

Diversity And Utilization Of Medicinal Plants In Home Gardens Of Uttara Kannada District, Karnataka, India

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Article received- 02 Feb 2021

Revised- 10 March 2021

Accepted- 14 April 2021

Abstract

Home gardens in the Uttara Kannada district of Karnataka, India, represent vital agroforestry systems that contribute to food security, biodiversity conservation, and cultural heritage. This study, conducted from May 2017 to February 2019, surveyed 200 home gardens, documenting 80 medicinal plant species across 34 families. Notable families included Apocynaceae, Zingiberaceae, and Lamiaceae, with prominent species such as *Ocimum tenuiflorum* L., *Aloe vera* L., and *Andrographis paniculata* (Burm.f.) Nees. The study revealed that 48 species were herbs, 19 were climbers, 19 were shrubs, and 14 were trees. The majority of medicinal preparations utilized leaves (40%), followed by roots (26%), stems (18%), fruits (10%), and bark (6%). Traditional uses of these plants included applications for skin care, bone disorders, and culinary uses, with *Aloe vera* and turmeric noted for their cosmetic applications. This research underscores the significance of home gardens in preserving traditional ethnobotanical knowledge and providing accessible healthcare solutions, both for humans and animals. The findings highlight the critical role of home gardens in maintaining plant diversity and supporting local health practices.

Keywords: Medicinal Plants, Home Gardens, Biodiversity, Ethnobotany

Introduction

Home gardens are small-scale, diversified agroforestry systems located in or around the household premises, playing a crucial role in food security, biodiversity conservation, and cultural heritage. In the Uttara Kannada district of Karnataka, India, home gardens are integral to the socio-economic fabric, offering a variety of ecological and economic benefits. These gardens typically consist of a mix of ornamental, edible, and medicinal plants, reflecting the rich botanical diversity of the region (Bhat et al., 2014).

Uttara Kannada, with its varied topography and climatic conditions, supports a wide range of plant species. Home gardens in this region are known for their high species richness, which contributes to the conservation of plant genetic resources and provides ecosystem services such as pollination, soil fertility, and microclimate regulation (Kumar & Nair, 2006). The diversity of plant species in these gardens not only enhances the aesthetic value of the surroundings but also ensures a sustainable supply of food, medicine, and other resources for the local communities.

Previous studies have highlighted the significance of home gardens in maintaining plant diversity and supporting traditional agricultural practices. For instance, research by Bhat et al. (2014) documented the plant diversity in the rural home gardens of Honnavar Taluk, emphasizing their role in preserving indigenous plant varieties and traditional knowledge. Similarly, studies have shown that home gardens

in Karwar, another area within Uttara Kannada, harbor a substantial number of plant species used for various purposes, including medicinal applications (Bhat et al., 2014).

Materials and Methods

Study Area

The study was conducted in Uttara Kannada district, Karnataka, India, covering various home gardens in rural and semi-urban areas. The district is known for its rich biodiversity and varied climatic conditions, which support a wide range of plant species.

