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ARTICLE

Revisiting the traditional medicine of the tribals in the Jungle Mahals, 1947–2000

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Abstract
This paper deals with the medical system of the tribals (Santals, Oraons, Sabar and Birhors) of Jungle Mahals in eastern India. It also discusses the indigenous system of knowledge about the collection, preparation and medicinal practice highlighting the socio-cultural and ecological context of medicinal plants. The region faced excessive pressure from over-exploitation and the growing demand for forest resources resulting in biodiversity loss and species extinction. In the post-independent period, there was a major transformation in treatment methods among the healers. Most of the healers left the practice of exorcism due to increased awareness on witchcraft practices. This study found low levels of overlap in medicinal floras, even in the case of tribal communities who closely related linguistically, culturally, and ecologically. The efficacy of the medicine depends on the extent to which the healers properly followed the rules for the collection of medicinal plants, drug preparation and application. This medical practice is popular among the poverty-stricken tribal communities as they could not take facilities of western medicine because of their poverty and the high cost of allopathic medicine.

Keywords Diseases · Drug preparation · Jungle Mahals · *Mantra* (incantation) · Medicine men/healers · Medicinal plants · Tribals

1 Introduction

This paper focuses on the medical system of the tribals (Santals, Oraons, Sabar and Birhors) of Jungle Mahals in eastern India. In the field of disease, medicine and health, the recent scholars have been keen to realize the interactive process of the Western and non-Western counterparts. The 'folk' medical practices, as Mark Harrison notes, have been least discussed though a little research has been done on the medical 'systems' of Ayurveda (Hindu) and Unani (Islamic/Greco-Arabic) (Pati & Harrison, 2001, pp. 9–10). Following the line of Anthropologists, the social historians of medicine seek to explore non-Western medical practices (Samanta, 2018) like ethno-medicine of the tribals. The rich cultural heritage of the tribals is closely linked with the ecosystem they live in. Valentine Ball (1869) for the first time had given details of the flora of Manbhum and discussed the ethno-medicine of the region. The existing studies (Sengupta, 1997; Manna & Maiti, 2002; Basu, 2005; Maiti et al., 2010; Dey & Dey, 2012; Das et al., 2015; Ghosh & Sarkhel, 2013; Rahaman & Karmakar, 2015) have focused on traditional uses of plants in some of the specific diseases. But the ethno-botanists in their works provided socio-cultural and ecological information and interpretation, which at times appear to be inadequate. Though earlier studies on ethno-medicine have focused more on the Santals, the medicinal knowledge of the Savars and Birhors has been least discussed. Medical anthropologists provide a systematic list of medicinal plants but their works are insufficient. Roy Ellen comments, '...many accounts of folk medicinal uses still lack serious consideration of local ethnographic context.' (Ellen, 2006, S10) There is a huge list of medicinal plants in the vast body of literature. In this literature, as Elizabeth Hsu argues that there is a lack of technical details on drug preparation, the social context of the application, and the reason for which these were collected. It also lacks detailed information and even does not acknowledge the sources (Hsu, 2010, p. 1). This paper deals with the indigenous system of knowledge about the collection, preparation and practice of medicine. It also sheds light on the socio-cultural and ecological context of medicinal plants. It further explores the process in which

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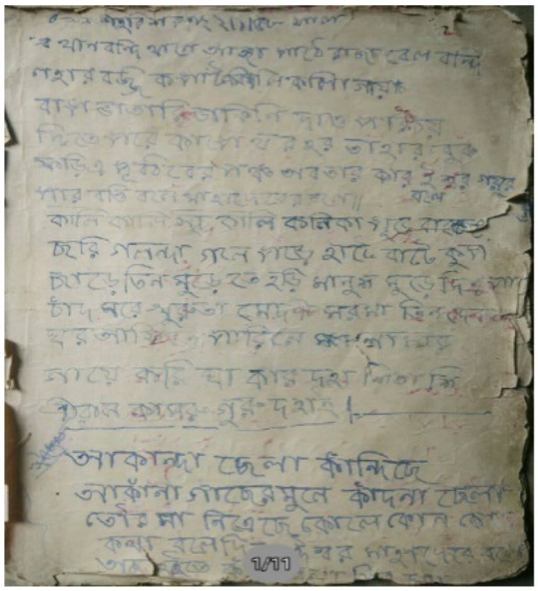

