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## RESEARCH ARTICLE

### PLANTS USED BY THE TRIBES OF KEONJHAR DISTRICT OF ODISHA, INDIA, TO INDUCE LACTATION IN NURSING MOTHER

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#### ABSTRACT

Medicinal plants are the local heritage with global importance. World is endowed with a rich wealth of medicinal plants which have always been the principal form of medicine and presently they are becoming popular throughout the developed world, as people strive to stay healthy in the face of chronic stress and pollution. Tribes of Keonjhar district of Odisha depend basically on different herbs for a wide range of ailments including mother and child health care. An ethnobotanical survey was conducted to collect information about medicinal plants used as galactagogue by the tribals of the district. This includes the indigenous knowledge of local traditional healers and native plants used by the tribes for inducing lactation among nursing mothers through questionnaire and personal interviews. A total of 55 informants within the age group of 50 to 68 were interviewed, among them fifteen were tribal practitioners. The investigation revealed that, the traditional healers and the inhabitants of the district use 46 species of plants distributed in 43 genera belonging to 28 families to induce lactation in nursing mother. The study also revealed that fresh plant materials were invariably preferred for the disease management. Breast feeding is a major source of nourishment for the tribal infants and it is carried for a prolonged period. Lactation inducing remedies are commonly used by the nursing mothers in order to meet the nutritional requirement of their children. Some of the lactation inducing (galactagogue) plant species are found growing in their natural habitat while others are domesticated. Galactagogue plants used by tribes of Keonjhar have been listed along with plant parts used. The present paper dealt with the ethnobotanical exploration, identification and documentation of potential galactagogue plants used by the ethnic groups of Keonjhar district of Odisha.

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#### INTRODUCTION

Ethnomedicines have been in use since time immemorial to combat various human ailments and is still the mainstay for the most part of the developing countries including India. It is based on the knowledge of plants by the local people and their usefulness as understood by people of a particular ethnic group, since information concerning a particular plant varies from one ethnic group to another (Tor-Anylin *et al.*, 2005; Igoli *et al.*, 2005). According to World Health Organization (WHO) as many as 80% of the world's populace depend on traditional medicine for their particular health care need. Therefore, the use of traditional medicines in various therapies by indigenous people, all over the world, cannot be overlooked. India is a home to almost more than half of the world's tribal population. Over 84 million people belonging to 698 communities are identified as members of scheduled tribes constituting 8.2% of

the total Indian population (Lokpriya, 1998) and is larger than of any other country in the world. There exist millions of herbal based traditions in the form of traditional birth attendants, vaidyas, bone setters, herbal healers, barefoot doctors, witch doctors and wondering monks to cure different ailments. Besides, there are millions of medicine-women and elders who have traditional knowledge on herbal household remedies, food and nutrition. The informal system of folk medicine, which exists in these ethnic communities, is passed orally from one generation to other, for which there is little documentation. Many plants have multipurpose use and they can be used singly or in combination with other ingredients against even life threatening diseases. This knowledge is mostly restricted to elder members of tribal communities. Odisha ranks fifth among the states of India, with 7 million tribal population, categorized under 62 notified communities. The tribal population is nearly 24% in comparison to the total population of the state and mostly restricted to rural areas. The tribes of Keonjhar district of Odisha constitute 43.88% of the total district population (as per 2001 census) and about 86.36%

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of these populations live in the rural areas. The concentration of tribes is highest in Keonjhar and lowest in Anandpur sub-division. The major tribes inhabiting in this district are Bhathudi, Bhuyan, Gond, Ho, Juang, Khaswar, Kisan, Kolha, Kora, Munda, Oran, Santal, Saora, Sabari and Saunti (according to 2001 census). These forest dwellers possess vast knowledge on various aspects of plants to cure their common ailments. Breast-feeding is best for infants, but it continues for a prolonged period (up to 2-3 yrs old child) as there are no other supplements of nutrition available and the tribal infants largely depend on mother's milk. On the other hand a good breastfeeding makes a good start, providing the newborn with the best nutrients, immunity and tenderness. In rural area, traditionally herbs and herbal cooking represent an important way to improve lactation. Most of the nursing mothers eat certain special food items and fruits to enhance lactation. Some herbs are also identified for possessing the property of galactogogue and are often used by the tribes to enhance lactation. The present paper is an endeavour to investigate various plants used as galactogogue or lactation inducers by the tribes of Keonjhar district of Odisha.

