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# Diversity and Economic Value Trees in Krishnagiri Taluk, Tamil Nadu, India

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***Abstract*:** Preliminary survey on the diversity and economic values of tree species was carried out in Krishnagiri taluk, Krishnagiri District, Tamil Nadu. A total of 115 tree species belonging to 90 genera and 36 families were recorded. Fabaceae is the most dominant family (18 genera and 28 species), and *Ficus* is the dominant genus with seven species, while seventy-three genera had only one species. Among the total number of species, nineteen species were recorded as edible fruit yielding trees (19 species), avenue trees (13 species), dye plants (17 species), medicinal plants (42 species), ornamental trees (14 species), oil yielding plants (8 species), exotic trees (17 species), and timber yielding trees (30 species). Few tree species, such as *Mangifera indica*, *Cocos nucifera,* and *Tamarindus indica,* were supporting the livelihoods of local peoples. Four gymnosperm species were observed: *Cupressus sempervirens, Araucaria heterophylla, Cycas circinalis,* and *C. revolute*.

***Keywords*:** Economical uses, Fabaceae, *Ficus,* Krishnagiri, Tamil Nadu, Tree species

Tree diversity plays a very important role in the cycle of nature and has a supreme role in maintaining balance in the ecosystem. Forests are part of the natural wealth of a country. Plants act as indicators of particular minerals and climates. More importantly, all plants, as part of the vegetation, contribute towards the stability of the environment. Rennolls and Laumonier (2000), Tchouto et al (2006), Evariste et al (2010) identified tree plant diversity as the most valuable aspect of forest ecosystem diversity and tropical forest biodiversity. Tree diversity also controls the forest ecosystem through factors like climate, stand structure, geomorphological structures, and species arrangements. The stand structure of forests was an important aspect of biodiversity and ecosystems (Ozcelik 2009). Trees also help in the interaction between the components and the ecosystem (Colding et al 2006). The diversity of trees purifies rainwater, controls pollution and soil erosion, and increases the oxygen/fresh air levels in the atmosphere. The economically valuable trees are a source of income for local people (Priya et al 2020).

Floristic survey and documentation are essential for determining the diversity status, species composition of particular districts. Only a few researchers worked and recorded the floristic diversity of the Krishnagiri (Matthew 1981-1988, Ambethkar 1992, Santhan and Rajasekarn 1993, Silambarasan and Santhan 2014). There is not a clear report on the documentation of economical valuable tree species in the present study area. Therefore, the present investigations were concerned with the documentation and also analysis economic importance of the tree species in Krishnagiri taluk, Krishnagiri district, Tamil Nadu.

## MATERIAL AND METHODS

**Study area and identification:** Krishnagiri is a taluk in the Krishnagiri district, Tamil Nadu located between the latitudes of 12°31'57.8"N and 12°53'27.17"E and the longitudes of 78°14'51.1"E and 78°24'75'24"E. The altitude was 1,614 feet above MSL. The total area is 1,276.19 km$^2$. The four national highways cross in this city (NH 46, NH 66, NH 7, and NH 219) and connect the three major states such as Pondicherry, Andhra Pradesh, and Karnataka. The collected specimens were prepared for herbarium using stranded methods (Jain & Rao 1977). The prepared herbariums were deposited in the Department of Botany, Government Arts College for Men, Krishnagiri-635001 Tamil Nadu. The collected specimens were identified for tree species, taxonomic descriptions, economic values, and herbarium preparation. Each species was identified by *'The Flora of Central and North Tamil Nadu – I, II, III'* (Britto 2019) and Plants of the Western Ghats (Ganeshaiah 2012).

## RESULTS AND DISCUSSION

In present investigation 115 species and 90 genera belonging to 36 families, which include 104 dicotyledons and 12 monocotyledons, were recorded from Krishnagiri taluk, Krishnagiri district (Table 1). Fabaceae is the largest family, with 18 genera and 28 species, followed by Arecaceae, which has nine genera, and ten species followed by Bignoniaceae,