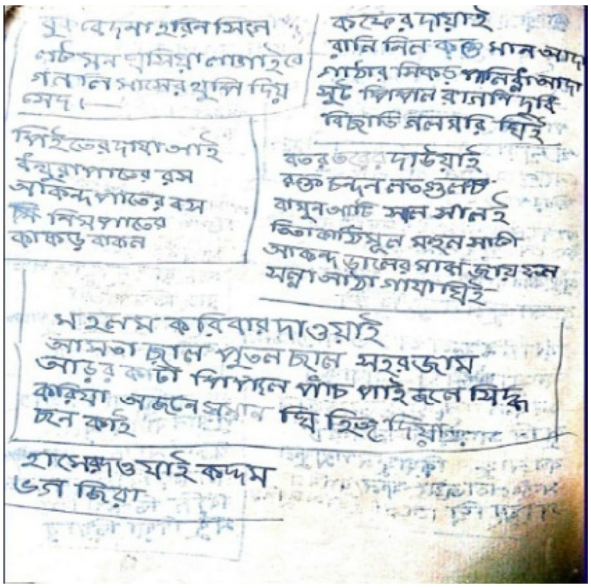

Figs. 1 and 2 Extract from healer's dairy/medical text

the tribal medical systems of culturally variegated groups meet and influence each other.

Human beings and plants are regarded as a single entity when we apply Bruno Latour's concept of 'realistic realism' in explaining the medicinal usage of plants. Thus, this social scientific explanation begins with the notion of 'object institution' or 'corporate body' (Hsu, 2010, p. 26). While dissolving the social scientific problem Latour speaks of the concept of 'ontological hybrids' but Ingold advocates the theory of 'enskillment'. According to him, 'a skill cannot be regarded simply as a technique of the body (Quoted in Hsu & Harris, 2010, p. 27; Ingold, 2000a, p. 352). Skill, in short, is a property not of the individual human body as a biophysical entity, a thing in itself, but of the total field of relations constituted by the presence of the organism-person, indissoluble body and mind, in a richly structured environment' (Hsu & Harris, 2010, p. 27; Ingold, 2000a, p. 353). Though he does not belong to a 'realistic realist' but treats the human being and the artifacts as a single unit. According to him, studying skills needs an ecological approach.

Based on Ingold and Latour's theoretical approach, Grasseni (2007) advocates the concept of ecology of practice. Latour argues that the existence of hiatus between the concept and the thing is socially constructed. But, as Hsu describes, Ingold emphasizes on 'all cultural forms that skilled practice results in are intrinsic to the thing-in-relation-to-the-agent...' Grasseni argues that cognition and skill grow up within the social actors 'acquiring and applying techniques that incorporate the material world into a web of social hierarchies and relations.' Hsu rightly observes that effectiveness comes 'from a skilled practice of putting practitioner-patient-plant-in-the-environment into interaction.' However, she rejects the total dependency on the role of plant chemistry, the practitioner's culture-specific theory and the patient's expectations (Hsu & Harris, 2010, pp. 35–36).

2 Methodology

A snowball sampling technique has been used for this study in which the interpersonal relationship becomes important. Information was collected through key informant interviews. A total of 60 informants were interviewed in the study area, with all the informants being local inhabitants with a profession of healers or who have medicinal knowledge. Some of them regarded it as a part-time profession. The present author in this way found some dairies of the Santal healers who wrote about different aspects of the disease, drug preparation and application. But for the Sabar tribe, the author collected the sources from their oral tradition. This study followed long-term participant observation as part of social anthropological and ethnographic fieldwork. The fieldwork through conversations and interviews were conducted in the Jungle Mahals region. We undertook extended visits (on foot) to different tribal villages near the forests in Manbazar, Boro and the hilly regions of Susunia and Ayodhya. These hilly areas are very important for the healers as these possessed wide varieties of medicinal floras. We complemented our fieldwork with the written dairies (Figs. 1, 2) of the healers and repeat photography. Only a few pictures of medicinal plants are given, which are only representative in nature (Fig. 3a–d).