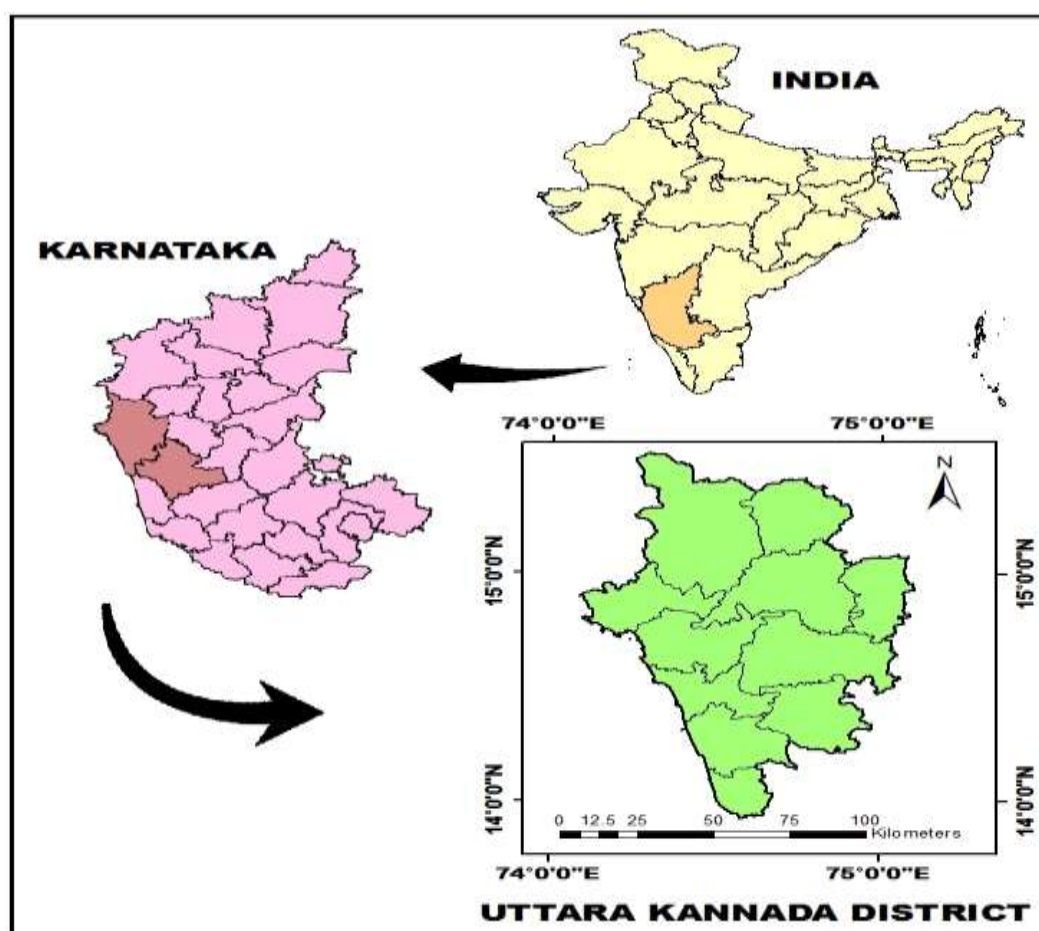


Fig. 1 Map of the Study area

Data Collection

Data were collected from May 2017 to February 2019. A total of 200 home gardens were surveyed, documenting 80 species of medicinal plants belonging to 34 plant families. Information on plant species, growth habits, plant parts used, and their medicinal applications was collected through structured interviews with local inhabitants, direct observations, and referencing previous literature such as "Flora of Udupi" by Dr. K. Gopalakrishna Bhat and "Gamble Flora."

Data Analysis

The collected data were analyzed to identify the most common plant families, growth habits, and parts used for medicinal purposes. The diversity of species within each family was noted, and graphical representations were created to illustrate the distribution of growth habits and plant parts used.

Results:

The study of medicinal plants in home gardens of Uttara Kannada revealed a total of 80 species distributed across 34 plant families. Prominent plant families with high species diversity included

Apocynaceae, Zingiberaceae, and Lamiaceae, contributing 11, 8, and 7 species respectively. The most frequently observed medicinal plants were *Ocimum tenuiflorum* L., *Aloe vera* L., and *Andrographis paniculata* (Burm.f.) Nees. Of the 80 species documented, 48 were herbs, 19 were climbers, 19 were shrubs, and 14 were trees (Fig 2.). The majority of medicinal preparations were derived from leaves (40%), followed by roots (26%), stems (18%), fruits (10%), and bark (6%). (Fig 3) Traditional uses of these plants were evident, with *Ocimum tenuiflorum* L. and *Aloe vera* L. frequently employed for skin nourishment and treatment of skin ailments. *Andrographis paniculata* (Burm.f.) Nees was noted for its use in treating bone-related disorders. Other critical medicinal plants included *Acorus calamus* L., *Sapindus trifoliatus* L., *Tinospora cordifolia* (Willd.) Miers, *Plectranthus amboinicus* (Lour.) Spreng., *Cymbopogon citratus* (DC.) Stapf., *Phyllanthus amarus* Schumach. & Thonn., and *Justicia adhatoda* L.

