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STUDIES ON TRADITIONAL PHYTOTHERAPY OF KOCH COMMUNITY IN THE SOUTH SALMARA-MANKACHAR DISTRICT OF ASSAM, INDIA

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Abstract

Present paper deals with the use of indigenous plants for phytotherapy practiced by the Koch community of South Salmara-Mankachar district, Assam. Field survey was carried out in all the villages of the district inhabited by Koch community. This paper provides information about 70 folklore medicinal plant species belonging to 65 angiospermic genera of 41 families. Further analysis of data revealed that leaves were used in the majority of cases for herbal medicine preparation (35 species), followed by roots (7 species), fruits (6 species), seeds (5 species) bark and stems (4 species) each, rhizome and flower (3 species) each, whole plant and cloves (1 species) each respectively. All the plant parts tested positive for the presence of alkaloids.

Key words : Phytotherapy, Koch community, South Salmara-Mankachar district, Alkaloids.

Introduction

In spite of enormous progress in modern medical system, about 80% of the world population still depends on traditional systems of medicine for primary health care, which is yet again true in the Indian scenario (Anonymous, 2002). North-Eastern region comprising primitive societies like Abor, Garo, Dafla, Khasi, Kuki, Mishi, Rabha, Koch, Naga, Apatani etc. are rich in traditional knowledge and have been practicing traditional healing system since time immemorial (Biswas and Chopra, 1982; Jamir, 1989, 1990; Jamir and Rao, 1990; Pandey and Issar, 1991; Mahanti, 1994; Sinha, 1996; Lalramnghinglova, 1996; Kharkongor and Joseph, 1997; Kumar, 2002; Sharma, 2004; Das and Tag, 2006; Shankar and Rawat, 2008, 2012; Shankar *et al*., 2009; Shankar and Devalla, 2012; Majumdar and Shyam, 2013; Majumdar *et al*., 2017).

Koch community of South Salmara-Mankachar district of Assam, recognized as other backward classes (OBC) of the state. The term Koch is derived from the word "kochimuchi" meaning shrinkage due to shame. On the basis of cultural and dialectal variations and geographical boundaries, there are several groups of Koches viz., Wanang, Harigaiya, Satpari, Chapra or Dasgaiya, Tintikiya, Banai and Sankar Koch. This community also prevails in the state of Meghalaya, Manipur, Tripura, North Bengal Bangkura in West Bengal, Purnia in Bihar and in Chittagong and Noahkali of Bangladesh (Jaganathan, 2002). This Koch community of the district has its own culture, traditions, language, belief and practice of using forest products as food and other daily requirements. Naturally, they have plenty of knowledge about medicinal plants and their utilization. An attempt has been made to document the age old traditional healing practices of the community for treatment of various diseases and findings of survey and analysis are discussed in this study.

Materials and Methods

Description of the study area

South Salmara-Mankachar district is an administrative district in the state of Assam. The district headquarter is located at Hatsingimari town. The total land area of South Salmara-Mankachar district is 568 sq. km. The coordinates of the district are 25.68^0 N latitude and 89.98^0

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Map of Assam

Map of South Salmara Mankachar district.

E longitude. The population of the district according to 2011 census is 5,55,114. The study was carried out in nine villages namely Adarsha-Manjurigaon, Baghapara, Gopalpur, Tongnapara, Pakrapara, Makrikola, Tanggaon, Birupara and Batapara inhabited by Koch community.