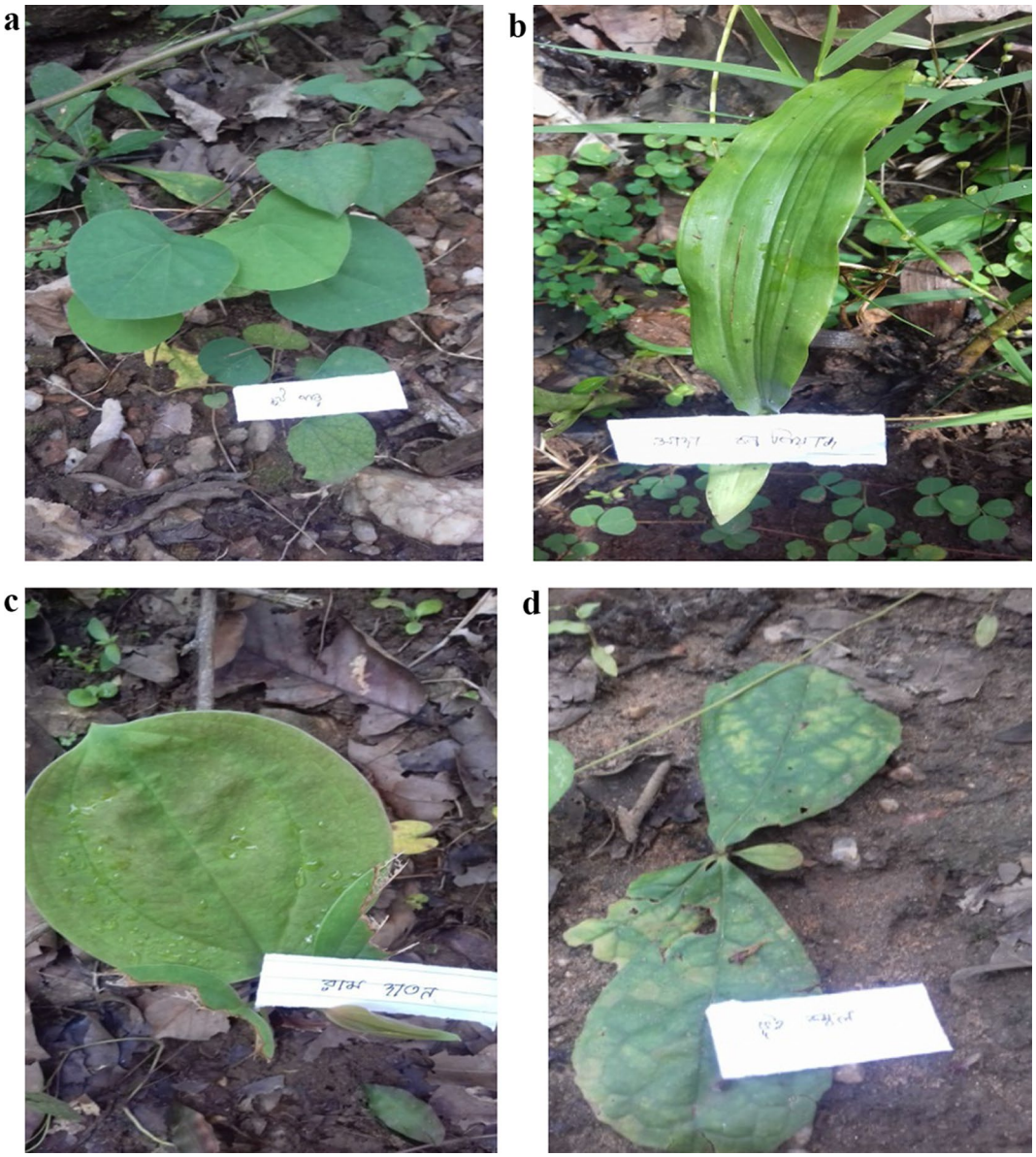

Fig. 3 **a** *Choto par* (*Cissampelospareira L.*). **b** *Ban piyāj* (*Urgineaindica* (Roxb.)Kunth. **c** *Rāmdātan* (*Smilax Ovalifolia*). **d** *VuinKambal (Pygmaeopremna herbacea* (Roxb.)

3 Healers and their treatment methods

The validation of medical knowledge of the tribal people was carried out through different search engines like Google to validate their claims. The data were compared with Ayurvedic texts, reference books and journals (Biswas and Ghosh 1950; Dutt 1877). Their claims are not reported in any literature and may be regarded as novel claims. Information on traditional medicinal floras was collected from 60 informants (healers) from July 2019 to February 2021. The informants were both females and males, and they played an important part in the activities of collecting and using traditional medicinal plants. In the pre-colonial and colonial period (in the nineteenth century) the medicine man, as mentioned by Bodding, was called a *rānānic*. This type of 'doctor' knew the preparation of their medicine (*rān*, a Santali word). Perhaps from the twentieth century onwards, different tribal communities adopted the *ojha* system from the Hindus. Most of the special *bonga* (spirits) invoked by the Santal *ojha* belonged to Hindu origin. But the practice of the Santals *ojha* was quite different. As per the Santals tradition they learnt to be *ojha* from a person called *Kamru* guru who was regarded as their first teacher. He was invoked in the majority of their *mantras*. He had also given instructions to the witches. The Santal medical practices and related superstition were constructed around him (Bodding, 1925,

pp. 10–11, 123).Similarly, the *ojha* system evolved among the Mundas and Dantari was regarded as their first teacher like the *Kamru* guru of the Santals (Hembrom, 2011, pp. 3–7). The influence of Hinduism is evident in the *mantras* mentioned by Bodding (1925, p. 112, 1986) and *mantras* collected by the author from a Santal healer Lusu Murmu. In the *mantras*, Hindu deities such as Manasā, the snake-goddess, Durga, Śiva, Viṣṇu and Saraswati got much more importance than the tribal deities. However, Kamru guru is mentioned occasionally.[1]

Females only had special knowledge about leucorrhea and child diseases. Some of the healers are bonesetter specialists. They are traditional orthopedics specializing in treating broken bones using traditional indigenous medical knowledge. They are efficient in the management of fractures, dislocation, and congenital deformities. However, they also provide the primary treatment to patients suffering from chronic musculoskeletal conditions such as arthritis and post-polio residual paralysis.

