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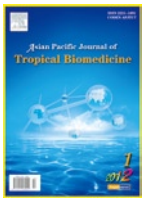

Document heading

Traditional uses of medicinal plants among the rural people in Sivagangai district of Tamil Nadu, Southern India

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ABSTRACT

Objective: To elucidate the medicinally important herbs and their role in the health cares of the villagers living in Sivagangai district of Tamil Nadu, India. **Methods:** Interviews and detailed personal discussions were conducted with the herbalist and local people to identify plants and collect the medicinal informations for 12 months (from June 2009 to May 2010). The medicinal important plants were botanically identified. **Results:** Totally 71 species of 61 genera belonging to 36 families were reported with ethnomedicinal values. Leaves are the mostly used part to prepare medicine. Generally fresh parts are used. **Conclusions:** Attention should be made on proper exploitation and utilization of these medicinally important plants.

1. Introduction

The value of medicinal plants to the mankind is very well proven. It is estimated that 70% to 80% of the people worldwide rely chiefly on traditional health care system and largely on herbal medicines[1]. India harbours about 15 percent (3 000 – 3 500) medicinal plants, out of 20 000 medicinal plants of the world. About 90 percent of these are found growing wild in different climatic regions of the country[2]. Scientific investigations of medicinal plants have been initiated in many parts of our country because of their contributions to health care. The tribal and rural people of various parts of India are highly depending on medicinal plant therapy for meeting their health care needs. This is attracting the attention of several botanists and plant scientists who directing vigorous researches towards the discovery or rediscovery of several medicinal plants along with their medicinal remedies for various diseases. Several workers were reported the utility of plants for the treatment of various diseases by the different tribal and rural people inhabiting in various regions of Tamil Nadu[3-18]. In such a way, the present work was carried out to explore the medical remedies of some medicinal plants used by the rural people living in Sivagangai district of Tamil Nadu, India.

2. Materials and methods

2.1. Study area

The present study was conducted in several villages of Sivagangai district in Tamil Nadu, India. Geographically, the entire area of Sivagangai district is lies between 9° 30′ N and 10° 30′ N latitude and 77° 00′ E and 78° 30′ E longitude. The altitude of the study area is about 102 m (334 feet) above mean sea level. The district is spread over an area of about 4189 sq. km and is bounded on the North and Northeast by Pudukkottai district, on the Southeast and South by Ramanathapuram district, on the Southwest by Virudhunagar district and on the West by Madurai district. Temperature scarcely fluctuates in the year, with the mean monthly minimum and maximum temperatures of 24 and 40 ℃ respectively, and annual rainfall reaches 635 – 1 000 mm.

2.2. Data collection

The field survey was conducted in different localities of Sivagangai district for 12 months from June 2009 to May 2010. In the interview survey with 20 herbalist healers and

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50 households, the authors used a structured questionnaire. The questionnaire items included each healer's age, their experience of school education and medicinal plant(s) used for a particular disease were recorded. In the case of herbalist healers his/her age at the first practice of herbal therapy was also noted.

For the medicinal plants, which were used by the healers and households, their vernacular names in Tamil were recorded. All the plants collected were deposited as herbarium in Post Graduate and Research Department of Botany, Thiagarajar College, Madurai (Tamil Nadu), India. For all the specimens, the voucher numbers were given, and they were botanically identified by one of the authors (SS) with the help of Flora of Tamil Nadu Carnatic[19] and An Excursion flora of Central Tamil Nadu[20].

3. Results

3.1. Characteristics of healers and households

According to the interview survey, for the herbalist healers, their age at becoming a healer varied largely. Mostly (50%) within the age of 35 years, the males became as herbal healers and the females (100%) became at 35 – 50 years. It was also revealed that only one-third of the healers were educated at school. In the case of households, most of the interview personalities (68%) who have the tremendous knowledge on the use of plants as medicine were come under the age category of above 50 years and like wise the healers, one-third of the households were educated (Table 1).

Table 1
Percent distributions of the interviewed herbalist healers and households in Sivagangai district by basic characteristics.

