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TRENDS OF UTILIZATION PLANTS RESOURCES AMONG SANTHAL OF NEPAL

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ABSTRACT

An ethnobotanical survey was conducted in Gauradaha municipality of Jhapa, Nepal. The objectives of study were documentation of ethnobotanical practices of santhal tribes. Some common ethnobotanical methodologies and techniques were applied during the course of study. Altogether 30 households were surveyed. 56 peoples were participated among them 8 were informants of age ranged from 40 to 90 years. Total 88 varieties of plants were listed which are used for different purpose and these species were distributed among 76 genera of 49 families. The highly represented family was Poaceae (7 species), Solanaceae (6 species), Compositae (5 species). The remaining families comprise very few species of identified plants. Distribution of plants according to habit were reported, among them herbs (42%), shrubs (27%), trees (24%) and climbers (7%).The majority of the plant species were reported to be used for medicinal purpose (36%)followed by multiple used i.e. a plant used for different purpose (27%), vegetable(12%), fodder (6%), food (6%), ornamental (5%), religious (5%) and fruit (3%).Distribution of plants according to part used were reported i.e. leaf (30%), multiple part i.e. different parts of a plant used (17%), fruit (16%), whole part (10%), stem (9%), seed(6%), root (6%), flower (4%) and bark (2%) for various purpose. So, from this study it is clear that this tribe has good knowledge about the importance of plant available in the study area.

Keywords: Ethnobotany, Santhal, Medicinal, Indigenous, Gauradaha

INTRODUCTION

Ethnobotany is the study of the biological and cultural interactions between people and plants in a given place. Thousands of plant species are present throughout the world which is used by different ethnic communities for medicinal, religious and other purpose. The study of such native plants used by particular ethnic groups is known as ethnobotany (Richard Evans Schultes, 1940s). Human beings of every ethnic groups directly or indirectly depends upon plants to fulfill their basic needs. Therefore, there is in-separable inter-relationship between ethnic group and plants. It's a field study including aboriginals' direct interactions with the environment's vegetation (Kunwar, R. M., & Bussmann, R. W. 20080 . It is, without a doubt, a very vast field that encompasses many aspects of botany as well as many other disciplines. It has also been constructed to include studies of those life forms traditionally, but no longer, considered as plant: algae, lichen and fungi.

Unity in diversity is one of the most spectacular features amongst the population of Nepal. Here, most of the tribal people with long history of ethnobotanical practices are dating back thousands of years ago. Nepal has 59 number of tribes like, Dhimal, Tharu, Danuwar, Kisan, Gurung, Magar, Hyolmo, Santhal, Thakali, Bhote, Raute, Rajbanshi, Sherpa, Meche,etc. The objectives of our study is the documentation of ethnobotanical practices of santhal tribes of Gauradaha municipality. The santhals are one of the 59 indigenous groups recognized by Nepalese government (Global Press Journal, 2012). The Santhal community is one of the most excluded ethnic groups in Nepal. More than 97% of Santhal people of Nepal lives in the Eastern terai including Jhapa, morang and Sunsari district where their population is only 0.19% of total population of country but are rich in cultural practices(CBS, 2011). Santhals are dark in complexion with curley, thick and short hair, flat nose like those of Negro and the size and shape of skull is like those of Aryan. They were strong to fight against the hostile climatic condition of terai region. They survive there because of their strong physical strength and capacity to adapt in dense forest area of eastern terai. (Santhal people, Wikipedia). Most of the Santhali people still rely on their own traditional medicinal practitioners for treatment of various ailments with medicinal plants. So, the current research is a report on the ethnobotanical usage of plant species for various purpose by Santhal tribes of Jhapa district. The current application of listed plant species were compared to finding from prior research conducted among the santhal tribes of Alipurduar district, West Bengal, India. While santhal tribes of West Bengal were found to use 73 medicinal plants (Mandal, A., Adhikary,et al. 2020) , the santhals of Nepal (jhapa district) used 32 medicinal plants. Some of the plants were found to be common use where some are used differently or even then there were variances in how plant component were used . To introduce novel drugs, new compound that are derived from plant species with new medicinal uses can be screened for their bioactive properties and pharmacological activities.