**Table 1.** Diversity and economic value trees in Krishnagiri taluk, Tamil Nadu

| Family/Botanical name | Economical values |
|---|---|
| Magnoliaceae | |
| *Michelia champaca* L. | Timber, Ornamental, Exotic |
| Annonaceae | |
| *Annona reticulata* L. | Fruit, Dye |
| *A.squamosa* L. | Fruit |
| *Artabotrys hexapetalus* (L. f.) Bhandari | Medicinal |
| *Polyalthia longifolia* (Sonn.) Thwaites | Timber, Exotic |
| Arecaceae | |
| *Areca catechu* L. | Medicinal |
| *Borassus flabellifer* L. | Fruit |
| *Cocos nucifera* L. | Fruit, Oil |
| *Dypsis lutescens* (H. Wendl.) Beentje & J. Dransf | Ornamental |
| *Phoenix dactylifera* L. | Fruit |
| *P. sylvestris* (L.) Roxb. | Exotic |
| *Pritchardia pacifica* Seem. & H. Wendl. | Ornamental |
| *Roystonea regia* (Kunth) O.F.Cook | Exotic |
| *Washingtonia filifera* (Linden ex André) H. Wendl. ex de Bary | Exotic |
| *Wodyetia bifurcata* A.K. Irvine | Exotic |
| Musaceae | |
| *Musa paradisiaca* L. | Fruit |
| Poaceae | |
| *Bambusa arundinacea* Willd. | Timber |
| Proteaceae | |
| *Grevillea robusta* A. Cunn. ex R. Br. | Timber |
| Fabaceae | |
| *Acacia auriculiformis* Benth. | Ornamental, Exotic |
| *Acacia catechu* (L.f.) Willd. | Timber, Medicinal, Dye |
| *Acacia leucophloea* (Roxb.) Willd. | Medicinal |
| *Acacia nilotica* (L.) Delile | Dye |
| *Acacia planifrons* Wight & Arn. | Medicinal |
| *Albizia amara* (Roxb.) B.Boivin | Timber |
| *Albizia lebbeck* (L.) Benth. | Timber |
| *Bauhinia purpurea* L. | Ornamental, Avenue, Dye |
| *Bauhinia tomentosa* L. | Ornamental, Dye |
| *Calliandra inermis* (L.) Druce | Exotic |
| *Cassia fistula* L. | Medicinal, Avenue |
| *Cassia roxburghii* DC. | Medicinal |
| *Cassia siamea* Lam. | Avenue |
| *Dalbergia sissoo* DC. | Timber |
| *Delonix elata* (L.) Gamble | Medicinal |
| *Delonix regia* (Hook.) Raf. | Medicinal |
| *Dichrostachys cinerea* (L.) Wight & Arn. | Medicinal |
| *Erythrina variegata* L. | Medicinal |
| *Gliricidia sepium* (Jacq.) Walp. | Exotic |
| *Lysiloma latisiliquum* (L.) Benth | Timber |
| *Peltophorum pterocarpum* (DC.) Backer ex K. Heyne | Medicinal, Dye |
| *Pithecellobium dulce* (Roxb.) Benth. | Fruit |
| *Pongamia pinnata* (L.) Pierre | Avenue, Oil |
| *Prosopis cineraria* (L.) Druce | Medicinal |
| *Prosopis juliflora* (Sw.) DC. | Timber |
| *Samanea saman* (Jacq.) Merr. | Avenue |
| *Sesbania grandiflora* (L.) Pers. | Medicinal |
| *Tamarindus indica* L. | Timber, Fruit, Dye |
| Rhamnaceae | |
| *Ziziphus jujuba* Mill. | Fruit |
| *Ziziphus oenoplia* (L.) Mill. | Fruit |
| Ulmaceae | |
| *Holoptelea integrifolia* (Roxb.) Planchon. | Medicinal |
| Moraceae | |
| *Ficus benghalensis* L. | Avenue |
| *Ficus benjamina* L. | Medicinal |
| *Ficus drupacea* Thunb. | Medicinal |
| *Ficus elastica* Roxb. ex Hornem. | Ornamental |
| *Ficus nitida* Thunb. | Ornamental |
| *Ficus racemosa* L. | Medicinal |
| *Ficus religiosa* L. | Medicinal |
| Casuarinaceae | |
| *Casuarina equisetifolia* L. | Timber, Exotic |
| Calophyllaceae | |
| *Calophyllum inophyllum* L. | Timber, Oil |
| Phyllanthaceae | |
| *Phyllanthus acidus* (L.) Skeels | Fruit |
| *Phyllanthus emblica* L. | Fruit |
| Combretaceae | |
| *Terminalia arjuna* (Roxb. ex-DC.) Wight & Arn. | Timber, Dye |
| *Terminalia bellirica* (Gaertn.) Roxb. | Timber, Medicinal |
| *Terminalia catappa* L. | Timber, Ornamental, Dye |
| Lythraceae | |
| *Lagerstroemia indica* L. | Medicinal, Exotic |
| Myrtaceae | |
| *Corymbia ficifolia* (F. Muell.) K.D. Hill & L.A.S. Johnson | Avenue, Exotic |