		Herbalist healers			Households		
		Male(n = 16)	Female (n = 4)	Total(n = 20)	Male(n = 36)	Female (n = 14)	Total(n = 50)
Current age	<50 years	37.5	50.0	40.0	33.3	28.6	32.0
	>50 years	62.5	50.0	60.0	66.7	71.4	68.0
Age at becoming healers	<35 years	50.0	0	40.0	–	–	–
	35–50 years	37.5	100.0	50.0	–	–	–
	>50 years	12.5	0	10.0	–	–	–
School education	Yes	43.8	0	35.0	47.2	14.2	38.0
	No	56.2	100.0	65.0	52.8	85.8	62.0

Table 2
The list of medicinally important plants used by the villagers of Sivagangai district, with their family name, voucher number, local name and medicinal uses.

Plant name	Family name	Voucher no.*	Local name	Medicinal use(s)
Abutilon indicum L.	Malvaceae	TCBH 401	Thuthi	Root extract is taken orally twice a day for two weeks to cure piles.
Acalypha indica L.	Euphorbiaceae	TCBH 402	Kuppaimeni	The herb paste is applied on throat once a day for 2 days to cure severe cough. Leaf paste is applied twice a day for 1 week to cure bronchitis.
Achyranthes aspera L.	Amaranthaceae	TCBH 403	Naayuruvi	The flowering spike ground to make paste and this paste is used as an external application in poisonous insect bites.
Aerva lanata (L.) Juss.	Amaranthaceae	TCBH 404	Sirukanpeelai	Root decoction is taken orally in empty stomach once a day for one month to cure diabetes.
Alternanthera sessilis DC.	Amaranthaceae	TCBH 405	Ponnaanganni	Leaf is cooked and eaten with normal diet for 20 – 30 days to cure night blindness.
Amaranthus graecizans L.	Amaranthaceae	TCBH 407	Sirukeerai	Leaf paste is applied twice a day for 3 – 5 days to cure wounds.
Amaranthus spinosus L.	Amaranthaceae	TCBH 408	Mullikkeerai	Shoot infusion is applied for eczema until cure.
Amaranthus tritis Roxb.	Amaranthaceae	TCBH 409	Thandangeerai	Decoction of leaves is given to drink for 3 days to reduce the pain during menstruation.
Argemone mexicana L.	Papaveraceae	TCBH 411	Birammathandu	Decoction of root is taken thrice a day with 100 ml of hot water for 2 – 3 days to get relief from fever.
Aristolochia indica L.	Aristolochiaceae	TCBH 413	Perumarundhu	Leaf juice is taken orally for Snake bite.
Asystasia gangetica (L.) T. Anderson	Acanthaceae	TCBH 414	Medday keerai	Entire plant juice is administered twice a day for one week to cure rheumatism.
Azima tetracantha Lamk.	Salvadoraceae	TCBH 415	Sangilai	Juice of the leaves is given to drink along with honey for 2 days to get relief from cold and cough.
Boerhavia diffusa L.	Nyctaginaceae	TCBH 416	Padarmookirattai	Root decoction is taken twice day for 3– 4 weeks to treat asthma.
Boerhavia erecta L.	Nyctaginaceae	TCBH 417	Mookirattai	Dried plant powder is smoked as a cigarette once day for one month to get relief from asthma.