Ethnobotanical data collection

The study was done during August, 2016 to July, 2018 in South Salmara-Mankachar district of Assam. In the study, aged people, who have been practicing medicine, called as kabiraj, hojai, pankur hawni or jaba hawni of Koch community were interviewed throughout the district. The data gathered were verified by repeated quarries among local herbalists in order to authenticate the information (Cochran and Cornfield, 1951; Jain, 1989; Martin, 1995). A specially designed questionnaire was prepared for the survey of the local health practices prevailing in the study area, which included most relevant questions to obtain data for fulfillment of the objectives of the present work. Information about ethnomedicinal uses, vernacular name of the plants, plant parts used, formulation and preparation of recipes, dose regimen, duration and mode of administration were sought from the local healers. Every informant was visited two to three times in order to confirm the reliability of the ethnobotanical information. Information provided by informants that lack consistency were rejected and they were not included in the sample. Specimens of the reported medicinal plants were collected from the study site. Collection and preparation of herbaria were done following Jain and Rao (1977). Identification of herbaria was done in the Department of Botany, B. Borooah College, Guwahati and voucher specimens were deposited in the department.

Biochemical analysis

Plant samples were dried and powdered. It was moistened with distilled water and then mixed with ammonia. Thereafter, petroleum ether was added to the mixture and shaken. The extract was concentrated and shaken with equal amount of dil. H_2SO_4. The mixture was separated into two layers with a separating funnel. The collected acidic solution was made alkaline by adding sodium carbonate (Na_2CO_2). The precipitate was extracted in ethanol. Later, the presence of alkaloids in the plant parts was tested by Mayer's reagent, Dragendorff's reagent and Wegner's reagent (Buzarbarua, 2000).

Results and Discussion

Traditional medicine is very popular and useful among the people of Koch community of South Salmara-Mankachar district of Assam since ancient times. The traditional medicines have a very strong hold on the local population. So far no proper attempt has been made to explore the possibilities to get the knowledge from the local herbalists belonging to Koch community of South Salmara-Mankachar district of Assam. During the investigation about 70 folklore medicinal plant species belonging to 65 Angiospermic genera of 41 families were

Table 1 : List of plants showing botanical name and family, vernacular name, name of disease, plant parts used, mode of administration and test for alkaloids (+ve means presence of alkaloids).

S. no.	Botanical name and Family	Vernacular name	Name of disease	Plant Parts used	Mode of administration	Test for alkaloid
1.	*Achyranthes aspera* L. (Amaranthaceae)	Kachipha pan	Labour pain & parturition	Roots	The plant is pulled out of the soil in one breadth taking the name of the pregnant women. The roots that come out are tied to the sikha (hair) of the women with a thread. It should be removed immediately after delivery.	+ ve
2.	*Aegle marmelos* (L.) Correa. (Rutaceae)	Nono thai pan	Hypersexual disorder	Leaves	Single leaf is taken regularly in empty stomach.	+ ve
3.	*Ageratum conyzoides* L. (Asteraceae)	Guwal pan	Cuts	Leaves	The leaves are crushed in the palm along with saliva and applied onto the affected area.	+ ve
4.	*Allium sativum* L. (Amaryllidaceae)	Rosun	Eczema	Cloves	Small bit of black grease from kitchen wall is mixed with 3 cloves of *Allium sativum* along with a pinch of salt and applied on the affected area.	+ ve
5.	*Aloe vera* (L.) Burm. f. (Xanthorrhoeaceae)	Dhekikanchan	Nocturnal emission	Leaves	Leaf juice is taken orally for 1 week.	+ ve
6.	*Alstonia scholaris* (L.) R. Br. (Apocynaceae)	Satiyal pan	Cat bite or Dog bite	Bark	Juice of the bark is taken orally.	+ ve
7.	*Andrographis paniculata* (Burnm. f) Ness. (Acanthaceae)	Panekneem	Diabetes	Leaves	Leaf paste is made into small balls and taken regularly.	+ ve
8.	*Asparagus officinalis* L. (Asparagaceae)	Sotmul	Body weakness	Roots	Root extract is mixed with a glass of water and regularly taken for a weak.	+ ve
9.	*Averrhoa carambola* L. (Oxalidaceae)	Kamrenga	Headache	Fruits	Fruit is crushed and the paste is applied on the forehead.	+ ve
10.	*Azadirachta indica* A. Juss. (Meliaceae)	Neem teeta	Cuts and wounds	Leaves	Leaves dried in shade is powdered and applied on the affected area.	+ ve
11.	*Bacopa monnieri* (L.) Wettst (Plantaginaceae)	Bramhi	Increasing memory power	Leaves	Leaf juice is taken orally on regular basis.	+ ve
12.	*Bauhinia variegate* L. (Fabaceae)	Kanchan pan	Epistaxis	Bark	Bark juice is taken twice daily until cure.	+ ve
13.	*Bryophyllum pinnatum* (Lam.) Oken. (Crassulaceae)	Khodai-mosto	Kidney stone	Leaves	½ of the leaf is chewed and taken orally on regular basis.	+ ve
14.	*Cajanus cajan* (L.) Millsp. (Fabaceae)	Paykong Pan	Jaundice	Leaves	Leaf infusion in taken orally.	+ ve