MATERIALS AND METHODS

Study Area

Geography

Gauradaha municipality is located in (26.30˚N and 87.40˚E) with an area 151 square kilometer of Jhapa District. The population of this area is 53,033 according to census 2011 (DDC Jhapa, 2068).

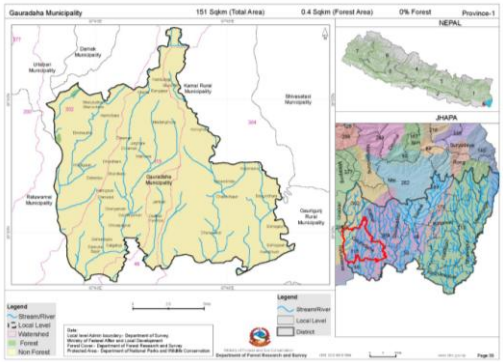

Fig1. Map of Gauradaha municipality (source, Google Map)

Climate

The weather is hot and humid summer and chilling cold winter.Average temperature in summer is around 26.8˚C (DDC Jhapa,2068).

Ethnographic Background

People of different tribes with their own indigenous particular tradition and language i.e.Brahmin, Chhetri,Newar,Limbu,Rajbanshi,Tajpuria,Santhal,etc.comprises of 12070 household (CBS, Nepal).

METHODS

Data Collection

The ethnobotanical data is obtained by gathering information from the people of santhal tribes residing in Gauradaha municipality of Jhapa through primary and secondary data collection.

Primary Data Collection

Primary data were collected from main source through interviews with informants, questionnaire surveys, etc. We were collecting data and information from the respondents by questioning and dealing with the related topic. For this a detailed structure of questionnaire was prepared.

Secondary Data Collection

Secondary data was gathered from a variety of published and unpublished sources, including books, magazines, newspapers, and journals.

RESULT

Total 88 plants species were listed which were used for different purpose and these species were distributed among 76 genera of 49 families (Table-1). The highly represented family was Poaceae (7 species), Solanaceae (6 species), Compositae (5 species). The remaining families comprise very few species of identified plants. Distribution of plants according to habit were reported, among them herbs (42%), shrubs (27%), trees (24%) and climbers (7%).The majority of the plant species were reported to be used for medicinal purpose (36%)followed by multiple used i.e. a plant used for different purpose (27%), vegetable(12%), fodder (6%), food (6%), ornamental (5%), religious (5%) and fruit (3%).Distribution of plants according to part used were reported i.e. leaf (30%), multiple part i.e. different parts of a plant used (17%), fruit (16%), whole part (10%), stem (9%), seed(6%), root (6%), flower (4%) and bark (2%) for various purpose.

Table 1. Plants used by santhal tribe for various purpose in the study area.

S. N.	Vernacular name(s)	Local name	Scientific name	Family	Habit	Part used	Method of use
1	Neem	Neem	***Azadirachta indica* A.Juss**	Meliaceae	Tree	Leaf	cooked with rice to treat stomach worm.
2	Ool	Aap	***Mangifera indica* L.**	Anacardiacea e	Tree	Bark and fruit	juice from bark is used to treat diarrhoea and jaundice
3	Kayara	kera	***Musa paradisiaca* L.**	Musaceae	Shrub	Fruit and leaf	fruit for religious use and leaf as fodder
4	Pattharjatta	Pattharjatta	***Bryophyllum pinnatum*(Lam.) Oken**	Crassulaceae	Herb	Leaf	leaf is eaten to treat stone.

