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STUDY OF MEDICINAL PLANTS USED FOR THE TREATMENT OF MALARIA IN THE TIRUCHIRAPPALLI REGION

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ABSTRACT

An Ethno botanical study was undertaken to collect the information from Tiruchirappalli District in Tamilnadu. The traditional knowledge of traditional healer and medicinal practices on medicinal plants was collect through questionaries' and personal interviews during field trips. The study area field visits conducted during June to November 2017. 55 species of medicinal plants of malaria were reported the survey and having discussion with local traditional healers and local peoples. These medicinal plants belongs to 31 families. This studies show that the peoples still continue to depend on medicinal plants, however the traditional healer are on the decline because the younger generation of the people have no interest and knowledge of this form of medicine as they have started moving towards the towns and cities. Therefore, it is necessary to document the plants to effectively conserve these.

KEYWORDS: Ethnobotany, Tiruchirappalli District, Medicinal plants and malaria.

INTRODUCTION

Malaria is a major parasitic disease in the world, especially in Africa. It is responsible for 500 million new cases and 2 to 3 millions deaths every year, mostly among children under five years and pregnant women. *Plasmodium falciparum* the most widespread etiological agent for human malaria has become increasingly resistant to standard antimalarials *e.g.* chloroquine and antifolates. Consequently, new drugs or drug combinations are urgently needed today for the treatment of malaria. These drugs should have novel modes of action or be chemically different from the drugs in current use (WHO, 2008).

Plants have been used in traditional medicine for several thousand years. The knowledge of medicinal plants has been accumulated in the course of many centuries based on different medicinal systems such as Ayurveda, Unani and Siddha. In India, it is reported that traditional healers use 2500 plant species and 100 species of plants serve as regular sources of medicine (Yirga 2010). During the last few decades there has been an increasing interest in the study of medicinal plants and their traditional use in different parts of the world. Documenting the intangibility of modern health facilities, most people especially rural people are still forced to practice traditional medicines for their common day ailments (Mesfin 2007; Dawit 2001). Most of these people form the poorest link in the trade of medicinal plants. A vast knowledge of how to use the plants against different illnesses may be expected to have accumulated in areas where the use of plants is still of great importance (Diallo *et.al.,* 1999; Bekele 2007).

Ethnobotany is not new to India because of its rich ethnic diversity. Jain printed out that there are over 400 different tribal and other ethnic groups in India. The tribals constitute about 7.5 percent of India's population (Verma *et.al.,* 2007; Sabitha *et.al., 2012*). During the last few decades there has been an increasing interest in the study of medicinal plants and their traditional use in different parts of India and there are many reports on the use of plants in traditional healing by either tribal people or indigenous communities of India. Apart from the tribal groups, many other forest dwellers and rural people also posses' unique knowledge about plants (Hebber *et.al.,* 2004; Mollik *et.al.,* 2010).

Globally, about 85% of the traditional medicines used for primary healthcare are derived from plants [Farnsworth 1988]. A great deal of attention has been devoted to medico-ethno botanical research in folk society in recent time. They are in need of these medicinal plants, which are found in plenty around their habitations. They know the practical usage of these Medico-ethno botanical plants only by experience. The intimate knowledge of local tribal communities about their medicinal plants is clearly visible when we observe different local names by which these plants. Some individuals are able to tell the properties, habitat of the plants, morphology, and collection time, phenology and able to identify poisonous plants too. The present study was undertaken to explore the wild medicinal plant use for malaraia and disorders by gathering knowledge from the traditional healers of Tiruchirappalli District district.

MATERIAL AND METHOD

Study area

We collected the plants from Tiruchirappalli and its surroundings. It is approximately located at 10.7905° N, 78.7047° E and its land mass is 16.72 Km2 and its population is 11,29,422.

Study period

We did our work from June to November 2017.

Survey

The ethno botanical survey was carried out during June to November 2017 and all the information‘s were gathered from the local traditional healer of Tiruchirappalli District and these information were selected applying both questionnaire and Random sampling techniques. This questionnaire about the traditional healer and medicinal plants and uses. The collected medicinal plants were identified and authentication with taxonomically using, The Flora of Tamil Nadu Carnatic, Matthew, K.M Vol. I (1981), II (1982), III (1983), The Identified plants species were then confirmed to the Rapinet Herbarium, St. Joseph’s College, Tiruchirappalli. Flora of the Presidency of Madras, J S Gamble vol. I-III (1957).