Table 1. List of Medicinal Plants with Families

Botanical Name	Family	Common Name	Habit	Part used	Therapeutic applications
<i>Acorus calamus</i> L.	Acoraceae	Bajae	Herb	Rhizome	Respiratory problems
<i>Aerva lanata</i> (L.) Juss	Amaranthaceae	Bili Hindi	Herb	Root	Snakebite and Kidney stone
<i>Aloe vera</i> L.	Xanthorrhoeaceae	Lole Sara	Herb	Leaf	Dandruff and stomach problems
<i>Alpinia calcarata</i> (Haw) Roscoe.	Zingiberaceae	Rasana Gida	Herb	Rhizome	Cough, asthma, and joint pain
<i>Alpinia galangl</i> (L.) Willd.	Zingiberaceae	Kallu Shunti	Herb	Rhizome	Rheumatism, ulcers, throat infections,
<i>Alstonia scholaris</i> (L.) R.Br.	Apocynaceae	Saptaparni	Tree	Bark	Skin disorders, malarial fever, chronic dysentery, and diarrhoea
<i>Andrographis paniculata</i> (Burm.f.) Nees	Acanthaceae	Kiraayti Kaddi	Herb	Leaf	Fever
<i>Aphanamixis polystachya</i> (Wall.) R. Parker	Meliaceae	Rakta Rohita	Tree	Bark	Spleen, liver diseases, tumours and abdominal problems.
<i>Aristolochia indica</i> L.	Aristolochiaceae	Ishwari Balli	Climber	Root	Medicinal
<i>Asparagus racemosus</i> Willd.	Asparagaceae	Shatavari	Climber	Root	Hormonal problems in women
<i>Azadirachta indica</i> A. Juss.	Meliaceae	Kahi Bevu	Tree	Leaf	Anthelmintic, antifungal, antidiabetic antibacterial and antiviral,
<i>Bacopa monnieri</i> (L.) Wettst.	Plantaginaceae	Jala Brahmi	Herb	Leaf	Tonics
<i>Boerhavia diffusa</i> L	Nyctaginaaceae	Punarnava	Herb	Stem	Joint pain
<i>Brophyllum pinnatum</i> (Lam.) Oken	Crassulaceae	Kaadu Basale	Herb	Leaf	Gall bladder stones
<i>Bryophyllum pinnatum</i> (Lam.) Oken	Crassulaceae	Kaadu Basale	Herb	Leaf	Gall bladder stones
<i>Calotropis gigantea</i> (L.) Dryand.	Apocynaceae	Ekke	Shrub	Root	Fevers, rheumatism, indigestion, cough, cold, eczema and asthma
<i>Cardiospermum helicacabum</i> L.	Sapindaceae	Agniballi	Climber	Leaf	Fever

