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Documentation of traditional knowledge on medicinal plants of Thirukkanur village, Puducherry region, India

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Abstract
The survey of medicinal plants was recorded through knowledge of elder people to study on medical uses of local common medicinal plants in the Thirukkanur village of Puducherry region. Direct oral record of elders' knowledge might be helpful for conservation of traditional knowledge of medicinal plants that have been recorded through questionnaire and personal interviews. In this study, a total of 40 plant species, 31 genera belonging to 28 families have been documented and this might be scientifically authorized for their therapeutic properties. Local people of the area depend on knowledge of "Nattu Vathiyar" (locally healer's common name) for simple ailments and also people depend on local primary healthcare centre for major health problems. Therefore, it would be important to document the traditional knowledge of medicinal plants for further healing purpose.

Keywords: Ethnomedicine, folk knowledge, herbal plants, medical plants, Puducherry

1. Introduction
Understanding Traditional Knowledge on medicinal plants can provide important primary information for the management of folk medicine since human civilization (Jasmine *et al*., 2016). It comprises all species of plants, animals and micro-organisms and their variations might be differed, however understanding the parts of every organism are necessary to known on traditional knowledge of medicinal plants [1, 2]. Moreover, transferring the knowledge from one generation to next generation sustains the medicinal plant diversity and knowledge which can be useful for human health society [3]. This wisdom is now fast vanishing due to modernization, habitat destruction and the tendency of younger generation to discard their traditional life style. However, habitat destruction would be major problem for current developing modern human civilization that leads many forests medicinal plants might be vulnerable. Therefore, using forest medicinal plants might be rare chance for local people. Thus, common medicinal plants are always useful for village people to use easily with the help of local healer or traditional knowledge. In this study, we focused on scientific documentation of traditional knowledge on common medicinal plants used by local healers. Hence, this information could be more beneficial to local village people of Puducherry region. Therefore we had undertaken a survey of medicinal plants to document traditional knowledge in the Thirukkanur village of Puducherry, southern India.

2. Methodology
2.1 Study Area Description
The survey of medicinal plants was used by the local people of Thirukkanur villages of the Puducherry. Puducherry is situated on the Eastern Coast at about 160 Km south of Chennai. It is bounded by Bay of Bengal in the East, Villupuram on the West, Chennai on the North and Cuddalore on the South. The area is 290 square Kilometres comprised 11 enclaves. It is located between 11° 46' and 12° 03' North latitude and between 79° 36' and 79° 53' of East longitude (Fig 1). The soil type is Alluvial consisting of black compact clay materials. The total area of the district is spread over 480 sq. kms and a population density of 2,034 per sq. kms. The 2001 census showed the population of Puducherry to be 9, 72, 432 (4, 87, 053 males and 4, 86, 379 females) [4]. The average maximum temperature is 31.5 C and average minimum temperature is 23.9 C.

Summer is from March through July and winter is from December through February. The rainy months of this area are September to December [5]. The dry evergreen forests of the area are protected by sacred groves around these areas [6].

Fig 1: Map showing the study area of Puducherry region

The village people dwell in thatched sheds, semi-permanent tailed houses or in concrete buildings. Each village normally has a "Nattu Vaidhyair" (local healers) who gives treatment for the villages for the simple ailments. For minor problems such as stomach ache, itching, psoriasis, diarrhoea, dysentery, cough, cold and vomiting, the villagers get the advice and prescription from the Vaidhyair. They do not hesitate to go to the primary health centre or hospital situated in the nearby towns for certain major and chronic ailments. The women folk though normally prefer to have their delivery in hospitals, the post-natal care for the babies is given only in the houses by the mid-wives. Many plant-based drugs are given both to the lactating mothers as well as the babies for the speedy recovery. The survey of medicinal was carried out by field trips to this region. Ten field trips each for one or two days were undertaken in duration of four months from July 2015 to October 2015. The field survey was undertaken with the help of the local people and Traditional Medical Practitioners (TMP), who have thorough knowledge about the medicinal plants. The methodology was followed by the study [7]. The details of TMPs with their experience and their field of specialization are given in Table 1. For collecting the information, three classes of approach were used as follows: (i) Direct observation (ii) Structured interviews with TMPs and (iii) Interaction with villagers.