The healers generally provide treatment for some of the diseases, such as cough, fever, cuts, wounds, *dhāt*, arthritis, snake bite, jaundice, tuberculosis, gastrointestinal disorder, dermatological complaints, migraine headache, joint pain, respiratory problems, leucorrhea, internal parasites, bone fractures and women related diseases like pre- and post-delivery cases and pregnancy complaints. Different healers deal with the *dhāt* syndrome which is a culture-bound and culture-specific syndrome (Mehta et al., 2009). It has both psychiatric and somatic bound symptoms prevalent in a specific society and culture. Chaturvedi et al. (1993) for the first time mentioned *dhāt* symptoms of vaginal discharge in females and *dhāt* syndrome prevalent among men through loss of semen. Shanta Savar[2] a sixty year old female Savar healer learnt medicinal knowledge from father in-law late Patu Sabar who had learnt some of the *mantras* from a Brāhmin. She narrates the method of preparation of medicine for the treatment of *dhāt* with a combination of 18 plants. These are *nīlkaṇṭha* [*Polygala arvensis* Wild. (Polygalaceae)], roots of *rāli*{*Piper longum* L. (Piperaceae), *rāmdātan* {*Smilax ovalifolia* Roxb. ex D.Don. (Liliaceae)}, *kumārikā* {*Smilax ovalifolia* (Smilacaceae, *svetapalāsa* (white) {*Beuta Monosprma* (Lam.) Kuntze. (Fabaceae)}, *svetasimula* [*Eriodendronan fractuosum* DC. (Malvaceae)], roots of *circhiti* [*Desmodium trifloram* (L) DC. (Fabaceae)], young shoot of *tagar* {*Tabernaemontana divaricata* (L.) R. Br. ex Roem & Schult. (Crepe Jasmine)}, *Padma* [*Nelumbium speciosum* Wild. (Nymphaceaceae)], *sansiyari* [*Nyctanthesarbor-tristis* L. (Oleaceae)], roots of *kedāra*, root of *cāldhuvā*, young shoot of *kurchi* [*Holarrhena pubescens* (Buch-Ham.) Wall Ex G. Don (Apocynaceae)], white *akanda* [*Calotropis gigantean* L. (Asclepiadaceae)], white *durbā{Cynodon dactylon* (L.) Pers (Poaceae)}, root of *khāprāsāk* {*Trianthema monogyna* Linn. (Aizoaceae)}. She also adds three plant combinations *jaifala*{*Myristica fragrans* Houtt. (Myristicaceae)}, fried *rābing*{*Piper nigrum* L. (Piperaceae)} and *pīpala* {*Piper longum* L. (Piperaceae)}. It is fried in the case of post-delivery mother as *talān* (Kabiraj ingredients) and two animals viz. monitor lizard and earthworm. After washing the collected ingredients, it is grinded on a flat stone (*śilabaṭi*) with the help of a cylindrical stone (*naḍa*) to make a paste of big size. It is dried in sunlight for one day and prescribed as pills for one month.

Shanta Savar learnt this *mantra* from the father of her father in law, who was a bonded labour to a Brahmin from whom he picked up the *mantras*. Savars did not have a tradition similar to that of Santal *Kamruguru* or *Dantari* for the Mundas. After losing their home in the forest during the colonial period the Savars and Birhors came in close contact with the caste communities and learnt the incantation from the Hindus. Pasupati Mahato narrated his own experience as a patient in the 1980s about the effectiveness of tribal medicinal practices among Savars. He also noted that healers were efficient in dealing with the diseases such as smallpox, snake bites, scorpion bite, dog bite, skin diseases.[3]Shanta Savar informed that she purchases the ingredients from the weekly market. As species are getting extinct due to deforestation in the region, she could not find all the plants available in her area. There is food restriction during the period of treatment. The patient should take vegetarian food, such as boiled rice, pigeon peas and ridge gourd. The patient should avoid also fried food like puffed rice. During the time of preparing the medicine, the healer chanted *mantras*. In the case of a scorpion bite, the healer prepared a paste from *višalyakarani* (*Tridax procumbens*) (Mahato, 2022, p. 4).

An over fifty year old Santal healer Bangsidhar Tudu-[4]diagnoses the *dhāt* by applying the method of a urine test and through the observation of the symptoms, such as the feeling of weakness, light fever and white stuff in urine. If ants are attracted to a place where a patient urinates, it implies that the patient is suffering from *dhāt*. He prepares the drug from eight plant species, i.e., leaves of *bel*{*Aegle marmelos* (L.) Corr. (Rutaceae)}; *tulsī*{*Ocimum tenuiflorum* (Lamiaceae)}; turmeric, *musṭā*/nut grass{*Cyperus rotundus*, (Nutsedges)}; roots of *sāluka* {*Nymphaea nouchali*

[1] Healer's Dairy, Lushu Murmu, Vill. Dalalata, P.O. Tara, P.S. Kashipur, Dist. Purulia, W.B.