Botanical Name	Family	Common Name	Habit	Part used	Therapeutic applications
<i>Centella asiatica</i> (L.) Urb.	Apiaceae	Ondelaga	Herb	Leaf	Tonics and hair oil
<i>Chassalia curviflora</i> (Wall.)	Rubiaceae	Kaadu Garuda Paataala	Shrub	Root	Snake and insect bites
<i>Cheilocostus speciosus</i> (J. Koenig) C specht	Costaceae	Narikabbu	Herb	Leaf	Diabetes
<i>Cissus quadrangularis</i> L.	Vitaceae	Sandu Vaata Balli	Climber	Stem	Bone fractures, scurvy, and cancer,
<i>Costus pictus</i> D. Don	Costaceae	Diabetes Gida	Herb	Leaf	Diabetes
<i>Cryptolepis dubia</i> (Burm.f.)	Apocynaceae	Kare Balli	Climber	Plant/Root	Blood-purifier
<i>Curcuma aeruginosa</i> Roxb.	Zingiberaceae	Kuve Gadde	Herb	Rhizome	Dysentery
<i>Curcuma longa</i> L.	Zingiberaceae	Arishina	Herb	Rhizome	Antiseptic
<i>Cymbopogon citratus</i> (DC.) Stapf.	Poaceae	Majjige Hullu	Herb	Leaf	Stimulant and antiperiodic
<i>Eclipta prostrata</i> (L.) L.	Asteraceae	Bhrangaraj	Herb	Fruit	Hair growth and colour
<i>Gmelina arborea</i> Roxb.	Lamiaceae	Shivani	Tree	Bark	Skin problem and fever.
<i>Hemidesmus indicus</i> (L.) R.Br. ex Schult.	Apocynaceae	Sogade/Haalu Beru Balli	Climber	Plant/Root	Blood-purifier and fever
<i>Hemigraphis colorata</i> (Bl.) Hallier	Acanthaceae	Vranaropani Ele	Herb	Leaf	Wound healing
<i>Holarrhena pubescens</i> (Buch. -Ham.) Wall.ex G. Don	Apocynaceae	Kodasiga	Tree	Root	Amoebic dysentery and diarrhoea
<i>Homalocladium platycladum</i> (F. J. Muell. ex Hook.) L. H. Bailey	Polygonaceae	Ribbon Gida (Maulembeckia)	Herb	Leaf	Centipede bite
<i>Ichnocarpus frutescens</i> (L.) W.T. Aiton	Apocynaceae	Vanamaali /Kuglu Balli	Climber	Root	Cholera and asthma.
<i>Justicia adhatoda</i> L.	Acanthaceae	Aadusoge	Shrub	Leaf	Fever, cold and cough.
<i>Kaempferia galanga</i> L.	Zingiberaceae	Kachchoora	Herb	Rhizome	Sore throat and rheumatism.
<i>Kaempferia rotunda</i> L.	Zingiberaceae	Nelasuruli Gadde	Herb	Rhizome	Skin disease
<i>Leptadenia reticulata</i> (Retz.) Wight& Arn.	Apocynaceae	Jeevanthi	Climber	Plant/Root	Ringworm infection, wounds, ear problems, asthma, and cough
<i>Leucas lavandulifolia</i> Sm.	Lamiaceae	Tumbe	Herb	Leaf	Skin problems.
<i>Marantha arundinaceae</i> L.	Maranthaceae	Aaraaroot	Herb	Rhizome	Dysentery
<i>Marsdenia sylvestris</i> (Retz.) P.I Forst.	Apocynaceae	Madhu Nashini	Climber	Leaf	Diabetes
<i>Melia azedarach</i> L.	Meliaceae	Hucchu Bevu	Tree	Leaf	Anthelmintic, antifungal, antidiabetic antibacterial and antiviral
<i>Memecylon edule</i> Roxb.	Melastomataceae	Adchare	Tree	Root	Herpes and viral infections
<i>Morinda citrifolia</i> L.	Rubiaceae	Noni	Shrub	Fruit	Abdominal pain