To ensure the correct identity of the plants, the local names of the queried plants were noted as revealed by the villagers. They were encouraged to locate the specific plants either in the field or pick out from the collections. Plants were identified taxonomically by using Flora of presidency of Madras [8] and Flora of Tamil Nadu Carnatic. The nomenclature followed in this report is essentially from an excursion flora of central Tamil Nadu, India' [9-12]. The identity was further confirmed by comparing the specimens with the Herbarium of French Institute, Puducherry. All the dialogues were gathered in Tamil Essential floristic and ecological details such as the locality, type of vegetation etc., were recorded in the field itself. All data were on a structured questionnaire (Appendix A and B) followed by the method [13]. The data was collected were classified into three categories as (1) Part\organ of the plant used for medicinal purpose, (2) methods and preparation of the drug, and (3) Disease cured\ or controlled. Local names of the plants were recorded as they pronounced by the local people. The enumeration of medicinal plants is in alphabetical order of the binomials. Each medicinal plant is described with its binomial name, local name, family name, habit, part of use, method of use. The therapeutic effect of each plant is described with part used, and the diseases cured.

2.2 Enumeration of Medicinal Plants

The medicinal plants are arranged in alphabetic sequence of Binomial name, local name, Family Name, Habit, Part of uses, method of use, and the disease cured are enumerated.

Medicinal plant names	Family	Local Name	Habit	Parts Used	Medicinal uses
Acalypha indica L.	Euphorbiaceae	*Kuppaimeni*	Herb	Leaves	Leaf extract is applied externally to cure poisonous insect bite
Achyranthus aspera L.	Amaranthaceae	*Naiyuruvi*	Herb	Leaves	Crushed leaves applied externally to scorpion bite
Aegle marmelos (L.) Carr. Serr.	Rutaceae	*Vilvam*	Tree	Leaves	Juice of leaf is applied externally to cure eye diseases
Allium cepa L.	Liliaceae	*Vengaayam*	Herb	Bulb	Crushes the onion, then the crushed bulbs are made into juice or poultice (like flour) is rubbed for skin disease to remove irritation and inflammation.
Andrographis paniculata Burm.F.	Acanthaceae	*Nilavembu,*	Herb	Leaves	The leaf juice is taken orally to treat jaundice and leaf paste is used to treat snake bite
Azadiracta indica A. Juss.	Meliaceae	*Vembu*	Tree	Bark, Leaves Seeds Fruit	Bark and leaves have been used to treat skin diseases and rheumatism. The fruit is used as purgative. Seeds are used to make neem oil.
Bombusa arundinacea (Retz.) Wild.	Poaceae	*Moongil*	Tree	Stem	Stem used for multipurpose for storing honey, as spatula for stirring, and also for building materials, roof material.
Bidens pilosa L.	Asteraceae	*Mukkuthi poo*	Herb	Flower	Boil the water plant material in an enamelled container for 2 minutes. Filter to a glass container shelf life 24 hours (Uterine cervicitis) cure in stomach pain, diabetes.
Calandula officinalis L.	Asteraceae	*Saamanthi*	Herb	Flower	The flower have been considered beneficial in reducing inflammation, wound healing and used as an antiseptic, cure cough and snake bites.
Calotropis gigantia (L.) R. Br.	Asclepidaceae	*Erukkam*	Shrub	Leaves	The leaves are powered and these are boiled in sweet oil and used for skin disease, live skin eruption, skin ecjema and skin ulcers.

