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A SYSTEMATIC REVIEW ON SELECTED MEDICINAL PLANTS USED IN THE MANAGEMENT OF NEERCHURUKKU (UTI)

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ABSTRACT

The Neerchurukku (UTI) can be corrected with urinary tract infection (UTI) in modern medicine according their sign and symptoms. As per WHO an estimated 50% of females were reporting UTI. It's affecting 150 million people in year in around the world. Aim of this study is to collect and review the medicinal plants used in the management of *Neerchurukku* noi. The Objectives were to list out the medicinal plants used for management of *Neerchurukku* noi, and to document the pharmacological studies of plants which are used for management of *Neerchurukku* noi. Research Type: Review study by systematic review method. study performed in Library, Government Siddha Medical College, Palayamkottai and PubMed, Google search from the published journal articles. This research finally concluded as collected and reviewed the 39 medicinal plants used in the management of *Neerchurukku* noi (UTI). listed out the 39 medicinal plants used for management of *Neerchurukku* no. Fabaceae family's plants were 5, Asteracea and Malvaceae family plants were 4, Lamiaceae family's plants were 3, Apiaceae, Euphorbiaceae and Mimosaceae family's plants were 2. Other 1 plant in various 17 families out of the 24 families. Plant's Parts used for management of UTS as; leaves were most used in 18 plants (38%), roots were used in 9 plants (19%), barks were 7 plants (15%), 4 plants of fruits and seeds used (9%) and aerial parts, whole plants, stem flower and gum

were used by only one plant (2%). Documented Antibacterial, Antifungal, Anti-plasmodial, Antimicrobial, Antioxidant, inhibits α-glucosidase, Antiviral and Anti-inflammatory pharmacological actions of plants which are used for management of *Neerchurukku* noi. Decoction was most common prepared form of medicine to manage the *Neerchurukku* noi (UTI) by these medicinal plants.

Keywords: *Neerchurukku noi, Urinary Tract Infection (UTI), Medicinal Plants*

INTRODUCTION

A Siddha aspect, Yogi describe the disease *Neer Noikal* in his text yogi Vaithya Chinthamani is Neerinai perukkal noi and Neerinai Arukkal noi The *Neerchurukku* is described in the category of Neerinai Arukkal noi [28]. *Neerchurukku* can be corrected in modern aspect is urinary tract infection (UTI) according to their sign and symptoms. Urinary tract infection is one of the infectious diseases affecting both sexes, but most common in females.[20] As per WHO an estimated 50% of females reporting having had a UTI some points of their lives[17]. UTI affecting 150 million people each year worldwide. UTI is very common disease in the society particularly in a summer season. [4]

Causes of UTI:

- Inadequate or consume small amount of oral fluids
- Retention of urine
- Renal stone
- Diabetic
- Un hygienic Sexual activities
- Prostatitis in Male [7,3,16,17,18,20]

The severe UTI are occurred more frequently in diabetic patients. In a study from Europe, asymptomatic bacteria were more prevalent among women with diabetes (26%) than in women without diabetes (6%).[1,2,5,7,9,10,24] Diabetic patients are at a high risk of development of UTIs.[10,12,13] Antimicrobial therapies should be guided both by in vitro sensitivity and clinical response. In Siddha system of medicine prescribed the management to *Neerchurukku* from ancient era by the available natural resources such as plants, animal products and metals & minerals. It has many evidence in manuscripts, textbooks and published articles now.

Materials and Methods

Research Type: Review study by systematic review method

Details search will be performed in Library, Government Siddha Medical College, Palayamkottai and Pub med, Google search from the published journal articles.

Quality Assurance: Following procedures are conducted in time with the good planning by primary investigator. Whole research work had done with time frame schedule. The steps include: Protocol development -> Data collection -> Data analysis with RCS of references.

Ethical Issue: The study is to be carried out in research articles. It does not involve any physical examinations or instrumented. Therefore, this study does not need IEC approval.