Table 1 continued...

Table 1 continued...

15.	*Calotropis procera* (Aiton.) Dryand. (Apocynaceae)	Ankon	Toe pain	Leaves	One leaf is placed on a heated earthen pot and the toe is placed on it for a while.	+ ve
16.	*Capsicum annuum* L. (Solanaceae)	Akashi jhaluk	Scabies	Fruits	Fruit paste is applied regularly on the affected part.	+ ve
17.	*Carica papaya* L. (Caricaceae)	Madhumut-ha	Cat bite	Latex	Latex is applied on the affected area.	+ ve
18.	*Catharanthus roseus* (L) G. Don, (Apocynaceae)	Cheramara	a) Low memory	Roots	3 drops of root extract is mixed with 10 drops of honey and taken regularly every morning in empty stomach.	+ ve
			b) Diabetes	Leaves	3-4 leaves are chewed in the morning in empty stomach along with a glass of water.	
19.	*Cheilocostus speciosus* (J.Koenig.) C.D.Specht. (Costaceae)	Kewa pan	Urinary pain	Rhizome	Juice extracted from the rhizome is mixed with little sugar and taken orally.	+ ve
20.	*Cissus quadrangularis* L. (Vitaceae)	Haathjora pan	Bone fracture	Stems	Paste prepared from the swollen stem is applied on the broken part and it is repeated for 7 days.	+ ve
21.	*Citrus limon* (L.) Burm.f. (Rutaceae)	Lebu pan	Vomiting	Mature leaves	Paste from the leaves is mixed with jaggery and taken orally.	+ ve
22.	*Colocasia esculenta* (L.) Schott (Araceae)	Penek waktuk	Bee sting	Petiole	Juice of petiole is applied on the affected area.	+ ve
23.	*Crinum asiaticum* L. (Amaryllidaceae)	Dhap dhup pan	Body pain	Leaves	Leaf smeared with mustard oil and made a hot compress that is placed on the affected area.	+ ve
24.	*Curcuma longa* L. (Zingiberaceae)	Holdi	Body pain	Rhizome	Paste of the rhizome is applied on the affected area.	+ ve
25.	*Cuscuta reflexa* Roxb. (Convolvulaceae)	Akashi lata	Hair growth	Whole plant	Paste is made and applied on the scalp.	+ ve
26.	*Cynodon dactylon* (L.) Pers. (Poaceae)	Dubla talay	a) Urinary pain	Whole plant	A ring is made with the plant and put on the little finger until cure.	+ ve
			b) Piles		3 spoon of leaf juice is mixed with 10 drops honey and taken orally.	
27.	*Cyperus rotundus* L. (Cyperaceae)	Kendlai talai	Stomach ache	Rhizome	The rhizome is directly chewed.	+ ve
28.	*Datura stramonium* L. (Solanaceae)	Dhutura gillik laisak	Bone fracture	Tender leaves	3-4 tender leaves of *Datura stramonium*, rhizome of *Curcuma longa* and about 30-40 leaves of *Lawsonia inermis* are mixed together and bandaged on the affected area and kept for 3 days	+ ve

Table 1 continued...