[2] Shanta Savar, Vill. Dakatairn, P. O. Kuda, P. S. Kenda, Dist. Purulia, W. B.

[3] Pasupati Mahato, '*banoshodhi niye pathyapustaka*', *Karamthirtha* (Local Bi Weekly News Paper), 5th August, 1985.

[4] Oral history collected from Bangsidhar Tudu, Vill. Pandra, P.O. Kumari, P.S. Boro, Dist. Purulia, W. B.

Willd. (Nymphaeaceae); young shoot from *karama* tree {*Haldina cordifolia* Roxb. (Rubiaceae)}; roots from *circiti*{*Desmodium trifloram* (L) DC. (Fabaceae)}; bark from *sāhrā* tree{*Streblus asper* Lour. (Moraceae)}. He also adds powder extracted from quartzite rock. Along with these, he used to add 32 ingredients. After washing the collected materials the medicine man grind these into paste through flat and cylindrical stone and lastly makes pills and prescribes it for 9–11 days. There is a separate rule for taking the medicine on the first day. He washes out the stones used for grinding the materials and collects the washed water and put a piece of hot quartzite stone into the water. He advises the patient to take this water for the first day and from the next day the patient is advised to take the pills. The patient is also advised to avoid sour, stale and non-vegetarian food during the treatment period (Mahato, 2022, p. 4).

Gurupada Shikari, a sixty two year old another healer from Birhor tribe[5] prepares drug for the treatment of *dhāt* with the combination of eight plant species i.e., white flower collected from the pond, roots of jaundice, *rāmdātan*{*Smilax ovalifolia* Roxb.ex D. (Liliaceae)}, *anantamula*{*Hemidesmus indicus* (L.) R. Br. (Asclepiadaceae)}; bark of *pichāli* {*Ventilago maderaspatana* (Gaertner)}, *laṭāmurgā* (*Dalbergia volubilis* Roxb.) and monitor lizard (*Varanus bengalensis*). He also adds unrefined brown sugar and thirty two plant combination as *kaviraji* ingredients. He prefers to collect it on the day of the new moon. He does not generally collect these medicinal plants on wednesday as they believe it is the birthday of medicinal plants. After washing the collected ingredients, the medicine man grinds it into a paste and prepares a ball of big size of pea. He dries it for one day in sunlight and prescribes the pills for 3–7 days twice daily as per the condition of the patients. However, as there is food restriction the patient should take only vegetarian food during the period of treatment (Mahato, 2022, pp. 4–5).

Haradhan Savar (Fig. 4) of Jahanabad, is a well-known healer in the Savar society. His father was also a renowned healer and very close friend to another renowned healer Sri Tarani Mahato of Kumordi. He prepares drugs for arthritis with a combination of freshly harvested ten plants, the root of *Rāmdātan* (*Smilax Ovalifolia*), *Barahāmi*, *Cotohāmi*, *tālmuli*[*Curculi goorchioides* Gaertn. (Hypoxidaceae)], flower of *kālha* {*Salvia uliinosa* Buch-ham (Acanthaceae)}, fruits of *svetasimuli* [*Eriodendronan fractuosum* DC. (Malvaceae)], flower or bark of *svetpalāsa* (white) {*Beuta monosprma* (Lam.) Kuntze. (Fabaceae)}, *sveta-jurgunda* [(White) *Chrysopo gonaciculatus* (Retz.)], roots of *cādhuwa* {*Aerva sanguinolenta* (L.) Blum (Amaranthaceae)}, flower of

Fig. 4 Haradhan Sabar, a healer

lālsaluk{*Nymphaea rubra* (Mymephacea)} and two plants *jaifala* (*Myristica fragrnans* Houtt.) and *pipala* (*Piper longum* L.)]. Applied as an ointment (external use), he prepares the medicine from freshly harvested three plants (oil extracted from the Banyan tree and Gab tree) and three animal species (fat extracted from cow or buffalo, hen and *dhāmna* sap/ rat snake). In the case of leucorrhea, they prepare the drug from freshly harvested twenty one plant species and eight types of salt. They boil the combination for a period of time when it is reduced to an amount of 1/5th of its original amount. They advise the patient to take the juice twice daily (morning and evening) for one week. After dedicating the medicine to the Goddess Manasā they give it to the patients. They collect the medicinal plants during the night of *amaāvasya* (new Moon). However, Lushu Murmu of Kashipur prepares the medicine for arthritis with a combination of four medicinal plants *bhuikambal* [*Pygmaeopremna herbacea* (Roxb.) (MoldenkeVerbenaceae)], *kāntakambala*, *svetsaiya*, the root of *khunt*, salt and sulfur. Here, the efficacy of the medicine depends on how much a healer followed the rules and regulations for collecting and preparing the medicine. If the *mantra* fails they applied medicine and vice versa (Mahato, 2022, p. 4).

