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A preliminary report on ethnomedicinal uses of selected plants by *Sahara* tribal groups of Kangaon village of Bargarh district in western Odisha

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Abstract
Ethnomedicinal plants are playing a significant role to cure various diseases. In this present manuscript the authors were documented the conventional practices of therapeutic medicinal plants by *Sahara* tribal groups of Kangaon village of Bargarh District, in western Odisha, India. As this village is the residence of both the authors ARS and MS, observation of plants and close interactions with the local practitioners of Sahara tribes to extract the data were done regularly. In this present manuscript authors had documented a total of 52 plant species belong to 45 genera and 32 families based on their ethno-botanical significance. Due to communication problems and systematic transmission among young generation the conventional knowledge may be decline. Hence it is urgent to document such knowledge of elderly peoples. Several species of the present study can be further studied for their pharmacological activity and active compounds.

Keywords: Bargarh district, ethnomedicine, Kangaon village, western Odisha

Introduction
In conventional medicine system, medicinal plants are the backbone; in less developed countries more than 3.3 billion depend on plants and plant parts as medicine source in their day today life. Medicinal plants consist of rich source of secondary metabolites that secondary metabolites used in drug developments in different pharmaceutical industries [17]. The early ethnic communities throughout the World had utilized their local flora to cure a number of diseases as well as immune booster. As per the World Health Organization, > 80% of the world depends on traditional medicines. In India about 65% of people in the rural area used Ayurveda and different plants for their primary healthcare purpose [14]. But the tribal people are not like to share their ethnomedicinal knowledge except some commonly useful medicinal plants [3]. In India, more than 43% of the angiosperms are reported for their medicinal importance [6]. Tribal people had knowledge on local utilization of plants or plant parts as foods and medicine purposes. Many tribal communities also worship plants as per their religious believes, hence they were associated towards conservation of plants. The collection and documentation of ethno-medicinal knowledge has great importance towards modern drug development [18]. Many of these plants are rare and endemic and found only in forest region medicinal plants are known to be in uses by mankind since the time of immemorial [1]. Odisha is one of the tribal dominated state of India where variable in climatic conditions, huge forest area and many number of tribal communities were staying and depends on forest for their primary healthcare purpose [6, 10]. The tribal district of Odisha is inhabited by large rural population. Many people in Bargarh district till yet depend on plants for their primary treatments.

Material and Methods
Study area
Bargarh district, one of the ten districts of Western Orissa lies between 20^0 43' to 21^0 41' North latitude and 82^0 39' to 83^0 58' East latitude and having 5837 Sq. Km of geographical area. The major rivers in the district are tributaries of Mahanadi River, Ong (Ang), Jira and Jhaun rivers.

Agriculture is the main source of income of tribal people, they also depend on forest and forest based product for their regular uses. Different tribes of peoples were living in the Bargarh district, among them the Sahara, Binjhal, Kondh and Gond are the major tribes of the district [8]. Kangaon (Latitude: 21.32 and longitude: 83.43) is a medium size village located in Sohela Block of Bargarh district, Odisha having 422 families residing. The total population of the village is 1533, out of them 798 are males and 735 are females as per the Census report 2011. Kangaon village has higher literacy rate i.e. 81.24% as compared to Odisha i.e. 72.87%. Although modern system of medicine has influenced the people, still the *Sahara* tribal people depend on plants for the treatment of different common diseases.

Data collection

Extensive field surveys were made and plant samples were collected and preserved as herbarium. With the help of Flora Books of Orissa the collected plant species were identified [13]. To collect the voucher specimen we had followed the protocol as described by Mohanty [2] and were stored in the Department of Botany, Vikash Degree College, Bargarh. Further the local names were cross checked by using available previous report of Bargarh district of western Odisha [5-7, 9-12, 15, 16]. As this village is the residence of both the authors ARS and MS, observation of plants and close interactions with the local practitioners of Sahara tribal groups to extract the data were done regularly. The plants are categories and compiled in tabular form, in the first column the botanical name were written alphabetically, next column contains the local name, third columns contains the family, then plant parts, and last column contains the conventional uses.

