been carried out.

In India medicinal plants have been used to treat different kinds of disease. Where is an increasing desire to unravel the role of ethnomedicinal botanical studies in therapy the centuries old additional folk knowledge as well as in searching new plant resources of food drugs etc. (Jain 1987, 1991)

Indian traditional medicine is based on different system such

as Ayurveda Siddharth and Unani used by various communities (gadgil 1996).

People preparing medicines from there available species of plants which are used to treat common disease the tribes of India have reserve a large bulk of traditional knowledge of medicinal uses of plants. Growing around them. Knowledge is handed down 2 generation chord mouth and extensively used for the treatment of common disease and condition. Medicinal plants have always been the principle source of medicine in India. Since ancient past and presently they are becoming popular.

There has there has been a rapid extension of allopathic system off medical treatment in our country during the past century. (Dwivedi et .al. 2007).

MATERIAL AND METHODS

In the present study several field trip where under taken in different reasons of the study area during the year 2019-20 in collect information on medicinal plants the collected herbal plants were identified up to genus level from flora of Bhopal. (M.Oomachan); persons possessing the information about the medicinal plants. The data were collected by discussion, observation and cross checking at different places among the rural people.

In the enumeration all the medicinal use have been mention under the corresponding plant name that have arranged alphabetically the correct botanical name is followed by family name within parentheses, local name medicinal uses locality from where information was secured.

RESULT AND OBSERVATIONS

The plant parts used for medical preparation were bark, flowers, rhizomes, root, leaves, seeds, and whole plants ,The paper present a brief account of the uses of various ethno-

medicinal plants parts against the diseases, like skin diseases , jaundice, asthma, bronchitis, diabetes, snakebite, cough and cold diseases by the people of Vidisha district.the plants are arranged alphabetically each by its botanical name scientific name followed by name of the family and local names the medicinal uses are described with the details of part used table 1

Table -1 Use of different plant species by the tribes and rural of Vidisha district.

S.No	Botanical Name	Family	Local Name	Habitat	Plant part Used	Name of Disease
1	<i>Achyranthus aspera</i> L.	Amaranthaceae	Chircita	Shrubs	Seeds, Leaves	bleeding of wounds. Purgative
2	<i>Adohatodavasi ca</i> Nees.	Acanthaceae	Basa or Adusa	Shrubs	Root, Leaves and Flower	Cough and Cold
3	<i>Aegle marmelos</i> L.	Rutaceae	Bel	Tree	Fruit	Diuretic,Laxative
4	<i>Aloe vera</i> L	Liliaceae	Ghee Kumar	Herbs	Leaf, Pulp	Stomachic Pain
5	<i>Argemone mexicana</i> L.	Papaveraceae	Pilikateli	Herbs	Seeds, Roots.	Diuretic
6	<i>Asparagus racemosus</i> willd	Liliaceae	Satavar	Climber	Roots. Leaves	Root powder as tonic. Aphrodisiac
7	<i>Azadirachtaind ica</i> A .juss.	Meliaceae	Neem	Tree	Bark	About 20 gm of Bark is boiled in 1 liter of water bath with the boiled water will care skin diseases.
8.	<i>Bauhinia variegata</i> L.	Cacelpiniaceae	Kachanar	Tree	Seeds, Roots,Leaves	Astringent Carminative
9	<i>Boerhaviadiffusa</i> L.	Nyctaginaceae	Punrava	Climber Herbs	Roots	Diuretic Jaundice
10	<i>Calotropis Procera</i> L.	Asclepiadaceae	Safed madar	Shrubs	Roots. Leaves	Snake bites

