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Research Article

Status and Composition of Home Garden Plants in Rural and Urban Areas in Kanyakumari District, Tamil Nadu, India.

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Abstract: The present study is aimed to carry out a baseline survey to evaluate the status, structure, composition, diversity and utilization of home garden (HG) plants in two villages located one in rural area (Arumanalloor) near Nagercoil and another one (Konam) in town municipality of Nagercoil, Kanyakumari District, Tamil Nadu, India, and to understand the impact of socio-economic conditions of households on home garden structure. Questionnaire was prepared to collect information from the households (respondents) of 128 home gardens (of which 66 were rural HGs and 62 were urban HGs), categorized into –hutted, tiled, terraced, storied, fenced and non-fenced, in addition to enumerate the available plants. The overall HG area surveyed in both rural and urban HGs was 17209.88m^2 (1.72ha.) with an average HG area of 134.45m2 (0.013ha) and it is higher in rural (183.03m^2) as compared to urban (82.74m^2) HG area. The number of species recorded in the HGs was 89 species belongs to 45 families comprises 80 genus. The range of species recorded overall in the HGs surveyed was 5-35 with an average of 13.86species/HG. Five vertical strata – emergent (>10m), canopy (10-15m), understory (5-10m), shrubs (1-5m) and herbs (<1m), were identified in the HGs with maximum percentage (31.46%) of herbs among the life form groups. In case of plant utilization pattern –edible, medicinal, vegetable, ornamental and multipurpose uses were recorded from the HG respondents with an overall maximum (38.20%) use of ornamental plants. This study indicates the need for creating awareness among the households about the importance of HG plants for their day-to-day life and its conservation.
Keywords: Home garden plants, Plant diversity, Plant distribution and utilization, Plant structure and composition, Rural and Urban village area, Nagercoil, Kanyakumari district.

INTRODUCTION

Home gardens (HG) are traditional agro-forestry systems characterized by the complexity of their structure and multiple functions. They have attracted considerable research attention during the past few decades [1, 2]. Several studies have been undertaken to investigate home gardens in different regions of world including India. Home gardens have been known to provide a diverse and stable supply of socioeconomic products and benefits to the families that maintain them [3]. Ramakrishnan *et al*. [4] stressed that socioeconomic and sociocultural issues and traditional knowledge of the local communities aided in the sustainability of agro-ecosystem. A study of different ethinic groups in Brahmaputra velley, Assam, India indicated that production from home gardens maintained by immigrant people was higher and their economic returns were greater than those maintained by the native people [5]. The present study attempts to investigate the status, patterns of diversity, composition and utilization of home garden plant species of rural and urban areas around Nagercoil at Kanyakumari District, Tamil Nadu, India.

METHODOLOY

Home garden survey was conducted from June 2013 to September, 2013 by field visits in the study area during the study period. The study area is distributed around Nagercoil at Kanyakumari District, Tamil Nadu. The area experiences a warm, humid climate having both southwest monsoons (June to September) and northeast (October to November). The mean minimum temperature ranges from 25°C to 32°C.

Home garden study carried out in a total of 128 home gardens of rural (66 HGs from Arumanalloor (@8.3246603, 77.4034292) and Veeravanalloor (@8.3242463, 77.4077636) villages comes under Arumanalloor panchayat) and urban (62 HGs from Konam (@8.1567039, 77.3913739) village panchayat comes under Nagercoil municipality) areas. Selection of households was at random based on house type (hutted, tiled, terrace and multistoried). Each type of household was surveyed by the schedule (Questionnaire) methods [6, 7] for socio-economic factors and information on home gardens. For this the actual respondent of the household was identified as one who involved in most of the decision making in the home garden (agricultural) related matters. In some cases, the

interview was conducted more than one member as well. Finally the filled questionnaires were checked to confirm the competence and quality of the information collected. The filled questionnaires were thoroughly checked and numerical coding of the filled questionnaires for the data entry and calculations of various parameters was done.