4 Process of collecting medicinal floras

As the plants are supposed to take rest or sleep after sunset till sunrise, the healers would not disturb them by harvesting at night. The tribal used to uproot some herbs in one breath.

[5] Oral history collected from Gurupada Shikari, Vill. Barodi, P.S. Bagmundi, Dist.Purulia, W. B.

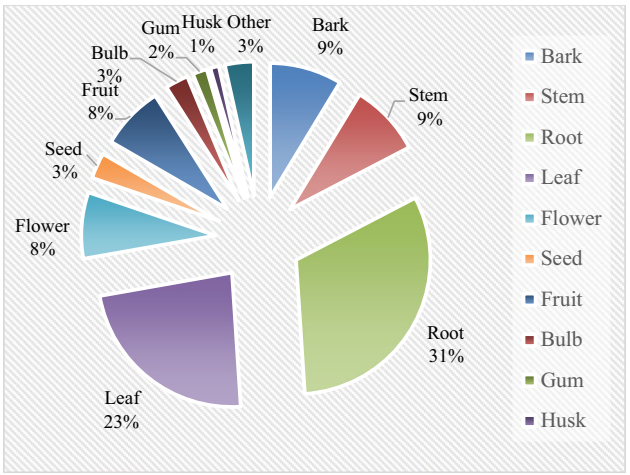

Fig. 5 Plants parts used as drug preparation

Accordingly, it indicates the will force of the ailing person. During the period of harvest, the healers prefer to collect the exposed roots only near the water channel (Hembrom & Goel, 2005). They cut it with a single stroke in the absence of any person. The healers collect some rare medicines in the early morning call so that the work could be executed in absence of any person. The medicine men used to debark a tree in one breath after cutting a branch from bottom to top, i.e. in an upward direction (Mahato, 2020, p.75).

Most of the informants generally belong to the 51–60 age group. This study recorded 111 medicinal floras which are used for the treatment of 31 ailments (Supplementary Table 1). Healers in the study area used different plant parts for the preparation of traditional drugs. Based on the data from informants, the majority of the traditional medicinal floras were harvested as a whole plant, followed by the roots, leaves, stems, bark, fruits, flowers and other parts. In this study, we found that different plant parts, such as 31% roots, 23% leaf, 8% flower, 3% seed, 8% fruit, 3% bulb, 2% gum, 1%, husk, 3% bark, 9% stem, others 3% are used as medicine (Fig. 5). The result shows that the drugs for skin diseases occupy the highest proportion, flowed by digestive, anti-venom and so on (Fig. 6). Some studies argue that there is a high rate of root exploitation leading threat to the plant species for overexploitation.

5 Drug preparation process

Like pharmaceutical drugs, the usage of medicinal plants is culturally specific processing. Their therapeutic efficiency depends on the timing of the collection of plants, the technique of persuading plants to be effective, sometimes