11	<i>Cassia fistula</i> Linn.	Cacelpiniaceae	Amaltas	Tree	Leaves	Leaves juice in skin diseases.
12	<i>Catharanthus roseus</i> L.	Apocynaceae	Sadabhar	Herbs	Roots, Leaves	Anticancer, Antidiabetics.
13	<i>CissusQuadra gularis</i>	Vitaceae	Harjor	Climber	Rhizome , Leaves, roots	Antiasthmatic
14	<i>Convolvulus pleuricaulis</i> L.	Convolvulaceae	Shankhpushpi	Herbs	Flowers Whole Plant	Brain tonic
15	<i>Ficus glomerate</i> Roxb.	Moraceae	Umar	Tree	Leaves	Gastro intestinal problems.
16	<i>Madhucaindica</i> Gmel L.	Sapotaceae	Mahua	Tree	Pulp	Snake bites
17	<i>Ocimum sanctum</i>	Lamiaceae	Tulsi	Shrubs	Leaves	Cough, Fever
18	<i>Phyllanthus frantemus webster</i>	Euphobiaceae	Bhuiamla	Herbs	Roots, Whole plants	Jaundice
19	<i>Rauwolfia serpentine</i> L. kurz.	Apocynaceae	Sarpagandha	Shrubs	Leaves	Stomach pain.
20	<i>Swertiachirata</i>	Jentianaceae	Chirata	Shrubs	Leaves	Cough, Fever
21	<i>Syzygiumaromaticum</i> L.	Myrtaceae	Clove	Tree	Flower bud	Toothache, Asthma problems
22	<i>Syzygiumcumini</i> L.	Myrtaceae	Jamun	Tree	Seed	Diabetes problems.
23	<i>Tinosporacordifoliya</i> Willd.	Menispermaceae	Giloy	Climber	Stem, Leaves	Cough and Cold, Fever
24	<i>Vitex negundo</i> L.	Verbenaceae	Nirgundi	Shrubs	Leaf	Rheumatism



Picture -Plants.

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CHAPTER -16

A Glimps of medicinal plant in Ancient Indian literature



Prof. Dr. Suman Lata Gupta

Medicinal plants are those plants that are used in treating specific diseases. Indian literature refers to the literature as a form of expression for every individual author. As well as it is the reflection of humanity and analysis of experience. In ancient Indian literature different parts of several medicinal plants have been in vogue to cure specific diseases. In our country nature has bestowed a very rich Botanical wealth and different types of plants grow wild in different parts of our country. Result is our knowledge of medicinal plant has mostly been inherited traditionally.

KEY WORDS

Medicinal plants, literature, disease, India, cure etc. India is a vast country where there are variations in climate, soil, altitude and latitude. During thousands of year of early human existence many herbs and different roots of plants, leaves, seeds etc. were identified for combating human diseases either by trial or by error. The earliest mention of

the use of plants for medicine is found in Rigveda. As the plants have medicinal value, therefore plants and trees are worshipped in India. Bhiksu Atreya professor of taxila, jivaka who was the physician of Bimbisara, Dhanvantari and nagarjuna were amongst those persons who have intimate knowledge of medicinal plants. Today there has been significant development in the synthetic drug chemistry. But these synthetic drugs have harmful after effects on human body. Therefore plants based drugs are being used substantially, Ayurveda, a sub script of Atharvaveda recognises cannabis as a sacred plant in Vedas. "Cannabis, otherwise known as ganja, bhang is well known for its connections with Lord- Shiva, is believed to have been introduced to the human kind by Lord- shiva"

- 1 Cannabis sativa's "mature leaves and flowering top of the female plants are used medically .The tincture of this plant and hemp extract are used for pharmaceutical preparations. Indian hemp mixed with tobacco is used to treat asthma, haemorrhage, tetanus .This is also used to treat depression, bladder, inflammation, gonorrhoea and nervous disorder."
- 2 The Other sacred plants in Vedas found in every Hindu household is Tulsi plant worshipped by all Hindus this plant is revered as a symbol of purity. "The leaves and seeds of this plant have medicinal value .The infusion of juice of leaves is used to treat digestive complaints, bronchitis and catarrh and administered locally to cure ringworm and skin diseases .The juice of leaves is dropped in ears to relieve earache. To cure common cold decoction of leaves is prescribed."
- 3 Sandalwood used in temples as a sign of Hindu custom can be seen on Hindu forehead, Sandalwood paste is advised by skin doctors when it comes to skin care.

Jasmine, a sacred plant, is identified with Lord Shiva and according to the Vedas have ample medicinal values .It is used to cure breast cancer by acting on the lymphatic system.