Botanical Name	Family	Common Name	Habit	Part used	Therapeutic applications
<i>Neolamarckia cadamba</i> (Roxb.)	Rubiaceae	Apathya-Kadamba	Tree	Bark	Small fox
<i>Ocimum gratissimum</i> L.	Lamiaceae	Rama Tulsi	Shrub	Leaf	Skin disease, toothache, and paralysis
<i>Ocimum tenuiflorum</i> L.	Lamiaceae	Tulasi	Shrub	Leaf	Skin disease and toothache
<i>Ocimum basilicum</i> L.	Lamiaceae	Kaama Kasturi	Herb	Leaf	Skin disease and toothache
<i>Paederia foetida</i> L.	Rubiaceae	Prasarini	Herb	Leaf	Herpes infection and paralysis
<i>Pavetta indica</i> L.	Rubiaceae	Bili Gonchalu	Shrub	Root	Urinary complaints.
<i>Phyllanthus amarus</i> L.	Phyllanthaceae	Nelanelli	Herb	Leaf	Urinary infection and kidney stone
<i>Phyllanthus debilis</i> Klein ex Willd	Phyllanthaceae	Nelanelli	Herb	Leaf	Urinary infection and kidney stone
<i>Piper longum</i> L.	Piperaceae	Hippli	Climber	Fruit	Digestion and to improve appetite
<i>Plectranthus amboinicus</i> (Lour.) Spreng.	Lamiaceae	Dodda Patre/Sambar Soppu	Herb	Leaf	Cold, fever and cough
<i>Plumbago indica</i> L.	Plumbaginaceae	Kempu-Chitra Mula	Shrub	Root	Jaundice, piles, and leprosy
<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Bili Chitra Mula	Shrub	Leaf/Root	Mosquito repellent and leprosy.
<i>Rauvolfia serpentina</i> (L.) Benth. Ex Kurz	Apocynaceae	Sarpagandha	Shrub	Root	High blood pressure
<i>Rauvolfia tetraphylla</i> L.	Apocynaceae	Dodda Sarpagandha	Shrub	Root	High blood pressure
<i>Ruellia tuberosa</i> L.	Acanthaceae	Beli Gadde Gida	Herb	Root	High fever.
<i>Ruta graveolens</i> L.	Rutaceae	Naga Daali	Herb	Leaf	Paralysis.
<i>Salacia chinensis</i> L.	Celastraceae	Eknayaka	Shrub	Root	Regularization of menstruation and antidiabetic
<i>Sapindus trifoliatus</i> L.	Sapindaceae	Atle Kaayi	Tree	Fruit	Lice
<i>Saraca asoca</i> (Roxb.) Willd.	Fabaceae	Ashoka	Tree	Bark/Root	Uterine bleeding and dysmenorrheal problem
<i>Sauropus androgynous</i> (L.) Merr.	Phyllanthaceae	Vitamin Soppu	Shrub	Leaf	Source of vitamin
<i>Senna sophora</i> (L.) Roxb.	Fabaceae	Alemurga	Shrub	Root	Osteoarthritis and pain in knee joints
<i>Sesamum indicum</i> L.	Pedaliaceae	Yallu	Herb		Medicinal
<i>Sida acuta</i> Burm.f.	Malvaceae		Herb	Root	Coolant, astringent, diaphoretic, antipyretic, nerve, and urinary diseases
<i>Sida cordata</i> (Burm.f.) Borss. Waalk.	Malvaceae		Herb	Leaf	Coolant, astringent, diaphoretic, antipyretic, nerve, and urinary diseases
<i>Sida cordifolia</i> L.	Malvaceae		Herb	Leaf	Cardiac tonic, swelling of wounds and, hyperacidity
<i>Sida rhombifolia</i> L.	Malvaceae	Kadlangadle	Herb	Leaf	Piles and cardiac tonic

Botanical Name	Family	Common Name	Habit	Part used	Therapeutic applications
<i>Spilanthes mauritiana</i> L.	Asteraceae	Gantalu Gonde	Herb	Inflorescence	
<i>Stevia rebaudiana</i> Bertoni	Lamiaceae	Stevia/Sakre Gida	Herb	Leaf	Diabetic patients
<i>Terminalia chebula</i> Retz.	Combretaceae	Anale	Tree	Fruit	Throat infection and fever
<i>Tinospora cordifolia</i> (Willd.) Miers	Menispermaceae	Amruta Balli	Climber	Stem	Diabetes, stomach pain, fever, gonorrhoea, syphilis, and immune booster.
<i>Tinospora sinensis</i> (Lour.) Merr.	Menispermaceae	Kadu Amrutaballi	Climber	Stem	Chronic rheumatism, stomach pain and fever
<i>Trichosanthes tricuspidata</i> Lour.	Cucurbitaceae	Kaadu Padavala	Climber	Leaf	Asthma
<i>Tylophora indica</i> (Burm.f.) Merr.	Apocynaceae	Kaphada Balli	Climber	Leaf	Asthma
<i>Uvaria narum</i> (Dunal)	Annonaceae	Kakke Balli	Climber	Bark/Root	Fits
<i>Vernonia anthelmintica</i> (L.) Willd.	Asteraceae	Kaala Jeera	Herb	Seed	Roundworm and urinary infections
<i>Vitex negundo</i> L.	Lamiaceae	Nukki Soppu	Shrub	Leaf	Fungal infection.
<i>Zingiber officinale</i> Roscoe	Zingiberaceae	Shunti	Herb	Rhizome	Stomach upset, motion sickness, nausea, and vomiting.
<i>Zingiber zerumbet</i> (L.) Roscoe ex Sm	Zingiberaceae	Agalu Shunti	Herb	Rhizome	Medicine