Data Analysis

The ethno botanical data has been analyzed using quantitative methods of data analyses. Descriptive statistics like percentage and frequency method to analyze the data.

RESULTS AND DISCUSSION

The result of present study shown that 55 species of medicinal plants of dengue and malaria were reported the survey and having discussion with local traditional heaalers and local peoples. These medicinal plants belongs to 31 families. The following (Table 1 and 2) families categorized according to their, botanical name, local name, common name family, parts used and habit is recorded. Thus Families for malaria are Meliaceae, Euphorbiaceae, Capparaceae, Ploygalaceae, Mrtiaceae, Breciaceae, Solanaceae, Lamiaceae, Zingerberaceae, Fabaceae, Cariaceae, Amaryllidaceae, Rubiaceae, Verbenaceae, Cucurbitaceae, Phyllanthaceae, Piperaceae, Rutaceae, Asteraceae, Diliaceae, malvaceae, Myrtaceae, Poaceae, Combretaceae,acoaceace, lamiaceace, Caesalpinaceace, Pittosporaceace, Plumbaginaceace, Araliaceace, Apocynaceace, Meliaceace and Annonaceae. Which are active application by the people living in an around Tiruchirappalli district have been

recorded not only conserve their heritage but also to bring out their traditional folk wisdom and belief concerning health care.

Table 2: Families For Anti Malarial Medicinal Plants.

S.NO	Name of the Famalies	Number of the Families
1	Meliaceae	4
2	Euphorbiaceae	1
3	Capparaceae	1
4	Ploygalaceae	1
5	Urtiaceae	1
6	Breciaceae	1
7	Solanaceae	3
8	Lamiaceae	5
9	Zingerberaceae	1
10	Fabaceae	6
11	Cariaceae	1
12	Amaryllidaceae	1
13	Rubiaceae	5
14	Verbenaceae	1
15	Cucurbitaceae	2
16	Phyllanthaceae	1
17	Piperaceae	2
18	Rutaceae	2
19	Asteraceae	3
20	Liliaceae	1
21	Malvaceae	1
22	Myrtaceae	2
23	Poaceae	1
24	Combretaceae	1
25	Annonaceae	1
26	Acoaceace	1
27	Caesalpinaceace	1
28	Pittosporaceace	1
29	Plumbaginaceace	1
30	Araliaceace	1
31	Apocynaceae	1

According to the analysis on habitats of the medicinal plants and parts as medicine for human beings. Herbs were the primary source of medicine and the largest number contributing to (32.55%) species and following by shrub, tree and the lowest number of climber(4.65%) (Table 2 and 3). Habit of medicinal plants used to treat dengue in figure -1.

Table 3: Anti Malarial Medicinal Plants.

Habitat	Total Number	Percentage
Herbs	14	32.55%
Shrubs	12	27.90%
Trees	10	23.25%
Medium sized Trees	4	9.30%
Climbers	2	4.65%

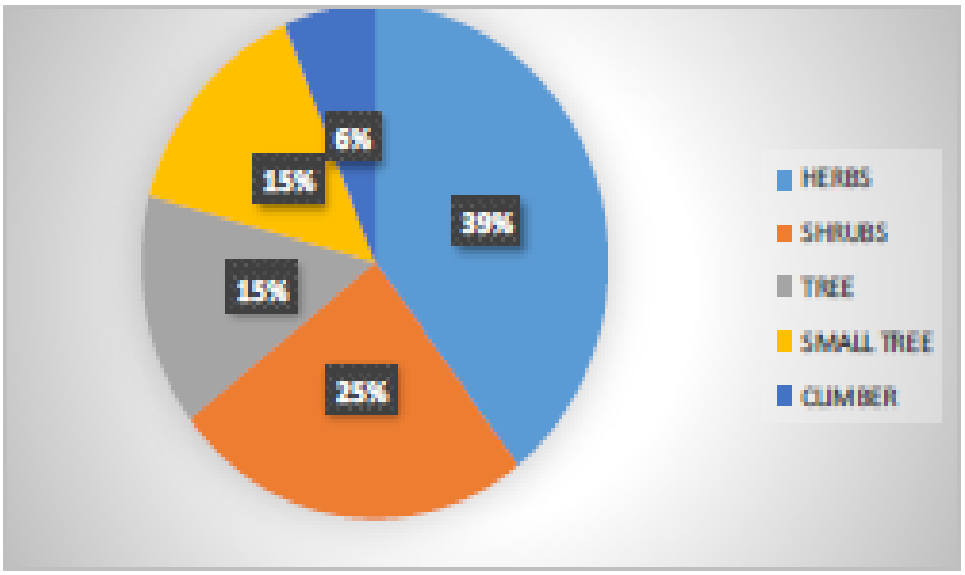

Figure 1: Anti Malarial Medicinal Plants Percentage.