Result

Table 1: List of Medicinal plants used in UTI

Sl. No.	Botanical name	Plant family	Plant part used	Plant used indications	application	Chemical composition	References
1	*Abelmoschus esculentus* (L.) Moench	Malvaceae	Fruit	Skin infections, UTIs	With sugar seedless fruits taken orally	Glycosides, Terpenoids, Tannins	Afolayan AJ, *et al*. (2014)
2	*Abutilon indicum* L.	Malvaceae	Root, leaves	UTIs	Powder of leaves and roots taken orally	Alkaloids, Steroids, Flavonoids, Sterols, Terpenoids, Phenols, Glycosides, Saponins	Sharma A, *et al*. (2009)
3	*Acacia gerrardii* Benth.	Mimosaceae	Bark	Stomach infections, UTI	Decoction	Infections of the upper respiratory system	Kokwaro (1976)
4	*Acacia nilotica* (L.) Delile	Mimosaceae	Bark, Leaves, Gum,	Stomach infections, Malaria, UTIs	Decoction, Gum Paste and leaves with cow's milk are taken orally. Powder of Bark	Antibacterial, H. pylori urease inhibition, Flavonoids, Cardiac Glycosides, Anthraquinones, Tannins, Saponins	Amin et al.(2013); Venkataswamy et al.(2010)
5	*Ananus comosus* (L.) Merr.	Bromeliaceae	Leaves, fruit	Skin infections, UTIs	Leaves and fruit juice in combined form	Alkaloids, Phenols, Flavonoids, Glycosides, Tannin, Phytosterols,	Jaradat NA, *et al.*, (2017)
6	*Andrographis paniculate* Wall. ex. Nees.	Acanthaceae	Leaves	Skin infections, UTIs	Extract of Fresh leaves	Alkaloids, Anthracene, Steroids, Glycosides, Quinines, Flavonoids, Phenols, Tannins	Clark TE, (1997)
7	*Apium graveolens* L.	Apiaceae	Aerial part	Skin infections, UTIs	Extract of fresh leaves and fruits	Alkaloids, Tannins, Steroids, Flavonoids, Terpenoids, Phenols,	Turner A, *et al*., (2007)
8	*Asparagus africanus* Lam.	Asparagaceae	Root	UTIs	Poultice, decoction	Anti-plasmodial, sexual diseases	Debella et al.(1999); Oketch-Rabah et al.(1997);Neuwinger(1998)
9	*Azadirachta indica* A. Juss.	Meliaceae	Fruit, leaves, Bark	Skin infections, UTIs	Powder of bark and leaves, fresh fruits are taken	Alkaloids, Polyphenols, Saponins, Flavonoid, Anthraquinones, Cardiac glycosides, Terpenoids, Terpenes, Steroids, Tannins,	Bussmann RW, *et al*., (2006)
10	*Bidens pilosa* L.	Asteraceae	Whole herb	Skin infections, UTIs	Extract of entire plants is taken	Alkaloids Flavonoids, Steroids, Anthraquinones, Tannins, Glycosides, Saponins,	Nie Y, *et al.*, (2013)

11	*Bischofia javanica* Blume	Euphorbiaceae	Root	Stomach infections, UTIs	Decoction	Antibacterial	Rajbongshi et al.(2014), Guptaetal.(1988)
12	*Brassica nigra* L.	Brassicaceae	Seed	UTIs	Seeds are grinded to take	Flavonoids, alkaloids, Sterols, Saponins, Glycosides, Steroids, Tannins,	Mirzaii M, *et al.*, (2018)
13	*Caesalpinia decapetala* (Roth)Alston	Caesalpiniaceae	Root	Skin infections, UTIs	Decoction	Antioxidant	Weietal.(2013); Pawar & Surana(2010)
14	*Caesalpinia nuga* (L.)	Fabaceae	Leaves, root	UTIs	Powder of root and leaves	Flavonoids, Carbohydrates, Glycosides, Phenols, Saponins, Tannins	Wojnicz D, (2012)
15	*Camellia sinensis* L.	Theaceae	Leaves	UTIs	Dry unprocessed leaves, spray-dried aqueous extract	Phenolic compounds, glycosides, alkaloids	Kasote DM, (2017)
16	*Carissa edulis* Vahl	Apocynaceae	Root	UTIs	Decoction	Anti-plasmodial (P.falciparum)	Kebeneietal.(2011)
17	*Cassia didymobotrya* Fresen.	Fabaceae	Leaves	Stomach, skin, oral Cavity infections, UTIs	Poultice	Antimicrobial	Boily & Van-Puyvelde(1986)
18	*Cichorium intybus* L.	Asteraceae	Leaves	UTIs	Powder of leaves is	taken Flavonoids, Terpenoids, Tannins, Saponins, Cardiac glycosides	Rafsanjany N, (2013)
19	*Clerodendrum myricoides* (Hochst) R.Br.	Lamiaceae	Root	Stomach infections, UTIs	Decoction	Antibacterial, Anti-fungal, Anti-plasmodial	Mulaudzi etal.(2012); Muregietal.(2004)
20	*Clitoria ternatea* L.	Fabaceae	Root	UTIs, skin infection	Special preparation with rice water is made to take its roots	Phenols, Flavonoids, Saponins	Chang SS, *et al.*, (1999)
21	*Croton macrostachyus* Hochst ex Delile	Euphorbiaceae	Bark	Oral cavity infections, UTIs	Decoction for gargle	Antimicrobial	Lulekal et al.(2013)
22	*Cucumis sativus* L.	Cucurbitaceae	Seed	UTIs	Grinded seeds with rock salt are taken	Cardiac glycosides, Tannins, Phytosterol, Terpenoids, Saponins,	Rosin MP. (1992)
23	*Dichrocephala integrifolia*	Asteraceae	Leaves	Oral cavity infections, UTIs	Poultice, decoction	Antimicrobial, antioxidant, inhibits α-glucosidase	Zhu. (2012); Zhu etal.(2010); Kuiatee-tal.(1999)
24	*Erythrina abyssinica* Lam.	Fabaceae	Bark	UTIs	Decoction	Antiviral	Mohammed etal.(2012)