5	Relli	Ban Paan	***Hedera helix* L.**	Araliaceae	climber	Root	paste of root is mixed with milk and crystal sugar to treat diarrhoea of infants
6	Aalakjedi	Pahelolahara	***Cuscuta abyssinica* A. Rich.**	Convolvulaceae	climber	whole part	juice is used to treat jaundice and sugar
7	Haadjoda	Haadjoda	***Cissus quadrangularis* L.**	Vitaceae	Shrub	Leaf and stem	used to treat bone fractures
8	Garudeada		***Amaranthus blitoides* S.Watson**	Amaranthaceae	Herb	young leaf and root	young leaves are used as vegetable and paste of root is used to treat pneumonia
9	Meedi	Mendi	***Lawsonia inermis* L.**	Lythraceae	Shrub	Leaf	paste of leaf is used to treat skin burning
10	Jhepni	Lajjawati jhaar	***Mimosa pudica* L.**	Leguminosae	Herb	root	paste of root is used to treat pneumonia and juice is used to treat uterus ulcer
11	Aaraada	Aaitinjhar	***Strobilanthes abbreviate*Y.F. Deng & J.R.I. Wood *; Syn:Strobilanthes alternata***	Acanthaceae	Herb	Leaf	Paste of leaf is used to treat cutting wound
12	Jenum	Bayar	***Prunus domestica* L.**	Rosaceae	Tree	Leafy bud and fruit	Paste of leaf is used to reduce body temperature also used as fruit
13	Eedel Dar	Simal	***Bombax ceiba* L.**	Malvaceae	Tree	Spiny bark	juice is used to treat measles
14	Jiyanti	Pirrejhar	***Persicaria hydr opiper* (L.) Delarbre**	Polygonaceae	Herb	Whole plant	used to harvest fish
15	Birchatam	Ghodtapre	***Centella asiatica* (L.) Urb.**	Apiaceae	Herb	Whole plant	juice is used to treat jaundice and diarrhoea of infants
16	Chinidaari	chinijhaar	***Scoparia dulcis* L.**	Plantaginaceae	Herb	Leaf	juice is used to treat jaundice and to reduce body temperature
17	Bhang	Gaanja	***Cannabis sativa* L.**	Cannabaceae	Shrub	leaf	used to treat indigestion of domestic animals
18	Pod	Khasreto	***Ficus hispida* L.f.**	Moraceae	Tree	Leaf	used as fodder
19	Bakaino	Bakaino	***Melia azedarach* L.**	Meliaceae	Tree	Leaf	used as fodder
20	Sadha	Thangne	***Streblus asper* Lour.**	Moraceae	Herb	Root	juice is used to treat urinary problem and used as fodder
21	Saru	Mane	***Colocasia antiquorum* Schott**	Araceae	Shrub	leaf	used as fodder
22	AdheGandhari	Jungali latte			Herb	young leaf	used as vegetable and fodder
23	Sarjyom	Sakhuwa	***Shorea robusta* Gaertn.**	Dipterocarpaceae	Tree	Leaf and stem	used for religious purpose and timber
24	Allu Ada	AaluJhar	***Spermacoce alata* Aubl.**	Rubiaceae	Herb	Leaf	Used as fodder
25	Tulsi Dari	Tulsi	***Ocimum tenuiflorum* L.**	Lamiaceae	Herb	Whole part	Used for religious and medicinal purpose
26	Kapurmuli	Babari	***Ocimum basilicum* L.**	Lamiaceae	Herb	Leaf	juice from leaf is used to treat ear ache
27	DeunaBaha	TitePati	***Artemisia vulgaris* L.**	Compositae	Herb	Leaf	Used to treat stomach ache
28	KuswiBaha	Sayapatri	***Tagetes erecta* L.**	Compositae	Shrub	Flower	Used as ornamental
29	Banahata	Totala	***Oroxylum indicum* (L.) Kurz**	Bignoniaceae	Tree	bark and flower	used to treat jaundice and used as vegetable
30	KakadaLattha	Datyun	***Achyranthes bidentata* Blume**	Amaranthaceae	Herb	stem	Used for religious purpose
31	Kanda Soru	Kachhu	***Dioscorea alata* L.**	Dioscoreaceae	Shrub	Young Leaf and stem	used as vegetable and fodder
32	Padin Ada	Pudina	***Mentha spicata* L.**	Lamiaceae	Herb	Leaf	Juice from leaf is used to reduce body temperature and use as vegetable.

