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Contribution of invasive plants in herbal medicinal practices

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Abstract
The present study on invasive plants and their medico-potentialities reveals that, there are about 28 invasive species belonging to 18 families were documented from Mukkam municipality of Kozhikode district, Kerala. The documentation was mainly based on the field observation, discussions with local peoples as well as scrutinizing the literature review. Many invasive plants are threat to the native flora, out of these some of them are utilized by people for curing and controlling various ailments.

Keywords: Invasive plants, Medico-potentiality, Kozhikode district, Kerala

1. Introduction
In the last few decades eco-friendly, bio-friendly, cost-effective and relatively safe herbal medicines have moved from the fringe to the mainstream with increased research in the field of traditional medicine. Medicinal plants are an integral component of alternative medical care [1]. The market for herbal drugs has grown at an impressive rate due to a global resurgence in traditional and alternative healthcare systems, and therefore medicinal plants have great economic importance India is rich in ethnic diversity and indigenous knowledge that has resulted in exhaustive ethno botanical studies [2]. The Indian subcontinent is a vast repository of medicinal plants that are used in traditional medical treatments. Many Westerners have long regarded the Indian systems of medicine as a rich source of knowledge [3]. The medicinal plants are listed in various indigenous systems such as Siddha (600), Ayurveda (700) and Amchi (600), Unani (700), Allopathy which 30 plant species for ailments [4]. Chemical principles from natural sources have become much simpler and have contributed significantly to the development of new drugs from medicinal plants. Biologically active compounds from natural sources have always been of great interest to scientists working on infectious diseases [5].Invasions by alien plant species are considered to be one of the largest threats to the ecosystems of the earth, and the services that they provide to humanity [6]. The impact associated with invasive alien plants include reduced surface water runoff and groundwater reserves, increased biomass and fire intensity, markedly reduced biodiversity and several economic consequences [7]. Several studies have shown that invasive alien plants also have positive economical, social and ecological contributions and that these need to be considered when assessing the costs resulting from invasions. It has also been recorded that invasive alien plant species can be used in agro forestry for functions and services that cannot be provided by native species [8]. These services include rapid biomass accumulation, nitrogen fixation, and reforestation of degraded land, improved fallows and contour hedgerows [9]. The practices of plant-based traditional medicine are based on hundreds of years of belief and observations, which predate the development and spread of modern medicine and this knowledge has been passed on orally from generation to generation without any written document [10, 11]. During the last few decades, the study of medicinal plants and their indigenous use in the world has been increasing and an interesting issue for the researcher and natural resource manager [12, 13].

2. Materials and Methods
2.1 Study area
Mukkam municipality is situated in Kozhikode district (11° 08'N and 11° 50'N and longitudes 75° 30'E and 76° 8'E), Kerala. It spreads across 31.23 square kilometer. The Kozhikode district is bounded by Kannur to the north, Wayanad to the east, Malappuram to the south and Arabian Sea to the west. Similarly on northern side of Mukkam municipality is bordered with Omassery and kodenchery Gramapanchayath. It's Eastern and Southern part is bordered with Iruvanjippuzha and west it has Chathamangalam Gramapachayath. Mukkam is a semi-urban place; the livelihoods of most of the people are agriculture and small scale businesses like the retail stores. Agriculture has historically been a key component of the Mukkam's economy.

The most valuable agricultural products in Mukkam area are areca nut, coconut, rubber and banana. The place is famous for its scenic beauty and festivals, which is located 28 Km from Calicut. Average annual rainfall received by area is 330 cm. Study area has a general humid climate but the hot season extending from March to May (Plate-1).

Plate -1

A) Map of India Showing Kerala State

B) Map of Kozhikode district

2.2 Documentation

The present study was based on an extensive survey and field observations during the year September 2016-February 2017. In this study an attempts were made to find out diversity of non-native plant species, which are distributed in the Mukkam municipality of Kozhikode district, Kerala. The documentation was mainly based on the field observation, discussions with local peoples as well as scrutinizing the literature review. During the field visits, the plant specimens were collected at different reproductive stages to prepare herbarium specimens. The collected specimens were identified taxonomically with the help of available floras and literature [14, 15, 16]. The nomenclature of each species has been brought up to data as per the rules given in the International Code of Nomenclature (ICN). More over all available information along with their nativity were also recorded. The specimens were processed for the preparation of Herbarium by standard methods [17]. The voucher specimens were deposited in the Herbaria of PG & Research Department of Botany, St, Joseph's College, Calicut (DEV) for future reference.