Table 2, Continued

Plant name	Family name	Voucher no.*	Local name	Medicinal use(s)
Calotropis gigantea (L). R.Br.	Asclepiadaceae	TCBH 418	Yerukkam	Root bark powder (1gm) with 5 ml of coconut oil is poured thrice a day for 2 – 3 days to cure ear-ache.
Cardiospermum halicacabum L.	Sapindaceae	TCBH 419	Mudakkathaan	Leaves are cooked and eaten twice a day for 7 days to cure rheumatism.
Cissus setosa Wallich	Vitaceae	TCBH 422	Pulinaranai	Leaf extract is given to drink for 2 days to expel the intestinal worms.
Citrullus colocynthis (L.) Schrader	Cucurbitaceae	TCBH 423	Kumattikkaai	Root decoction is taken orally once in the morning for 25 – 30 days to cure jaundice.
Cleome gynandra L.	Capparidaceae	TCBH 424	Nallavelai	Leaf paste is applied twice a day for wound until cure.
Cleome viscosa L.	Capparidaceae	TCBH 425	Naaikkadukhu	Leaf paste is applied for inflammations.
Clitoria ternatea L.	Fabaceae	TCBH 426	Sanguppoo	Fresh leaf paste with the paste of Pepper (Piper nigrum) is applied on swelling of legs.
Coccinia grandis L.	Cucurbitaceae	TCBH 427	Kovai	Leaf juice is taken orally twice a day for 2 days to cure fever.
Commelina benghalensis L.	Commelinaceae	TCBH 429	Thengaaipoochedi	Herb paste is applied once daily for 6 months to cure leprosy.
Croton bonplandianus Baillon.	Euphorbiaceae	TCBH 431	Yeliaamanakku	Leaf paste is applied on cuts and wounds to stop bleeding.
Cynodon dactylon (L.)Pers	Poaceae	TCBH 432	Arugambullu	Leaf extract is taken thrice a day to reduce the body heat.
Cyperus rotundus L.	Cyperaceae	TCBH 434	Korai	Tuber paste is applied twice a day for two days to cure stomach-ache.
Datura metel L.	Solanaceae	TCBH 436	Oomathai	Dried leaf powder is smoked as cigarette twice a day for 2 – 3 weeks to get relief from asthma. Fruit juice with oil is applied to check hair falling.
Desmodium gangeticum (L.) DC.	Fabaceae	TCBH 437	Pulladi	Leaf decoction is given to drink twice a day for 2 – 3 days to cure diarrhoea and dysentery. Leaf paste is applied on anus once a day for two weeks to cure piles.
Desmodium triflorum (L.) DC.	Fabaceae	TCBH 438	Sirupulladi	Decoction of leaves is taken orally along with 100 ml of milk twice a day for 2 days to get relief from dysentery.
Eclipta prostrata L.	Asteraceae	TCBH 440	Karisalaanganni	Roots paste is applied twice a day for 3 days to heal wounds.
Enicostemma axillare (Lam.) A. Raynal	Gentianaceae	TCBH 441	Vellarugu	5 – 10 drops of root extract is poured in the spot for Snake bite.
Euphorbia hirta L.	Euphorbiaceae	TCBH 443	Ammaan pacharisi	Herb extract is taken twice a day as a medicine for 2 days to cure cold and cough.
Evolvulus alsinoides L.	Convolvulaceae	TCBH 444	Vishnukarandhi	Leaf paste is applied 30 minutes before bath for 1 month to promote the growth of hair.
Fimbristylis cymosa R.Br.	Cyperaceae	TCBH 445	Kothuppullu	Root extract is taken orally in empty stomach along with 100 ml of milk for 2 – 3 days to cure dysentery.
Glinus lotoides L.	Aizoaceae	TCBH 446	Siruseruppadai	Tender shoots are cooked and eaten with normal diet twice a day for 5 – 7 days to get relief from urinary disorders.
Hibiscus vitifolius L.	Malvaceae	TCBH 447	Aattuparuthi	Leaf infusion is taken with 50 ml of milk twice day for 2 days to cure diarrhoea.
Hybanthes ennaespermus L.	Violaceae	TCBH 448	Oridhazh thaamarai	Herb extract is given to drink along with 100 ml of hot water once a day for 5 – 10 days to cure bowl complaints.
Hygrophila auriculata (Schum.) Heine	Acanthaceae	TCBH 449	Neermulli	Root paste is applied to get relief from body pain.
Indoneesiella echioides (L.) Sreemadh.	Acanthaceae	TCBH 450	Koburandhaangi	Leaf paste is applied twice a day for 5 – 7 days to cure itches and bronchitis.
Ipomoea aquatica Forsskal	Convolvulaceae	TCBH 451	Veelaikkeerai	Flower juice is applied once daily in early morning around the eye to cure black ring around the eye.
Ipomoea obscura (L.) Ker Gawler	Convolvulaceae	TCBH 452	Siruthaalikkodi	Leaf juice is administered for Snake bite.
Ipomoea pes-tigridis L.	Convolvulaceae	TCBH 453	Poonaikkeerai	Leaf paste is applied twice a day on the spot for 2 days to cure pimples. Seed paste with coconut oil is applied to heal wounds.
Leucas aspera (willd) Link.	Lamiaceae	TCBH 455	Thumbai	Leaf extract is applied for twice day for 2 days to treat painful swellings. 5 – 10 flowers are eaten raw for cough and cold.
Marsilea quadrifolia L.	Marsileaceae	TCBH 456	Aaraakkeerai	Leaves are cooked and eaten twice a day with normal diet for 2 days to cure fever.
Melochia corchorifolia L.	Sterculiaceae	TCBH 457	Yennaichedi	Decoction of leaves is taken orally twice day in empty stomach for 3 days to cure dysentery.
Merremia emarginata Burm.f.	Convolvulaceae	TCBH 458	Elikaadhukeerai	Leaf extract is given to drink with 50 ml of honey for 2 days to get relief from cold and cough.
Merremia tridentata (L.) Hallier	Convolvulaceae	TCBH 459	Mudhiyaar koondhal	Leaf paste is applied daily in the morning before bath for 2 – 3 weeks to improve the growth of the hair. Decoction of root is taken orally once a day for 30 – 45 days to cure diabetes.