**Cont...**

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**Table 1.** Diversity and economic value trees in Krishnagiri taluk, Tamil Nadu

| Family/Botanical name | Economical values |
|---|---|
| *Eucalyptus melliodora* A.Cunn. ex-Schauer | Medicinal, Exotic |
| *Melaleuca alternifolia* Cheel | Medicinal |
| *Psidium guajava* L. | Fruit, Dye |
| *Syzygium cumini* (L.) Skeels | Fruit, Dye |
| Anacardiaceae | |
| *Anacardium occidentale* L. | Fruit |
| *Lannea coromandelica* (Houtt.) Merr. | Timber |
| *Mangifera indica* L. | Timber, Fruit, Dye |
| Sapindaceae | |
| *Filicium decipiens* (Wight & Arn.) Thwaites | Timber, Ornamental |
| *Sapindus emarginatus* Vahl. | Timber, Medicinal, Oil |
| Rutaceae | |
| *Aegle marmelos* (L.) Corrêa | Medicinal, Dye |
| *Citrus aurantiifolia* (Christm.) Swingle | Fruit |
| Simaroubaceae | |
| *Ailanthus excelsa* Roxb. | Medicinal |
| *Simarouba glauca* DC. | Timber |
| Meliaceae | |
| *Azadirachta indica* A.Juss. | Timber, Medicinal, Dye, Oil |
| *Melia azedarach* L. | Timber, Medicinal, Oil |
| Muntingiaceae | |
| *Muntingia calabura* L. | Avenue |
| Malvaceae | |
| *Ceiba pentandra* (L.) Gaertn. | Timber |
| *Thespesia populnea* (L.) Sol. ex Corrêa | Timber |
| Moringaceae | |
| *Moringa oleifera* Lam. | Medicinal |
| Caricaceae | |
| *Carica papaya* L. | Fruit |
| Santalaceae | |
| *Santalum album* L. | Timber |
| Nyctaginaceae | |
| *Bougainvillea spectabilis* Willd. | Medicinal |
| *Pisonia grandis* R. Br. | Medicinal |
| Cornaceae | |
| *Alangium salviifolium* (L.f.) Wangerin | Medicinal |
| Lecythidaceae | |
| *Couroupita guianensis* Aubl. | Medicinal |
| Sapotaceae | |
| *Madhuca longifolia* (J.Koenig ex L.) J.F. Macbr. | Avenue, Medicinal, Oil |
| *Manilkara zapota* (L.) P. Royen | Fruit |
| *Mimusops elengi* L. | Timber, Dye |
| Rubiaceae | |
| *Guettarda speciosa* L. | Medicinal |
| *Morinda tinctoria* Roxb. | Dye |
| *Neolamarckia cadamba* (Roxb.) Bosser | Medicinal |
| Apocynaceae | |
| *Alstonia scholaris* (L.) R. Br. | Medicinal, Avenue, Oil |
| *Plumeria obtusa* L. | Ornamental |
| *Plumeria rubra* L. | Ornamental |
| *Wrightia tinctoria* R.Br. | Timber |
| Boraginaceae | |
| *Cordia domestica* Roth | Timber |
| *Cordia subcordata* Lam. | Avenue |
| *Ehretia laevis* Roxb. | Medicinal |
| Oleaceae | |
| *Nyctanthes arbor-tristis* L. | Medicinal |
| Bignoniaceae | |
| *Jacaranda mimosifolia* D.Don | Medicinal, Exotic |
| *Kigelia pinnata* (Jacq.) DC. | Timber, Exotic |
| *Markhamia lutea* (Benth.) K. Schum. | Avenue |
| *Millingtonia hortensis* L. f | Avenue |
| *Spathodea campanulata* P.Beauv. | Exotic |
| *Tabebuia aurea* (Silva Manso) Benth. & Hook. f.ex S. Moore | Medicinal |
| *Tabebuia rosea* (Bertol.) Bertero ex A.DC. | Timber, Exotic |
| *Tecoma stans* (L.) Juss. ex Kunth | Timber, Ornamental |
| Lamiaceae | |
| *Duranta plumieri* Jacq. | Ornamental |
| *Gmelina arborea* Roxb. | Medicinal |
| *Tectona grandis* L.f. | Timber, Dye |