25	*Hibiscus rosa-sinensis* L.	Malvaceae	Flower	UTIs	Decoction of flower is performed before taken	Flavonoides, Steroids, Tannins, Glycosides, Phenols, Saponins, Phlobatannins, Terpenoids,	Vicariotto F., (2014)
26	*Leonotis nepetifolia* (L) R.Br.	Lamiaceae	Leaves	Stomach infections, UTIs	Ash	Antimicrobial, antioxidative	Sobolewska et al.(2012)
27	*Malva sylvestris* L	Malvaceae	Leaves	UTIs	Used in salad	Alkaloids, Tannins, Phenols, Flavonoides, Saponins,	Duraipandiyan & Ignacimuthu(2009)
28	*Oxalis corniculata* L.	Oxalidaceae	Leaves	Skin infections, UTIs	Poultice	Antifungal, antioxidative	Lagnika etal.(2014); Aruna et al.(2014)
29	*Pimpinella anisum* L.	Apiaceae	Seed	UTIs	Seeds as such are taken	Alkaloids, Flavonoids, Cardiac Glycosides, Terpenoids, Carbohydrate, Phytosterols	Nadir M, (2013)
30	*Prunella Vulgaris*	Lamiaceae	Leaves, Stem	UTIs	Salads	Phytosteroids, tannins, lupeol, D-camphor, fenchone, cyanidin, delphinidin, beta-sitosterol,	Khosravi AD, *et al*., (2014)
31	*Rhoicissus tridentata* (L.f) Wild & Drum	Vitaceae	Leaves	Stomach, oral cavity infections, UTIs	Decoction, Ash decoction	Antibacterial, Antifungal, Anti-inflammatory	Lin etal. (1999)
32	*Rhus natalensis* Bernh. Ex Krauss	Anacardiaceae	Bark	UTIs	Decoction	Antimicrobial, diarrhoeal infections	Mwangietal. (2013); Koriretal.(2012); Kamatenesi et al. -2014
33	*Rubia cordifolia* L.	Rubiaceae	Leaves	Skin infection, UTIs	Poultice	Antibacterial	Ibraheimand Gouda (2010); Ibraeimand Ahmed (2009); Ibraheim (2002); Qiao et al.(1990)
34	*Spilanthes mauritiana* DC.	Asteraceae	Leaves	Oral cavity infections, UTIs	Decoction For gargle	Antibacterial and antiviral	Cos et al. (2002)
35	*Syzygium cumini* (L.) Skeels	Myrtaceae	Bark	UTIs	Extract of Bark is taken	Flavonoids, Phytosterols, Steroids, alkaloids, Amino acid, Cardiac glycosides, Saponins, Phenols, Tannins, Terpenoids	Duraipandiyan & Ignacimuthu (2009)
36	*Toddalia asiatica* (L.) Lam	Rutaceae	Root	UTIs	Boiling, decoction	Antibacterial, antifungal	Madhavan et al. (2012); Karunai et al. (2012); Orwa et al.(2008); Ishii et al.(1991)
37	*Urtica dioica* L.	Urticaceae	Leaves	Skin and stomach infections, UTIs	Poultice, ashash	Antibacterial, antifungal, diuretic	Bahmani M, *et al.,* (2016)

38	*Vigna mungo* L.	Fabaceae	Seed	UTIs, skin infection	Seeds are taken	Flavonoids, Alkaloids, Phenols, Ascorbic acid, Steroids, Tannins Glycosides, Saponins	Duraipandiyan & Ignacimuthu (2009)
39	*Zizyphus jujuba* Mill.	Rhamnaceae	Fruit	UTIs, skin infection	Extract of the fruit is taken	Alkaloids, Glycosides, Flavonoids, Saponins, Phenolic, Terpenoids	Bahmani M, *et al.*, (2016)