Among these, leaves are the most frequently used plant part (58.18%) which is followed by fruit, whole plant, rhizome, bulb and the lowest level used is bark, climber, flower, pepper and root(1.81%). All the plant parts are used in the traditional medication in Malaria in (Figure1 and 2).

Table 4: Medicinal Plants Parts Used For Malaria.

S.NO	PART USED	TOTAL NUMBER	PERCENTAGE
1	LEAF	32	58.18%
2	FLOWER	1	1.81%
3	AERIAL PARTS	6	10.90%
4	STEM	3	5.45%
5	SEED	2	3.63%
6	RHIZOME	1	1.81%
7	PEPPER	3	5.45%
8	BULB	2	5.45%
9	BARK	1	1.81%
10	FRUIT	2	5.45%
11	ROOT	1	1.81%
12	PEPPER	1	1.81%

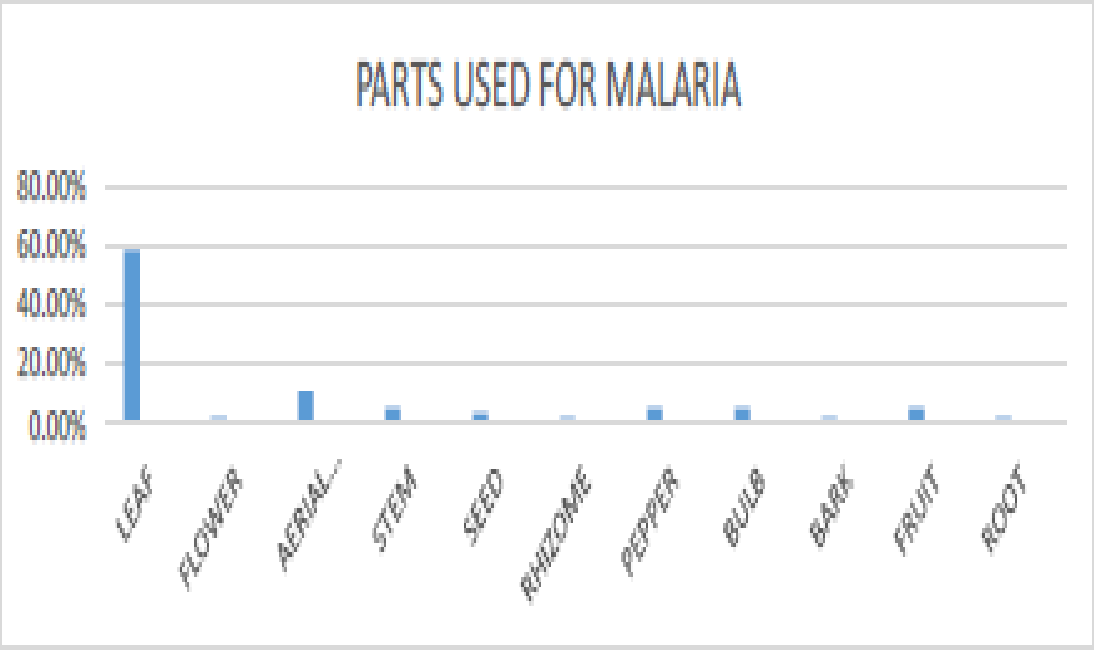

Figure 2: Medicinal Plants Parts Used For Malaria Percentage.

The medicinal plants are useful for healing as well as for curing of human diseases because of the presence of phytochemical constituents Phytochemicals are naturally occurring in the medicinal plants, leaves, vegetables and roots that have defense mechanism and protect from various diseases (Srithi *et.al.*, 2009; Chaitanya *et.al.*, 2013). Phytochemicals are primary and secondary compounds. Chlorophyll, proteins and common sugars are included in primary constituents and secondary compounds have terpenoid, alkaloids and phenolic compounds. Terpenoids exhibit various important 12 pharmacological activities i.e., anti-inflammatory, anticancer, anti-malarial, inhibition of cholesterol synthesis, anti-viral and anti-bacterial activities. Terpenoids are very important in attracting useful mites and consume the herbivorous insects. Alkaloids are used as anaesthetic agents and are found in medicinal plants. These compounds are synthesized by primary or rather secondary metabolism of living organisms(Mikawlawng 2014; Rahman *et.al.*, 2004). Secondary metabolites are chemically and taxonomically extremely diverse compounds with obscure function. They are widely used in the human therapy, veterinary, agriculture, scientific research and countless other areas. A large number of phytochemicals belonging to several chemical classes have been shown to have inhibitory effects on all types of microorganisms in vitro. Plant products have been part of phytomedicines since time immemorial. This can be derived from barks, leaves, flowers, roots, fruits, seeds. Knowledge of the chemical constituents of plants is