Myrtaceae, Apocynaceae. Fourteen families were monospecific, like Magnoliaceae, Musaceae, Poaceae, Proteaceae, Ulmaceae, Lythraceae, Casuarinaceae, Calophyllaceae, Muntingiaceae, Moringaceae, Caricaceae, Santalaceae, Cornaceae, and Lecythidaceae. *Ficus* is the most dominate genera with 7 species, followed by *Acacia* and, *Cassia, Terminalia* with 6 and 3 species. 12 genera were two species such as *Annona, Phoenix, Albizia, bauhinia, Delonix, Prosopis, Ziziphus, Phyllanthus, Plumeria, Cordia, Tabebuia* and 74 genera in only one species.

For analysis various aspects of economical values like medicinally plants (42 sp.), timber-yielding trees (33 sp.), oil-yielding tree (8 sp.), dye yield trees (17 sp.), edible fruit plants

(19 sp.), exotic plants (17 sp.), avenue trees (13 plants), and ornamental tree (12 sp.) were identified from the study area (Table 1). Few gymnosperm species were also recorded in the present study area, such as *Cupressus sempervirens, Araucaria heterophylla, Cycas circinalia,* and *C. revoluta*.

For their healthcare issues, the residents of Krishnagiri use a variety of morphologically beneficial parts, including leaves, flowers, bark, fruit, and stems. The various ailments that can be treated with these gathered medicinal plants include dengue fever, skin conditions, knee discomfort, kidney stones, digestive issues, hemorrhages, etc. The primary source of medicinal compounds derived from plants and the phytochemicals they contain. In the past few decades, the majority of medicinal plants' phytochemical composition and therapeutic qualities have been identified (Sayed Nudrat and Usha 2005). A small number of plants identified by earlier researchers as medicinal plants in Egalnathum village, Krishnagiri district, are also mentioned in the investigations (Silambarasan and Santhan 2014, Madhankumar and Murugesan 2016, Sivasankari et al 2013). Out of a commercial and use standpoint, oil-producing crops have been the cornerstone of the farming economy. Oil-producing medicinal herb for additional purposes, such as vitamins and supplements and cooking oil. The study's conclusions showed that the majority of the plants exploited by the study area's people produced oil in their seeds, stems,

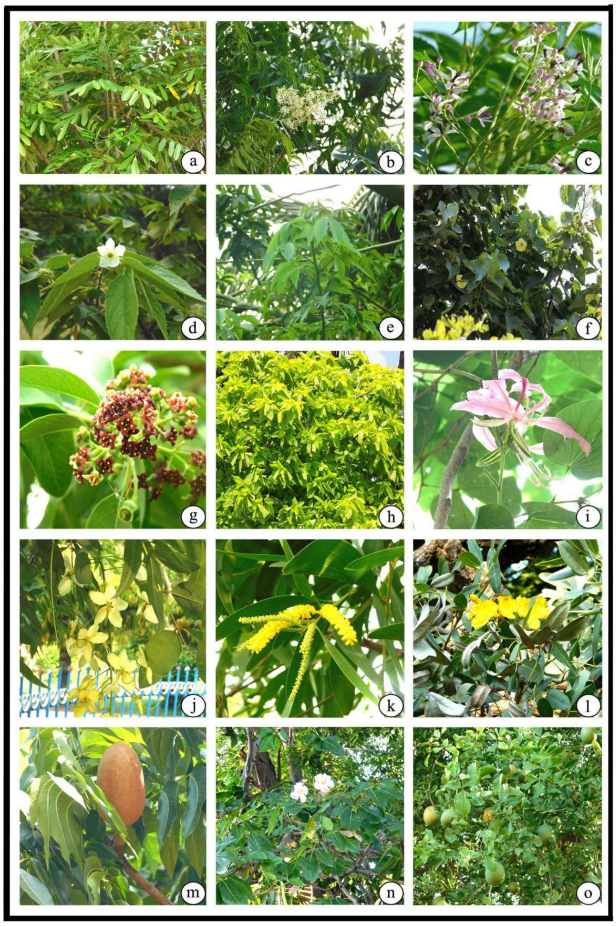

**Fig. 1. a.** *Simarouba glauca* DC. **b.** *Azadirachta indica* A. Juss. **c.** *Melia azedarach* L. **d.** *Muntingia calabura* L. **e.** *Ceiba pentandra* (L.) Gaertn. **f.** *Thespesia populnea* (L.) Sol. ex Corrêa **g.** *Santalum album* L. **h.** *Pisonia grandis* R. Br. **i.** *Bauhinia purpurea* L. **j.** *Cassia fistula* L. **k.** *Acacia auriculiformis* Benth. **l.** *Tabebuia aurea* (Silva Manso) Benth. & Hook. f.ex S. Moore **m.** *Spathodea campanulata* P.Beauv. **n.** *Tabebuia rosea* (Bertol.) Bertero ex A.DC. **o.** *Aegle marmelos* (L.) Corrêa