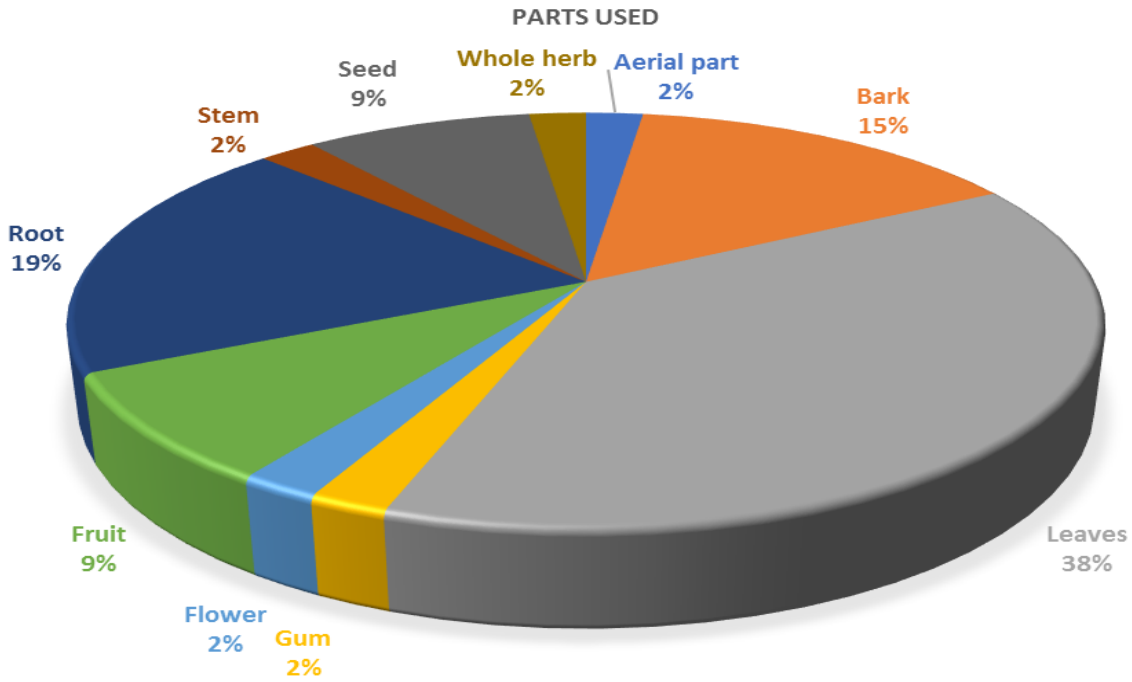
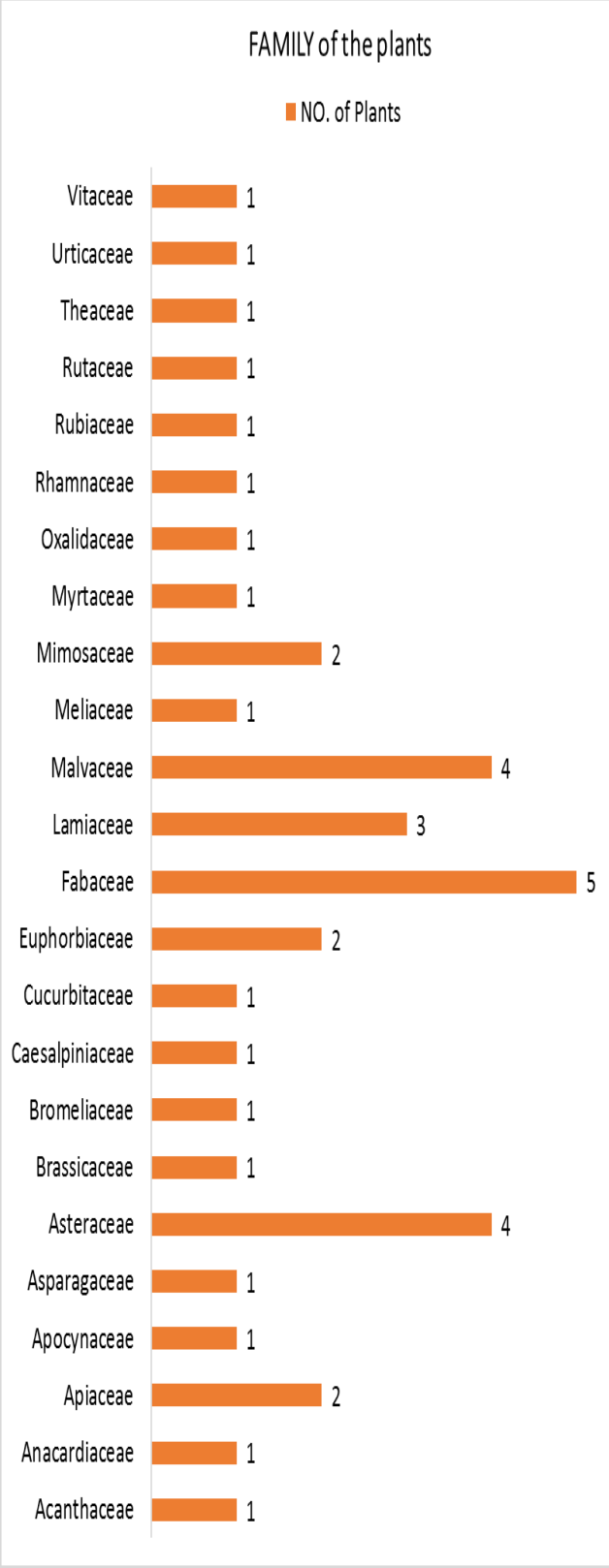