3. Results and Discussion

Among the 18 different plant families were recorded from the study area. Among these Asteraceae topped the list with 5 species and it is predominated with Solanaceae, Verbenaceae, Poaceae with 3 species each. In the study we noted a total of 28 invasive species (Table-1). Among the invasive plants studied, their root, stem, leaf, fruit and even the whole plant has the medicinal potentialities. The Roots of *Chassalia curviflora*, stem of Glycosmis pentaphylla and *Crassocephalum crepidioides* has medicinal uses. Leaves of *Scoparia dulcis*, *Syndrella nodiflora*, *Hyptis suaveolens* and *Euphorbia heterophylla* are used traditionally to cure many diseases. The fruits of *Solanum torvum* is used in the preparation of tonic and haemopoietic agents and also for the treatment for body pain. The whole plant *Gomphrena celosioides* is used against skin diseases. 3 species are commonly used for the treatment of fever and 5 species are used for skin diseases. *Dactyloctenium aegyptium, Ruellia tuberose, Ipomoea cairica* and *Glycosmis pentaphylla* has the antioxidant properties.

A similar studies on the uses of the invasive alien species was done by Semenya *et al* [46]. Accroding to them, the results obtained in this pilot study revealed that exotic species are extensively exploited in the Africa. In fact, some of these species have become imbedded in the daily lives of residents of Africa, through their use in traditional medicine. This wide use of invasive alien plant species is seen as imperative for their ultimate control and should form part of their management strategy. As part of this management strategy, land owners should be educated on the do's and don'ts of using alien invasive species. Ultimately, the use of exotic species, as part of a management strategy could allow the indigenous vegetation to recuperate thereby enhancing the regions biodiversity. Another study on the diversity of medicinal plants in Sharavathi valley region of central Western Ghats was comducted by Savinaya *et al* [47]. According to them the traditional healers resided in and around the valley region uses various plant parts for medicinal purposes. In majority of the cases, leaves were used as the medicinal source followed by stem bark, root and fruit. Investigation of traditional use of medicinal plants in Wayanad district and Jawalamukhi, Himachal Pradesh concluded that the traditional healers uses leaf part in most of the medicinal care. The traditional healers generally prefers various plant parts for currig/control various ailments, which occured in human life.