4. Neem is also used for leprosy, eye disorders, lloocky nose, intestinal worms, skin ulcers, fever, diabetes, gum diseases etc. Ramayan is a great Epic which knows no boundaries of religion. It has taught the values of life and behaviour to men and women over centuries. It is a useful source of information about plants of medicinal values .The Epic mentions why some trees become sacred .Although Ramayan was written by valmiki around 1000 BC. Major events of the Epic took place in the forest .Rama mentions those plants that have certain sacred qualities and which are used for medicinal purposes. The story of Sanjeevani plant is narrated in the Ramayan during the battle, Lakshmana was struck by an arrow and fainted ."sushena,the medicinal man of vanaras (91-6-19-6-101-3739)instructed Hanuman to rush to the Dronagiri helps to fetch four plants MritaSanjivani (capable of re-storing the dead to life) vishalyakarni (capable of extracting weapons and healing all wounds inflicted by weapons) Suvarnakarni (re -storing the body to its original complexion) and Sandhani; the great herb (capable of joining several Limbs or fractured bone)(6.74.29.34.)" 4 Hanuman was sent to the Himalayan Mountains to fetch the SanjivaniBooti so that Lakshman could be revived. But Hanumanji was unable to identify that particular Booti therefore he lifted the entire mountain and brought it to Lanka. Besides SanjivaniBooti there are other medicinal plants mentioned in the chitrakoot hill regions Svetakanthakari(solanum virginianum Brahmi Bacopa

monnieri) katuka(picrorizakurroo)ativisha(aconitum heterophyllum)and hilamocika (Euhyarahincha)etc.Valmiki mentions so many other medicinal plants in Ramayan. Thus literature in its various narrative forms (Novel legends etc.) reflects human society and culture. One of these cultural traditions is the use of medicinal plants as cure for sickness and carry the belief up to the present time .Ailments have over the years been a scourge and threat to mankind. People from different cultural background have used different herbal plants, plants extract animal products and mineral substances as a means to care, cure and treat ill- health.

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CHAPTER-17

Medicinal plants as a immunity Booster



Dr. Suchi Modi

MEDICINAL PLANTS IN INDIA

Plants have medicinal value too along with ornamental purpose. Indians and Chinese have been using plants as medicines to treat wounds and pacify the inflammation. The ancient science of Ayurveda and Yoga relies heavily on these plants to treat major conditions, from pain management to weight management and everything in between. Arena Flowers brings you the lowdown on the plants you can grow in the backyard or even in the kitchen garden easily! Keep them growing and keep nurturing them so that you can utilize them and treat your condition naturally.

ALOE VERA

Extremely easy to grow, aloe vera is India's most favorite and a succulent plant that is low-on-maintenance and easy-to-grow! The plant is a trusted remedy for Indians to treat skin inflammation, breakouts, and burns. Its juice is well-known to boost a weak immune system. It is believed to be full of oxidants, which help the body to fight free radicals and stay fit as well as young!

TULSI / BASIL

Tulsi or Holy Basil is called 'Elixir of Life' in Ayurveda in India and well known medicinal plant. It has been proved that Tulsi clears away the pollutants within the ten miles of its radius. Besides, *Tulsi* tea in India is very effective in treating common cold and flu. The plant also features in NASA list of **air-purifying plants**. Its leaves can treat digestive issues and are also believed to have anti-cancer properties.

CORIANDER

Easy to sow, coriander is a no-fuss medicinal plant in India. Use any container to sow the seeds and put it on a window sill. It doesn't need much sunlight or water. The little shoots of leaves would appear within a week. The young leaves can be plucked to put in curd, raita or vegetables to enhance the flavor as well as to utilize the benefit. Indian *Dhania* leaves are refreshing and treat digestive issues.

MINT

A very homegrown medicinal plant in India. The fragrance of mint leaves is enough to refresh your mind and make you feel good! In summer in India, mint leaves seem to be a godsend as its fragrance is rejuvenating! Mint tea helps you stay calm and if you are insomniac, mint tea can help you feel composed and have a sound sleep. Its fragrance is believed to keep the mosquitoes away. It is very beneficial in treating cold, cough, and diarrhea

LEMONGRASS

Lemongrass' therapeutic effect is widely known. Drink lemongrass tea to relieve a sore throat and menstrual pain. If you have trouble sleeping, drinking lemongrass tea before sleeping can help you get rid of insomnia and stress. Lemongrass is also helpful in pain management and has anti-pyretic properties.

