Original Research Article **Pharmaceutics**

International Journal of Pharma and Bio Sciences **ISSN 0975-6299**

USE OF MEDICINAL PLANTS FOR THE TREATMENT OF URINARY TRACT INFECTIONS: A STUDY FROM PASCHIM MEDINIPUR DISTRICT, WEST BENGAL, INDIA

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ABSTRACT

Urinary tract infections (UTIs) have become a severe public health problem affecting millions of people worldwide. These are caused by a range of pathogens, where *Candida albicans*, *Enterococcus faecalis, Escherichia coli*, *Klebsiella pneumoniae*, *Proteus mirabilis*, *Pseudomonas aeruginosa, Staphylococcus aureus, Staphylococcus saprophyticus* most common. High recurrence rates and increasing antimicrobial resistance among uropathogens make the situation more serious. The traditional medicines are the best alternatives to control the UTIs, as these medicines are used from the time of immemorial with same efficacy. Up till now a little attention has been paid on documentation of medicinal plants used for the treatment of UTIs from Paschim Medinipur district. An attempt has been made to collect the information about the use of phytomedicine for the treatment of UTIs of Paschim Medinipur district. The prescription of ethnomedicine were thoroughly interviewed and cross interviewed with the local healers, patients, old and experienced local peoples regarding doses and administration. About fifty three indigenous medicinal plants under thirty five families have been recorded. The present investigation is an important thrust area to the society for the treatment of UTIs and also helpful for the detailed account of the studied medicinal plant for future research to generate new phytochemicals and to formulate new bioactive compounds in the medical world.

KEY WORDS: **Drug resistance; Phytomedicine; Traditional knowledge, Urinary tract infections.**

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Received on: 06-06-2017
Revised and Accepted on: 29-06-2017
DOI: http://dx.doi.org/10.22376/ijpbs.2017.8.3.p250-259

INTRODUCTION

Urinary tract infections (UTIs) are one of the most common bacterial infections in the world and are accounting for 25% of all infections.[1] UTIs affect nearly 150 million people each year worldwide and cost the global economy in more than 6 billion US dollars.[2] UTIs can occur in any populations and in any age groups but it is more prevalent in females who are in reproductive age.[1,3] It may be due to absence of prostatic secretions, short urethra, easy contamination of urinary tract with faecal flora and pregnancy.[1-4] Singh et al reported that 40-50% women suffer at least one clinical episode during their lifetime.[5] The pregnant mothers very much susceptible to be infected because of dilation of ureter which persist upto delivery and may increase the ureterovenical reflux and urinary stasis. The volume of plasma increased and the concentration of urine decreased, and glycosuria also found during pregnancy which encourage the bacterial growth in the urine.[6] The risk factors like personal hygiene, lower socio economic status, increased parity, increased age, sickle cell trait and anaemia, lack of prenatal care, diabetes mellitus and the functional urinary tract abnormalities are responsible for UTIs.[7,8] UTIs may lead to adverse pregnancy outcomes, such as low birth weight infants, premature delivery, hypertension, renal failure, preeclampsia and foetal death.[9] It is associated with poor self-esteem, impaired quality-of-life, social isolation, and depression.[10-11] UTIs are caused by a range of pathogens, but most commons are *Candida albicans*, *Enterococcus faecalis, Escherichia coli*, *Klebsiella pneumoniae*, *Proteus mirabilis*, *Pseudomonas aeruginosa, Staphylococcus aureus, Staphylococcus saprophyticus*.[12-15] High resistance power of uropathogens and high prevalence of UTIs become a serious threat at the present era. The microbes of UTIs have great drug resistance power due to which it is very difficult to control. The improper and uncontrolled use of the antibiotics may be the main cause of this antimicrobial resistance.[16] The antimicrobial resistance has become a severe problem globally. So, there is some urgent need of restriction in the unnecessary use of antibiotics and also to search out some new drugs. The traditional medicines are the best alternatives to it, as these medicines are used from the time of immemorial with same efficacy. The antimicrobial efficacy of some plants for the treatment of UTIs has been beyond belief. The plants bio-constituents have been a good source of antimicrobial agents but still many of the plant species remained unexplored. It is reported that the local communities have used only ten percent of all flowering plants on the earth for this purpose but one percent of these plants were recognized by modern scientists.[17] The plants are the rich source of secondary metabolites like tannins, alkaloids and flavonoids. These secondary metabolites have proven their antimicrobial properties in many in vitro studies.[18] Considering this information, the present study was initiated with an aim to identify medicinal plants resources and traditional knowledge of local people of Paschim Medinipur district, West Bengal, India to treat the UTIs. A synoptic account of these medicinal plants with their species, family, parts used, approximate doses in possible cases and ethno–medicinal values to cure UTIs has been prepared in the present investigation.