## MATERIALS AND METHODS

### Study area

Keonjhar is a district having 8240 sq. km. area, situated in the northern part of Odisha and surrounded by Singhbhum district of Jharkhand in the north, Jajpur in the south, Dhenkanal and Sundergarh in the west, and Mayurbhanj and Bhadrak in the east. It lies between 21° 01' N and 20° 0' N latitude and between 85° 1' E and 86° 22' E longitude and 480 meters altitude. It is a predominantly tribal district endowed with rich minerals such as iron ore, manganese and chromites apart from the luxuriant forest wealth. Half of the district nearly 4043 sq. km. is covered by forest of northern tropical moist deciduous type. The climate of the district is characterized by hot summer with high humidity. Temperature is maximum in the month of May. The weather is pleasant at the advent of monsoon in June and remains as such up to the month of October. The temperature in the month of December is lowest and sometimes drops down to 7 °C. The Baitarani is the principal river of the district. The soil is red throughout the district with patches of black cotton soil towards south.

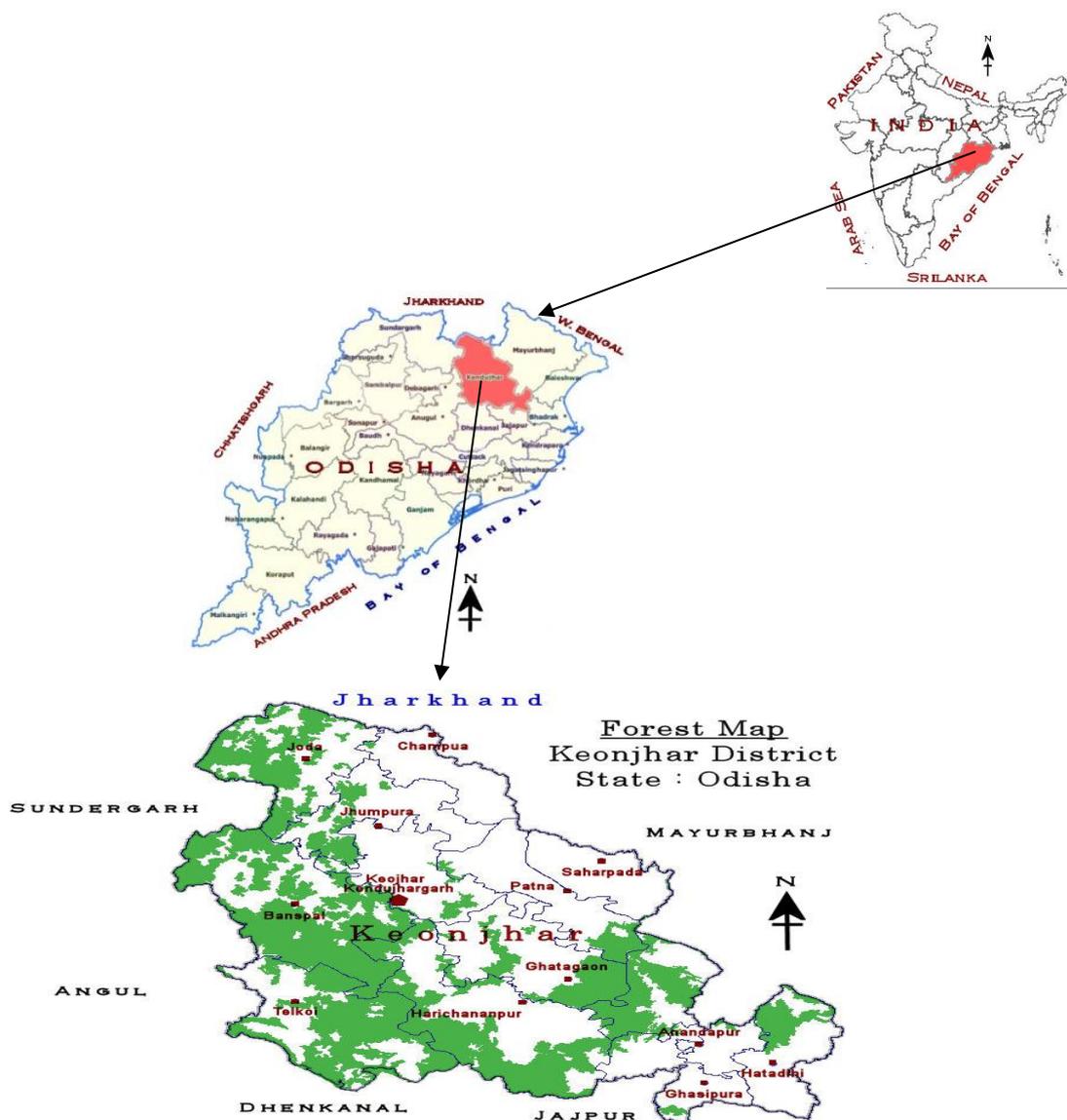


Fig. 1. Map of Keonjhar district of Odisha

## Methodology

Ethnobotanical surveys were undertaken among the various tribal communities in the blocks of Keonjhar district. Data collection was done through interviews and discussions with elderly tribal women and traditional healers to know the uses of plants for the purpose of lactation. Additional information regarding doses, form in which a plant is used, whether solely used or used with other ingredients etc. were also