CAROM / AJWAIN

A backyard medicinal plant and also available at every house in India. Battling with digestive issues? Trust ajwain to help you deal with it easily! Growing ajwain plant at home is painfully easy. The plant doesn't require much water or sunlight. The ridged leaves of the plant are edible and you can boil them in water to make ajwain tea to cure your upset stomach. Use the seeds or leaves to parathas, curries, vegetables, salads, and curd to enhance the flavor and get its medicinal benefits. You can also chew the leaves directly as a mouth freshener. One more reason to add this plant to add to your kitchen garden is that Feng Shui believes it to be a good luck charm.(1)



Aloe vera



Tulsi



Coriander



Mint



Lemongrass



Carom / Ajwain

INTRODUCTION

The term of medicinal plants include a various types of plants used in herbalism and some of these plants have a medicinal activities. These medicinal plants consider as a rich resources of ingredients which can be used in drug development and synthesis. Besides that these plants play a critical role in the development of human cultures around the whole world. Moreover, some plants consider as important source of nutrition and as a result of that these plants recommended for their therapeutic values. These plants include ginger, green tea, walnuts and some others plants. Other plants their derivatives consider as important source for active ingredients which are used in aspirin and toothpaste.(2)

IMMUNITY

The term immunity defines body's natural defense system against a vast array of diseases and disorders. Remarkably sophisticated and advanced among vertebrates, the complex immune system is capable to generate a limitless variety of cells and molecules to arrest enormous spectrum of infections and undesirable substances. Immunomodulators refer to those substances capable of inducing, amplifying, and inhibiting any system. Immunostimulatory and immunosuppressant are two types of immunomodulators are known for use. In fact, immunopharmacology is a newer branch of pharmacology concerned with immunomodulators. (4) Administration of immunostimulatory as in the case of AIDS and use of immunosuppressor in cases of an exaggerated response of an immune system is appreciating to reconstitute the normal immune system and increase the longevity of life.

Immunomodulator intake along with antigen, the process is meant to boost the immune system, and the modulator is known as immune adjuvant It is an evident from the human history that

medicinal plants have been the treatment regimen to cure a variety of diseases, including diseases caused by insects, fungi, bacteria, and viruses. The effects shown by the plants are due to the chemicals present in them and they work in the same manner as the conventional drugs. However, there are equally chances for these plants to have some potential harmful and toxic effects also.

These undesired side effects can be reduced by processing of the plant's crude product. Ethnobotany is the study of traditional plants for their medicinal properties and is an effective method to discover future medicines. immunomodulators, is gaining much interest.

Generation of herbal medicine as multiple-component agent expected to modulate the complex immune process in such a way so as to prevent the infection rather than treatment and cure of the disease.

With all these aspects keeping in mind, the present review focuses on an overview of a number of medicinal plants and their immunomodulatory activity. more than 300 plants have been identified to have therapeutic potential. (3)

Around 122 chemicals derived from plants have been identified as therapeutic substances which are also used in commercial drugs, for example, bark of willow tree is very rich in salicylic acid, which is also an active metabolite of aspirin, and this bark has been used from ancient times as a pain killer and antipyretic substance.

Some of the drugs which are frequently used by the physicians are also derived from plant sources, for example, aspirin, digoxin, quinine and opium, etc. (4)

They have a long history of use as herbal drug. Currently, there is much growing interest to use these medicinal plants as modulators of the complex immune system. Through a number

of researches conducted in the area have explored that many of the chemicals in the form of alkaloids, flavonoids, terpenoids, polysaccharides, lactones, and glycoside products are responsible to cause alterations in the immunomodulatory properties.(5)