Table 1: List of non-native plants with medicinal uses

SL No.	Botanical Name	Family	Medical Potentialities
1.	*Cleome burmannii* Wight & Arn.	Capparaceae	It has anthelmintic properties [18]
2.	*Sida acuta* Burm.f.	Malvaceae	Medicine for various diseases like Fever, bronchitis, ulcer, diarrhea, dysentery, skin diseases etc [19]
3.	*Glycosmis pentaphylla* (Retz.) DC.	Rutaceae	Traditionally used for the treatment of fever, liver complaints and certain other diseases. The stems are widely used as a brush for cleaning the teeth. Also have antimicrobial and antioxidant properties [20]
4.	*Senna alata* (L.) Roxb.	Caesalpinaceae	Traditionally acclaimed to be effective in treating skin infections in man and animals and also credited for the treatment of haemorrhoids, constipation, inguinal hernia, intestinal parasitosis, syphilis and diabetes [21]
5.	*Bryophyllum pinnatum* (Lam.) Kurz.	Crassulaceae	Used for hypertension, skin disorders, asthma, cold, insect stings. Also used for bleeding disorders, renal calculi, ulcers, diarrhoea etc [22]
6.	*Chassalia curviflora* (Wall. *ex* Kurz) Thw.	Rubiaceae	Decoction of the roots is taken for rheumatism, pneumonia, malaria and cough. Root and leaves are applied topically to cure wounds, ulcers and also to treat headache [23]
7.	*Crassocephalum crepidioides* (Benth.) S. Moore.	Asteraceae	The leaves and stems are eaten as vegetable and many parts of the plant use for medical purposes. It is used for the treatment of indigestion, stomach upset, treatment for fresh wound [24]
8.	*Eclipta prostrata* L.	Asteraceae	It is an active ingredient of many herbal formulations prescribed for liver ailments and shows effect on liver cell generation. It is used as a tonic and diuretic in hepatic and spleen enlargement. It is also used in catarrhal jaundice and for skin diseases [25]
9.	*Emilia sonchifolia* (L.) DC.	Asteraceae	The plant is used in folklore medicine for the treatment inflammation, cough, rheumatism, cuts and wounds [26]
10.	*Synedrella nodiflora* (L.) Gaertn.	Asteraceae	The leaves are used for rheumatism and juice of the leaves is used for earache. Leaves are taken as laxative and leaf sap is used for mouth infections and it is rubbed on gums for tightening [27]
11.	*Tridax procumbens* L.	Asteraceae	It has significant medicinal properties against blood pressure, bronchial catarrh, malaria, dysentery, diarrhoea, stomach ache, headache, wound healing, it also prevents hair fall and check haemorrhage from cuts and bruises [28]
12.	*Ipomoea cairica* (L.) Sweet.	Convolvulaceae	The pharmacological studies showed that different parts of plants posesses antiinflammatory, antioxidant, antimicrobial, activities [29]
13.	*Datura stramonium* L.	Solanaceae	Used for curing various human ailments, including ulcers, wounds, inflammation, rheumatism and gout, sciatica, bruises and swellings, fever, asthma and bronchitis, and toothache [30]
14.	*Physalis peruviana* L.	Solanaceae	Has antispasmodic, diuretic, antiseptic, sedative, analgesic, throat trouble relief, elimination of intestinal parasites and amoeba and even antidiabetic properties [31]
15.	*Solanum torvum* Sw.	Solanaceae	The plant is sedative and diuretic and the leaves are used as a haemostatic. The ripened fruits are used in the preparation of tonic for the treatment for body pain [32]
16.	*Scoparia dulcis* L.	Scrophulariaceae	Decoction of the leaves or the whole plant for stomach pain, for menstrual disorder, as an aid in child birth, as a blood purifier, for insect bites, fever, heart problems, liver and stomach disorders, malaria, sexually transmitted diseases and as a general tonic [33]
17.	*Ruellia tuberosa* L.	Acanthaceae	Traditionally it is used as diuretic, antipyretic and anti-hypersensitive agent and could be a potential source for natural antioxidant as well as chemo-preventive agent against breast cancer in future [34]
18.	*Clerodendrum paniculatum* L.	Verbenaceae	Used traditionally in the treatment of rheumatism, neuralgia, ulcer, inflammation, and for healing wounds [35]
19.	*Stachytarpheta jamaicensis* (L.) Vahl.	Verbenaceae	It has antacid, analgesic, anti-inflammatory, hypotensive, antihelminthic, diuretic, laxative, lactagogue, purgative, sedative, spasmogenic, vasodilator, vulnerary, and vermifuge properties [36]
20.	*Stachytarpheta urticifolia* (Salisb.) Sims.	Verbenaceae	Has analgesic, anti-inflammatory, hypotensive, antihelminthic, diuretic, laxative, lactagogue, purgative, sedative properties [37]
21.	*Hyptis suaveolens* (L.) Poit.	Lamiaceae	Used as a stimulant, carminative, and as a cure for parasitic diseases. Crude leaf extract is also used as a relief to colic and stomachache. Leaves and twigs are considered to be antispasmodic and used in antirheumatic, antiinflammatory, antifertility agents, it also applied as an antiseptic in burns, wounds, and various skin complaints [38]
22.	*Gomphrena celosioides* Mart.	Amaranthaceae	The extract of this plant is effective and commonly used in the treatment of urinary tract disorders and kidney stones. The leaf paste is used to treat Malaria. The whole plant is used in the treatment of skin diseases [39]
23.	*Peperomia pellucid* (L.) Kunth.	Piperaceae	Widely used for different medicinal purposes including conjunctivitis, convulsions, fatigue, fever, headache, gout, rheumatic pains, skin diseases, to lower blood cholesterol level and breast cancer [40]
24.	*Euphorbia heterophylla* L.	Euphorbiaceae	It is used in traditional medical practices as laxative, antigonorrheal, migraine and wart cures. The plant lattices have been used as fish poison, insecticide and ordeal poisons. The leaves are used as anticonvulsant and cough remedy [41]
25.	*Commelina benghalensis* L.	Commelinaceae	Used as a folk medicine for the treatment of variety of ailments. The plant is used for mouth thrush, inflammation of the conjunctiva, psychosis, epilepsy, nose blockage in children, insanity and exophthalmia [42]
26.	*Bambusa vulgaris* Schrad.	Poaceae	The leaves are reported to used in the treatment of several diseases diarrhoea, fever, inflammations, ulcers and wounds [43]
27.	*Cynodon dactylon* (L.) Pers.	Poaceae	Used for the treatment of diarrhoea, dysentery, wounds, hemorrhages and hyperdypsia. Fresh juice of plant was used as demulcent, astringent and in the treatment of dropsy, catarrhal opthalmia, secondary syphilis, chronic diarrhoea and dysentery [44]
28.	*Dactyloctenium aegyptium* (L.) P. Beauv.	Poaceae	It has anti-oxidant, anti-inflammatory, anticancer and antipyretic properties and it also used for treating small pox, wounds and ulcers [45]