collected. Plant specimens were collected and identified following 'Flora of Orissa' (Saxena and Brahmam, 1994-1996) and other standard compilations (Mooney, 1950; Haines, 1921-1925). Some of the frequently used galactogogue plants among the tribal people of Keonjhar are enumerated in Table 1 which are arranged with the binomials of the plants mentioned alphabetically along with their local names and the mode of application. The voucher specimens have been deposited in the Post Graduate Department of Botany, Utkal University, Bhubaneswar for further reference.

## RESULTS AND DISCUSSION

Generally breast milk is considered best for newborn babies and during the survey it was observed to be the major source of nutrition which is continued for longer period in tribal communities of the district. It may be due to lack of sufficient nutritional food for the infants. Nursing mothers sometimes find it difficult to produce adequate milk and hence use various plants to enhance their lactation. Although some of the plants are scientifically proven others have no supporting data which needs for pharmacological evaluation and confirmation. Many of the earlier literatures regarding herbal cure does not meet scientific standards, still a large number of research reports about medicinal plants does exist (Wichtl, 1994; Duke, 1992; Leung and Foster, 1996; Newall *et al.*, 1996; McGuffin *et al.*, 1997; Kitiikar and Basu, 1975; Nadkarni, 1958; Raghunathan and Mitra, 1982; WarTier *et al.*, 1994; Satapathy, 2008, 2010; Satapathy and Brahmam, 1996, 1999; Satapathy and Chand, 2003; Satapathy and Panda, 1992; Satapathy *et al.*, 2012).