Carica papaya L.	Caricaceae	*Pappali*	Tree	Seeds and Fruit	The seeds of papaya possess medicinal properties. They are good in treating intestinal worms in the body. Papaya helps in preventing constipation and aids for digestion.
Cassia fistula L.	Caesalpinaceae	*Manjal kondrai*	Tree	Flower	Flower juice is used to treat a variety of diseases, to cure cancer, malaria and the cold.
Catharanthus roseus (L.) Don.	Apocynaceae	*Nitiya kalayani*	Herb	Leaves	The leaf decoction is used for the cancer and diabetes.
Centella asiatica Urban	Apiaceae	*Vallarai*	Herb	Flower and Leaves	The powered flower is used to treat diabetes and leaf is used for memory power.
Cissus quadrangularis L. Mant	Vitaceae	*Pirandai*	Liana	Fleshy leaves	Young top is given orally to enhance the memory power and cure in stomach ache
Citrus limon Linn.	Rutaceae	*Elumichai*	Tree	Fruit	Fruit is used to cure nail infection, juice inflation freshness
Clitoria ternata L.	Fabaceae	*Sangu pusphi*	Liana	Flower and Root	The juice of flowers may be used for insect bites and skin diseases. The roots are useful in asthma.
Coccinia indica (Cephalandra indica) L. Voigt	Cucurbitaceae	*Kovai*	Liana	Leaves	Leaf juice is used to cure for stomach ulcer.
Coleus aromaticus L.	Lamiaceae	*Karpuravalli*	Herb	Leaves	The leaf juices are used to cure asthma disease.
Croton bonplandianum Baill.	Euphorbiaceae	*Millakaai poondu*	Herb	Latex	Latex mixed with a pinch of turmeric. Powder is applied on the affected areas. Daily twice for 2-4 days and it cures scabies.
Curcuma longa L.	Zingiberaceae	*Manjal*	Herb	Rhizome	Rhizome powder mixed with milk and is given orally to cure cough
Cynodon dactylon (L.) Pers.	.Poaceae	*Arugampillu*	Herb	Leaves	Dry leaf powder made to juice to cure menstrual problem for women
Desmodium gangeticum (L.) DC.	Fabaceae	*Alari sedi*	Liana	Stem and Bark	Stem and Bark. Juice can prepare from the stem, bark is boiled with gingely oil and two drops are poured into ear to treat ear pain.
Eucalyptus citriodora Hook.	Myrtaceae	*Thila maram*	Tree	Leaves	The paste of this leaves used in skin infections, chicken box and joint pain
Ficus benghalensis L.	Moraceae	*Aala maram*	Tree	Bark and Seed	Seeds are soaked in water. Water juices are used to treat diabetics and skin diseases.
Ficus religiosa L.	Moraceae	*Arasa maram*	Tree	Bark	The bark of the plant is dried and powdered. It also cures mouth ulcer and gingivitis.
Hibiscus rosasinensis L.	Malvaceae	*Semparuthi*	Shrub	Flower and Leaves	Bark taken with dried powdered leaf acts as coolant. Flower consumed at the rate of one per day for 48 days. Cures heart related diseases.
Lawsonia inermis L.	Lythraceae	*Maruthaani*	Shrub	Leaves	Leaf paste is used to cure itches, scabies and wounds.
Melia azedarach L.	Meliaceae	*Malai vembu*	Tree	Leaves and stem	Leaf paste is used for skin diseases and fever
Mentha arvensis L.	Lamiaceae	*Pudhina*	Herb	Leaves	Leaves are mainly used for strong smelling, aromatic leaves are used as to cure coughs.
Momordica charantia L.	Cucurbitaceae	*Paavaikkai*	Liana	Leaves	A spoon of leaf juice when consume in the morning cure stomach ache.
Moringa pterigosperma L.	Moringaceae	*Murungai*	Tree	Leaves	Leaf is used as vegetable to cure stomach ache and flower is taken as food and it's given to chillness to eyes.
Murraya koenigii L.	Rutaceae	*Kariveppilai*	Shrub	Leaves	Leaf petiole of this plant with the petioles of gooseberry and neem are mixed and decotion is prepared. This can also control vomiting.
Musa paradisiaca L.	Musaceae	*Vazai*	Tree	Leaves and Flower	The juices of leaves are used in malignant ulcers, and cooked flower are given for diabetics.
Ocimum sanctum (O. tenuiflorum) L.	Lamiaceae	*Thulasi*	Herb	Leaves	The leaves are crushed first and the juice is extracted form is applied for skin diseases lick itches, ecozema, rashes and cold.
Phyllanthus amarus L.	Euphorbiaceae	*Kizhanelli*	Herb	Leaves	The leaves of paste are cure for skin ulcers, jaundice, cooling, and stomach ache.
Phyllanthus emblica L.	Euphorbiaceae	*Nellikai*	Tree	Fruit	The consumption of fruit purifies the blood; it is also used as coolant.
Psidium guajava L.	Myrtaceae	*Koyya*	Tree	Leaves	Leaf paste with mix of warm water can be cure snake bite especially bitten by Siru Paambu (small snake).
Ricinus communis L.	Euphorbiaceae	*Aamanakku*	Shrub	Leaves	The leaf is mixed with cumin and onion along with other ingredients and prepared in the form of rasam and consumed. It cures stomach ache
Tamarindus indica L.	Caesalpinaceae	*Puliyamaram*	Tree	Leaves	Leaves are boiled in water and poured on the inflated portion in the case of inflammations. Leaves are boiled in water and used to warm the infected body parts in the case of rheumatism.