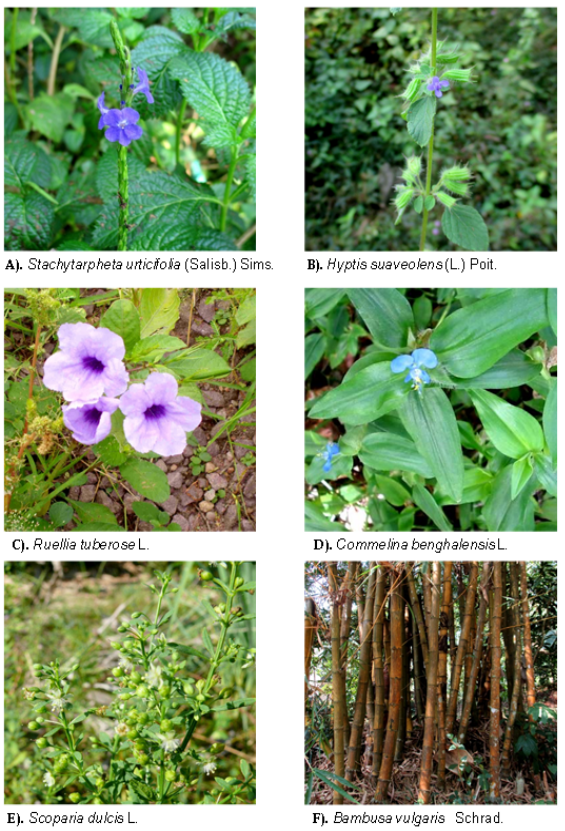
PLATE – 2

A). *Cleome burmannii* Wight & Arn. B). *Sida acuta* Burm.f.

C). *Bryophyllum pinnatum* (Lam.) Kurz. D). *Chassalia curviflora* (Wall. ex Kurz) Thw.

E). *Crassocephalum crepidioides* (Benth.) S. Moore. F). *Synedrella nodiflora* (L.) Gaertn.

PLATE – 3



A). *Stachytarpheta urticifolia* (Salisb.) Sims. B). *Hyptis suaveolens* (L.) Poit.

C). *Ruellia tuberose* L. D). *Commelina benghalensis* L.

E). *Scoparia dulcis* L. F). *Bambusa vulgaris* Schrad.

4. Conclusion

In India, plants serve as the main source of medicine for preventive, promotive and curative purposes. Medicinal plants have been preliminary selected on the basis of local traditional knowledge. The traditional knowledge with its holistic and systems approach supported by experimental base can serve as an innovative and powerful discovery engine for newer, safer and affordable medicines. The development of these traditional systems of medicines with the perspectives of safety, efficacy and quality will help not only to preserve this traditional heritage but also to rationalize the use of natural products in the health care. Many invasive plants have a crucial role in the traditional medicinal practices. Plant parts like Roots, Bark, Stems, Leaves, fruits and even the whole plant will have medicinal value. Invasive plants in the new areas alter indigenous community composition, deplete species diversity, affect ecosystem process and thus cause huge economic and ecological imbalance. But on the other hand they can be used as a tool of medicine for the well being of human society. An invasive plant species which is threat to the native plants and society can be manipulated so that it will benefit in different ways. Thus the medicinal potentialities of the unwanted invasive plants, those are least recognized by others, will yield a gem to the Research world.