MATERIALS AND METHODS

Frequent field visits during last five months were arranged to collect the information from the people of Paschim Medinipur District. Repeated enquiries were made to understand their knowledge, methods of diagnosis and treatment of this disease. Data were collected on the specific parts of the plants used, collection, method of uses of the drugs, and dosage administration. The information on medicinal uses of the indigenous plants have been described after gathering information from general local people, experienced aged rural folk, traditional herbal medicine practioners and local herbal drug sellers. Local elder, experienced tribal peoples, “Vaidyas” and “Ojhas” were interviewed and cross – interviewed following the questionnaire regarding doses and administration.[19-21] The medicinal plants specimens were collected and identified with the help of authentic specimens, books, journals, floras and revisions.[22-33]

RESULTS

The present investigation deals with 53 plants species under 35 families of which 8 species belong to trees, 4 species belong to shrubs, 1 species belongs to lianes and 40 are herbs (Table 1). From the tree species the bark, leaves, seeds and roots were used. In case of herbs species the whole plant was used. Out of 35 families fabaceae stands the first position, the family apiaceae second position and malvaceae holds third position considering the number of plants used (Fig. 1). Similarly herbaceous plants acquiring the topmost position for use (Fig. 2).

Table 1
List of investigated plants used for the treatment of urinary tract infections