desirable because such information will be value for synthesis of complex chemical substances.(Nostro *et.al.,* 2000; Awoyeni *et.al.,* 2012).

India is one of the twelve mega-biodiversity countries of the World having rich vegetation with a wide variety of plants with medicinal value. In many countries, scientific investigations of medicinal plants have been initiated because of their contribution to healthcare. Herbal medicines have good values in treating many diseases including infectious diseases, hypertension, etc. That they can save lives of many, particularly in the developing countries, is undisputable [Patick 2002]. Even today many local and indigenous communities in the Asian countries meet their basic needs from the products they manufacture and sell based on their traditional knowledge. Herbal drugs obtained from plants are believed to be much safer; this has been proved in the treatment of various ailments [Mitalaya *et.al.,* 2016]. Nearly 80% of the world population use traditional medicine, mainly medicinal plants, to cure illnesses and ailments. Ethno botany is the scientific study of the relationship that exists between people and plants. Since the beginning of civilization, people have used plants as medicine [Benthy and Trimen 1980]. Use of herbal medicines in Asia represents a long history of human interactions with the environment. Plants used for traditional medicine contain a wide range of substances that can be used to treat chronic as well as infectious diseases. A vast knowledge of how to use the plants against different illnesses may be expected to have accumulated in areas where the use of plants is still of great importance [Diallo 1999]. Many investigators are of the view that there should not be any further delay in the recording of useful data concerning ethno medicine and Phytotherapeutic practices by ethnic groups lest such vital information would be lost permanently as primitive populations become more and more acculturated to modern life styles and technological changes.

Table 1: Medicinal plants used for treatment of Malaria.

S.no	Botanical name	Family	Common name	Local name	Parts used	
1	*Azadirachta indica A.Juss*	meliaceace	Neem	Vepillai	Leaf	
2	*Acalypha indica L*	Euphorbiaceace	Indian mercury	Kuppai meni	Leaf	
3	*Capperis tomentosa Lam*	Capparaceace		Woolly caper brush	Leaf	
4	*Securidaca longipedunculata Fresen.*	Polygalaceace		Violet tree	Leaf	
5	*Girardinia diversifolia L*	Urtiaceace	Himalayan/Niligiri Nettle	Sishond, kandeli	Stem	
6	*Lepidium sativum. L*	Brassiaceace	Graden cress	Chandrashoor	Leaf	
7	*Datura stramonium. L*	Solanaceace		Devil's snake, moon flower	Flower, leaf	
8	*Ocimum basilicum*	Lamiaceace	Holy basil	Tulasi	Leaf	
9	*Zingiber officinale*	Zingiberaceace	Ginger	Inji	Rhizome	
10	*Cicer arietinum. L*	Fabaceace	Chick pea	Kondaikadalai [Tamil]	Seed	
11	*Carica papaya. L*	Cariaceace	Papaya	Papali	Leaf	
12	*Capsicum annum. L*	Solanaceace	Bell pepper	Milakai	Leaf, pepper	
13	*Allium sativum*	Amaryllidaceace	Garlic	Pudu	Bulb	
14		*Morinda lucida*	Rubiaceace		Fruit	
15	*Solanum nigram*	solanaceace		Black nightshade	Leaf	
16	*Melia azedarach*. L	Meliaceace	Pride of India	Malai vembu	Leaf	
17	*Hyptis suaveolens* (L)Poit	Lamiaceace	Pignut	Vilayti tulsi	Leaf	
18	*Lantana camera*. L	Verbenaceace	Big sage		Whole	
19	*Momordica charantia*. L	Cucurbitaceace	Bitter gourd	Pakarkai	Fruit	
20	*Phyllanthus amerus. L*	Phyllanthaceace			Leaf	
21	*Piper nigrum*. L	Piperaceace	Black pepper	Milaku	Pepper	
22	*Leucas aspara*. L	Lamiaceace		Thumbai	Whole	
23	*Aegle marinelos*.(L).lorea	Rutaceace	Bengal quince	Vilvam	Leaf	
24	*Cinchona officinalis*. L	Rubiaceace		Quinine	Leaf	
25	*Cinchona pubescensvahi*. L	Rubiaceace		Red Quinine	Leaf	
26	*Cinchona ledgeriana*. Moen ex treme	Rubiaceace		Quinine	Leaf	
27	*Bidens pilosa*. L	Asteraceace		Black jack	Leaf	
28	*Artemisia annua*. L	Asteraceace		Sweet wormwood	Whole	
29	*Acanthospermum australe*.(Loet).Kuntze	Asteraceace		Sheep bur	Leaf	