**Table 1. Plants frequently used by the tribes of Keonjhar district of Odisha to increase lactation**

Plant name	Local name	Mode of uses
<i>Allium sativum</i> L. (Liliaceae)	Rasun	Garlic paste (5 g) mixed with coriander seed powder (2 g) is given once a day for 7 days to increase lactation.
<i>Alocasia macrorrhizos</i> (L.) G.Don	Manasaru	The corm is taken as a vegetable and prepared curry if given after delivery enhances lactation.
<i>Alstonia scholaris</i> (L.) R.Br. (Apocynaceae)	Chhanchana /Chhatian	Root powder (2-3 g) mixed with 5 drops of its latex and 20 ml of freshly prepared curd is prescribed as lactogogue for nursing women.
<i>Alternanthera sessilis</i> (L.) R.Br. ex DC. (Amaranthaceae)	Madaranga	Decoction (100 ml) of the whole plant, with one cup of milk once a day for 15 days is prescribed to feeding mother against galactorrhoea. The patient is also advised to take the leaf of this plant along with the leaf of 'Kanta saga' ( <i>Amaranthus spinosus</i> ) as vegetable in her daily diet during pregnancy.
<i>Amaranthus spinosus</i> L. (Amaranthaceae)	Kanta saga	Root paste (5 g) along with sugar candy (10 g) is given early in the morning to the nursing mothers to increase lactation.
<i>Asparagus racemosus</i> Willd. (Liliaceae)	Shatavari/Satawari	A decoction of tuberous roots prepared with milk is also given to delivered mother to increase breast milk. A cupful of infusion of dried root mixed with 5 drops of honey is also given in empty stomach to lactating mother against galactorrhoea.
<i>Barringtonia acutangula</i> (L.) Gaertn. (Lecythidaceae)	Hinjala/Hijal	Five fruits are dried, powdered and given along with a cup of milk to the nursing mothers for inducing lactation.
<i>Boerhavia diffusa</i> L. (Nyctaginaceae)	Puruni-saga	Leaves (10 g) fried in cow's ghee is taken twice a day for at least a month for increasing breast milk.
<i>Calotropis procera</i> (Ait.) R.Br. (Asclepiadaceae)	Dhala arakha	The milky latex mixed with equal amount of latex of <i>Euphorbia hirta</i> is applied on the breast once a day for at least 7 days to induce lactation.
<i>Carica papaya</i> L. (Caricaceae)	Amruta-bhanda	Green fruits (250 g) are boiled and made into a paste and is given twice a day along with a pinch of common salt and 'jeera' ( <i>Cuminum cyminum</i> ) powder for three months from the seventh day of the delivery against improper lactation.
<i>Caryota urens</i> L. (Arecaceae)	Salapa	The stem is incited and the juice is collected. A glass of fresh juice is given once a day for 3 days to nursing mother for enhancing lactation.
<i>Cassia tora</i> L. (Caesalpinaceae)	Chakunda	Seeds (10 g) are dried and ground to a powder and given to the nursing mothers for enhanced lactation purpose.
<i>Coriandrum sativum</i> L. (Apiaceae)	Dhania	Fruit powder (10 g) infusion is taken twice a day for 7 days to increase breast-milk production during pregnancy.
<i>Cryptolepis buchananii</i> Roem. and Schult. (Periplocaceae)	Gopakana/Dudhi	Leaf juice (10 ml) is prescribed to nursing mother for one month for enhancement of lactation.
<i>Cuminum cyminum</i> L. (Apiaceae)	Jeera	Seeds (10 g) boiled in one cup of water, filtered and the filtrate mixed with 10 ml of honey is prescribed on an empty stomach in the morning to enhance lactation.
<i>Curculigo orchiooides</i> Gaertn. (Hypoxidaceae)	Talamuli	As a tonic, powder of the roots with milk is given to women after delivery to restore the broken health and increase lactation. Powder of the roots with milk and sugar is given to the pregnant women to induce lactation. To increase secretion of breast milk, a paste of the rhizome is applied on the breast of the delivered women.
<i>Curcuma longa</i> L. (Zingiberaceae)	Haldi	Powdered rhizomes (2 g) is added to date palm juice (50 ml) and given once a day for about one month to increase lactation.