Sl. No.	Scientific name	Family	Local name	Habit	Parts used	Mode of application
1.	*Abelmoschus esculentus* (L.) Moench	Malvaceae	Bhendi	Herb	Fruit	Seedless fruits taken orally with sugar.
2.	*Abutilon indicum* L.	Malvaceae	Paatri	Herb	Root, leaves	Leaves and roots powder taken orally.
3.	*Acacia nilotica* Delile	Fabaceae	Babool	Tree	Leaves, bark & gum	Paste of 10g gum and two leaves taken with cow's milk. Bark powder are used.
4.	*Allium sativum* L.	Liliaceae	Rasun	Herb	Bulb	Fresh eating.
5.	*Ananus comosus* (L.) Merr.	Bromeliaceae	Anarus	Herb	Leaves, fruit	A combination of leaves and fruit juice.
6.	*Andrographis paniculata* Wall.ex.Nees.	Acanthaceae	Kalmegh	Herb	Leaves	Fresh leaves extracts taken.
7.	*Apium graveolens* L.	Apiaceae	Apium	Herb	Aerial part	Fresh leaves and fruits extracts taken.
8.	*Azadirachta indica* A. Juss.	Meliaceae	Neem	Tree	Fruit, leaves, bark	Fresh fruits taken. Leaves and bark taken as powder.
9.	*Bidens pilosa* L.	Asteraceae	Hairy Beggartides	Herb	Whole herb	Whole plants extracts taken.
10.	*Brassica nigra* L. Left	Brassicaceae	Sorsa	Herb	Seed	Grinded seeds taken.
11.	*Caesalpinia nuga* (L.) Aiton	Fabaceae	Lata	Lianes	Leaves, roots	Leaves and root powder taken.
12.	*Centella asiatica* (L.) Urban	Apiaceae	Thankuni	Herb	leaves	Fresh leaves taken.
13.	*Cichorium intybus* L.	Asteraceae	Chicori	Herb	Leaves	Dried and grinded leaves taken.
14.	*Cinnamomum verum* Presl	Lauraceae	Dalchini	Tree	Bark	Berk powder taken.
15.	*Citrulus vulgaris* L.	Cucurbitaceae	Makal	Herb	Seed	Grinded seed taken.
16.	*Citrus lemon* L.	Rutaceae	Lebu	Shrub	Fruit	Fruit juice taken.
17.	*Clitoria ternatea* L.	Fabaceae	Aparajita	Herb	Root	Water in which rice has been rinsed is mixed with about 2" portion of root and grounded to obtain juice. The juice is taken two spoonfuls at a time 2-3 times daily till cure.
18.	*Commiphora mukul* (Hook. ex Stocks) Engl.	Burseraceae	Guggul	Under shrub	Latex	The resinous latex (2 g) in hot water is given to the patient for one month.
19.	*Coriandrum sativum* L.	Apiaceae	Dhana	Herb	Leaves and fruit	Leaves and fruit extract taken.
20.	*Crataeva murvala* Buch-Han.	Capparidaceae	Tita sag	Small tree	Bark	Bark decoction taken twice daily for seven days.
21.	*Cucumis sativus* L.	Cucurbitaceae	Sasa	Herb	Seeds	About 10-15 seeds grinded with a little rock salt given twice a day for five days.
22.	*Curculigo orchioides* Gaertn.	Amarlyllidaceae	Talmuli	Herb	Root, rhizome	10 g of root or rhizome paste with fermented rice water taken two times daily for seven days.
23.	*Curcuma longa* L.	Zingiberaceae	Haldi	Herb	Rhizome	Fresh rhizome eaten.
24.	*Cyperus scariosus* R.Br.	Cyperaceae	Jalmuthi ghas	Aquatic Herb	Tubers	Extracts of tubers eaten.