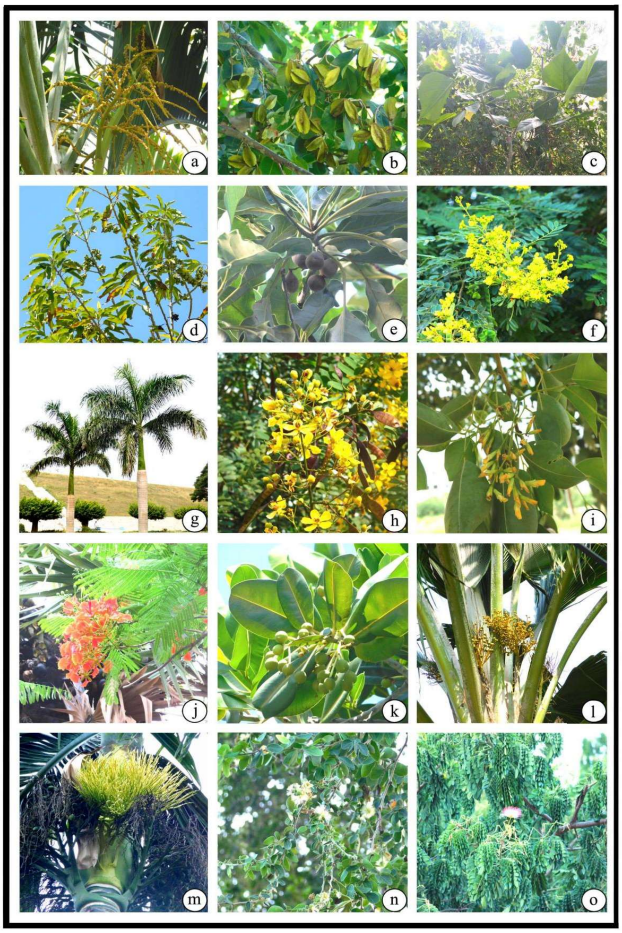

**Fig. 2. a**. *Dypsis lutescens* (H.Wendl.) Beentje& J. Dransf **b.** *Terminalia arjuna* (Roxb. ex-DC.) Wight & Arn. **c.** *Erythrina variegata* L. **d**. *Michelia champaca* L. **e.** *Terminalia bellirica* (Gaertn.) Roxb. **f.** *Cassia siamea* Lam. **g.** *Roystonea regia* (Kunth) O.F.Cook **h.** *Peltophorum pterocarpum* (DC.) Backer ex K. Heyne **i.** *Dalbergia sissoo* DC. **j.** *Delonix regia* (Hook.) Raf. h. **K.** *Calophyllum inophyllum* L. **l**. *Pritchardia pacifica* Seem. & H. Wendl. **m**. *Areca catechu* L. **n.** *Pithecellobium dulce* (Roxb.) Benth. **o.** *Samanea saman* (Jacq.) Merr.

