Biospectra : ISSN: 0973-7057, Vol. 17(2), September, 2022, pp. 1-4
An International Biannual Refereed Journal of Life Sciences

1(PS).
Plant Science

ISSN : 0973-7057

Int. Database Index: 616 www.mjl.clarivate.com

Ethnobotanical studies of medicinal plants used by indigenous group of Hile region on Dhankuta District, Eastern Nepal

Babita Kumari[a] & Ashok Kumar Jha[b]*

[a]University Department of Botany, B.N.M. University, Madhepura, Bihar, India

[b]Department of Botany, M.L.T. College, Saharsa, B.N.M. University, Madhepura, Bihar, India

Received : 23rd April, 2022 ; Revised : 24th May, 2022

Abstract- In Hile region of Dhankuta district, Nepal the ethnic people of villages belonging to the ethnic group- Chhetri, Rai, Limbu, Magar and Tamang, mainly depends on medicinal plants for their healthcare. In the present study, 35 informants from Limbu, Rai and Tamang ethnic group were selected to acknowledge the medicinal properties, preparation of drug, part of the plant used for drug preparation and use of medicinal plants for particular healthcare. Altogether, 26 plants belonging to 19 families were identified. The FIC value and FL (%) value were calculated. FIC value was calculated for 23 disease categories. The maximum value of FIC was 0.87 for Blood pressure and Liver disorder and the minimum FIC value was 0.29 for Dermatological problem. The FL (%) value was maximum for *Coelogyne corymbosa* (82.35) and *Eclipta prostata* (82.35) against Dermatological problem and Liver disorder respectively.

Key words: Fidelity level (FL), Informants consensus factor (FIC), Ethnic group.

INTRODUCTION

Ethnobotany may be defined as scientific relationship between people and plants. Thus, ethnobotany include use of plants as food, shelter, rituals, clothing, medicine, etc. Utilization of plants for medicine purposes in India and Nepal has been documented long back in ancient literature.

Medicinal value of plants is mentioned in Rigveda and Atharvaveda. Several ancient Rishi described medicinal importance and use of plants for healing human beings. Charak is one of them. He wrote the book entitled "Charak Samhita" in which methods of preparation of drug from different part of plants has been described.

*Corresponding author :
Phone : 7070392487
E-mail : akjhabiotech41@gmail.com

Right from its beginning, the documentation of traditional knowledge on medicinal use of plants has provided many important drug of modern time.

The knowledge of drug formulation from plants acquired by indigenous people through experience was passed verbally from generation to generation. If the knowledge of drug formulation from plant known to indigenous people is documented, it will provide cost effective treatment without any side effect.

METHODOLOGY

An ethnobotanical survey was conducted in different area of Hile, Dhankuta, Eastern Nepal. Hile is 13km north to Dhankuta at an elevation of 1948m. The major ethnic group of this locality are Chhetri, Rai, Limbu, Magar and

Tamang. Local people were consulted out of which 35 persons agreed to give proper information regarding medicinal plants of this area and their use in treatment of different diseases. Informants were both male and female belonging to the ethnic group Limbu, Rai and Tamang. The details of the informants is mentioned in Table 01.

Table 1- Age & Gender distribution of Ethnic informants

Ethnic Group	Gender		No. of Persons	Percentage (%)
	Male	Female		
Limbu	10	5	15	42.85
Rai	7	6	13	37.15
Tamang	4	3	7	20
Total	21	14	35	

Plant specimens were collected and their local name, season of the flowering of plant, part of the plant used for medicine and the disease for which it was used, acknowledged from informants.

The specimens were identified with the help of standard monograph.[1] Local names and medicinal uses were documented critically. The herbarium specimens were made accordingly.[2]

Informants consensus factor (FIC):

Informants consensus factor was calculated to find out the homogeneity in the information given by the informants. The *FIC* is calculated by the following formula.[3-6]

$$FIC = \frac{N_{ur} - N_t}{N_{ur} - 1}$$

Where, N_{ur} is the number of use report in a particular illness category by informants and N_t is the number of taxa or species used to treat that particular category by informants.