25.	*Ferula asa-foetida* L.	Apiaceae	Hingh	Herb	Dried latex	30-40 drops of tincture of asafoetida taken 3 times a day.
26.	*Hemidesmus indicus* (L.) R.Br.	Asclepiadaceae	Anantamul	Herb	Root	Root powder mixed with cow milk eaten.
27.	*Hibiscus rosa-sinensis* L.	Malvaceae	Jaba	Shrub	Flower	Flower decoction is taken thrice daily for 3 days.
28.	*Lagenaria vulgaris* Ser.	Cucurbitaceae	Lau	Herb	Fruit	Pulp extract taken.
29.	*Linum usitatissimum* L.	Linaceae	Tisi	Herb	Seed	Grinded seeds are taken.
30.	*Malva sylvestris* L.	Malvaceae	Mallow	Herb	Leaves	Used in salad.
31.	*Mangifera indica* L.	Anacardiaceae	Aam	Tree	Leaves	Powder form leaves taken for few days.
32.	*Nelumbo nucifera* Gaertn	Nymphaeaceae	Saluk	Herb	Rhizome	Fresh rhizome taken for two weeks.
33.	*Nigella sativa* L.	Ranunculaceae	Kalazira	Herb	Seeds	Grinded seeds taken.
34.	*Ocimum sanctum* L.	Lamiaceae	Tulsi	Herb	Leaves	Leaves are taken.

35.	*Paederia scandens* (Lour.) Merrill	Rubiaceae	Gandal	Herb	Leaves	Decoction of leaves taken.
36.	*Phylanthus fraternus* Webster	Euphorbiaceae	Bhumiamla	Herb	Whole plant	Plant juice drunk once daily for few days.
37.	*Pimpinella anisum* L.	Apiaceae	Mitha zira	Herb	Seed	Seeds taken.
38.	*Portulaca oleracea* L.	Portulacaceae	Portulaca	Herb	Aerial parts	Extract of the whole plant taken in the morning for 3-5 days.
39.	*Punica granatum* L.	Punicaceae	Anar	Tree	Seed	Fleshy and juicy seeds taken.
40.	*Raphanus sativus* L.	Brassicaceae	Mula	Herb	Whole plant	Roots and leaves taken.
41.	*Rosmarinus officinalis* L.	Lamiaceae	Rosemary	Herb	Leaves, flower	Extracts of flower and leaves taken.
42.	*Solanum indicum* L.	Solanaceae	Kanta Begun	Herb	Fruits	Fruits extracts taken.
43.	*Sphaeranthus indicus* L.	Asteraceae	Ghorkmundi	Herb	Whole plant	Decoction taken.
44.	*Syzygium cumini* (L.) Skeels	Myrtaceae	Jamun	Tree	Bark	Bark extract taken.
45.	*Terminalia chebula* Retz.	Combretaceae	Harituki	Tree	Fruit core	Fruit extract taken.
46.	*Tinospora cordifolia* (Willd.) Hook f. & Thoms.	Menispermaceae	Gulancha	Herb	Stem	Stem powder (10 g) of this plant and 2-3 g of 'black pepper' powder (Piper nigrum) are prescribed for 7 days.
47.	*Trianthema portulacastrum* L.	Aizoaceae	Trianthema	A small succulet prostrate herb	Whole plant	Whole plant extracts taken.
48.	*Tribulus terrestris* L.	Zygophyllaceae	Gokhuro	Herb	Whole plant	Whole plant extracts taken.
49.	*Trigonella foenum* -graecum L.	Fabaceae	Methi	Herb	Whole plant	Whole plant extracts taken.
50.	*Vigna mungo* L.	Fabaceae	Mung	Herb	Seed	Seeds taken.
51.	*Zea mays* L.	Poaceae	Bhutta	Herb	Seed	Seeds taken.
52.	*Zingiber officinale* Rosc.	Zingiberaceae	Ada	Herb	Rhizome	Fresh rhizome taken.
53.	*Zizyphus jujuba* Mill.	Rhamnaceae	Tak kul	Shrub	Friut	Extract of the fruit is taken.