The plant species were identified on the basis of vernacular names, published field inventories, floras [8, 9], experts in plants and consulting available herbaria of the region. The plant species have been arranged alphabetically for each species including various details and presented in the tabular column for further analysis (Annexure Table-1). Parameters such as species density (Number of species per HG/ Unit area of HG), species composition and distribution of plants were directly enumerated (Annexure Table-2). Vertical stratification was measured visually.

RESULTS AND DISCUSSION

Socio-economic conditions of households

The socio-economic status of the villagers is determined on the basis of criteria such as household size, annual income, annual expenditure level to home gardens, home type, number of household members, education level, etc (Table-1). The home garden size and diversity were found to be related to the socio-economic conditions of the families that maintains them. The households surveyed were predominantly small holders (<1ha.). The HG size recorded in the rural area was 12080.30m^2 (1.21ha) and it ranged from 20.24m^2 (0.002ha) to 4047.00m^2 (0.4ha) in rural areas with an average HG size of 183.03m^2 (0.02ha) whereas in urban area the total area HG area was 5129.58m^2 (0.51ha) ranges from 20.24m^2 (0.002ha) to 526.11m^2 (0.053ha) with an average size of 83.39m^2 (0.008ha). The overall HG area surveyed in this study was 17,209.21m^2 (1.72ha) with an average HG area of 134.45m^2 (0.013ha). This falls below the range of global inventory of other tropical home gardens by Fernandes and Nair [1] and Das and Das [10]. In this context, Perera and Rajapakse [11] recorded the size of Kandyan HGs in Srilanka ranging from 0.05 to 2.5ha. The average size of West Java HGs was 0.0229ha [12] and the size of Santa Rosa HGs in Amazon varied from 0.0067 to 0.7322 ha [13]. Home garden size is by and large a function of the population density. Distinct variations in size, diversity and composition were observed within the small households (<1ha) in the study area. With increase in holding size, more variations in species composition were encountered.

The HGs surveyed in the study area (rural and urban) includes various types of home, categorized into hutted, tiled, terraced, and storied. Out of 128 homes surveyed, 42.19% were storied, 28.91% were tiled, 23.44% were terraced and 5.47% were hutted. In rural area, most of the houses were tiled (45.45%), whereas in urban area, 72.58% homes were storied and there is no hutted house (Table-1). It was noted that most of the houses, 100 out of 128 surveyed, were fenced and it was about 78.13% with a maximum of 82.26% fenced in urban area 74.24% in rural area and the remaining are non-fenced (Table-1).

The number of family members exists in the range between 2 to 6. Most of the families 46.88% have 4 members in overall study area and it was about 48.88% in rural area and 45.16% in urban area HGs. The educational status of family members recorded in the study area indicate that about 52.34% of the respondents from overall study area had above 10^{th} level formal education while it was 46.97% in rural area and 58.06% in urban area and a overall 14.07% of respondents showed illiteracy without having any formal education and it was low (8.06%) in urban area and high (19.70%) in rural area. The occupation nature of the households in the overall study area indicates that most of the households were professionals (56.25%) in the overall study area with a maximum of 37.88% in rural areas and 62.90% in urban areas, whereas the farmers in rural area were about 37.88% while in urban area it was only 12.90% (Table-1).

The annual income of most of the households (40.63%) in the overall study area comes under range of Rs. 1, 00, 000/= to Rs. 2, 00, 000/=, while it was 50% in rural area found under this income group. In urban area, about a maximum of 46.77% comes under the income group of Rs. 2, 00, 000/= to Rs. 5, 00, 000/=. For home garden maintenance, the overall annual expenditure is up to Rs. 1000/- for most (45.31%) of the households noted in overall study area while it was only 3.91% of the households spent above Rs. 10,000/- per year for home garden maintenance. It was noted that 6.06% of the households in rural area spent more than Rs. 10,000/= for HG maintenance while it was only 1.61% in urban area (Table-1).