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29.	*Dioscorea bulbiflera* L (Dioscoreaceae)	Hanthi	Cuts	Leaves	Paste is applied locally.	+ ve
30.	*Dischidia lanceolata* (Blume.) Decne. (Apocynaceae)	Nakor chipa pan	Eczema behind the ears	Leaves	The leaf paste is applied on the affected area.	+ ve
31.	*Elephantopus scaber* L. (Asteraceae)	Machu thalai pan	a) Carbuncle	Leaves	Leaf paste is applied on the affected area.	+ ve
			b) Peripheral-edema	Roots	The plant is pulled out in single breath and tied with 3 white threads and used as garland close to the chest level.	
32.	*Epiphyllum oxypetalumm* (D.C.) Haw. (Cactaceae)	Farokini rani	Cuts	Leaves	Leaf paste is applied on the affected area.	+ ve
33.	*Hibiscus rosa-sinensis* L. (Malvaceae)	Joba pan	Piles	Flower bud	Paste is made into small balls and orally taken continuously for 15-20 days.	+ ve
34.	*Hydrocotyle javanica* Thumb. (Araliaceae)	Manik Laichak	Conjunctivit-is	Leaves	Juice extracted from the leaves is applied on the eyes.	+ ve
35.	*Jatropha curcas* L. (Euphorbiaceae)	Mandhar pan	Cuts	Leaves	Leaf paste is applied on the affected area.	+ ve
36.	*Jatropha podagrica* Hook. (Euphorbiaceae)	Goda pan	Elephantiasi-s	Stems	Juice extracted out from the lower part of the stem is mixed with coconut oil and concentrated and massaged in the affected area.	+ ve
37.	*Justicia adhatoda* L. (Acanthaceae)	Botsam luri	Cough and cold	Whole plant	Juice is extracted and taken thrice daily after meal.	+ ve
38.	*Lablab purpureus* (L.) Sweet. (Fabaceae)	Haangot	Ring worm	Leaves	Seven leaves of the plant along with a leaf of *Bryophyllum pinnatum* are crushed with a pinch of rice and salt and applied on the affected area.	+ ve
39.	*Lathyrus sativus* L. (Fabaceae)	Khesari dal pan	Boil	Seeds	Seed paste is mixed with little salt and applied on the boil.	+ ve
40.	*Lawsonia inermis* L. (Lythraceae)	Mindi pan	Body pain	Leaves	Leaf paste is applied on the affected area.	+ve
41.	*Leea macrophylla* Roxb. Ex Hornem. (Vitaceae)	Mungmai nakor pan	Asthma	Leaves	Leaves dried in the shade are powder and then it is rolled in *Zea mays* leaf and smoked at bedtime.	+ ve
42.	*Litsea glutinosa* (Lour.) C. B. Rob.(Lauraceae)	Bagnala	Cuts	Bark	Paste of the bark is applied on the affected area and tied with cotton cloth.	+ ve
43.	*Mimosa pudica* L. (Fabaceae)	Ladura pan	Toothache	Roots	The roots are chewed.	+ ve

Table 1 continued...

Table 1 continued...