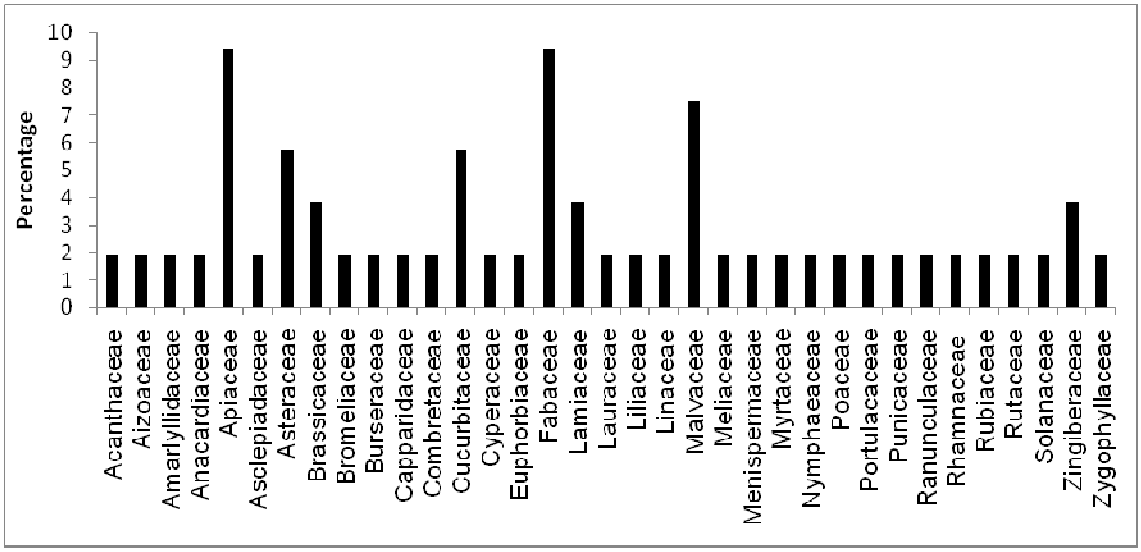

Figure 1
Usefulness of families for the treatment of urinary tract infections

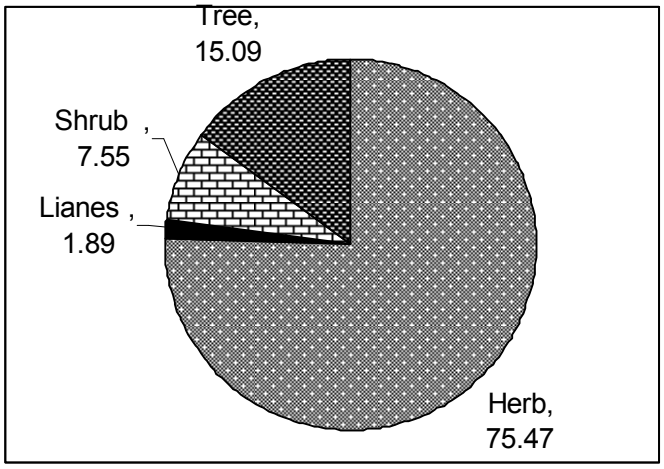

Figure 2
Plant habit for the treatment of urinary tract infections

DISCUSSION

Medicinal plants are used to treat the diseases all over the world from the ancient times.[34] Even at the 21st century the herbal medicines achieved the reliability in mind set of global people as because it have no such side effects, relatively less expensive and better patient tolerance.[35] It is reported that nearly 80% of people from developing countries depending on traditional medicines for primary health care and in modern medicine also approximately 25% are based on plant derived drugs.[36-38] In Paschim Medinipur District nearly 87.8% people live in the villages and are knowledgeable to use the herbals to treat the UTIs and the people from upper class society have less experience about it. The whole plant body of the herbaceous plants; bark, leaves, flowers, fruit and seeds of the shrub and tree were used. The plant parts or extracts were taken orally directly or mixed with water, milk, honey, black pepper etc. The medicines were administered in empty stomach early in the morning in most of the cases.Depending on the age, sex and health conditions one or two teaspoonful were prescribed. Most healers collect the herbals from the forest or roadside but never cultivated and the study was purely nonbiochemical. That's why it is the high time to analyze the chemical components that are present in the potential medicinal plants and also find out the specific bioactive compounds which are solely responsible to control the disease. Few potential chemical components have been found in recent years (Table 2).[39-95] Hence, the present study will be helpful for the future phytochemical and pharmacological screening to formulate different potential drugs for the treatment of UTI.