30	*Allium sativum*. L	Liliaceace	Garlic	Poondu	Bulb	
31	*Ocimum grattissimum*. Ls	Lamiaceace	Clove tulsi	Tulsi	Leaf	
32	*Gossypium arboretum*. L	Malvaceace	Cotton	Paruthi	Stem	
33	*Khaya grandifolia*. L	Meliaceace		Large leaved mahogany	Leaf	
34	*Psidium guajava*. L	Myrtaceace	Guava	Koiyakai	Leaf	
35	*Eucalyptus robusta*.SM	Myrtaceace		Swamp mahogany	Leaf	
36	*Cymbopogan citratus*.(D.C)stapf	Poaceace	Lemon grass	Elumpichai pul	Whole	
37	*Piper umbellatum*. L	Piperaceace		Pariparoba	Pepper	
38	*Terminalia superba*. Engl & Diels	Combretaceace		Limba	Leaf	
39	*Cajanus cajan*(L)Millsp	Fabaceace	Red gram	Pasiparupu	Leaf	
40	*Coffea arabica*. L	Rubiaceace		Mountain coffee	Bark	
41	*Citrus sinesis*(L)Osbeck	Rutaceace	Sweet orange	Orangu	Leaf	
42	*Pongamia pinnata*(L)Pierre	Fabaceace	Indian beach	Pungai	Leaf	
43	*Annona muricata*. L	Annonaceace	Sour sop	Mul seetha	Leaf	B43
44	*Acacia karroo Hayne.*	Fabaceae	Sweet thorn	Udai vel	Aerial parts	B44
45	*Aloe parvibracteata*	Aloaceae	Lowveld spotted aloe	Kaththalai	Leaves	B45
46	*Cassia abbreviate*. Oliv	Fabaceae	Sjambok pod		Stem Bark	M46
47	*Cassia occidentalis*. L	Fabaceae	Coffeeweed	Pon avarai	Roots	M47
48	*Leonotis leonurus*. L	Lamiaceae	lion's tail	Mint	Aerial parts	M48
49	*Momordica balsamina*.L	Cucurbitaceae	African cucumber	Valari	Aerial parts	M49
50	*Parkinsonia aculeate*. L	Caesalpiniaceae	jelly bean tree	Sina tumana	Aerial parts	M50
51	*Pittosporum tobira*.(Thunb)W.T. Aiton	Pittosporaceae	Japanese cheesewood	Nanum	Aerial parts	M51
52	*Plumbago auriculata* Lam.	Plumbaginaceae	blue plumbago	Chithra moolam	Aerial parts	M52
53	*Schefflera actinophylla* (Endl.) Harms.	Araliaceae	dwarf umbrella tree	Ketakai	Leaves	M53
54	*Tabernaemontana diverigata* R.Br.ex Roam & Schult.	Apocynaceae	Toad tree	Nandiar vettai	Leaves	M54
55	*Trichilia emetica*	Meliaceace		(Natal mahogany)	Seeds	M55

CONCLUSION

Present survey revealed that a number of medicinal plant species are used by indigenous people of the study area to treat various ailments. The indigenous community still relies on traditional medicine although; the modern health-care services are available, which indicates the significance of plant based traditional medicine. Our findings provide baseline data to establish a connection between the traditional health practioners and scientific communities, which could be substantial in novel drug discovery. Furthermore, ethnobotanical data is of significant value for conservation managers and policy makers for sustainable management of medicinal plant species, which are under threat due to over exploitation. Therefore such popular plant species could be further analyzed for bioactive constituents, *in vivo/in vitro* biological activities, which may leads to new and potential drugs for Malaria.