ALTERNATIVE MEDICINE

These days the term “Alternative Medicine” became very common in western culture, it focus on the idea of using the plants for medicinal purpose. But the current belief that medicines which come in capsules or pills are the only medicines that we can trust and use. Even so most of these pills and capsules we take and use during our daily life came from plants. Medicinal plants frequently used as raw materials for extraction of active ingredients which used in the synthesis of different drugs. Like in case of laxatives, blood thinners, antibiotics and antimalaria medications, contain ingredients from plants. Moreover the active ingredients of Taxol, vincristine, and morphine isolated from foxglove, periwinkle, yew, and opium poppy, respectively.(2)

FUTURE OF MEDICINAL PLANTS

Medicinal plants have a promising future because there are about half million plants around the world, and most of them their medical activities have not investigate yet, and their medical activities could be decisive in the treatment of present or future studies. (2)

CHARACTERISTICS OF MEDICINAL PLANTS

Medicinal plants have many characteristics when used as a treatment, as follow:-

- Synergic medicine- The ingredients of plants all interact simultaneously, so their uses can complement or damage others or neutralize their possible negative effects.
- Support of official medicine- In the treatment of complex cases like cancer diseases the components of the plants

proved to be very effective.

- Preventive medicine- It has been proven that the component of the plants also characterize by their ability to prevent the appearance of some diseases. This will help to reduce the use of the chemical remedies which will be used when the disease is already present i.e., reduce the side effect of synthetic treatment.(2)

ROLE OF MEDICINAL PLANTS IN IMMUNE SYSTEM

A broad range of health-care practices is required to exploit the beneficial effects of Ayurveda, which is the most ancient system of medicines. Being the essence of Ayurvedic medicines, Indian medicinal plants manifest miraculous effects in curing a vast range of diseases and disorders among humans and can be better called as “elixirs of life.” Currently, there is much growing interest in the use of these medicinal plants as modulators of the complex immune system. Through a number of vast researches conducted in the area, it is being explored that many of the chemicals in the form of alkaloids, flavonoids, terpenoids, polysaccharides, lactones, and glycoside products are responsible to cause alterations in the immunomodulatory properties. Keeping in mind, the tremendous potential of the medicinal plants and their derived drugs.

Some plant which most commonly used in herbal drugs and strong immune system

Plants Name ———— Plants Parts use in Disease

Abutilon indicum (Kanghi) - Seeds are used as laxative and in piles and leaves are locally applied on ulcer and boils.

Acacia catechu (Khair) - The bark of the tree is used in chronic diarrhea.

Acacia nilotica(Babul) — The twig of the plant is used as natural tooth brush. The extract of fresh bark is used as tonic.

Adhatodavasica(Vasaka) — The decoctions of leaves are given to cure asthma and other bronchial troubles.

Aloe vera (Gwarpatha) — The peelings of the leaves are used in skin burn and gel is given orally in ulcers. The fleshy part is also used in facial creams.

Andrographis paniculata(Kalmegh) — The plant is used for malarial fever and as liver tonic.

Anisomelosindica (Bhandari) — Leaves used in cough and cold.

Anogeissuslatifolia (Dhawra) — Leaves are used in diarrhea. Gum is used as tonic.

Argemone mexicana(Pili Katari)— The extract is used in various skin diseases. The latex is applied in eyes in case of conjunctivitis.

Azadirachtaindica(Neem) — Seed oil is used in skin diseases and in lice. Bark is useful in malarial fever. Tender twigs are used as tooth brush.

Boerhaaviadiffusa (Punarnava) — Plant used in jaundice, urinary troubles and in skin diseases.

Catharanthusroseus (Sadabahar) — The leaves and white flowers are used to reduce sugar level. *Chlorophytum* spp. (Safed Musli) — The roots of the plant are used for general weakness, as tonic and aphrodisiac.

Curculigoorchoides (Kali Musli) — Roots are used as tonic and aphrodisiac; in leucorrhoea and menstrual irregularities.

Curcuma caesia (Kali Haldi) — Rhizomes are used in sprains, bruises and internal injuries.

Cyperusscariosus (Nagarmotha) — The tubers are used in urinary and heart troubles.

Datura metal (Dhatura) — Smoke of seeds

inhaled in bronchial troubles.

Gymnema sylvestre (Gurmar) ——— The leaves of the plant are used in diabetics.

Ocimum sanctum (Tulsi) — The leaves are used to cure cough and cold and also to cure boils and ulcers.