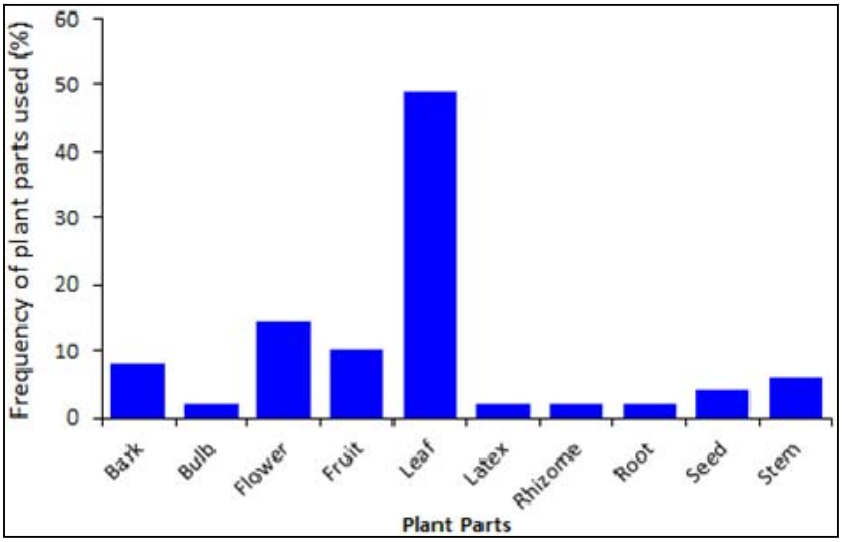
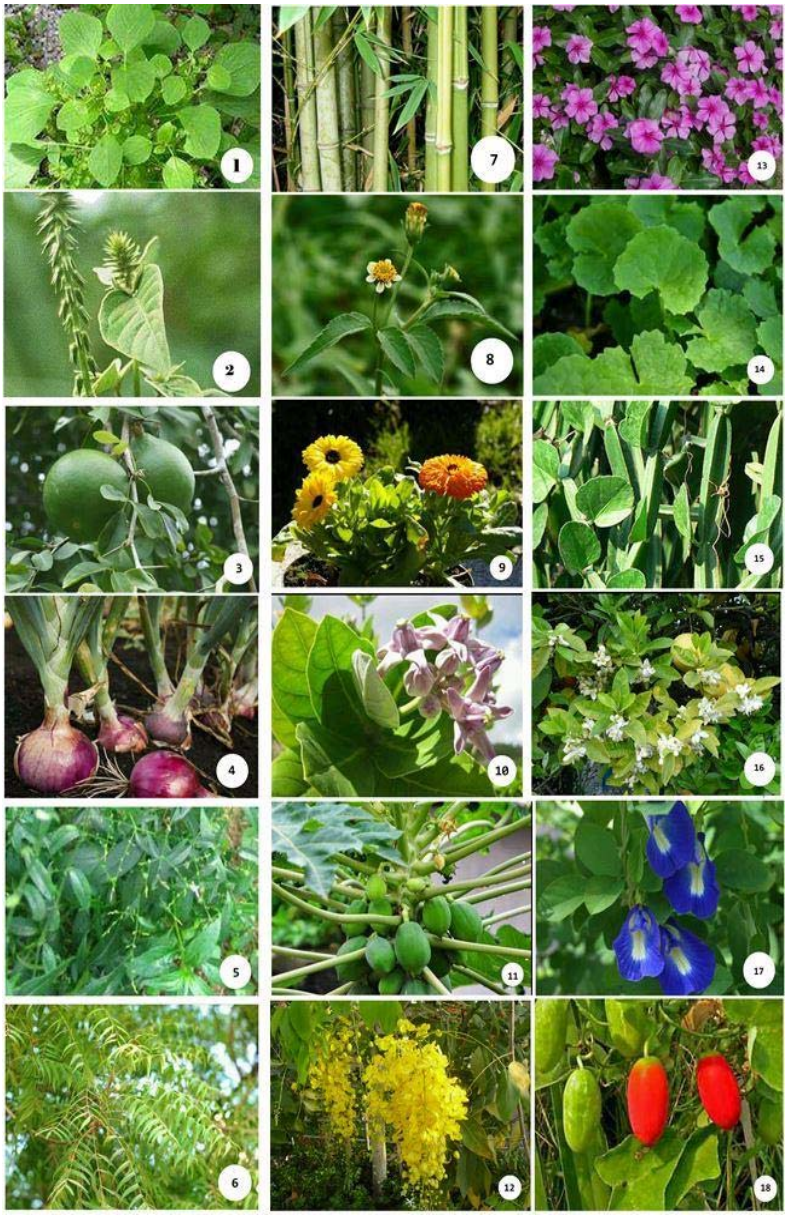