Table 2
Potential phytochemicals present in the investigated medicinal plants

Sl. No.	Scientific name	Phytochemicals	References
1.	*Abelmoschus esculentus* (L.) Moench	Glycosides, Tannins, Terpenoids	Huang et al.,[39] Honda et al.[40]
2.	*Abutilon indicum* L.	Alkaloids, Flavonoids, Glycosides, Phenols, Saponins, Steroids, Sterols, Terpenoids	Dhawale[41]
3.	*Acacia nilotica* Delile	Anthraquinones, Cardiac Glycosides, Flavonoids, Saponins, Tannins	Deshpande,[42] Harbone[43]
4.	*Allium sativum* L.	Alkaloids, Anthraquinones, Flavonoids (allicin),Glycosides, Phenol, Saponin, Steroids, Tannins, Trepenoids,	Aliyu et al.[44]
5.	*Ananus comosus* (L.) Merr.	Alkaloids, Flavonoids, Glycosides, Phenols, Phytosterols, Tannins,	Kalpana et al.[45]
6.	*Andrographis paniculata* Wall.ex.Nees.	Alkaloids, Anthracene, Flavonoids, Glycosides, Phenols, Quinines, Steroids, Tannins,	Anand et al.[46]
7.	*Apium graveolens* L.	Alkaloids, Flavonoids, Phenols, Steroids, Tannins, Terpenoids,	Ravichandran et al.[47]
8.	*Azadirachta indica* A. Juss.	Alkaloids, Anthraquinones, Cardiac glycosides, Flavonoid, Glycosides, Polyphenols, Saponins, Steroids, Tannins, Terpenes, Terpenoids	Biu et al.,[48] Daniel et al.[49]
9.	*Bidens pilosa* L.	Alkaloids, Anthraqoinones, Flavonoids, Glycosides, Saponins, Steroids, Tannins,	Khan et al.[50], Silva et al.[51]
10.	*Brassica nigra* L. Left	Alkaloids, Flavonoids, Glycosides, Saponins, Steroids, Sterols, Tannins,	Krishnaveni et al.[52]
11.	*Caesalpinia nuga* (L.) Aiton	Carbohydrates ,Glycosides, Flavonoids, Phenols, Saponins, Tannins	Harjit et al.[53]
12.	*Centella asiatica* (L.) Urban	Alkaloids, Phenols, Saponins, Tannins	Tadesse et al.[54]
13.	*Cichorium intybus* L.	Cardiac glycosides, Flavonoids, Saponins, Tannins, Terpenoids,	Shad et al.[55]
14.	*Cinnamomum verum* Presl	Alkaloids, Flavonoids, Glycosides, Saponins, Tannins, Terpenoids	Ahuja et al.[56]
15.	*Citrulus vulgaris* L.	Alkaloids, Anthraquinones, Flavonoids, Glycosides, Phenols, Saponins, Steroids, Sterols, Tannins, Terpenoids, Triterpenoids	Otutu et al.[57]
16.	*Citrus lemon* L.	Alkaloids, Cardiac glycosides, Flavonoids, Phenols, Phytosterols, Saponins, Steroids, Tannins,	Mathew et al.[58]
17.	*Clitoria ternatea* L.	Flavonoids, Phenols, Saponins	Manjula et al.[59]
18.	*Commiphora mukul* (Hook. ex Stocks) Engl.	Alkaloids, Flavonoids, Glycosides, Phytosterols, Saponins, Steroids, Tannins, Terpenoids,	Singh et al.[60]
19.	*Coriandrum sativum* L.	Alkaloids, CoumarinFlavonoids, Phenolic compounds, Saponins. Tannins,	Thangavel et al.[61]
20.	*Crataeva murvala* Buch-Han.	Alkaloids, Flavonoids, Phytosterol, Saponins. Tannins, Triterpene,	Bhattacharjee et al.[62]
21.	*Cucumis sativus* L.	Cardiac glycosides, Phytosterol, Saponins, Tannins, Terpenoids	Sood et al.[63]
22.	*Curculigo orchioides* Gaertn.	Alkaloids, Flavonoids, Glycosides, Phenolic compounds, Saponins. Sterols, Tannins,	Asif et al.[64]
23.	*Curcuma longa* L.	Alkaloids, Anthocyanin, Coumarin, Diterpenes, Emodins, Flavonoids, Phenol, Phlobatannin, Phytosterol, Saponin, Steroid, Tannin,	Rajesh et al.[65]
24.	*Cyperus scariosus* R.Br.	Alkaloids, Flavonoids, Hydrocarbons, Mono and sesquiterpenes, Saponins, Steroids, Terpenoids,	Kasana et al.[66]
25.	*Ferula asa-foetida* L.	Alkaloids, Coumarins, Flavonols, Saponins, Sesquiterpene, Tannins, Terpenoids, Terpinoides	Iranshahyet et al.[67]
26.	*Hemidesmus indicus* (L.) R.Br.	Anthraquinone, Flavonoid, Steroid, Tannins, Terpenoid	Banerjee et al.[68]
27.	*Hibiscus rosa-sinensis* L.	Alkaloides, Anthraquinones, Cardiac glycosides, Flavanoides, Phenols, Phlobatanins, Saponins, Steroids, Tanins, Terpenoids,	Kumari et al.[69]
28.	*Lagenaria vulgaris* Ser.	Alkaloids, Flavonoids, Glycosides, Saponins, Steroids, Tannins	Gautam et al.[70]
29.	*Linum usitatissimum* L.	Alkaloids, Flavonoids, Glycerides, Saponins,	Bekala et al.[71]
30.	*Malva sylvestris* L.	Alkaloids, Flavonoides, Phenols, Saponins, Tannins,	Hanaa et al.[72]
31.	*Mangifera indica* L.	Alkaloids, Anthraquiones, Flavonoids, Glycosides, Saponins, Tannins	Nwankwo et al.[73]
32.	*Nelumbo nucifera* Gaertn	Alkaloids, Flavonoids, Glycosides, Phytosterols, Polyphenols, Sterols, Tannins, Triterpenoids,	Gnana et al.[74]
33.	*Nigella sativa* L.	Alkaloids, Flavanoids, Sterols, Tannins,	Javed et al.[75]