Phyllanthus amarus (Bhuiamla) — It is a common household remedy for the treatment of Jaundice.

Solanum nigrum (Makoy) ———The leaves are used in skin diseases and jaundice.

Syzygium cumini (Jamun) — Seed-powder is useful in diarrhea, dysentery and diabetics.

Tylophora indica (Antamool) —— The leaves are taken orally in asthma.

Urginea indica (Janglipyaj) —— The juice of the bulb is used in respiratory disorders.

Vitex negundo (Nirgundi) —— The extract of the leaves is used in body pain and in skin diseases.(6)

Medicinal Plants & Their Uses

Hindi Name	English Name	Botanical Name	Uses
<u>Adusa/Vasaka</u>	Malabar Nut	<i>Adhatodavasica</i> Nees Pannel	Cough, Asthma, Bronchitis
<u>Ananas</u>	Pineapple	<i>Ananas comosus</i> Pannel	Sore Throat, Diabetes, Heart Disease, Obesity
<u>Babool</u>	Indian Gum	<i>Acacia arabica</i> Willd Pannel	Oral Care, Bleeding Gums, Wounds
<u>Brahmi</u>	Thyme leafed gratiola	<i>Bacopa monniera</i> Pannel Pannel	Enhances Memory, Anxiety
<u>Dhaniya</u>	Coriander	<i>Coriandrum sativum</i> Linn Pannel	Indigestion, Flatulence, Controls Spasmodic Pain
<u>Kalmegh</u>	Kalmegh	<i>Andrographis paniculata</i> Pannel	Indigestion, Acne, Diarrhea
<u>Lashun</u>	Garlic	<i>Allium sativum</i> Pannel	Ringworm, Dysentery, Wounds
<u>Nagarmotha</u>	Nut Grass	<i>Cyperus rotundus</i> Linn Pannel	Fever, Diabetes, Solar Dermatitis

<u>Punarnava</u>	Spreading Hogweed	Boerhaaviadiffusa Linn Pennel	Anemia, Liver Diseases, Wounds
<u>Shalparni</u>	Shal Leafed Bush	Desmodiumgangetium DC Pennel	Analgesic, Anti-Inflammatory
<u>Tulsi</u>	Holy Basil	Ocimumsactum Linn Pennel	Indigestion, Heart Diseases, Respiratory Diseases
<u>Vridhadaru</u>	Elephant Creeper	Argyreiaspeciosa Sweet Pennel	Diabetes, Skin Diseases, Wounds
<u>Agarkasth</u>	Eagle Wood	Aquilaria agallochaRoxbPennel	Bed-Wetting, Incompetency of Urinary Bladder
<u>Ankol</u>	Sage leaf alangium	AlangiumsalvifoliumPennel	Snakebite, Scorpion Bite, Dog Bite
<u>BadiElaichi</u>	Greater Cardamom	Amomum subulatumPennel	Bronchitis, Asthma, Appetizer, Digestant
<u>Chirchita</u>	Prickly chaff flower	Achyranthes aspera Pennel	Indigestion, Cough, Asthma, Anemia, Jaundice
<u>Elaichi</u>	Lesser Cardamom	ElettariacardamomumMatonPennel	Nausea, Vomiting, Dry Cough
<u>Kanghi</u>	Country Mallow	Abutilon indicumPennel	Facial Paralysis, Joint Disorders, Increases Strength
<u>Malkagini</u>	Staff Tree	CelastruspaniculatusWilldPennel	Muscle Cramps, Backache, Osteoarthritis, Paralysis
<u>Neem</u>	Margosa Tree	Azadirachta Indica A. JussPennel	Leprosy, Eye Disorders, Bloody Nose, Intestinal Worms
<u>Pyaj</u>	Onion	Allium cepa Linn Pennel	Prostate Cancer, Esophageal, Stomach Cancer
<u>Shatavari</u>	Asparagus	Asparagus racemosusWilldPennel	Infertility, Loss Of Libido, Threatened Miscarriage
<u>Ulatkambal</u>	Devil's Cotton	AbromaagustaPennel	Gynaecological Problems, Irregularity In Periods
<u>Yavasa</u>	Camel Thorn	AlhagicamelorumPennel	Rheumatism, Vomiting, Stomachache, Constipation