Fidelity level (FL) value

The fidelity level (FL), the percentage of informants claiming the use of a certain plants for the same major purpose was calculated according to the following formula.[7]

$$FL(\%) = \frac{I_P}{I_U} X\ 100$$

where I_p is the number of informants who independently suggested the use of a plant species for a particular disease and I_u is the total number of informants who mentioned the same plant for any disease.

RESULT

An ethnobotanical survey was conducted in Hile region of Dhankuta district, Eastern Nepal. Local people were consulted. 35 informants were agreed to participate in present study. Informants belong to three ethnic groups- Limbu, Rai and Tamang. Both male and female informants were consulted at a regular visit in different seasons. The number of male informants were 10 from Limbu, 7 Rai, 4 Tamang and the female informants from ethnic group Limbu-5, Rai-6 and Tamang was 3. All informants were in between the age group of 30 to 65. The specimens were collected from field and herbarium were prepared. Each specimen was identified in the laboratory with the help of standard monograph. Local name, Medicinal value, parts of the plant for formulation of drug and the ailment were acknowledged from the informants and recorded. Altogether, 26 plants belonging to 19 families were identified. The maximum plants were from family Compositae (4). Name of the family and the no. of plants were recorded in table 4. *FIC* value and Fidelity level value were also determined which are recorded in table 02 and 03 respectively. *FIC* value was calculated for 23 disease categories. The maximum value of *FIC* was 0.87 for Blood pressure and Liver disorder and the minimum *FIC* value was 0.29 for Dermatological problem. The FL (%) value was maximum for *Coelogyne corymbosa* (82.35) and *Eclipta prostata* (82.35) against Dermatological problem and Liver disorder respectively.

Table 2- Informant consensus factor (*FIC*) by categories of diseases

Disease category	Use Report (N_{ur})	No. of Texa (N_t)	F_{IC}
Asthma	5	3	0.5
Bleeding	12	7	0.45
Blood pressure	9	2	0.87
Bronchitis	7	4	0.50
Cardio-vascular disease	6	2	0.8
Cold and Cough	22	12	0.47
Dermatological diseases	18	13	0.29
Diarrhoea and Dysentery	24	17	0.30
Diuretic	15	8	0.5
Dyspepsia	8	3	0.71
Gastro-intestinal	14	6	0.61
Hormonal disorder	7	2	0.83
Leucorrhoea	16	5	0.73
Liver disorder	9	2	0.87
Lymphatic system	4	2	0.67
Musculoskeleton	7	4	0.5
Nervous system	13	8	0.41
Oral, Dental and ENT	21	12	0.45
Piles	17	11	0.37
Pulmonary	5	2	0.75
Skin disease and Intestinal disorder	18	11	0.41
Urinary disease	22	15	0.33
Venereal	8	2	0.85

Table 3- Fidelity level (FL) value of medicinal plants against a given Therapeutic category.

Medicinal Plant	Therapeutic Categories	I_P	I_U	FL%
Bergenia ciliata	Urinogenital and venereal	12	16	75
Potentilla polyphylla	Bleeding	14	19	73.68
Centella asiatica	Nervous system	8	10	80
Camellia kissi	Lymphatic system	9	12	75
Cuscuta reflexa	Oral, Dental and ENT	14	20	70
Tinospora sinensis	Gastro-intestinal	16	21	76.19
Dendrodium moschatum	Oral, Dental and ENT	13	19	68.42
Vitex negundo	Pulmonary	8	10	80
Swertia chirayita	Blood pressure	15	20	75
Indigofera bracteata	Hormonal disorder	11	14	78.57
Sambucus adnata	Cold and Cough	16	22	72.72
Nephrolepis auriculata	Cardio-vascular disease	9	11	81.81
Coelogyne corymbosa	Dermatological	14	17	82.35
Zanthoxylum acanthopodium	Musculoskeleton	12	16	75
Acalypha indica	Bronchitis	15	19	78.94
Cicca disticha	Liver tonic	16	20	80
Phyllanthus niruri	Urinogenital	11	14	78.57
Evolvulus alsinoides	Bronchitis and Asthama	12	18	66.67
Eclipta prostata	Liver tonic	14	17	82.35
Ageratum conyzoides	Diarrhoea and Dysentery	14	20	70
Echinops hiatus	Dyspepsia	8	10	80
Vernonia cinerea	Leucorrhoea	10	13	76.92
Achyranthes aspera	Urinary disease	11	15	73.34
Rungia repens	Diuretic	9	12	75
Oxalis corniculata	Piles	8	11	72.72
Aloe vera	Skin disease and Intestinal disorder	16	22	72.72