44.	*Moringa oleifera* Lam. (Moringaceae)	Khonjon pan	Acidity	Leaves	Leaf paste is taken orally with rice.	+ ve
45.	*Mucuna pruiens* (L.) DC. (Fabaceae) Dysfunction	Meawthai pan	Erectile	Seeds	Seed coat is removed and the cotyledon is sun dried and powdered. Three spoon of the powder along with one spoon of honey is taken daily until cure.	+ ve
46.	*Murraya koenigii* (L) Spreng. (Rutaceae)	Sung-Sung mai	Acidity	Leaves	Leaf juice is taken orally.	+ ve
47.	*Musa acuminate* Colla. (Musaceae)	Aanaji likthai	Dysentery	Unripe fruits	3 banana mixed with 3L milk and 250g Palm candy, taken whenever the person feels hungry.	+ ve
48.	*Ocimum gratissimum* L. (Lamiaceae)	Ram tulsi	Cough and cold	Leaves	Leaf infusion is taken orally.	+ ve
49.	*Ocimum sanctum* L. (Lamiaceae)	Panek tulshi	Cough and cold	Leaves	Leaf extract is mixed with powder of *Piper nigrum* peppercorn and taken orally.	+ ve
50.	*Ocimum tenuiflorum* L. (Lamiaceae)	Tulsi pan	Headache	Infloresence	Inflorescence is fried in coconut oil and used for head massage.	+ ve
51.	*Oroxylum indicum* (L.) Kurz. (Bignoniaceae)	Naura pan	Jaundice	Bark	Bark juice is taken orally.	+ ve
52.	*Paederia foetida* L. (Rubiaceae)	Diphai laichak	Dysentery	Leaves	Juice extracted from the leaves is taken orally.	+ ve
53.	*Phyllanthus emblica* L. (Phyllanthaceae)	Param thai	Diabetes	Fruits	The raw fruit is taken regularly.	+ ve
54.	*Piper betle* L. (Piperaceae)	Panchak	Cuts	Leaves	Leaf is lightly chewed and applied on the affected part.	+ ve
55.	*Piper nigrum* L. (Piperaceae)	Gol jhaluk	Sore Throat	Fruits	5-7 peppercorns are boiled along with tender leaves of *Bambusa vulgaris* and little sugar and concentrated. The extract is used to gargle.	+ ve
56.	*Portulaca grandiflora* Hook. (Protulacaceae)	Naow ghonta pan	Cuts	Leaves	Leaf paste is applied locally on the affected area.	+ ve
57.	*Psidium guajava* L. (Myrtaceae)	Aashupuri pan	Dysentery/blood dysentery	Leaves	Tender leaves are taken orally.	+ ve
58.	*Pterocarpus indicus* Willd. (Fabaceae)	Laphang pan	Eczema	Leaves	Leaf paste is applied on the affected area.	+ ve
59.	*Rauvolfia serpentina* (L.) Benth. Ex Kurz (Apocynaceae)	Chando teeta	Hypertensi-on	Roots	Root paste is made and taken orally.	+ ve

Table 1 continued...

Table 1 continued...

60.	*Ricinus communis* L (Euphorbiaceae)	Indi pan	Arthritis	Roots	Root is crushed and the juice is taken orally in the morning and evening.	+ ve
61.	*Santalum album* L. (Santalaceae)	Botsam chandan	Vitiligo	Stems	Stem paste is applied regularly.	+ ve
62.	*Scoparia dulsis* L. (Plantaginaceae)	Bamon-mora	Diabetes	Leaves	Leaf juice is mixed with a pinch of sugar and 2 spoon of it is taken regularly.	+ ve
63.	*Sesamum indicum* L. (Pedaliaceae)	Dipring	Skin allergy	Seeds	Seeds are crushed and applied on the affected area.	+ ve
64.	*Swertia chirayta* (Roxb.) Buch- Ham. ex C.B. Clarke. (Unresolved) (Gentianaceae)	Haa neem	Malaria	Leaves	Leaf paste is made into small balls and taken orally.	+ ve
65.	*Syzygium cumini* (L.) Skeels. (Myrtaceae)	Jamu pan	Diabetes	Seeds	Seeds are dried and made powder and taken along with water.	+ ve
66.	*Tabernaemonata divaricata* R.Br. ex Roem. & Schult. (Apocynaceae)	Parbujum	Conjunctivi-tis	Flowers	Extract from 3 flowers are applied on the affected area.	+ve
67.	*Tagetes erecta* L. (Asteraceae)	Genda pan	Cuts and wounds	Leaves	Leaves are crushed and applied on the affected area	+ ve
68.	*Tamarindus indica* L. (Fabaceae)	Tintali pan	Small pox	Fruits	The fermented fruit is taken orally.	+ ve
69.	*Trigonella foenum-graecum* L. (Fabaceae)	Methi	Small pox	Seeds	Seeds are soaked in water and the water is taken orally.	+ ve
70.	*Vitex negundo* L. (Lamiaceae)	Nisondhora	a) Body pain	Leaves	The leaves are crushed and applied on the affected area.	+ ve
			b) Obesity		Leaves dried in the shade are powdered. 2 spoon of the powder is taken regularly with a glass of water.	
			c) Toothache		Leaves are boiled along with a pinch of $NaHCO_3$ and used for gargling.	
			d) Tonsil		Leaves are boiled with water and gargled.	