<u>Akarkara</u>	Pellitory	Anacyclus pyrethrum Pennel	Toothache, Dryness Of The Mouth, Throat, Catarrh
<u>Ashgandh</u>	Winter Cherry	WithaniasomniferaDunalPennel	Stress Tolerance, Immunity, Joint Pains, Skin Sores
<u>Bael</u>	Bengal Quince	Aegle marmelos Corr. Pennel	Dysentery And Diabetes, Sunstrokes, Anti-Cancer
<u>Chitvan</u>	Leadwort	Plumbago zeylanica Linn Pennel	Arthritis, Skin Diseases, Menstrual Disorders, Obesity
<u>Ghee Kunwar</u>	Aloes	Aloe vera Tourn ex. Linn Pennel	Ulcers, Burn Injuries, Jaundice, Acne
<u>Ketaki</u>	Crepe Ginger	Costusspeciosus (Koeing) Sm. Pennel	Obesity, Hyperlipidaemia, Diabetes
<u>Mandukparni</u>	Gotu Kola	Centellaasiatica Urban Pennel	Sedative, Antibiotic, Detoxifier, Laxative
<u>Palasha</u>	Bastard Teak	Butea monospermaKuntzePennel	Complexion of Skin, Worm Infestations, Roundworm
<u>Ratti</u>	Rosary Pea	AbrusPrecatorius	Joint Pains, Paralysis, Alopecia
<u>Shirish</u>	Siris Tree	Albizialebeck (Linn) BenthPennel	Bronchial Asthma,
<u>Bach</u>	Sweet Flag	Acorus calamus Pennel	Flatulent Colic, Atonic Dyspepsia, Ulcers
<u>Amaltas</u>	Indian Laburnum	Cassia fistula Linn Pennel	Ulcers, Wounds
<u>Ashok</u>	Sorrowless tree	SaracaindicaPennel	Menstrual Irregularities, Uterine Stimulant
<u>Bharangi</u>	Bharangi	Clerodendronserratum Moon Pennel	Common Cold, Chronic Sinusitis, Allergic Rhinitis,
<u>Chitvan</u>	Dita	AlstoniascholarisPennel	Skin Ulcers, Fever, Increasing Lactation
<u>Guggulu</u>	Indian Bdellium	CommiphoramukulEnglPennel	Joint Disorders, Heart Diseases, Hypolipidaemic,
<u>Kadirkasth</u>	Cutch Tree	Acacia catechu WilldPennel	Skin & Respiratory Problems, Oral Hygiene, Astringent

<u>MeethaVish</u>	Monks hood	Aconitum ferox Pennel	Fever, Diuretic Action, Arthritis
<u>Patha</u>	Velvet Leaf Tree	Cissampelospareira Linn Pennel	Ulcers, Sinuses, Skin Diseases, Poisonous Bites
<u>Senna</u>	Indian Senna	Cassia angustifolia VahlPennel	Laxative, Constipation, Irritable Bowel Syndrome, Weight Loss
<u>Supari</u>	Areca Nut/Betelnut	Areca catechu Linn Pennel	Obesity, Hyperlipidaemia, Diabetes, Irregular Menstruation
<u>Vajradanti</u>	Barleria	Barleriapronitis Linn Pennel	Strengthens Teeth, Fever, Catarrh
<u>Amla</u>	Indian Gooseberry	Emblica officinalis Linn Pennel	Antioxidant, Antistress, Constipation, Fever
<u>Atees</u>	Indian Ateech	Aconitum heterophyllum Wall Pennel	Fever, Respiratory
<u>Bhojpatra</u>	Himalayan Birch	Betula utilis D. Don Pennel	Wounds, Obesity
<u>Dalchini</u>	Bark Cinnamon	CinnamomumZeylanicumBreynPennel	Antibacterial, Antiseptic
<u>Jimikand</u>	Elephant yam	Amorphophallus campanulatusPennel	Dysentery, Piles, Haemorrhoids
<u>Kulanjan</u>	Greater Galangal	Alpinia galangaPennel	Flatulence, Dyspepsia, Vomiting, Seasickness, Catarrh
<u>Mulethi</u>	Liquorice	Glycyrrhiza glabra Linn Pennel	Digestive Disorders, Ulcers, Bronchitis
<u>Pippali</u>	Long Pepper	Piper longum Linn Pennel	Asthma, Cough, Indigestion
<u>ShalaiGuggal</u>	Indian Olibanum	Boswellia serrata Roxb. Pennel	Joint Pains, Headache, Diabetes
<u>Tamalpatra</u>	Cinnamon Leaf	CinnamomumtamalaNeesPennel	Diabetes, Digestion, Cold
<u>Varun</u>	Three Leafed Caper	Crataevanurvala Buch-Ham Pennel	Kidney Stones, Bladder Stones