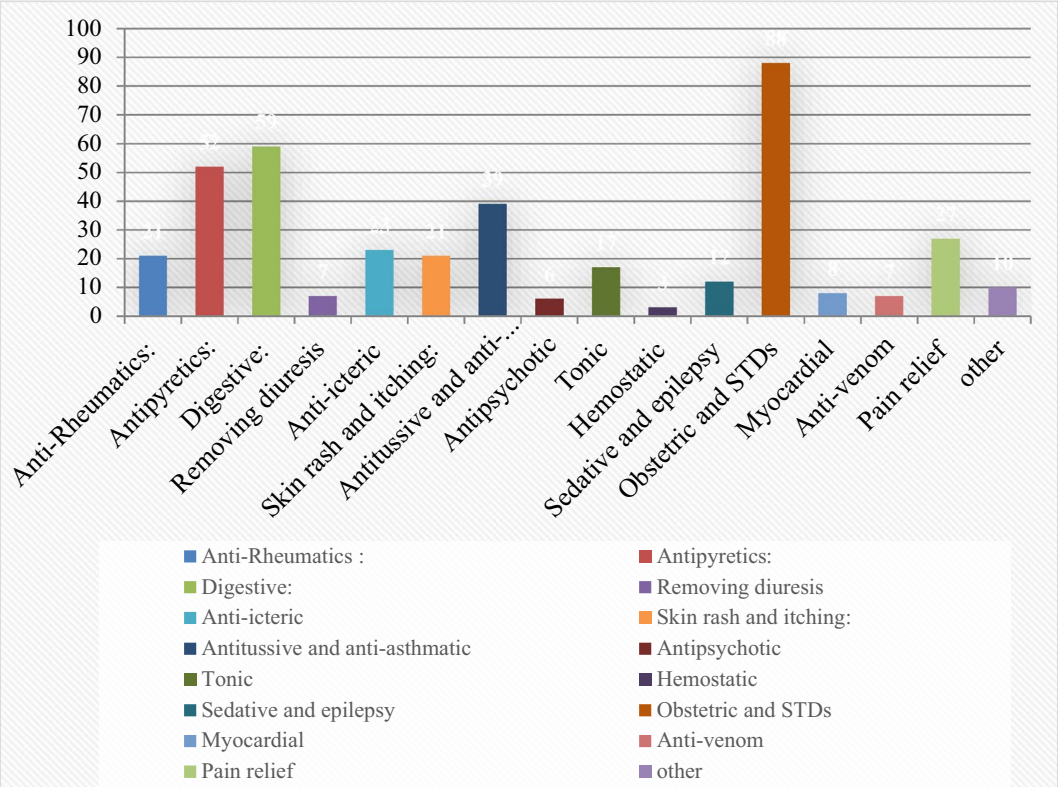

Fig. 6 Statistics of therapeutic effects

through spells and charms, sometimes by cunning actions and their mode of preparation (Mahato, 2020, p. 75). Modes of preparation may involve culturally specific forms of cutting, drying, cooking, fermenting, often mixed with cultural specific products (Hsu & Harris, 2010, p. 5). Hsu writes, 'Plant materials applied in medical practice are after all material culture: due to culture-specific preparations they are turned into cultural artifacts' (Hsu, 2010, p. 21). The healers prepared the medicine through the combination of plants, seventeen animals, lime, honey, soil from termite heaps, soil produced by earthworms and five minerals ingredients.

The medicine man prepares different types of drugs like pills, paste, powder, infusion, decoction, mixture, syrup, extracts both in water and in alcohol, fresh juice by squeezing fresh materials, fermentation, medicated oil both from plant parts and from animal fats, massage balm, fumes, burning ash, plaster etc. In case of powder preparation at first the healer washes the plant and then dries it completely in shades. The next day, he/she dries it for one day in sunlight and after that pounds it on a flat stone with the help of a cylindrical stone. After that strain it through cloth and finally, the powder is ready.

Paste are prepared after washing the collected leaves and grinding these into a paste and finally rolling into shape of a ball. The medicine in the juice form is prepared by washing the leaves, grinding them to paste and turning into a ball. After that, it is put in a cloth and squeezed to extract juice. For cold infusion, a healer marks the trunk of a particular tree on his/her four fingers. Then, discarding the outermost layer, the healer peels off bark from the trunk. After crushing it, he adds to it some water and leaves to sit for some time. Lastly, he/she strains it through a cloth. In the case of hot infusion, the healer marks on the trunk an area of four fingers and then discarding the outermost layer he/she peels off the bark. He/she crushes it and puts the crushed bark in hot water. It is covered and left to cool, strained it after cooling and this way the infusion is prepared. In case of decoction, the healer washes leaves, stem and roots and chop these into pieces. He puts 1 cup of chopping to 4 cups of water. After boiling it, it is left to evaporate till 1/4th volume is left. Lastly, it is strained into cups. For pills at first, the healer takes 1 kg. leaves (approx.) and boils it in 4 L of water. Later on, he/she leaves it for evaporation up to 1/4th of its volume. Thus he/she collects the strain and thickens it on fire. He/she prepares pea size pills and lastly, these are put in for sun drying. For preparing oil from leaves, the healer at first takes 1 kg of leaves. After washing, makes these into a paste and squeeze these and collect the juice. *Tila* oil is added to this juice and boiled. The healer tests the water content after evaporation. Oil from seeds is extracted by removing the seed kernels and crushing them. Then they are placed on leaves like *Butea monosperma* and wrapped. They are provided with sufficient steams and unwrapped after that and finally, oil is extracted.

It was observed that tribal healers used to prepare all the major and minor forms of drugs depicted in Ayurveda. The five basic preparations of medicines included juice, paste, decoction, hot and cold infusion (Sharnagdhara, 2008). The application mode of medicine is an important aspect of their healing process. Also, the dosages and timing of the application of medicine play important roles. There are some burning issues they deal with, for example, at which period they apply medicine in the course of illness and at which rate in a day. These procedures need what Ignold (2000a, 2000b) referred to as 'enskillment' which takes into account aesthetic aspects, cultural dispositions, culture-specific drug preparations and local history. Due to poverty, lack of medical and transport facilities, the tribal people are dependent on the medical services from traditional healers. They were very efficient to identify the plants exactly from the forest, cultivated areas, sacred groves and home gardens. Thus the healers were not only concerned for individual health but for the community as a whole. Foster and Anderson (1998) argue that the efficacy of such a system could be assessed in such a way that their 'ability to successfully play roles that lie far beyond the cure of illness and maintenance of health' (Mathews, 1992, p. 9).