Results and Discussion

Present manuscript deals with a total of 52 species belonging to 45 genera that comprises from 32 families and enlisted in Table 1, photographs of 16 selected species were shown in Figure 1. Both the family Combretaceae and Fabaceae contribute four species each; both the family Asclepiadaceae and Moraceae contributes three species each; two species each from the ten family *viz*. Acanthaceae, Apocynaceae, Asteraceae, Convolvulaceae, Lytheraceae, Malvaceae, Phyllanthaceae, Rutaceae, Smilacaceae and Verbanaceae; one species each from 18 families i.e. Amaranthaceae, Amarylliadaceae, Anacardiaceae, Asparagaceae, Caesalpiniaceae, Capparidaceae, Dioscoreaceae, Euphorbiaceae, Liliaceae, Loganiaceae, Meliaceae, Menispermaceae, Myrtaceae, Nyctaginaceae, Oleaceae, Plumbaginaceae, Sapotaceae and Zingiberaceae (Figure 2). Out of 52 plants, 12 (23%), seven (14%), ten (19%) and 23 (44%) comes under herbs, shrubs, climbers and trees respectively (Figure 3). The Sahara tribal people of Kangaon village were used the whole plants, plant parts like roots, leaves, flower, fruits, seeds, seed oils, gums of different plant species to treat different diseases.

A total of 13 similar plants like *Abrus precatorius* L., *Achyrantes aspera* L., *Aegle marmelos* (L.) Corr., *Boerhavia diffusa* L., *Calotropis gigantean* R.Br., *Curculigo orchioides* Gaertn., *Ficus benghalensis* L., *Ficus racemosa* L., *Hibiscus rosa-sinensis* L., *Lawsonia innermis* L., *Phyllanthus emblica* L., *Strychnos nux-vomica* L., *Terminalia arjuna* (Roxb.) Wight. & Am. were reported for the used against skin diseases in Bargarh district in Orissa [15]. Used of 35 ethnomedicinal plants by the tribals for the treatment of diarrhea and dysentery in Bargarh distirct was reported by Sen and Bahera [16]. In this present report plants like *Achyranthes aspera* L., *Aegle marmelos* (L.) Corr, *Azadirachta indica* L. Juss., *Butea monosperma* (Lam.) Taub., *Madhuca indica* Gmel., *Terminalia arjuna* (Roxb.) Wight & Arn., and *Vitex negundo* L. were noticed to use as tooth brush and tongue cleaner in regular basis. Similar kinds of uses of same six plants were reported in Bargarh district [6, 9, 11, 12] and in Kahalandi district [8]. In this present manuscript we had reported about the ethnomedicinal uses of 23 similar plants that were reported by Sahu *et al*. 2013 [9], in that manuscript they had reported about the ethnomedicinal used of 117 plant species by the native people of Sohela Block of Bargarh district [6]. Latex of *Calotropis gigantean* R.Br. was used to cure gum pain by the native peoples of Kalahandi district [8]. Further, the tribal people of Kalahandi district used the small stem of *Smilax zeylanica* L as tooth brush to cure toothache and pyorrhea [11, 12]. A total of 12 same medicinal plants species had been reported in relieving urogenital ailments by the tribal people of Bargarh district [10].

Table 1: List of medicinal plants used by *Sahara* tribal groups of Kangaon village of Bargarh district in western Odisha