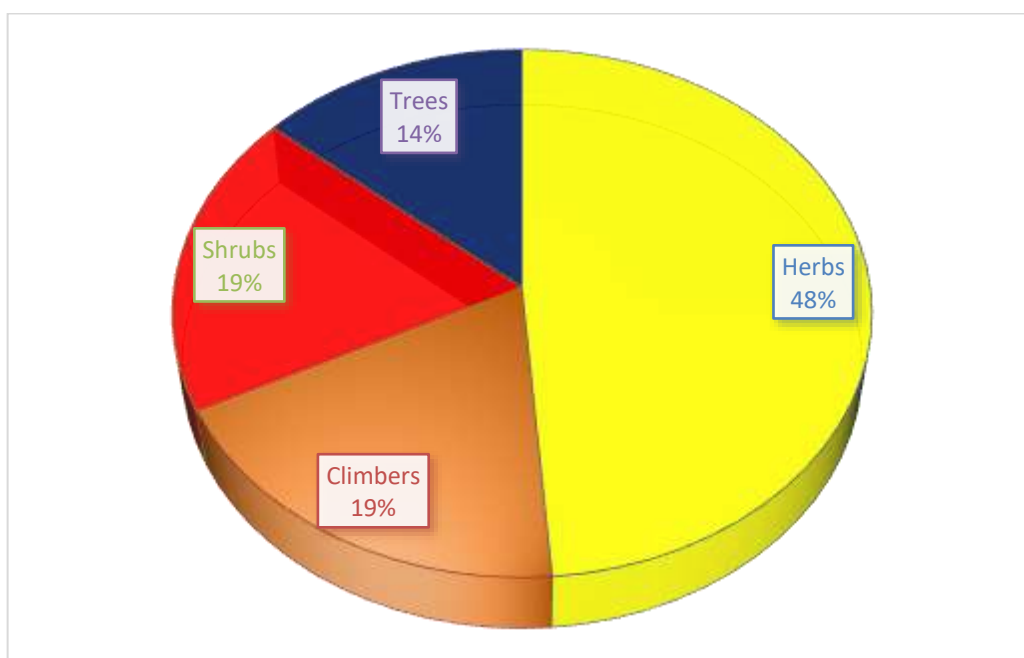


Figure 2: Growth Habit of Medicinal Plants

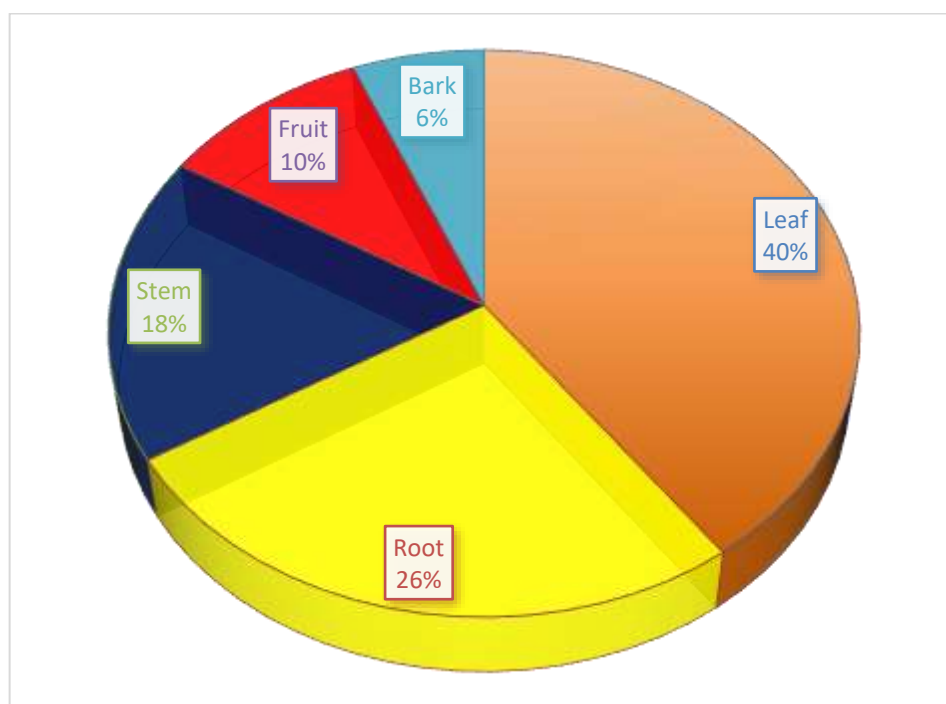


Figure 3: Plant Parts Used as a Medicine

Medicinal plants in these gardens were also used in food preparation and beverages, such as Kashaya, Sharabat, and Kokum (Mundaragi et al., 2017a). Aloe vera and turmeric were particularly noted for their cosmetic applications (Rao & Rao, 2006). Traditional ethnobotanical knowledge was prevalent, with local inhabitants relying on these plants for treating conditions like diabetes, jaundice, and bone fractures (Sharma et al., 2014). Additionally, some plants were used for treating animals against common ailments.

Discussion

The diversity of medicinal plants in home gardens reflects a rich tradition of ethnobotanical knowledge and the integral role these plants play in local healthcare practices. The significant representation of families such as Apocynaceae, Zingiberaceae, and Lamiaceae highlights the diverse therapeutic potential of these plants. *Ocimum tenuiflorum* L., commonly known as Tulsi, and Aloe vera L. are widely used for their skin-soothing and anti-inflammatory properties, corroborating their traditional uses (Rao & Rao, 2006). *Andrographis paniculata* (Burm.f.) Nees, noted for its application in bone-related disorders, is consistent with its documented uses in traditional medicine (Sharma et al., 2014).