6 Discussion

The tribal people of Jungle Mahals used different types forest produce as food items and food supplements. These food supplements became the sole source of their diet during times of scarcity and famine. Due to colonial interventions from the nineteenth century onwards, forest ecosystems were devastated as a result of the agrarian intervention and people's relationship with the forest changed. Traditional food items were reduced with the destruction of forests (Mahato, 2020, pp. 130–133). The region faced excessive pressure from over-exploitation and the growing demand for forest resources which resulted in biodiversity loss and species extinction. Shanka Sinha rightly observed that the decline in forest cover and also the restrictions on the use of forest products made it increasingly difficult for healers to procure medicinal plants and animal meat (Sinha, 2006). The healers took the path of exorcism and ascribed the cause of diseases to individuals, usually women. Kelkar and Nathal (1991) argue that historically women might had a more important role in healing and the *ojha* system was a relatively late institution among the Mundas. The power of women in terms of their procreative abilities was thus sought to be constrained by preventing them access to rituals such as those of the sacred grove.

Fig. 7 Tarachand Soren, a tribal healer in his chamber

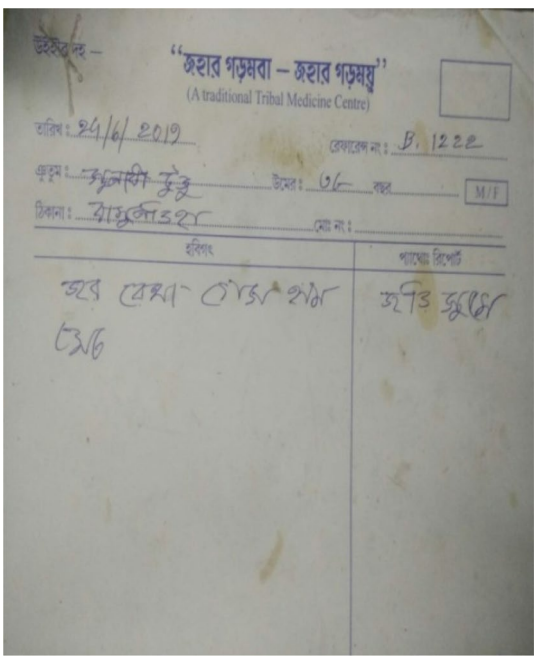

Fig. 8 A Sample of Medical Prescription given by a tribal healer

In the post-independence period, there was a major transformation in treatment methods among the healers. Most of the healers left the practice of exorcism due to awareness programmes on witchcraft practices. The healers used to consult reports of X-Ray, blood sugar etc. Traditional orthopedics also purchased bandage materials from the markets. They also purchased *kavirāji* ingredients from the market. Tarachand Soren a forty year old healer may be regarded as an important example of such a type of healer who records a list of patients and case history of treatment episodes (Fig. 7). Like modern doctors, he gives prescriptions (Fig. 8). According to his written records, he has treated more than twelve thousand patients over ten years, which indicates how much both the healer and the medical system are popular among the tribal communities.[6]

Though the Hinduised Santals and Savar have their belief in animism but they also protect their sacred groves. This study found low levels of overlap in medicinal floras, even in the case of tribal communities which are linguistically, culturally, and ecologically closely related. Thus, the knowledge of the healers about many medicinal floras is greatly local. The efficacy of the medicine depends on how much the healers properly follow the rules for the collection of medicinal plants, drug preparation and application. The knowledge transmission about medicinal floras among different tribal communities is very healthy. This transmission occurred both through the vertical and horizontal processes. Shanti Murmu, a Santal woman, learnt medicinal knowledge from Laxmikanta Savar, a Savar healer. Classical Ayurvedic literature contains vast knowledge and it is very difficult to validate each drug claim in all literature. Different medicinal plants used in compound preparation are mentioned for the treatment of a specific disease in the Ayurveda but the tribal healers use a different combination of different plants for the treatment of another disease as reported in this study and it may be regarded as their traditional medical knowledge.

7 Conclusion

The traditional tribal medicines practiced at low cost in poverty-stricken areas have become popular among tribal communities. They could not take facilities of western medicine because of their poverty and the high cost of allopathic medicine. According to the patient's perspective, this medicinal system became popular because of its effectiveness in curing ailments and not merely its low cost. The effectiveness of the medicinal system depends on many factors such as the patient's faith in the system, the healer's skilled knowledge about the proper herb collection process, drug preparation, proper diagnosis and application of *mantras*. In the 1920s, as Bodding mentioned, many new-generation Santal people were interested to learn about their medical system and this trend continued up to the 1980s. But from the 1990s, onwards new generation became less interested in picking

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up the knowledge as most of the healers belong to the age group of above fifty-five. The knowledge transmission about medicinal floras among different tribal communities is very healthy. This transmission occurred both through the vertical and horizontal processes. Due to excessive biodiversity loss and the non-availability of medicinal floras in local areas, the healers purchase some of the ingredients from markets. Therefore, a new type of market network has developed and new herbs sellers have emerged.

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Declarations

Conflict of interest I state that I have read and agreed to the submission guidelines, policies, and submission declaration of this journal.

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