Local name	Botanical names	Family	Voucher No.	Plant parts	Conventional uses
Bonbhendi	*Abelmoschus crinitus* Wall.	Malvaceae	ARS/BGH/-001	Leaf/Root	Cramp, cuts, depression, joint pain/Sexual Disability
Gunj	*Abrus precatorius* L.	Fabaceae	ARS/BGH/-003	Seeds/root	Constipation/boil
Apamarga	*Achyrantes aspera* var. indica L.	Amaranthaceae	ARS/BGH/-009	Leaf, roots, stem	Typhoid, tooth brush and tongue cleaner
Basang	*Adhatoda vasica* Nees	Acanthaceae	ARS/BGH/-011	Root /Leaf	Piles/Leprosy, Bronchitis, Cough, tuberculosis
Bel	*Aegle marmelos* (L.) Corr.	Rutaceae	ARS/BGH/-012	Leaf, stem	Acidity, gastric, toothbrush
Poksunga	*Ageratum conyzoides* L.	Asteraceae	ARS/BGH/-015	Leaf	Skin disease, cuts, itches
Bhueinlim	*Andrographis paniculata* (Burm. F.) Wall. Ex. Nees	Acanthaceae	ARS/BGH/-025	Leaf	Headache, dysentery, diarrhea
Iswarjata	*Aristolochia indica* L.	Asparagaceae	ARS/BGH/-215	Root	Snake and insects bites
Satabari	*Asparagus racemosus* Willd.	Liliaceae	ARS/BGH/-031	Root.	Dysentery
Lim	*Azadirachta indica* L. Juss.	Meliaceae		Leaf/bark/twigs	Skin diseases/to cure white discharge/used as tooth brush and tongue cleaner
Gadhapurni	*Boerhavia diffusa* L.	Nyctaginaceae	ARS/BGH/-038	Root	Cough
Palas	*Butea monosperma* (Lam.) Taub.	Fabaceae	ARS/BGH/-045	Gum, young twigs	Diarrhea, tooth brush and tongue cleaner
Arakh	*Calotropis gigantean* R.Br.	Asclepiadaceae	ARS/BGH/-049	Flower, latex	Asthma, gum pain reliever
Sunari	*Cassia fistula* L.	Caesalpiniaceae	ARS/BGH/-055	Fruit, stem bark	Rheumatism, constipation, headache