The predominance of leaf preparations aligns with findings from similar studies, indicating a preference for readily accessible and easy-to-use plant parts (Mundaragi et al., 2017a). The use of medicinal plants in food preparation, such as in Kashaya and Sharabat, illustrates their importance beyond direct medicinal applications (Mundaragi et al., 2017a). Moreover, the use of Aloe vera and turmeric in cosmetic applications underscores the multifaceted roles of these plants (Rao & Rao, 2006).

The reliance on herbal medicine, despite its perceived crude nature, reflects its accessibility and cost-effectiveness. This aligns with observations of traditional practices where local inhabitants continue to depend on herbal remedies for conditions such as diabetes, jaundice, and bone fractures (Sharma et al., 2014). The use of medicinal plants for treating animals also highlights their broad utility in maintaining both human and animal health.

Conclusion

The study of medicinal plants in home gardens of Uttara Kannada reveals a diverse and valuable resource, reflecting a rich tradition of ethnobotanical knowledge. The significant species diversity and the varied plant parts used for medicinal preparations emphasize the importance of these gardens in local healthcare practices. The findings suggest that home gardens play a critical role in preserving traditional medicinal knowledge and providing accessible, cost-effective health solutions. Future research should focus on the conservation of these plants and the documentation of their traditional uses to ensure their continued availability and efficacy.

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