found to be used by the people of Koch community of the district for the treatment of various diseases. Leaves were used in the majority of cases for herbal medicine preparation (35 species), followed by roots (7 species), fruits (6 species), seeds (5 species), bark and stems (4 species) each, rhizome and flower (3 species) each, whole plant and cloves (1 species) each, respectively. All the plants/ plant parts tested positive for the presence of alkaloids. Information of use of medicinal plants for phytotherapy is transmitted from one generation to the next by the local practitioners of the Koch community through informal and oral traditions. Information about ethnomedicinal uses, local name of the plants, plant parts used, formulation and preparation of recipes, dose regimen, duration, mode of administration and presence of alkaloids are tabulated in table 1.

Traditional knowledge and ethnobotanical information play an important role in scientific research (Awadh *et al*., 2004). India is one of the twelve mega-biodiversity countries of the world having rich vegetation with a wide variety of plants with medicinal value that have been used for treatment of several diseases, including infectious diseases, hypertension etc, that are capable of life saving (Patrick, 2002). Eventhough, the rate of medicinal plant utility is ever increasing, so little is known about its use pattern. It is very important to document, analyze and evaluate this knowledge not only for preservation of their cultural, but also for from commercial point of view, as ethnomedicinal use of plants is one of the most successful criteria that is used by the pharmaceutical industries in finding new therapeutic agents (Cox and Balick, 1994).

In India, the traditional system of healing is directly linked to its rich floral diversity. Even today, many local and indigenous communities in the Asian countries meet their needs from the products they manufacture based on their traditional knowledge. Herbal drugs obtained from plants are believed to be much safer. This has been proved in the treatment of various ailments (Mitaliya *et al*., 2003). In view of the importance of traditional medicine which provides health services to 75-80% of the world population and increasing demand of herbal drugs, it is high time to document the medicinal utility of lesser known plants available in remote areas of the country (Zaidi and Crow, 2005).

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References

Anonymous (2002). *WHO traditional medicine Strategy 2002–2005*. World Health Organisation, Geneva, Switzerland. (WHO/EDM/TRM/2002.1.).

Awadh, A., N. R. Ali and U. K. Lendequist (2004). Some medicinal plants used in Yemeni herbal medicine to treat Malaria. *African Journal of Traditional, Complementary and Alternative Medicine*, **1** : 72-76.

Biswas, K. and R. N. Chopra (1982). Common medicinal plants of Darjeeling and the Sikkim Himalaya, Vivek Vihar, Delhi.

Buzarbaruah, A. A. (2000). *Text Book of Practical Plant Chemistry*. S. Chand and Company Ltd., New Delhi, 10-13.

Cochran, W. C and J. Cornfield (1951). Modern methods in sampling of human population. *Amer. J. Public Health*, **45** : 647- 661.

Das, A. K. and H. Tag (2006). Ethnomedicinal studies of the Khampti tribe of Arunachal Pradesh. *Indian Journal of Traditional Knowledge*, **5** : 317-322.

Jaganathan, S. (2002). Ampati (A view of the people, places and infrastructure of Ampati Civil Sub-Division). The Narayan group Ltd., Tura. 26-48.