Chart 1: Part used of Medicinal plants which are used in UTI

Chart 2: List of Families used in UTI



In this study showed, the Fabaceae family's plants were 5, Asteracea and Malvaceae family plants were 4, Lamiaceae family's plants were 3, Apiaceae, Euphorbiaceae and Mimosaceae family's plants were 2. Other 1 plant in various 17 families out of the 24 families.

DISCUSSION

Neerchurukku is classified under Neerinai Arukkal noigal therefore, we have to treat the *Neerchurukku* patient with siddha medicines especially herbal preparation which were single materials or compound medicines. It is notified in siddha literatures already by their clinical trials. Herbal remedy for *Neerchurukku* is essential one with cost effective and less harmful naturally available plants source management. Therefore, this research is going to explore the siddha knowledge and reveal the siddha system to the world.

In this research concluded as; Fabaceae family's plants were 5, Asteracea and Malvaceae family plants were 4, Lamiaceae family's plants were 3, Apiaceae, Euphorbiaceae and Mimosaceae family's plants were 2. Other 1 plant in various 17 families out of the 24 families.

The plant parts used in the management of UTS as; leaves were most used in 18 plants (38%), roots were used in 9 plants (19%), barks were 7 plants (15%), 4 plants of fruits and seeds used (9%) and aerial parts, whole plants, stem flower and gum were used by only one plant (2%).

The all medicines were proved, and authenticated actions are Antibacterial, Antifungal, Anti-plasmodial, Antimicrobial, Antioxidant, inhibits α-glucosidase, Antiviral and Anti-inflammatory. All medicinal plants having Phenols, Flavonoids, Saponins, Cardiac glycosides, Tannins, Phytosterol, Terpenoids, Steroids, Glycosides, Anthraquinones, Terpenes, Carbohydrate, Fenchone, Cyanidin, Delphinidin, Beta-Sitosterol, Phytosterols, Alkaloids, Amino acid and Phloba-tannins of the selected plants.

Form of administration of plant such as; With sugar seedless fruits taken orally, Decoction, Gum Paste and leaves with cow's milk are taken orally, Powder of Bark, Extract of fresh leaves and fruits, Powder of bark and leaves, fresh fruits are taken, Extract of entire plants is taken, Seeds are grinded to take, Powder of

root and leaves, Dry unprocessed leaves, spray-dried aqueous extract, Special preparation with rice water is made to take its roots, Decoction for gargle, Used in salad, Poultice and Ash decoction.

CONCLUSION

This research finally concluded as; collected and reviewed the 39 medicinal plants used in the management of *Neerchurukku* (UTI). listed out the 39 medicinal-plants used for management of *Neerchurukku*. Fabaceae family's plants were 5, Asteracea and Malvaceae family plants were 4, Lamiaceae family's plants were 3, Apiaceae, Euphorbiaceae and Mimosaceae family's plants were 2. Other 1 plant in various 17 families out of the 24 families. Plant's Parts used for management of UTS as; leaves were most used in 18 plants (38%), roots were used in 9 plants (19%), barks were 7 plants (15%), 4 plants of fruits and seeds used (9%) and aerial parts, whole plants, stem flower and gum were used by only one plant (2%).

Documented Antibacterial, Antifungal, Anti-plasmodial, Antimicrobial, Antioxidant, inhibits α-glucosidase, Antiviral and Anti-inflammatory pharmacological actions of plants which are used for management of *Neerchurukku*.

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