Akanbindhi	*Cissampelos pareiram* L.	Menispermaceae	ARS/BGH/-064	Leaf	Prevent miscarriage and bleeding after childbirth.
Lembu	*Citrus limon* (L.) Burm. f.	Rutaceae	ARS/BGH/-067	Fruit Juice	Acidity, Cold, Cough, Headache, Rheumatism, Abdominal pain, Anti-vomiting
Karada	*Cleistanthus collinus* (Roxb.) Benth. Ex. Planch	Verbenaceae	ARS/BGH/-216	Leaf	Insecticides
Barun	*Crateva magna* (Lour.) DC.	Capparidaceae	ARS/BGH/-078	Leaf	To cure fissure.
Talmulee	*Curculigo orchioides* Gaertn.	Amarylliadaceae	ARS/BGH/-217	Rhizome	Piles
Nirmuli	*Cuscuta reflexa* Roxb.	Convolvulaceae	ARS/BGH/-082	Stem	To cure epilepsy
Sissoo	*Dalbergia sisso* Roxb.	Fabaceae	ARS/BGH/-086	Seed oil	applied on burning skin to cure itching problem
Masiakanda	*Dioscorea pentaphylla* L.	Dioscoreaceae	ARS/BGH/-218	Tubers	To increase sex power
Chitakuti	*Euphorbia hirta* L.	Euphorbiaceae	ARS/BGH/-104	Root	Common cold and fever
Bichamalia	*Evolvulus nummularis* L.	Convolvulaceae	ARS/BGH/-105	whole plant	increasing memory power and to decrease hysteria
Bar	*Ficus benghalensis* L.	Moraceae	ARS/BGH/-106	Tender prop root, Bark	Piles, Diabetes
Dumer	*Ficus glomerata* Roxb.	Moraceae	ARS/BGH/-107	Fruit, Bark	Diabetes, Dyspepsia, Asthma, Increase in Milk Secretation
Pipal	*Ficus religiosa* L.	Moraceae	ARS/BGH/-108	Bark	Skin Diseases, Boils, Blisters, Carbuncles
Gudamari	*Gymnema sylvestre* (Retz.) Schult.	Asclepiadaceae	ARS/BGH/-114	Leaf	Diabetes
Annanta mula	*Hemidesmus indicus* L.	Asclepiadaceae	ARS/BGH/-117	Root	Diarrhea
Mandar	*Hibiscus rosa-sinensis* L.	Malvaceae	ARS/BGH/-118	Stem bark, Flower buds, stem	Abortion, Contraceptive/young stem also used as tooth brush and tongue cleaner
Kure	*Holarrhena pubescens* (Buch.-Ham.) Wall. Ex. G. Don.	Apocynaceae	ARS/BGH/-120	Seed	Stomach-ache, diarrhea.
Syamolota	*Ichnocarpus frutescens* (L.) R.Br.	Apocynaceae	ARS/BGH/-219	Root	To clear stone in the bladder
Benjati	*Lawsonia innermis* L.	Lytheraceae	ARS/BGH/-126	Root	Anemia, Jaundice
Mahul	*Madhuca indica* Gmel.	Sapotaceae	ARS/BGH/-129	Bark, young twigs	Dysentery, tooth brush and tongue cleaner.
Ganga Siuali	*Nyctanthes arbortristis* L.	Oleaceae	ARS/BGH/-147	Leaf	Malaria
Anla	*Phyllanthus emblica* L.	Phyllanthaceae	ARS/BGH/-098	Fruit, Seed oil	Digestion, mature fruit is edible; hair oil
Bhuein anla	*Phyllanthus fraternus* Webster.	Phyllanthaceae	ARS/BGH/-159	Root	Dysentery and diarrhea.
Dhob Chitaparu	*Plumbago zeylanica* L.	Plumbaginaceae	ARS/BGH/-163	Root	Abortification
Bija	*Pterocarpus marsupium* Roxb.	Fabaceae	ARS/BGH/-167	Bark, gum	Stomach-ache, cracks cream.
Bheluan	*Semecarpus anacardium* L.f.	Anacardiaceae	ARS/BGH/-024	Seed oil	Cuts, wounds healing
Chopachini	*Smilax aspera* L.	Smilacaceae	ARS/BGH/-220	Root extract	Scabies and blood purifier.
Muturi	*Smilax zeylanica* L.	Smilacaceae	ARS/BGH/-221	Root	Joint pain, spermatorrhea,
Kochila	*Strychnos nux-vomica* L.	Loganiaceae	ARS/BGH/-189	Stem	Leucoderma
Jam	*Syzygium cumini* (L.) Skeels	Myrtaceae	ARS/BGH/-191	Seed	Diabetics
Sahaj	*Terminalia alata* Heyne ex. Roth.	Combretaceae	ARS/BGH/-222	Leaf, bark	Loose motion, itching
Kahu	*Terminalia arjuna* (Roxb.) Wight. & Am.	Combretaceae	ARS/BGH/-197	Bark, young twigs	Internal injuries, tooth brush and tongue cleaner
Behera	*Terminalia bellirica* (Gaertn.) Roxb.	Combretaceae	ARS/BGH/-198	Fruit	Diarrhea, stomachache
Harda	*Terminalia chebula* Retz.	Combretaceae	ARS/BGH/-200	Fruit	To remove cough, stomach problems, skin diseases.
Bisalyakarani	*Tridax procumbens* L.	Asteraceae	ARS/BGH/-203	Leaf	Ringworm, to stop bleeding
Nirgundi	*Vitex negundo* L.	Verbanaceae	ARS/BGH/-207	Leaf, young twigs	To get relief pain from tooth, also used as tooth brush and tongue cleaner.
Dhataki	*Woodfordia fruticosa* (L.) Kurz	Lythraceae	ARS/BGH/-209	Dry Flower /Leaf	Leucorrhoea/Dysentery
Ada	*Zingiber officinale* Rosc.	Zingiberaceae	ARS/BGH/-211	Rhizome	Cold, Cough, Tooth ache, Asthma, Rheumatism, Stomach ache

Fig 1: Photographs of *Adhatoda vasica* Nees (a), *Andrographis paniculata* (Burm. F.) Wall. Ex. Nees (b), Fruits of *Cassia fistula* L. (c), *Cissampelos pareiram* L. (d), Fruits of *Citrus limon* (L.) Burm. f. (e), Leaves of *Crateva magna* (Lour.) DC. (f), Rhizome of *Curculigo orchioides* Gaertn. (g), *Cuscuta reflexa* Roxb. (h), Tubers of *Dioscorea pentaphylla* L. (i), *Gymnema sylvestre* (Retz.) Schult. (j), *Madhuca indica* Gmel. (k), Leaves of *Nyctanthes arbortristis* L. (l), Fruits of *Phyllanthus emblica* L. (m), Bark of *Pterocarpus marsupium* Roxb. (n), *Strychnos nux-vomica* L. (o), and Seeds of *Syzygium cumini* (L.) Skeels (p)