33	Dhatur	Dhaturo	***Datura stramonium* L.**	Solanaceae	Shrub	Fruit	Used to treat diseases of domestic animals
34	Edkei	Siudi	***Cactus acantho phlegmus* (Lehm.) Kuntze**	Cactaceae	Shrub	Stem	Used for religious purpose
35	Mirich	Khursani	***Capsicum annuum* L.**	Solanaceae	Shrub	Fruit	Used as spices
36	Sapsang	Besar	***Curcuma longa* L.**	Zingiberaceae	Shrub	Stem	Powder is used as spices and used to treat cough, stomach ache, etc
37	Badidari	Bar	***Ficus benghalensis* L.**	Moraeae	Tree	Leaf	Used for religious purpose
38	Kudche	Tamatar	***Solanum lycopersicum* L.**	Solanaceae	Shrub	Fruit	Used as vegetable
39	Allu	Aalu	***Solanum tuberosum* L.**	Solanaceae	Shrub	Stem	Used as vegetable
40	Adey	Aduwa	***Zingiber officinale* Roscoe**	Zingiberaceae	Shrub	Stem	Used as spices and medicine
41	Rasun	Lasun	***Allium sativum* L.**	Amaryllidceae	Herb	Stem	Used as spices and medicine
42	Kundaha	Farsi	***Cucurbita pepo* L.**	Cucurbitaceae	climber	Fruit	Used as vegetable
43	Hathat	Lauka	***Lagenaria siceraria* (Molina) Standl.**	Cucurbitaceae	climber	Fruit	Used as vegetable
44	Kaadam	Kadam	***Neolamarckia cadamba* (Roxb.) Bosser**	Rubiaceae	Tree	Stem and Bark	Used for timber, paper making and medicine for diabetes also used as fodder.
45	Tudi	Tori	***Brassica campestris*L.(Syn)**	Brassicaceae	Herb	Seed and leaf	Used for making oil and used as vegetable
46	Kidar	Kurilo	***Asparagus officinalis* L.**	Asparagaceae	Herb	Young stem	Used as medicine for cancer and other disease also as vegetable.
47	Karla	Karela	***Momordica charantia* L.**	Cucurbitaceae	climber	Fruit	Used as vegetable
48	Sindhuaari	Simali	***Vitex negundo* L.**	Lamiaceae	Shrub	Young leaf	Used to treat pinas, cough , cold etc
49	Haadpoha	Khirro	***Falconeria insignis* Royle**	Euphorbiaceae	Tree	Bark	Juice of bark is used to treat piles and stomach ache
50	Juba baha	Ghantiful	***Hibiscus rosa-sinensis* L.**	Malvaceae	Shrub	Flower	Used as ornamental
51	Duryo	Golijhar	***Sphaeranthus indicus* L.**	Compositae	Herb	Young leaf	Used to treat epilepsy
52	TawenBaha	Barhamasef ul	***Catharanthus roseus* (L.) G.Don**	Apocynaceae	Shrub	Flower and leaf	Used to treat Sugar and stone also as ornamental.
53	KhetKisari	Bhringiraj	***Eclipta prostrate* (L.) L. *Syn:Eclipta alba***	Compositae	Herb	Leaf	Used to treat cutting wound
54	Meral	Amala	***Phyllanthus emblica* L.**	Phyllanthaceae	Tree	Fruit	used for the treatment of diarrhoea, jaundice and inflammation also as fruit.
55	SitaDhinki	Uniu	***Pterisparkeri hort.;* Gard.Chr.(unresolved)**	Pteridaceae	Herb	Whole part	Used as fodder
56	Henje	Bii	***Solanum carolinense* L.**	Solanaceae	Shrub	Fruit	Used as vegetable
57	Hissa	Pipal	***Ficus religiosa* L.**	Moraceae	Tree	Leaf	Used for religious purpose
58	Rui Ada	Rayo	***Brassica juncea* (L.) Czern.**	Brassicaceae	Herb	Leaf	Used as vegetable
59	Jhinga	Ghiraula	***Luffa acutangula*(L.) Roxb.**	Cucurbitaceae	climber	Fruit	Used as vegetable
60	Dhinkiada	Niguro	***Matteuccia struthiopteris*(L.) Tod.**	Onocleaceae	Herb	Young stem	Used as vegetable
61	Mattha	Timur	***Zanthoxylum armatum* DC.**	Rutaceae	Shrub	Fruit, seeds and bark	Paste or powders is used as medicine for fever and dental troubles