Fig 2: shows that plant parts used for treating the disease of the local folks of Thirukkanur village of Puducherry region

Leaves are used from higher number of species plant parts (56%), followed by flower (14%), fruits (10%), bark (8%), stems (6%), seeds (4%), bulb (2%), rhizome (2%), root (2%) and latex (2%) respectively.



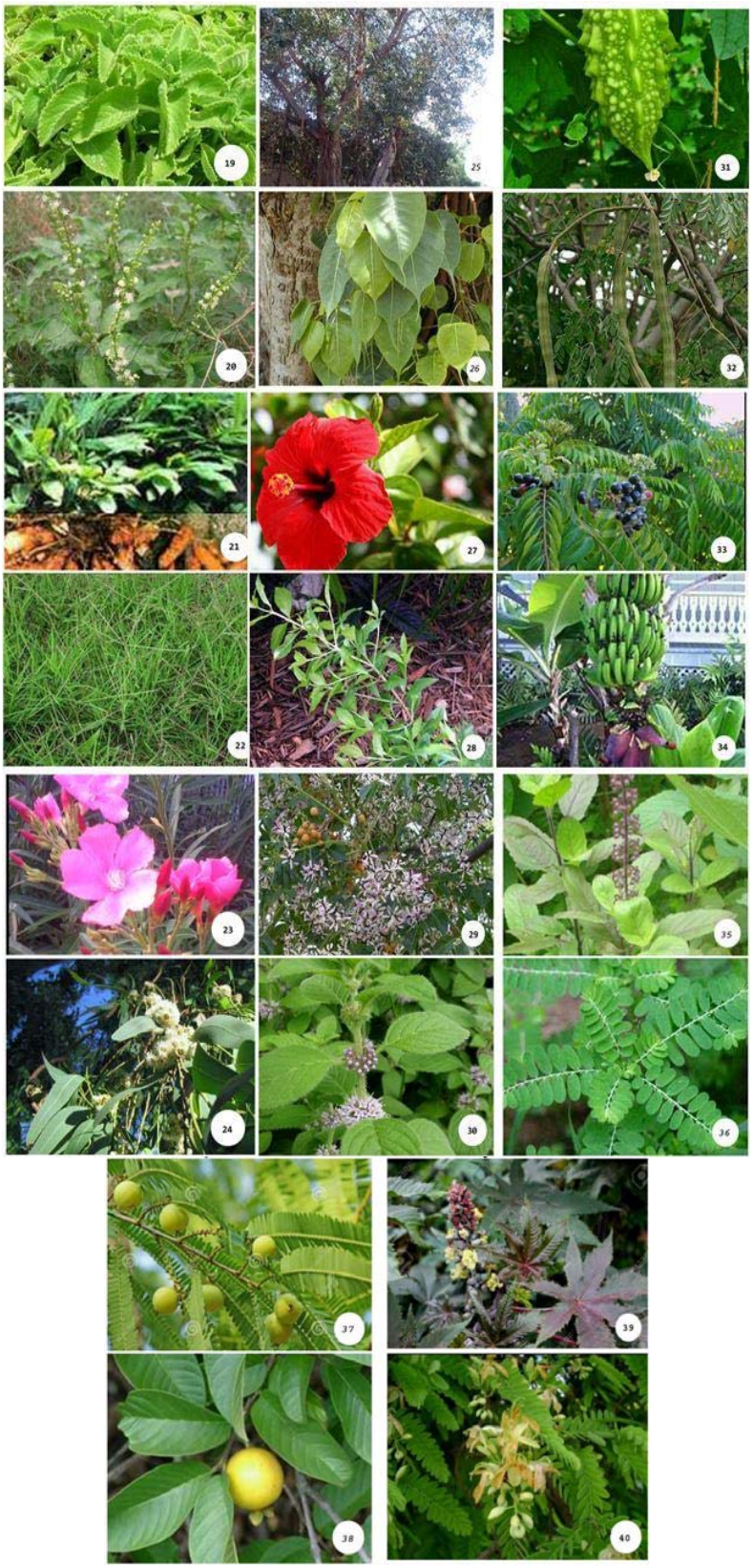


Fig 2: 1.Acalypha indica L. 2. Achyranthus aspera L. 3. Aegle marmelos (L.) Corr. Serr. 4. Allium cepa L. 5. *Andrographis paniculata* Burm.F. 6. *Azadiracta indica* A. Juss. 7. *Bombusa arundinacea* (Retz.) Wild. 8. *Bidens pilosa* L. 9. *Calandula officinalis* L. 10. *Calotropis gigantia* (L.) R. Br.11. *Carica papaya* L. 12. *Cassia fistula* L. 13. *Catharanthus roseus* (L.) Don. 14. *Centella asiatica* Urban 15. *Cissus quadrangularis* L. Mant 16. *Citrus limon* Linn. 17. *Clitoria ternata* L. 18. *Coccinia indica* (Cephalandra indica) L. Voigt. 19. *Coleus aromaticus* L. 20. *Croton bonplandianum* Baill. 21. *Curcuma longa L. 22. Cynodon dactylon* (L.) Pers. 23. *Desmodium gangeticum* (L.) DC. 24. *Eucalyptus citriodora* Hook. 25. *Ficus benghalensis* L. 26. *Ficus religiosa* L. 27. *Hibiscus rosasinensis* L. 28. *Lawsonia inermis* L. 29. *Melia azedarach* L. 30. *Mentha arvensis* L. 31. *Momordica charantia* L. 32. *Moringa pterigosperma* L. 33. *Murraya koenigii* L. 34. *Musa paradisiaca* L. 35. *Ocimum sanctum* (O. tenuiflorum) L. 36. *Phyllanthus amarus* L. 37. *Phyllanthus emblica* L. 38. *Psidium guajava* L. 39. *Ricinus communis* L. 40. *Tamarindus indica* L.

3. Discussion

Documentation of traditional medicinal knowledge could be beneficial activity for human mankind health purpose. The local healers have incredible knowledge of the medicinal properties and uses of their ambient natural resources. It exists in the form of traditions and uses maintained in perpetuity through verbal transmission only. Through this effort, the present study have made an