Jain, S. K. (1989). *Methods and Approaches in Ethnobotany*. Society of Ethnobotanists, Lucknow, 23-40.

Jain, S. K. and R. R. Rao (1977). *A Handbook for field and herbarium methods*. Today & Tomorrow's Publishers, New Delhi.1- 157.

Jamir, N. S. and R. R. Rao (1990). Ethnobotany of Ao and Angami Nagas of Nagaland. *J. Eon. Taxon. Bot*., **36** : 14(3) 593-604.

Jamir, N. S. (1989). Some interesting medico botany used by Ao-A Naga tribe. Proc. Research Devel. Indig. Drugs (INMMR), New Delhi, 259-264.

Jamir, N. S. (1990). Some interesting medicinal plants used by Nagas. *J. Res. Edu. Ind. Med.*, **9(2)** : 81-87.

Kharkongor, P. and J. A. Joseph (1997). Folklore medico-botany of rural Khasi and Jaintia tribes in Meghalaya. In S. K. Jain ed. Contribution to Indian Ethnobotany. 1, 2nd ed. Jodhpur, Scientific Publishers, 195-208.

Kumar, S. (2002). *The medicinal plants of Northeast India*. Jodhpur.

Lalramnghinglova, H. (1996). Ethnobotany of Mizoram, a preliminary survey. *Journal of Econ. Taxon. Bot*. (Addnl series), **12** : 439-459.

Mahanti, N. (1994). *Tribal Ethnobotany of Mizoram*. Inter India Publication series. T171, New Delhi.

Majumdar, H. C. and J. Shyam (2013). Studies on Indigenous Herbal Remedies for Jaundice in Nalbari District of Assam.

*Plant Archive*s, **13(2)** : 823-825.

Majumdar, H. C., J. Shyam U. Chowdhury, N. Roy and D. Koch (2017). An Ethnobotanical Survey of the Koch Community of South-West Garo Hills District, Meghalaya, India. *Int. J. for Sci. Resch and Dev*., **5(06)** : 45-49.

Pandey, V. N. and R. K. Issar (1991). Medico-ethnobotanical exploration of Sikkim Himalayas, CCRAS, New Delhi.

Shankar, R. and R. B. Devalla (2012). Conservation of folk healing practices and commercial medicinal plants with special reference to Nagaland. *Internat. J. Biodiv. Conserv*., **4(3)** : 155-163.

Shankar, R. and M. S. Rawat (2008). Medico ethnobotany of Arunachal Pradesh (Papumpare, Lower and Upper Subansiri and Kurungkumey districts). Himalayan Publisher, New Delhi & Itanagar.

Shankar, R. and M. S. Rawat (2012). *Medicinal plants of Arunachal Pradesh*. International Book Distributors, Dehra Dun.

Shankar, R., S. Deb and B. K. Sharma (2009). Traditional healing practices in north east India- Meeting Report. *Current Science*, **97(1)** : 12-13.

Sharma, U. K. (2004). *Medicinal plants of Assam*. Bishen singh Mahendra Pal Singh, Dehra Dun.

Sinha, S. C. (1996). *Medicinal Plants of Manipur*. Mass & Sinha, Imphal.

Cox, P. A. and M. Balick (1994). The ethnobotanical approach to drug discovery. *Scientific American*, **270** : 82–87.

Mitaliya, K. D., D. C. Bhatt, N. K. Patel and S. K. Dodia (2003). Herbal remedies used for hair disorders by tribals and rural folk in Gujarat. *Indian Journal of Traditional Knowledge*, **2(4)** : 389-392.

Martin, G. J. (1995). Ethnobotany: A 'People and Plants' Conservation Manual. Chapman and Hall, London.

Zaidi, M. A. and S. A. Crow (2005). Biologically active traditional medicinal herbs from Balochistan, Pakistan. *J. Ethnopharmacol*., **96** : 331-334.