Out of 128 households interviewed, about 37.88% were farm workers in rural area and the remaining were non farm workers while in urban area all (100%) were non-farm worker. It was also noted that 60.61% households had experience in HG works in rural area while it was 16.12% in urban area. The HG areas were also used for various other purposes like as social living area and as physical utility areas. Information collected from the respondents of households in the overall study area related to other uses of HGs and it was noted that most of the respondents (51.56%) use their HG area as flower garden, whereas 37.50% used as washing area, 34.38% as drying area, 28.91% used as ret or meeting area, 28.13% as storage area, 19.53% as play area (Table-1).

It was noted that most of the HGs (78.13%) in the overall study area having multilayered plants whereas 18.75% have two layered and 3.12% have single layered plants (Table-1). According to Millat-e-Mustafa *et al*. [14], Bangladesh HGs shows multilayered canopy configuration with lower plant

diversity and species richness in the upper strata. However, it was noted that such vary in numbers in different areas and may range from 3 to 6 [1, 10, 14]. Similarly, about 74.22% HGs maintain the plant growth in good conditions while 10.94% are moderately maintained and 14.84% are poor in maintenance.

Table-1: Characteristics of home gardens/ households surveyed* in the study area.

Parameters	No of Home Gardens (%)		
	Rural	Urban	Overall
1. House types			
i. Hutted house	7 (10.61)	----	7 (05.47)
ii. Tiled house	30 (45.45)	7 (11.29)	37 (28.91)
iii. Terrace house	20 (30.30)	10 (16.13)	30 (23.44)
iv. Storied house	9 (13.64)	45 (72.58)	54 (42.19)
v. Non-fenced house	17 (25.76)	11 (17.74)	28 (21.88)
vi. Fenced house	49 (74.24)	51 (82.26)	100 (78.13)
2. Household members			
i. 2 members	8 (12.12)	4 (06.45)	12 (09.38)
ii. 3 members	23 (34.85)	14 (22.58)	37 (28.91)
iii. 4 members	32 (48.48)	28 (45.16)	60 (46.88)
iv. 5 members	3 (04.55)	15 (24.19)	18 (14.06)
v. 6 members	----	1 (01.61)	1 (00.78)
3. Educational status of Households			
i. Non-formal education	13 (19.70)	5 (08.06)	18 (14.07)
ii. Formal education up to 10^{th} level	22 (33.33)	21 (33.87)	43 (33.59)
Iii. Formal education above 10^{th} level	31 (46.97)	36 (58.06)	67 (52.34)
4. Occupation of Households			
i. Farmers	25 (37.88)	8 (12.90)	33 (25.78)
ii. Businessman	8 (12.12)	15 (24.19)	23 (19.53)
iii. Professionals	33 (50.00)	39 (62.90)	72 (56.25)
5. Annual Income of Households			
i. Up to Rs. 50, 000/=	3 (04.55)	1 (01.61)	4 (03.13)
ii. Rs. 50, 000/= to 1, 00, 000/=	23 (34.85)	12 (19.35)	35 (27.34)
iii. Rs. 1, 00, 000/= to 2, 00, 000/=	33 (50.00)	19 (30.65)	52 (40.63)
iv. Rs. 2, 00, 000/- to 5, 00, 000/=	6 (09.09)	29 (46.77)	35 (27.34)
v. Rs. 5, 00, 000/= and above.	1 (01.52)	1 (01.61)	2 (01.56)
6. Annual Home Garden Expenditure			
i. Up to Rs. 1, 000/=	28 (42.42)	30 (48.39)	58 (45.31)
ii. Rs. 1, 000/= to 5, 000/=	16 (24.24)	27 (43.55)	43 (33.59)
iii. Rs. 5, 000/= to 10, 000/=	18 (27.27)	4 (06.45)	22 (17.19)
iv. Rs. 10,000/= & above.	4 (06.06)	1 (01.61)	5 (03.91)
7. Activity of Household Members			
i. Farm workers	25 (37.88)	----	25 (19.53)
ii. Non-farm workers	41 (62.12)	62 (100.00)	103 (80.47)
iii. Experience in home garden works	40 (60.61)	10 (16.12)	50 (39.06)
iv. No experience in home garden works	26 (39.39)	52 (83.87)	78 (60.94)
8. Home gardens used for other purposes			
i. Used as social/ living area			
a. Rest or meeting area	18 (27.27)	19 (30.65)	37 (28.91)
b. Children's play area	12 (18.18)	13 (20.97)	25 (19.53)
c. Flower garden	36 (4.55)	30 (48.39)	66 (51.56)
ii. Used as Physical/ utility area			
a. Storage area	13 (19.70)	23 (37.10)	36 (28.13)
b. Washing area	38 (57.58)	10 (16.13)	48 (37.50)
c. Drying area	15 (22.73)	29 (46.77)	44 (34.38)
9. Plant Growth Condition			
i. Well grown	48 (72.73)	47 (75.81)	95 (74.22)
ii. Moderately grown	10 (15.15)	4 (06.45)	14 (10.94)
iii. Poorly grown	8 (12.12)	11 (17.74)	19 (14.84)
10. Layering of Home Garden Plants			
i. Single layered	3 (04.55)	1 (01.61)	4 (03.13)
ii. Two layered	17 (25.76)	7 (11.29)	24 (18.75)
iii. Multilayered	46 (69.70)	54 (87.10)	100 (78.13)