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<i>Cyperus rotundus</i> L. (Cyperaceae)	Mutha	To increase secretion of breast milk, a paste of the root or tuber is applied on the breast of the delivered women. Decoction of the tubers (20 ml) is given if mother of a new born baby is suffering from inflammation in her breasts or the breast milk is impure or discoloured or if any pus formation.
<i>Desmodium gangeticum</i> (L.) DC. (Fabaceae)	Salaparni	Fresh roots (10 g) of this plant boiled in a cup of goat's milk and given once in a day for one month against galactorrhoea. Besides increasing breast milk it strengthen the heart and used as tonic.
<i>Desmodium triflorum</i> DC. (Fabaceae)	Kuradia gachha	Leaves of this plant along with the leaves of <i>Marsilea minuta</i> are cooked and prescribed as a vegetable to nursing mother or pregnant women for better lactation.
<i>Euphorbia hirta</i> L. (Euphorbiaceae)	Chitakuti	Roots (5 g) are steeped in water (20 ml) overnight and drunk by the lactating mother in the next morning to boost breast milk.
<i>Euphorbia tirucalli</i> L. (Euphorbiaceae)	Dangali Siju	The root juice (10 ml) mixed with its latex (2 drops) is given for 15 days to nursing mother to enhance lactation.
<i>Ficus hispida</i> L.f. (Moraceae)	Baidimiri	Ripe fruits are considered as tonic and lactagogue and given to promote lactation.
<i>Ficus racemosa</i> L. (Moraceae)	Dimiri	Ripe fruits are dried, powdered and given with sugar candy for lactation.
<i>Foeniculum vulgare</i> Mill. (Apiaceae)	Panamahuri	Seeds (10 g) boiled in 100 ml cow milk for 15 minutes over a slow fire and the lukewarm infusion is given to increase lactation.
<i>Hemidesmus indicus</i> (L.) R.Br. (Asclepiadaceae)	Anantamula	Decoction of the dried roots mixed with equal amount of goat's milk is given once a day for one month for enhanced lactation.
<i>Holarrhenna pubescens</i> (Buch.- Ham.) Wall.ex G.Don (Apocynaceae)	Korei	Flower paste mixed with 2 drops of coconut oil is applied to the breast of the pregnant women to increase lactation.
<i>Homonoia riparia</i> Lour. (Euphorbiaceae)	Pani Joval	The root juice (10 ml) is given daily for 15 days to nursing mother to enhance lactation.
<i>Ipomoea digitata</i> Auct. non L. (Convolvulaceae)	Bhuin-kakharu	Tuberous roots (20 g) are dried, powdered and given with fermented rice water (50 ml) to women to induce secretion of milk.
<i>Jatropha curcas</i> L. (Euphorbiaceae)	Baigaba	The decoction of the leaves is prescribed to stimulate secretion of milk in women.
<i>Lagenaria siceraria</i> (Molina) Standley (Cucurbitaceae)	Lao	Fruit pulp (100-200 g) boiled with cow milk (100-200 ml) and given daily for three months to increase the milk secretion in a lactating mother.
<i>Launea asplenifolia</i> DC. (Asteraceae)	Patheri	Young twigs (10 g) are cooked with the flowers (10 g) of <i>Moringa oleifera</i> and prescribed to the nursing mothers as well as pregnant women to enhance lactation.
<i>Lepidium sativum</i> L. (Brassicaceae)	Patri	Flower paste (5 g) mixed with a cup of milk and given on an empty stomach in the morning to enhance lactation.
<i>Madhuca indica</i> Gmel. (Sapotaceae)	Mahula	Juice of flowers along with pinch of rock salt is given to nursing mothers to increase lactation.
<i>Momordica charantia</i> L. (Cucurbitaceae)	Kalara	Fruit paste mixed with butter milk is applied to the breast of the nursing mothers for enhancing lactation and reduces inflammation in the breast, if any.
<i>Nigella sativa</i> L. (Ranunculaceae)	Kala-jira	Seeds (5 g) are powdered and prescribed in the morning for 15 days against galactorrhoea.
<i>Opuntia elatior</i> Mill. (Cactaceae)	Nagaphana	A poultice of the burnt flowers is applied to the breasts of a nursing mother or a pregnant woman to facilitate milk flow.
<i>Pueraria tuberosa</i> DC. (Fabaceae)	Bhuin kumra	Tubers are cut into pieces, sun dried, powdered and infused in goat's milk and prescribed two times in a day for 7 days inducing lactation in women after child birth.
<i>Ricinus communis</i> L. (Euphorbiaceae)	Jada/Gaba	Leaves are heated and tied to the inflamed breasts of the nursing mothers for the cure. The infusion of the leaves (5 ml) is given twice daily to nursing mother for better lactation.
<i>Scoparia dulcis</i> L. (Scrophulariaceae)	Vana yashthi-madhu	Root paste is applied to the breast of the lactating mothers for promoting lactation.
<i>Sesamum orientale</i> L. (Pedaliaceae)	Tila/Khasa	Seeds are roasted, pounded, mixed with sugar candy and given once a day for 7 days to the pregnant women suffering from inflammation in breast.
<i>Smithia conferta</i> J.E. Smith (Fabaceae)	Gokari	Plant juice (5 ml) mixed with 5 drops of honey is given to the nursing mother once daily enhances lactation.
<i>Solena amplexi-caulis</i> (Lam.) Gandhi (Cucurbitaceae)	Mataka/Bana-kunduri	Young fruits are ground to a fine paste with cow's butter and applied to the breast excluding the nipple area to increase production of breast milk. Immature fruits are also consumed decoction to augment lactation.
<i>Trigonella foenum- graecum</i> L. (Fabaceae)	Methi	Powdered seeds (5 g) and 10 ml cow's ghee is mixed with the cooked rice and given to nursing mothers as a diet during lunch to induce lactation.
<i>Vitex negundo</i> L. (Verbenaceae)	Begunia	Leaf juice along with equal amount of juice of ginger is prescribed to nursing mothers against galactorrhoea.
<i>Withania somnifera</i> (L.) Dunal (Solanaceae)	Aswagandha	Root powder along with cow milk is given to the mother of a new born baby as tonic to restore broken health and increase breast milk.