Table 2, Continued

Plant name	Family name	Voucher no.*	Local name	Medicinal use(s)
Mimosa pudica L.	Mimosaceae	TCBH 460	Thottaalsurungi	Decoction of root is taken orally once a day for one week to get relief from urinary complaints.
Mukia maderaspatana (L.) M. Roemer	Cucurbitaceae	TCBH 461	Musumusukkai	Root paste is applied twice a day for tooth-ache.
Ocimum basilicum L.	Lamiaceae	TCBH 462	Thulasi	5 – 10 leaves are eaten as raw twice day for cough and cold. Leaf infusion is taken orally twice a day in empty stomach to cure stomach-ache. Decoction of root is given once a day in the morning for 7 – 10 days to cure malarial fever.
Oldenlandia umbellata L.	Rubiaceae	TCBH 463	Muthkkaasu	Leaf extract is taken orally once a day for 3 – 4 weeks to get relief from asthma. Root paste is applied 1 week for bronchitis.
Passiflora foetida L.	Passifloraceae	TCBH 467	Mupparisavalli	Fruit decoction is taken orally along with 50 ml of honey for 2 – 3 weeks to cure asthma.
Pedalium murex L.	Pedaliaceae	TCBH 468	Yaanai nerungil	Fruit decoction is given to drink with 50 – 100 ml of hot water twice a day for 2 – 3 days to cure diarrhoea.
Pergularia daemia (Forsskal) Chiov.	Asclepiadaceae	TCBH 469	Velipparuthi	Decoction of leaves is given twice a day for 30 days to cure asthma. Root extract is given with honey for 3 days to cure menstrual troubles.
Phyllanthus niruri L.	Euphorbiaceae	TCBH 471	Keelaanelli	Root extract is taken in empty stomach for 2 – 3 weeks to cure jaundice.
Polygonum plebeium R.Br.	Polygonaceae	TCBH 473	Kanganichedi	Root paste is applied twice a day for inflammations.
Portulaca oleracea L.	Portulacaceae	TCBH 474	Paruppukkeerai	Herb paste is applied once a day for 1 week to cure mouth wounds.
Pupalia atropurpurea (Lam.) Moq.	Amaranthaceae	TCBH 475	Sunnaambukkeerai	Leaf paste is applied twice a day to heal wounds until cure.
Sida cordifolia L.	Malvaceae	TCBH 478	Nilathuthi	Leaf extract is taken twice a day in empty stomach for 2 – 3 days to cure dysentery.
Sida rhombifolia L.	Malvaceae	TCBH 479	Pazhambaasi	Decoction of leaves is given to drink with 50 – 100 ml of hot water twice a day for stomach-ache.
Solanum nigrum L.	Solanaceae	TCBH 480	Manathakkaali	Leaves are cooked and eaten daily to improve the vision. Leaf decoction is given to drink once a day in empty stomach for 7 days to cure stomach ulcer.
Stachytarpheta indica (L.) Vahl	Verbenaceae	TCBH 482	Seemainaayuruvi	Infusion of root bark is taken twice a day for 3 days to cure diarrhoea and dysentery. Leaf extract is given to drink for 2 days to remove intestinal worms.
Tephrosia purpurea Pers.	Fabaceae	TCBH 484	Kozhunji	Decoction of root is given with the extract of 5 gm Pepper (Piper nigrum) for one week to cure urinary disorders. Pods are eaten raw to stop vomit.
Tinospora cordifolia Miers	Menispermaceae	TCBH 485	Seendhil	Leaf extract is taken orally with equal quantity of honey daily in the morning for jaundice until cure.
Tragia involucrata L.	Euphorbiaceae	TCBH 486	Sendhatti	Root decoction with 10 gm paste of Pepper is applied for bronchitis until cure.
Trianthema decandra L.	Aizoaceae	TCBH 487	Sirusaaranai	Root decoction is given along with required quantity of honey twice a day for 20 – 30 days to treat asthma.
Trianthema portulacastrum L.	Aizoaceae	TCBH 488	Vellaichaaranai	Leaf decoction is given with 100 ml of hot water for 3 – 5 days to cure rheumatism.
Tribulus terrestris L.	Zygophyllaceae	TCBH 489	Nerungil	Leaf paste is applied twice a day for stomach-ache.
Trichodesma indicum (L.) R.Br.	Boraginaceae	TCBH 490	Kavizhthumbai	Root paste is applied once a day in the morning for 2 days for the treatment of swelling of joints.
Tridax procumbens L.	Asteraceae	TCBH 491	Thaathaapoochedi	Leaf paste is applied to check haemorrhage from wounds.
Vernonia cinerea L.	Asteraceae	TCBH 492	Sirudhevi sengeluneer	Root extract is taken twice a day for 2 – 4 days to treat diarrhoea. Leaf juice is given to drink twice a day for cough.