*-Number of Home Gardens surveyed –Rural-66; Urban -62; Overall-128;

Table-2: Details of home gardens/ plants recorded in the study area.

Details of HGs/ plant species recorded	Rural	Urban	Overall
1. Range of HG area surveyed(m^2)	20.24 to 4047.00	20.24 to 526.11	20.24 to 4047.00
2. Total area of HGs surveyed (m^2)	12,080.30	5,170.05	17,250.35
3. Average of HG area surveyed (m^2)	183.03	83.39	133.21
4. Total No of families recorded in HGs	43	43	45
5. Total No species recorded in HGs	83	76	89
6. Mean no of species per HG	17.45	10.27	13.86
7. Range of species in present in HGs	5 to 35	3 to 20	3 to 35
a. < 10 species	3 (04.55%)	24 (38.71%)	27 (21.09%)
b. 10 to 20 species	45 (68.18%)	37 (59.68%)	82 (64.06%)
c. > 20 species	18 (27.27%)	1 (01.61%)	19 (14.84%)
8. Total number of individuals in all species	2227	1228	3455
9. Average no of individuals in each species/HGs	33.74	19.81	26.99

Structure, composition and utilization of home garden plants

Home garden structure varies from place to place according to the local physical environment, ecological characteristics, socio-economic and cultural factors [3, 15, 16]. A complete inventory list of the species recorded from the home gardens of rural (AV-Arumanallur and Veeravanalloor) and urban (Ko-Konam) areas (Annexure Table-1). The overall total of 89 species of 80 genera belonging to 45 families have been taxonomically verified and identified as distinct species (Annexure Table-1). Detailed species list is presented in Annexure Table-1 along with common name of the plant species, family name, life form (habit), habitat (earthen/potted), nature of growth (wild/cultivated), useful parts, uses and source (rural-AV/ urban-Ko) of home garden recorded. The total number of genus and species recorded in rural HGs was higher (76 genus/83 species) as compared to urban HGs (71 genus/ 76 species), respectively (Table-2).

Table-3: Per cent distribution of species and their individuals in the HGs of study area surveyed.