BENEFITS & IMPORTANCE OF MEDICINAL PLANTS

Ayurvedic herbs are time tested for their health and other benefits. The nutritive value that they pack are highly recommended for their healing powers. Known to induce no side effects, they have a unique aroma and flavor and when consumed regularly, they act as a perfect mechanism to bring about a balanced harmony between mind and body. They rejuvenate the whole system instead of focusing on one specific organ or body part.

BENEFITS OF MEDICINAL PLANTS

- They have a holistic approach and aid in proper absorption and digestion
- They are not disease specific but act as a preventive medicine that positively effects the overall health and well-being by boosting the immune system
- They are at par with allopathic medicines and are at times known to be effective in treating diseases like cancer and autoimmune diseases
- They are self-contained and nutritive in nature, therefore, are non-toxic and harmless
- It deals with the overall well-being and aims to bring harmony between mind, body and soul
- Several metabolic and chronic conditions can be treated without any side effects using Ayurvedic medicines and treatments

AYURVEDIC HERBS/SPICES & THEIR MEDICINAL VALUES

- Ayurvedic Herbs and spices such as black pepper, cinnamon, aloe, sandalwood, ginseng, red clover, burdock, bayberry, and safflower are used to heal wounds, sores and boils.
- To reduce fever and the production of heat caused by the condition, certain antipyretic herbs such as Chirayta, black

pepper and sandal wood are recommended

- Sandalwood and Cinnamon are great astringents apart from being aromatic. Sandalwood is especially used in arresting the discharge of blood, mucus etc.
 - Ajwain, Amalaki, Aswatha etc., serve as antacids and are recommended for healthy gastric acid flow and proper digestion
 - Herbs like Cardamom and Coriander are renowned for their appetizing qualities. Other aromatic herbs such as peppermint, cloves and turmeric add a pleasant aroma to the food, thereby increasing the taste of the meal
 - Herbs like Aloe, Sandalwood, Turmeric, Sheetraj Hindi and KhareKhaskhas are commonly used as antiseptic and have very high medicinal values
- Camomile, Basil, Cardamom, Ginger, Peppermint and Coriander are known to promote blood circulation in the body and keep the heart healthy.(8)

ROLE OF MEDICINAL PLANTS IN HUMAN HEALTH DISEASE

Medicinal plants have been used in healthcare since time immemorial. Medicinal plants play vital roles in disease prevention and their promotion and use fit into all existing prevention strategies. The researches and utilization of herbal medicine in the treatment of diseases increases every day. Medicinal plants provide major source of molecules with medicinal properties due to presence of natural compounds. Medicinal plants are useful for curing human diseases and play an important role in healing due to presence of phyto chemical constituents. The natural and unique medicinal plants are used for curing various diseases/ailments and income generation. Ayurveda and other Indian literature have mentioned the use of plants in treatment of various human ailments. Medicinal plants

are important source to combat the serious diseases in all over the world. The present study focuses on the knowledge on medicinal uses of plants and the scientific investigation to confirm their medicinal values and the role, contributions and usefulness of medicinal plants in tackling the diseases of public health importance.(7)

CONCLUSION

Therefore it is a very important point for the open access journals to encourage researchers and clinicians to work hard in order to clarify the main active ingredients which can be extracted from medicinal plants. Moreover, to clarify their role in the treatment of present diseases, and how they can be used to produce or synthesis more effective drugs.(2)

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