34.	*Ocimum sanctum* L.	Alkaloids, Anthocyanins, Cardiac glycosides, Eugenol, Flavonoids (Apigenin), Luteolin, Polyphenols, Sesquiterpene, Steroids, Tannins, Thymol, Ursolic acid,	Joshi et al.[76]
35.	*Paederia scandens* (Lour.) Merrill	Alkaloids, Flavonoids, Glycosides, Polyphenolic compounds, Tannins, Terpenoids,	Patil et al.[77]
36.	*Phylanthus fraternus* Webster	Alkaloid, Cardiac glycosides, Flavonoids, Saponins, Steroid, Tannins, Terpenoid,	Kavit et al.[78]
37.	*Pimpinella anisum* L.	Alkaloids, Carbohydrate, Cardiac Glycosides, Flavanoids, Phytosterols, Terpenoids,	Salim et al.[79]
38.	*Portulaca oleracea* L.	Alkaloids, Cardiac glycosides, Flavonoids, Saponins, Tannins, Terpenoids	Okafor et al.[80]
39.	*Punica granatum* L.	Alkaloids, Gallotannins, Phenolic compounds, Phycobilins, Saponins, Steroids, Tannins, Triterpenoids,	Akkiraju et al.[81]
40.	*Raphanus sativus* L.	Alkaloids, Flavonoids, Glycoside, Phenolic compound, Phlobatannins, Steroids, Tannins, Terpenoids,	Aruna et al.[82]
41.	*Rosmarinus officinalis* L.	Flavonoids, Saponins, Terpenoids,	Johar et al.[83]
42.	*Solanum indicum* L.	Anthraquinones, Flavonoids, Saponins, Steroids, Tannins,	Deb et al.[84]
43.	*Sphaeranthus indicus* L.	Alkaloids, Cardiac glylosides, Flavanoids, Saponins, Steroids, Tannins, Terpenoids,	Santhosh et al.[85]
44.	*Syzygium cumini* (L.) Skeels	Alkaloids, Amino acid, Cardiac glycosides, Flavonoids, Phenols, Phytosterols, Saponins, Steroids, Tannins, Terpenoids,	Mubassara et al.[86]
45.	*Terminalia chebula* Retz.	Alkaloids, Carbohydrates, Cardenoloids, Deoxysugars, Flavanoids, Phenols, Reducing Sugar, Saponins, Steroids, Terpenoids,	Mamatha et al.[87]
46.	*Tinospora cordifolia* (Willd.) Hook f. & Thoms.	Alkaloids, Cardiac Glycosides, Carbohydrates, Flavonoids, Phenols, Proteins, Saponins, Steroids	Pradhan et al.[88]
47.	*Trianthema portulacastrum* L.	Alkaloid, Flavanoid, Ketone, Phytosterolins, Tetraterpenoid,	Verma et al.[89]
48.	*Tribulus terrestris* L.	Alkaloids, Carbohydrates, Glycosides, Phenols, Saponins, Saponins, Tannins, Terpenoids,	Vasait [90]
49.	*Trigonella foenum* -graecum L.	Alkaloids, Anthroquinone, Fattyacids, Flavonoids, Glycosides, Saponins, Steroids, Tannins, Triterpenoids, Volatile oils,	Nandagopal et al.[91]
50.	*Vigna mungo* L.	Alkaloids, Ascorbic acid, Flavonoids, Glycosides, Phenols, Saponins, Steroids, Tannins	Varma et al.[92]
51.	*Zea mays* L.	Flavonoids, Glycosides, Steroids, Sugars	Morshed et al.[93]
52.	*Zingiber officinale* Rosc.	Alkaloid, Flavanoids, Glycosides, Phlobotannins, Saponins, Tannin, Terpenoids	Riaz et al.[94]
53.	*Zizyphus jujuba* Mill.	Alkaloids, Compounds, Flavonoids, Glycosides, Phenolic, Saponins, Terpenoids	Tripath et al.[95]

CONCLUSION

The present investigation reveals mainly on the rural people health and treatment as they are deprived from the modern facilities and they are not aware of general health care. Recent discoveries reported that UTI pathogens are gradually becoming drug resistant and for that reason herbals which considered to be the best useful remedies. The herbals are the best alternative and like the supernatural blessing to the very poor people of the villages but as they do not know which plants are essential for the treatment of UTI, for that reason they have to go to the local traditional healers for the treatment of this disease. If proper documentation, cultivation procedure and dosages administration of these medicinal plants are done and focused in a very simple way to the village people it may yield a better for their own treatment. As there was no past scientific report regarding antimicrobial and phytochemical analysis of the recorded medicinal plants, greater attention and effort should be drawn on the indigenous practice right now. In this present circumstances, our study is much more appropriate to initiate the investigation in this direction. We hope future detail research work will open a new vistas for the formulation of new bioactive compounds in medical world for the treatment of UTI.

ACKNOWLEDGEMENT

Authors are thankful to the villagers for their kind co-operation during field investigation.

CONFLICT OF INTEREST

Conflict of interest declared none.

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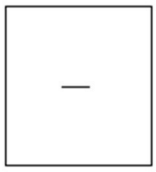

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We sincerely thank the above reviewers for peer reviewing the manuscript