Note: *Voucher number at Thiagarajar College Botanical Herbarium (TCBH), Thiagarajar College, Madurai (TN), India.

3.2. Medicinally important plants

The present study revealed that 71 plant species (70 of angiospermic and 1 of pteridophytic plants) of 61 genera belonging to 36 families were found in the different areas of Sivagangai district possess medicinal values and are used to cure various diseases and ailments like diarrhoea, diabetes, asthma, fever, jaundice, rheumatism, wounds, cuts, stomach pain, cough, cold, poisonous bites etc., Amaranthaceae is represented by the highest number of species (7 species) followed by Convolvulaceae (6 species), Euphorbiaceae (5 species) and Malvaceae (4 species). 7 families were represented by 3 species, 6 families were 2 species and 19 by 1 species. The medicinally important plants used by the villagers of Sivagangai district, with their family name, voucher number, local name and medicinal uses is given in the Table 2.

3.3. Illnesses and herbal therapies

The villagers which include both herbal healers and

Table 3
Name of the diseases, number of remedies and botanical name of the plants used by villagers of Sivagangai district.

Name of the disease	No. of remedies	Botanical of the plants used
Asthma	7	Boerhavia diffusa, Boerhavia erecta, Datura metel, Oldenlandia umbellata, Passiflora foetida, Pergularia daemia and Trianthema decandra.
Body heat	1	Cynodon dactylon.
Body pain	1	Hygrophila auriculata.
Bowl complaint	1	Hybanthes ennaespermus.
Bronchitis	4	Acalypha indica, Indoneesiella echioides, Oldenlandia umbellata and Tragia involucrata.
Cold	5	Azima tetracantha, Euphorbia hirta, Leucas aspera, Merremia emarginata and Ocimum basilicum.
Cough	7	Acalypha indica, Azima tetracantha, Euphorbia hirta, Leucas aspera, Merremia emarginata, Ocimum basilicum and Vernonia cinerea.
Diabetes	2	Aerva lanata and Merremia tridentata.
Diarrhoea	5	Desmodium gangeticum, Hibiscus vitifolius, Pedalium murex, Stachytarpheta indica and Vernonia cinerea.
Dysentery	6	Desmodium gangeticum, Desmodium triflorum, Fimbristylis cymosa, Melochia corchorifolia, Sida cordifolia and Stachytarpheta indica.
Ear-ache	1	Calotropis gigantea.
Eczema	1	Amaranthus spinosus.
Eye troubles	3	Alternanthera sessilis, Ipomoea aquatica and Solanum nigrum.
Fever	4	Argemone mexicana, Coccinia grandis, Marsilea quadrifolia and Ocimum basilicum.
Hair growth	3	Datura metel, Evolvulus alsinoides and Merremia tridentata.
Inflammation	2	Cleome viscosa and Polygonum plebeium.
Intestinal worms	2	Cissus setosa and Stachytarpheta indica.
Jaundice	3	Citrullus colocynthis, Phyllanthus niruri and Tinospora cordifolia.
Leprosy	1	Commelina benghalensis.
Menstrual troubles	2	Amaranthus tritis and Pergularia daemia.
Piles	2	Abutilon indicum and Desmodium gangeticum.
Pimples	1	Ipomoea pes-tigridis.
Poisonous bites	4	Achyranthes aspera, Aristolochia indica, Enicostemma axillare and Ipomoea obscura.
Rheumatism	3	Asystasia gangetica, Cardiospermum halicacabum and Trianthema portulacastrum.
Stomach-ache	4	Cyperus rotundus, Ocimum basilicum, Sida rhombifolia and Tribulus terrestris.
Stomach ulcer	1	Solanum nigrum.
Swelling	3	Clitoria ternatea, Leucas aspera and Trichodesma indicum.
Tooth-ache	1	Mukia maderaspatana.
Urinary troubles	3	Glinus lotoides, Mimosa pudica and Tephrosia purpurea.
Vomit	1	Tephrosia purpurea.
Wound	8	Amaranthus graecizans, Cleome gynandra, Croton bonplandianus, Eclipta prostrata, Ipomoea pes-tigridis, Portulaca oleracea, Pupalia atropurpurea and Tridax procumbens.