62	Kamaigum Ada	Kalojhar	***Solanum nigrum*(syn)**	Solanaceae	Herb	Whole part	Juice of plant is used on ulcer and skin disease and fruit is used to treat Asthma
63	Dangrakatta	Aank	***Calotropis gigantea*(L.) Dryand.**	Apocynaceae	Shrub	Leaf	Used to treat fracture bone
64	Chip chidip	Dallekuro	***Urena lobata* L.**	Malvaceae	Herb	Root	used to treat cold of infants
65	Uud	Chyau	***Agaricus campestris* L. (unresolved).*Syn: Agaricus alba***	Agaricaceae	Herb	Whole part	Used as vegetable
66	Siram	Siru	***Cortaderia araucana* Stapf**	Poaceae	Herb	Leaf	Used to make broom
67	Chukwiada	Chari amilo	***Oxalis articulate* Savigny**	Oxalidaceae	Herb	Leaf, Stem and root	Used as medicine for the treatment of influenza,urinary tract infection , diarrhoea and scurvy
68	Huddu	Dhan	***Oryza sativa* L.**	Poaceae	Herb	seed	seed is used as staple food
69	Guhum	Gahu	***Triticum aestivum* L.**	Poaceae	Herb	seed	seed is used as staple food
70	Kanthar	Katar	***Artocarpus heterophyllus* Lam.**	Moraceae	Tree	Fruit and leaf	Used as fruit and fodder
71	Kudisundui	UdaseJhar	***Galinsoga parviflora* Cav.**	Compositae	Herb	Leaf	Juice from leaf is used to treat nettle sting and skin inflammation
72	Maa	Baas	***Bambusa vulgaris* Schrad.**	Poaceae	Tree	Whole part	Used for construction, furniture, vegetable, biofuel and fodder.
73	Ghiukuwar	Ghiukumari	***Aloe vera* (L.) Burm.f.**	Liliaceae	Herb	Leaf	Used to heal burn,improve digestive health and clear acnes
74	Papita	Mewa	***Carica papaya* L.**	Caricaceae	Tree	Fruit	Used as fruit
75	Opdi sang	Ambak	***Psidium guajava* L**	Myrtaceae	Tree	Fruit	Used as fruit
76	Purai Ada	Poi saag	***Basella alba* L.**	Basellaceae	Herb	Leaf	Used to heal burn
77	Doan Baha	Parijat	***Nyctanthes arbor-tristis*L.**	Oleaceae	Tree	Flowerand leaf	Used to treat fever,dry cough, immunity booster also as ornamental.
78	Dhubi	Dubo	***Cynodon dactylon*(L.) Pers.**	Poaceae	Herb	Whole part	Used to treat urinary tract problem, prostatitis, and used to heal burn also as religious.
79	Toba Baha	Chameli	***Jasminum sambac*(L.) Aiton**	Oleaceae	Shrub	Flower	Used to treat Stomach ache and ornamental.
80	Lapang	Barro	***Terminalia actino phylla* Mart. *Syn:Ter minaliabellerica***	Combretaceae	Tree	Fruit	used to treat jaundice, vomiting, ulcer
81	Gub	Supari	***Areca catechu* L.**	Arecaceae	Tree	Fruit	used to treat bile disease
82	Kitthahuri				Shrub	Root	Paste of root is kept in thread and bind the thread in hand to treat hydrosil
83	Bardamandaari	Daadpatta	***Senna didymobotrya* (Fresen.) H.S.Irwin&Barneby**	Leguminosae	Shrub	Leaf	Paste of leaf is used to treat ringworm
84	Gulabbaha	Gulafful	***Rosa indica* L.**	Rosaceae	Shrub	Flower	Used as ornamental
85	Lichchu	Litchi	***Litchi chinensis* Sonn.**	Sapindaceae	Tree	Fruit	Used as Fruit.
86	Kade	Kodo	***Paspalum scrobiculatum* L.**	Poaceae	Herb	seed	Used as food
87	Jundra	Makai	***Zea mays* L.**	Poaceae	Herb	Seed	Used as food
88	Fapar	Fapar	***Fagopyrum esculentum* Moench**	Polygonaceae	Herb	Seed	Used as food

Distribution of Plant According to Habit

Distribution of plants according to habit was reported, among them herbs (42.04%), shrubs (27.27%), trees (23.86%) and climbers (6.86%).

Table 2. Distribution of plant according to habit.

S.N.	Habit	No. of species	Percentage
1.	Herbs	37	42.04%
2.	Shrub	24	27.27%
3.	Tree	21	23.86%
4.	Climber	6	6.85%
	Total	88	100%

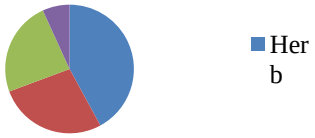

Fig 2.Distribution of plant according to habit

Distribution of Plant According to Uses

The majority of the plant species were reported to be used for medicinal purpose (36.36%) followed by multiple used i.e. a plant used for different purpose (26.13%), vegetable (12.5%), fodder (5.68%), food (5.68%), ornamental(4.54%), religious (4.54%) and fruit (3.40%).