attempt to document and explore the traditional medicinal knowledge by the people inhabiting the Thirukkanur village have been validated. To investigate the use of the plants parts revealed that almost all the plants parts are used for medicinal values that includes roots, leaves, stems, flower, fruits and seeds [14]. The study also recorded the plants which are used to cure for basic remedies properties such as fever, cough, diabetes, stomach ache, and curing jaundice [15, 16]. Some plants have also able to increase memory power, cure cancer and asthma. Our observation record also revealed that most of the inhabitants are suffered from eye diseases, malaria and vomiting. For these symptoms and diseases people are using the plants such as *Cassia fistula* L. *Aegle marmelos* (L.) Carr. Serr. and *Murraya koenigii* L. Leaf parts had high frequency of species from collected medicinal plants followed flower and fruits for the above ailments. Consequently, medicinal plants used in communities are not only vital as an essential part of the traditional medical system of local folks, but might also play a significant role as sources of therapeutic drugs in the future [17].

4. Conclusion

This study showed that the traditional uses of medicinal plants which might be used as positive indicator for the effectiveness of the reported medicinal plants in treating many human ailments and diseases. Few of the medicinal plants are reported as exotic species such as *Eucalyptus citriodora* Hook, However the species which have been used for many decades as traditional medicinal and knowledge accumulated in their utilization over generation will aid in identification of medicinal purposes. However, the further efforts should be made to start in-depth to understand the medicinal uses for pharmaceutical research which will bring for new treatment and develop primary health care centre of local folks.

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