5. References

1. Sen SA, Chakraborty RA, De BB. Challenges and opportunities in the advancement of herbal medicine: India's position and role in a global context. JHM. 2011; 1(3-4):65-75.
2. Jain SK. Dictionary of Indian Folk Medicine and Ethnobotany. Deep Publications, New Delhi. 1991.
3. Ballabh B, Chaurasia OP. Medico potentialities of non-native plants. JE. 2007; 112:341.
4. Rabe, Staden JV. JE Invasive plants and their influences on various native elements. JEP 1997; 56:81.
5. Cox P, Balick M. Introductions of inavsive floristic elements. SA 1994, 82-92.
6. Kaiser J. Stemming the tide of invasive species. SC 1999; 285:1836-1841.
7. Dogra KS, Sood SK, Dobhal PK, Sharma S. Alien plant invasion and their impact on indigenous species diversity at global scale: A review. JENE 2010; 2:175-186.
8. Richardson DM, Binggeli P, Schroth G. Invasive agroforestry trees: problems and solutions. ABCTL, 2004, 371-396.
9. Crooks JA. Characterizing ecosystem–level consequences of biological invasions: The role of ecosystem engineers Oiks. 2002; 97:153-166.
10. Samy RP, Ignacimuthu S. Antibacterial activity of some folklore medicinal plants used by tribals inWestern Ghats of India. JE 2010; 69(1):63-71.
11. Revathi P, Parimelazhagan T. Traditional knowledge on medicinal plants used by the tribe of Hasanur Hills, Erode District, Tamil Nadu, India. EL. 2010; 14:136-160.
12. McNeely JA, Mooney HA, Neville LE, Schei P, Waag JK. A Global Strategy on Invasive Alien Species, IUCN, Gland, Switzerland. 2001.
13. Wittenberg R, Cock MJW. Invasive Alien Species: A Toolkit for Best Prevention and Management Practices, CABl Publishing, Wallingford, UK. 2001.
14. Gamble JS. Fischer CEC. The Flora of the Presidency of Madras. Adlard & Son Ltd., London. 1915-1936.
15. Hooker JD. The Flora of British India. Reeve & Co., London. 1872-1897, 1-7.
16. Manilal KS, Sivarajan VV. Flora of Calicut. Bishen Singh Mahendrapal Singh, Dehra Dun. 1982.
17. Santapau H, Hentry AN. A Dictionary of the flowering plants in India. Council of Scientific & Industrial Research, New Delhi. 1973.