Table3. Distribution of plants according to uses.

S.No	Use as	No of species	Percentage
1.	Medicinal	32	36.36%
2.	Multiple uses	24	27.27%
3.	Vegetable	11	12.5%
4.	Fodder	5	5.68%
5.	Food	5	5.68%
6.	Ornamental	4	4.54%
7.	Religious	4	4.54%
8.	Fruit	3	3.40%
9.	Total	88	100%

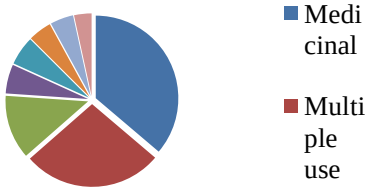

Fig 3 : Distribution of plant according to uses

Distribution of Plant According to Part Used

Distribution of plants according to part used were reported i.e. leaf (29.54%), multiple part i.e. different parts of a plant used (17.04%), fruit (15.90%), whole part (10.22%), stem (9.09%), seed (5.68%), root (5.68%), flower (4.54%) and bark (2.27%) for various purpose.

Table 4. Distribution of plant according to part used.

S.No	Part used	No of species	Percentage
1.	Leaf	26	29.54%
2.	Multiple parts	15	17.04%
3.	Fruit	14	15.90%
4.	Whole part	9	10.22%
5.	Stem	8	9.09%
6.	Seed	5	5.68%
7.	Root	5	5.68%
8.	Flower	4	4.54%
9.	Bark	2	2.27%
	Total	88	100%

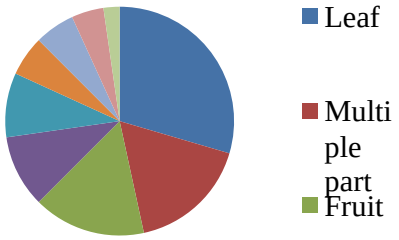

Fig 4. Distribution of plant according to part used

DISCUSSION

The santhal people have rich indigenous knowledge on the application of plant resources for their livelihood (Santhal people, Wikipedia). Due to traditional knowledge as well as closely related to nature, they depend highly on plants and their product for daily needs. A comparison of the present survey conducted among santhal tribes of jhapa district (Gauradaha municipality) strongly focuses the differences with previous survey conducted between the santhal tribes of Alipurduar district, West Bengal, India. While santhal tribes of West Bengal were found to use 73 medicinal plants, the santhals of Nepal (jhapa district) used 32 medicinal plants (Biswas, S., & Chatterjee, M. (2018). Some of the plants were found to be common use where some are used differently or even various parts were used for different purpose. Most of the vernacular names are also different from those of Nepal. For example, they called 'pattharkuchi' in India and pattharjatta in Nepal for the same plant'Bryophyllum pinnatum', 'aam' in India and 'ool' in Nepal for '***Mangifera indica'***,'simul' in India and 'eedeldar' in

Nepal for 'Bombaxceiba', 'rote ara' in India and 'birchatam' in Nepal for 'Centellaasiatica', 'akana' in India and 'dangrakatta' in Nepal for '***Calotropis gigantea'*** and so on. Several possible reasons for the differences may be lost of their traditional knowledge in younger generation, due to biodiversity loss, modernization etc.

CONCLUSION

An ethnobotanical survey on different application of plants in an area showed that the community frequently use various species for medicinal purpose, religious purpose, as food and fodder etc. The research resulted in identification 88 plant species from 49different families. Some species like ***Azadirachta indica, Cissus quadrangularis, Artemisia vulgaris, Sphaeranthus indicus***, etc. are used frequently by santhal tribe. The traditional knowledge regarding use of plant resources is fast disappearing. The knowledgeable person had given a high degree of level regarding use of plant species. So, from this study it is clear that this tribe has good knowledge about the importance of plant available in study area. However, traditional knowledge on plant resources is greatly threatened by rapid economic development for various reasons. Therefore, there is urgent need of plant protection. The policies and practices for conservation of plant related traditional knowledge are necessary to be considered. So that this ethnic knowledge and their bearers, who struggling for their existence can be saved.

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