REFERENCES

1. Anonymous. World Health Organization - The promotion and development of traditional medicine. Technical report series No. 622.1978.
2. Awoyemi OK, Ewa EE, Abdulkarim IA, Aduloju AR et al. Ethnobotanical assessment of herbal plants in southwestern Nigeria. Academic research international, 2012; 2: 50-57.
3. Bekele E. Study on Actual Situation of Medicinal Plants in Ethiopia. Prepared for Japan Association for international Collaboration of Agriculture and Forestry, Addis Ababa, 2007.
4. Bently R, Trimen H. Medicinal Plants. I-IV, J & A. Publishers, Churchill, London. 1980.
5. Chaitanya M, Dhanabal S, Rajan S. Pharmacodynamic and ethnomedicinal uses of weed speices in nilgiris, Tamilnadu State, India: A review. African Journal of Agricultural Research, 2013; 8: 3505–3527.
6. Dawit A. Plants as primary source of drugs in the traditional health care practices of Ethiopia. Plant genetic resource o Ethiopia, 2001; 6: 101-113.
7. Diallo D, Hveem B, Mahmoud MA, Betge G, Paulsen BS, Maiga A. *Pharmaceutical Biol*., 1999; 37: 80-91.
8. Farnsworth NR: Screening plants for new medicines. In *Biodiversity* Edited by: Wilson EO. National Academy Press, Washington, 1988- DC: 83-97.
9. Gamble, JS, Fischer, C.E.C. Flora of the Presidency of madras Vol. I-III. 1957.
10. Mattew KM, The Flora of Tamilnadu Carnatic, Vol I-III, (The Rapinet Herbarium, St Joseph's College, Tiruchirappalli). 1983.

11. Mesfin F An ethnobotanical study of medicinal plants in Wonago oreda, SNNPR, ETHIOPIA. MSc thesis. Addis Ababa University, Ethiopia. (2007).
12. Mikawlrawng K, Kumar S. Current scenario of urolithiasis and the use of medicinal plants as antiurolithiatic agents in Manipur (North East India): a review. International Journal of Herbal Medicine, 2014; 2: 1–12.
13. Mitalaya KD, Bhatt DC, Patel NK, Didia SK: Herbal remedies used for hair disorders by tribals and rural folk in Gujarat. *Indian Journal of Traditional Knowledge*, 2003; 2(4): 389-392.
14. Mollik MAH, Hossan MS, Paul AK, Taufiq-Ur-Rahman M, Jahan R, Rahmatullah M. A comparative analysis of medicinal plants used by folk medicinal healers in three districts of Bangladesh and inquiry as to mode of selection of medicinal plants. Ethnobotany Research and Applications, 2010; 8: 195–218.
15. Nostro A, Germanò MP, D'angelo V, Marino A, Cannatelli MA (2000) Extraction methods and bioautography for evaluation of medicinal plant antimicrobial activity. Lett Appl Microbiol 30: 379-384.). (The Indian Pharmacopoeia. Govt. of India).
16. Padmavathi B, Rath PC, Rao AR, Singh RP. Roots of Withania somnifera inhibit forestomach and skin carcinogenesis in mice. Evidence-Based Complementary and Alternative Medicine, 2005; 2: 99–105.
17. Patrick OE: Herbal Medicines: Challenges (Editorial). *Tropical Journal of Pharmaceutical Research*, 2002; 1(2): 53-54.
18. Rahman MA, Mossa JS, Al-Said MS, Al-Yahya MA. Medicinal plant diversity in the flora of Saudi Arabia 1: a report on seven plant families. Fitoterapia, 2004; 75: 149–161.
19. Sabitha S, Maher K, Mohamed M. Medicinal plants diversity and their conservation status in the United Arab Emirates (UAE). Journal of Medicinal Plants Research, 2012; 6: 1304–1322.
20. Srithi K, Balslev H, Wangpakapattana wong P, Srisanga P, Trisonthi C. Medicinal plant knowledge and its erosion among the Mien (Yao) in northern Thailand. Journal of Ethnopharmacology, 2009; 123: 335–342.
21. Verma AK, Kumar M, Bussmann RW. Medicinal plants in an urban environment: the medicinal flora of Banares Hindu University, Varanasi, Uttar Pradesh. Journal of Ethnobiology and Ethnomedicine, 2007; 3: 35.
22. Yirga G. Assessment of indigenous knowledge of medicinal plants in Central zoneof Tigray, Northern Ethiopia. African Journal of Plant Science, 2010; 4: 6-11.