Table 4- Taxonomic diversity of medicinal plants in Hile region of Dhankuta, Eastern Nepal

Name of Family	No. of genera	No. of species	Percentage of species
Saxifragaceae	1	1	3.84
Rosaceae	1	1	3.84
Apiaceae	1	1	3.84
Theaceae	1	1	3.84
Convulvulaceae	2	2	7.69
Menispermaceae	1	1	3.84
Orchidaceae	2	2	7.69
Verbenaceae	1	1	3.84
Gentianaceae	1	1	3.84
Fabaceae	1	1	3.84
Adoxaceae	1	1	3.84
Davalliaceae	1	1	3.84
Rutaceae	1	1	3.84
Euphorbiaceae	3	3	11.53
Compositae	4	4	15.38
Amarantaceae	1	1	3.84
Acanthaceae	1	1	3.84
Oxalidaceae	1	1	3.84
Liliaceae	1	1	3.84

Table 5- Medicinal plant of Hile region, Dhankuata district, Eastern Nepal

Name of Plant	Local Name	Family	Medicinal use
Bergenia ciliata	Ghungri	Saxifragaceae	Urinogenital and venereal
Potentilla polyphylla	Bajradanti	Rosaceae	Bleeding
Centella asiatica	Ghortapare	Apiaceae	Nervous system
Camellia kissi	Banchiya	Theaceae	Lymphatic system
Cuscuta reflexa	Akash bel	Convulvulaceae	Oral, Dental and ENT
Tinospora sinensis	Gurgo	Menispermaceae	Gastro-intestinal
Dendrodium moschatum	Sugandha	Orchidaceae	Oral, Dental and ENT
Vitex negundo	Simali	Verbenaceae	Pulmonary
Swertia chirayita	Chiraito	Gentianaceae	Blood pressure
Indigofera bracteata	Sakhino	Fabaceae	Hormonal disorder
Sambucus adnata	Moti phul	Adoxaceae	Cold and Cough
Nephrolepis auriculata	Panisaro	Davalliaceae	Cardio-vascular disease
Coelogyne corymbosa	Jibanti	Orchidaceae	Dermato-logical
Zanthoxylum acanthopodium	Annkhe Timur	Rutaceae	Musculo-skeleton
Acalypha indica	Kuppee	Euphorbiaceae	Bronchitis
Cicca disticha	Narphal	Euphorbiaceae	Liver tonic
Phyllanthus niruri	Jaramla	Euphorbiaceae	Urinogenital
Evolvulus alsinoides	Shankhavati	Convolvulaceae	Bronchitis and Asthama
Eclipta prostata	Bhagrai	Compositae	Liver tonic
Ageratum conyzoides	Osari	Compositae	Diarrhoea and Dysentery
Echinops hiatus	Gokru	Compositae	Dyspepsia
Vernonia cinerea	Sadodi	Compositae	Leucorrhoea
Achyranthes aspera	Latjira	Amarantaceae	Urinary disease
Rungia repens	Parpatha	Acanthaceae	Diuretic
Oxalis corniculata	Khattibunti	Oxalidaceae	Piles
Aloe vera	Ghritkumari	Liliaceae	Skin disease and Intestinal disorder

CONCLUSION

The present study reveals that the three ethnic communities Limbu, Rai and Tamang depends on a variety of plants for their requirements to cure various diseases. They have a good knowledge about medicinal preparation, part of the plant from which medicine is prepared, mode of administration and medicinal doses. The Hile region consist of varieties of medicinal plants to cure several diseases. The local people use these plants against different diseases. In present investigation, altogether 26 medicinal plants were collected belonging to the 19 families. The chemical composition of these medicinal plants should be identified scientifically which will be great contribution for pharmaceutical and herbal industries.

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