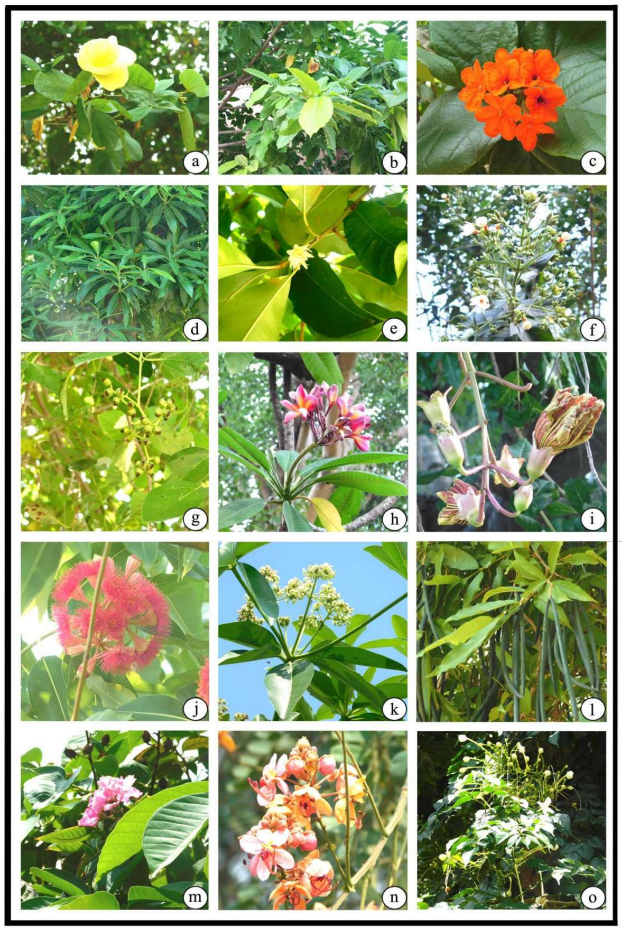

**Fig. 3. a.** *Bauhinia tomentosa* L. **b.** *Neolamarckia cadamba* (Roxb.) Bosser **c.** *Cordia subcordata* Lam. **d.** *Madhuca longifolia* (J.Koenig ex L.) J.F.Macbr. **f.** Nyctanthes arbor-tristis L. **g.** *Cordia domestica* Roth **h.** *Plumeria rubra* L. **i.** *Kigelia pinnata* (Jacq.) DC. **j.** *Corymbia ficifolia* (F. Muell.) K.D. Hill & L.A.S. Johnson **k.** *Alstonia scholaris* (L.) R. Br. **l.** *Wrightia tinctoria* R.Br. **m.** *Lagerstroemia indica* L. **n.** *Cassia roxburghii* DC. **o.** *Millingtonia hortensis* L. f

flowers, and leaves. The similar find out was recorded from Odisha (Nail and Mahalik 2020, Mendali and Behera 2018).

The study provides a critical overview of the species of plants that provide lumber that are currently found in Krishnagiri district, Tamil Nadu. These plant species are essential to human health and the continuation of life. The study provides a critical overview of the species of plants that provide lumber that are currently found in Tamil Nadu's Krishnagiri district. These plant species are essential to human health and the continuation of life. A small number of previously studied timber-producing species in India (Dobhal, Kumar and Bisht 2010, Sihag, Yadav and Mukundum 2022). The dye is a highly coloured material that is used to provide colour to a wide range of products, including food items, cosmetics, toothpaste, fabrics, paper, wood, varnishes, leather, ink, and fur (Siva 2007). Das and Mondal (2012) made an effort to investigate the traditional use of plants from West Bengal's lateritic zone that provide dye as well as its therapeutic potential. Garhwal Himalayan dye plants were reported by Sharma Antima et al (2012). According to Gokhale et al (2004) there are over 500 plant species from native India that produce dyes. An attempt was made at dye-producing plants in Tripura, Northeast India (Biswajit Sutradhar et al 2015). Similar findings of dye yielding plants were reported in Dharmapuri (Banu et al 2019).

Many authors reported ornamental plants in Tamil Nadu during 2014 to 2021 (Kensa et al 2014, 2018, Suba et al 2014, Sukumaran and Parthiban 2014, Neelamegam et al 2015a, 2015b, 2016, Parthiban et al 2016, Sukumaran and Jeeva 2017, Kensa 2018, Rejitha and Brintha 2019, Rejitha and Uma Devi 2021). Based on the present studies around 48.52% tree species available in Krishnagiri taluk, compared with the flora diversity in Krishnagiri and Dharmapuri district (Ramasamy, Manikandan and Ponnurangam, 2020). A variety of fruit-bearing trees have been reported to be an appropriate and valuable food supply for urban societies (Clark and Nicholas 2013, Kohli et al 1996).

## CONCLUSION

Krishnagiri taluk has more exotic, fruit-yielding, dye-yielding, and medicinal tree species. The diversity richness of indigenous areas demonstrates the significant variance in species occurrence between various locations. The majority of the tree species under investigation are significant from both a socioeconomic and medical aspect. The details required to decide with confidence on both the economic and ecological advantages of planting trees in towns and cities. The growth of cities and anthropogenic influence are making certain indigenous species scarce. The town's old trees should be preserved since they offer a look at native plants and serve as a suitable home for a number of animal and bird species. Given that trees provide refuge to numerous different species, more research is required to determine the Keystone value of trees.

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