Table 4
Percent distributions of the parts of the plant used and mode of treatment followed by the villagers of Sivagangai district.

S. No.	Parts used	Mode of treatment								Total
		Cooked	Decoction	Extract	Infusion	Juice	Paste	Powder	Raw	
1	Entire plant	–	–	2.44	–	1.22	3.66	1.22	–	8.54
2	Flower	–	1.22	–	–	1.22	1.22	–	1.22	4.88
3	Fruit	–	–	–	–	1.22	–	–	–	1.22
4	Leaf	4.88	9.76	9.76	2.44	6.09	17.07	1.22	1.22	52.44
5	Pod	–	–	–	–	–	–	–	1.22	1.22
6	Root	–	10.97	7.32	1.22	–	6.09	1.22	–	26.82
7	Tuber	–	–	–	–	–	1.22	–	–	1.22
8	Seed	–	–	–	–	–	1.22	–	–	1.22
9	Shoot	1.22	–	–	1.22	–	–	–	–	2.44
Total		6.1	21.95	19.52	4.88	9.75	30.48	3.66	3.66	100

households of Sivagangai district used 92 herbal therapies prepared from 71 plants present in the coconut plantations to treat 31 different illnesses. The name of the illness cases, number of remedies and the name of the plants used to treat respective disease is given in the Table 3. Regarding the plant parts used, leaf is the mostly used plant part (52.44%) to treat a particular disease followed by root (26.82%) and entire plant (8.54%). Fruit, Seed and Tuber are the least used part (1.22% of each). Most of the earlier ethnobotanical studies confirmed that leaves are the major portion of the plant used in the treatment of diseases[6,7]. Generally, fresh part of the plant is used for the preparation of medicine. In the case of mode of treatment, paste was found as mostly followed mode (30.48%) to treat the illness followed by

decoction (21.95%) and extract (19.52%). The Percentage of the various parts of plant used and different mode of treatment is given in the Table 4.

4. Discussion

The herbal preparations made from the traditional medicinal plants were mostly used for the treatment of wound healing (8 species), asthma (7 species), dysentery (6 species), cold and diarrhoea (5 species each). The study showed that a good number of the collected plants were used for the treatment of multiple diseases. Ocimum basilicum (cold, cough, malarial fever and stomach-ache) is used for the treatment of four diseases; Desmodium gangeticum (diarrhoea, dysentery and piles), Leucas aspera (cold, cough and painful swelling) and Stachytarpheta indica (diarrhoea, dysentery and intestinal worms) are used for the treatment of three diseases; 12 plants used for two diseases and the rest of the plants are used to treat only one disease.

The results of this study will now provide information on medicinal plants for possible on-farm conservation. Since most of them are herbs, they grow fast and therefore can provide a continuous supply of the medicinal products. When household needs are met the surplus can be sold for income generation. Some of these species are leguminous and hence will also contribute to soil fertility due to their ability to fix nitrogen. These species can be grown on farm edges or on the boundaries, where there is little interference with crop plants. These plants can become an additional source of income for the people, if they are made aware of the medicinal importance of these plants.

In conclusion, over exploitation of plant species in the name of medicine may lead some species ultimately to the disappearance in future. Therefore, attention should be made on proper exploitation and utilization of these plants. The findings of this study may become basic leads for chemical, pharmacological, clinical and biochemical investigations, which ultimately may birth to drug discovery. Therefore, phytochemical and pharmacological values of these medicinally important plants should also be tested.

Conflict of interest statement

We declare that we have no conflict of interest.

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