18. Pillai LS, Nair BR. Pharmacognostical standardization and phytochemical studies in *Cleome viscosa* L. and *Cleome burmanni* W. & A. (Cleomaceae). JPR.2012; 5(2):1231-1235.
19. Karou DB, Wendyam MC, Nadembega DP, Djeneba O, Messanvi G, Jacques S. *Sida acuta* Burm. f. a medicinal plant with numerous potencies. AJB 2007; 6(25):2953-2959.
20. Howlader A, Rizwan F, Sultana S, Rahman MR, Shams-Ud-Doha KM, Mowla R *et al*. Antimicrobial, antioxidant and cytotoxic effects of methanolic extracts of leaves and stems of *Glycosmis pentaphylla* (Retz.). JAPS 2011; 1(8):137-140.
21. Nayak BK, Mukilarasi V, Nanda A. Antibacterial activity of leaf extract of *Cassia alata* separated by soxhlet extraction method. DPL 2015; 7(4):254-257.
22. Nagaratna A, Prakash LH. A comprehensive review on Parnabeeja [*Bryophyllum pinnatum* (lam.) Oken]. JMPS 2015; 3(5):166-171.
23. Gopal GR, Anuja GI, Latha PG, Nair AJ, Gangaprasad A, Sudhakaran PR, Muraleedharan D *et al*. Anti-Hepatotoxic Property of Roots and Leaves of *Chassalia curviflora* (Wall.) Thwaites against CCl4 Induced Liver Damage in Rats. IJPSDR, 2016; 8(5):269-274.
24. Adekomi DA, Musa AA, Tijani AA, Muhammed OA. Some of the Effect of *Crassocephalum crepidioides* on the Frontal cortex, Kidney, Liver and Testis of Adult Male Sprague Dawley Rats: Microanatomical Study. EJEB 2011; 1(3):228-235.
25. Jaglan D, Brar AS, Gill R. Pharmacological Activity and Chemical Constituents of *Eclipta Alba*. GJMPDDTM 2013; 13(7):34-40.
26. Essien GE, Nwidu LL, Nwafor PA. Anti-Inflammatory and Analgesic Potential of Methanolic Extract of *Emilia Sonchifolia* (Compositae) Leaves in Rodents. AJBR 2009; 12(3):199-207.
27. Bhogaonkar PY, Dagawal MJ, Ghorpade DS. Pharmacognostic studies and antimicrobial activity of *Synedrella nodiflora* (L.) Gaertn. BD 2011; 2(3):317-321.
28. Ankita J, Jain A. *Tridax procumbens (L.)*: A weed with immense medicinal importance: A review. IJPBS 2012; 3(1):544-552.
29. Srivastava D, Shukla K. *Ipomoea cairica*: a medicinal weed with promising health benefits. IJIRR 2015; 2(5):687-694.
30. Gaire BP, Subedi L. A review on the pharmacological and toxicological aspects of *Datura stramonium* L. IM 2013; 11(2):73-79.
31. Puente LA, Claudia A, Pinto-Muñoz Castro ES, Cortes M. *Physalis peruviana* Linnaeus, the multiple properties of a highly functional fruit: A review. FRI 2011; 44:1733-1740.
32. Jaiswal BS. *Solanum torvum*: a review of its traditional uses, phytochemistry and pharmacology. IJPBS 2012; 3(4):104-111.
33. Lakshmi PP, Lethi CD. Effect of *Scoparia dulcis* (Linn.) and *Aerva lanata* (Linn.) whole plant and fruit part extracts on urine volume of ethylene glycol induced urolithiasis in male albino rats. IJCMAS 2014; 3(9):1218-1223.
34. Cheong BE, Waslimb MZ, Lema FF, Teoha PL. Antioxidant and anti-proliferative activities of Sabah *Ruellia tuberose*. JAPS 2013; 3(12):20-24.
35. Joseph J, Bindhu AR, Aleykutty NA. *In vitro* and *in vivo* Antiinflammatory Activity of *Clerodendrum paniculatum* Linn. Leaves. IJPS 2013; 75(3):376-379.
36. Liew PM, Yong YK. *Stachytarpheta jamaicensis* (L.) Vahl: From Traditional Usage to Pharmacological Evidence. EBCAM 2015, 1-7.
37. Griffis JL. Out of Africa New African plants with ornamental potential. PFSHS 1998; 111:1-3.
38. Shenoy C, Patil MB, Kumar R. Wound Healing Activity of *Hyptis suaveolens* (L.) Poit. IJPTR 2009; 1(3):737-744.
39. Chen S, Li Y. Remarks on the Species of *Gomphrena* (Amaranthaceae) of Taiwan. T. 2012; 57(3):312-317.
40. Ooi D, Iqbal S, Ismail M. Proximate Composition, Nutritional Attributes and Mineral Composition of *Peperomia pellucida* L. (Ketumpangan Air) Grown in Malaysia. M 2012; 17:11139-11145.
41. James O, Friday ET. Phytochemical composition, bioactivity and wound healing potential of *Euphorbia heterophylla* (Euphorbiaceae) leaf extract. IJPBR 2010; 1(1):54-63.
42. Khan MAA, Islam MT, Rahman A, Ahsan Q. Antibacterial activity of different fractions of *Commelina benghalensis* L. DPS 2011; 2(2):320-326.
43. Owolabi MS, Lajide L. Preliminary phytochemical screening and antimicrobialactivity of crude extracts of *Bambusa vulgaris* Schrad. *ex* J.C. Wendl. (Poaceae) from southwestern Nigeria. AJEONP 2015; 3(1):42-45.
44. Al-Snafi, AE. Chemical constituents and pharmacological effects of Cynodon dactylon- A Review. IJP 2016; 6(7):17-31.
45. Jebastella J, Reginald AM. Screening of antibacterial activity in medicinal grass (*Dactyloctenium aegyptium)* using two extract. IJRSR 2015; 6(7):5046-5048.
46. Semenya SS, Tshisikhawe MP, Potgieter MT. Invasive alien plant species: A case study of their use in the Thulamela Local Municipality, Limpopo Province, South Africa. SRE 2012; 7(27):2363-2369.
47. Savinaya MS, Sangamesh SP, Narayana J, Krishna V. Traditional medicine knowledge and diversity of medicinal plants in Sharavathi valley region of central western Ghats. IJHM 2016; 4(6):124-130.