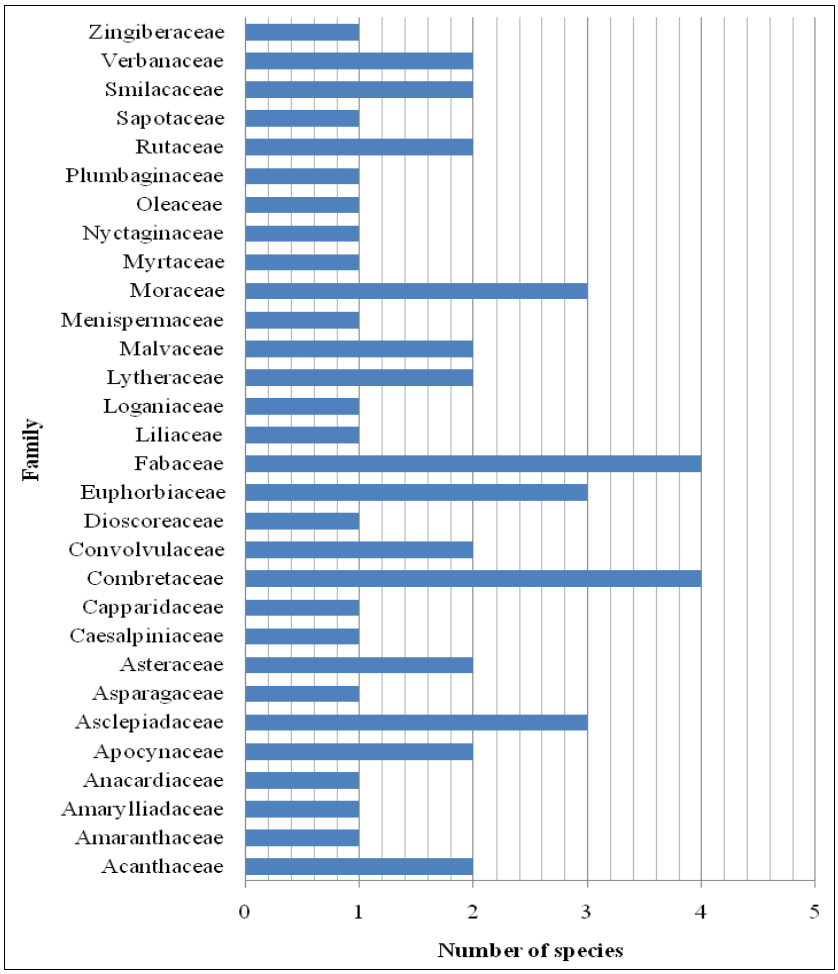

Fig 2: Family-wise distribution of medicinal plant species

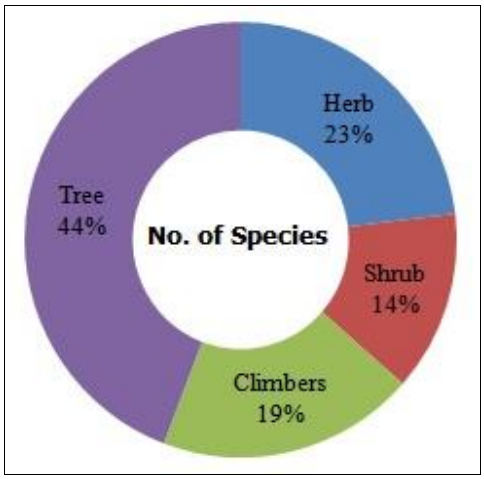

Fig 3: Diversity of plant species by habit

Conclusion

Traditional medicinal plants play a vital role in therapies uses to cure various diseases by *Sahara* tribal groups of Kangaon village of Bargarh District. Many of them till yet using young stem of different plants as tooth brush and tongue cleaner in their daily life. These plants can be further studied for their pharmacological activity and active compound. Awareness regarding scientific and systematic collections of medicinal plants may be done by responsible authority for commercial purposes, which can be beneficial for the local inhabitants.

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