However, scientific information about herb use to induce lactation, during present times, is comparatively sparse (Hale, 1997; Bingel and Farnsworth, 1991; Roberts, 1995; Mennella and Beauchamp, 1993). Some recent texts (Tyler, 1994; Wichtl, 1994; Newall *et al.*, 1996) and monographs (Anonymous, 1969, 1997; Farnsworth, 1993) focus on plants about which there is scientific evidence regarding their efficacy and safety.

Lactation is a physiological process which mostly occurs after child birth, while during pregnancy hormones like estrogen, progesterone and human placental lactogen are secreted thereby increasing the ducts, alveoli and stimulation of alveolar development (Reichert, 1994). Prolactin hormone is also increased during this period but it remains blocked due to estrogen. After childbirth estrogen level decreases and prolactin initiates lactation. So the plants which affect at any one of this above level induce lactation. Previous studies revealed that, *Foeniculum vulgare* has estrogenic property (Bingel and Farnsworth, 1991) which enhances formation of ducts and promotes lactation. Seeds of *Trigonella foenum-graecum* are rich with phytoestrogen and essential fatty acids that enhance lactation by producing prolactin. *Sylbum mananum*, *Carum carvy* and *Sesamum indicum* contain feminine estrogen. Lactating women with poor milk production treated with *Vitex* liquid extract were able to effectively increase production. *Asparagus racemosus* has been used as Galactagogue to increase milk production in lactating mothers. But plants like *Rubus idaeus*, *Urtica dioica*, *Cnicus benedictus* though used in various parts of the world as galactagogue, do not contain any hormone, but rich with high essential nutrients and probably promoting a sense of self efficacy and relaxation in the breastfeeding mothers. Phytochemical studies show that spice food like *Pimpinella anisum*, *Nigella sativa*, *Anethum graveolens*, *Coriandrum sativum* etc. act as food supplement and enhances lactation (Weed, 1986).

The present ethnobotanical study revealed the galactagogue potential of 46 plant species belonging to 28 families of which Euphorbiaceae and Fabaceae were predominant. Leaf, root and whole plant were in use for prescription, but root is the most often used part. Some of the plants are prescribed to the pregnant women, while others are given after child birth to induce lactation. Considering the form of preparations, paste, powders, decoction, juices and mixtures were much recommended over infusions. It is pertinent that some of the frequently used potential plants (*Alstonia scholaris*, *Alternanthera sessilis*, *Asparagus racemosus*, *Carica papaya*, *Cryptolepis buchananii*, *Curculigo orchioides*, *Desmodium gangeticum*, *Euphorbia hirta*, *Ficus racemosa*, *Ipomoea digitata*, *Pueraria tuberosa* and *Solena amplexicaulis*) with galactagogue properties in the study area require further investigation for chemical analysis and identification of bioactive molecules.

## Conclusion

It can be concluded that the tribes of Keonjhar district of Odisha, India possess rich ethnomedical knowledge and hence use several plant species and plant products in their primary healthcare needs including lactation in nursing mothers and

pregnant women. Phytochemical studies of these traditionally used medicinal plants have become a frontier area of research in present times. The findings of the present study will be of immense help to ethnobotanists and Pharmaceutical industries to isolate bioactive principles and development of new drug. Due to lack of knowledge and interest among the younger generations, the age old practice of phytotherapy and traditional medical information was buried together with the previous generations. The local government and the village authorities will certainly need to act at the earliest in order to conserve the rich ethnobotanical heritage of the district. The domestication and rearing of these plant species will be the gateway not only for the conservation of biodiversity but also to develop efficacious remedies for treating disease. Sustainable use and conservation of indigenous knowledge of useful and medicinal plants may benefit and improve the living standard of poor people of the district.

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