Plant distribution categories	Rural HGs		Urban HGs		Overall HGs	
	No. sp. (%)	No of Indi. (%)	No. sp. (%)	No of Indi. (%)	No. sp. (%)	No of Indi. (%)
I. Life forms						
i. Climbers	10 (12.05)	110 (04.94)	7 (09.21)	63 (05.13)	10 (11.23)	173 (05.01)
ii. Creepers	5 (06.02)	89 (04.00)	2 (02.63)	9 (00.73)	5 (05.62)	98 (02.84)
iii. Herbs	25 (30.12)	607 (27.26)	26 (34.21)	306 (24.92)	28 (31.46)	913 (26.42)
iv. Shrubs	21 (25.30)	639 (28.69)	22 (28.95)	451 (36.73)	22 (24.72)	1090 (31.55)
v. Trees	22 (26.51)	782 (35.11)	19 (25.00)	399 (32.49)	24 (26.97)	1181 (34.18)
II. Habitat						
i. Earthen plants	65 (78.31)	1788 (80.29)	53 (69.74)	802 (65.31)	66 (74.16)	2590 (74.96)
ii. Potted plants	8 (09.64)	151 (06.78)	9 (11.81)	119 (09.69)	9 (10.11)	270 (07.82)
iii. Earthen/Potted plants	10 (12.05)	288 (12.93)	14 (18.42)	307 (25.00)	14 (15.73)	595 (17.22)
III. Nature of Growth						
i. Cultivated	70 (84.34)	1924 (86.39)	65 (85.53)	1123 (91.45)	76 (85.39)	3047 (88.19)
ii. Wild	13 (15.66)	303 (13.61)	11 (14.47)	105 (8.55)	13 (14.61)	408 (11.81)
IV. Useful part						
i. Flower	1 (01.20)	2 (00.09)	---	---	1 (01.12)	2 (00.06)
ii. Fruit	22 (26.51)	473 (21.24)	16 (21.05)	166 (13.52)	22 (24.72)	639 (18.49)
iii. Leaf	4 (04.82)	91 (04.09)	3 (03.95)	67 (5.46)	4 (04.49)	158 (04.57)
iv. Pod	1 (01.20)	7 (00.31)	---	---	1 (01.12)	7 (00.20)
v. Rhizome	2 (02.41)	65 (02.92)	1 (01.31)	1 (00.08)	2 (02.25)	66 (1.91)
vi. Tuber	3 (03.62)	41 (01.84)	3 (03.95)	11 (00.90)	3 (03.37)	52 (1.51)
vii. Whole plant	50 (60.24)	548 (69.51)	53 (69.74)	983 (80.04)	56 (62.92)	2531 (73.26)
V. Uses						
i. Food/ Edible	10 (12.05)	245 (11.00)	7 (09.21)	97 (07.90)	10 (11.24)	342 (09.90)
ii. Medicine	11 (13.25)	279 (12.53)	9 (11.84)	109 (08.88)	11 (12.36)	388 (11.23)
iii. Multipurpose	19 (22.89)	763 (34.26)	14 (18.42)	373 (30.37)	19 (21.35)	1136 (32.88)
iv. Ornamental	28 (33.74)	677 (30.40)	34 (44.74)	496 (40.39)	34 (38.20)	1173 (33.95)
v. Vegetable	15 (18.07)	263 (11.81)	12 (15.79)	153 (12.46)	15 (16.85)	416 (12.04)

In both rural and urban area HGs 43 families were recorded. The number of species per HG was ranged from 5-35species with an average of 17.45sp/HG in rural area, 3-20 species with an average of 10.27sp/HG in urban area and 3-35 species with an average of 13.86sp/HG in overall area surveyed (Table-2). This was lower than the range of 37-65 with mean of 46, recorded in Kandyan HGs of Srilanka [11]; an average of 56 species reported in Javanese HGs [12]; and Das and Das [10] reported a mean of 20 in HGs of Barak Valley, Assam, Narth East India. The number of species can be related to the size of the HGs surveyed. It may be influenced by a number of factors such as socio-economic status, market integration, land holding size, etc. [10]. The total number of individuals in all the species recorded was higher (2227 individuals) in rural HGs than in urban (1228 individuals) HGs and it was 3455 individuals in the overall study area (Table-2).

Home garden exhibits complex structure, both vertically and horizontally. The vertical structure of HGs usually is composed to 3 to 4 layers –Herb (<1m), shrub (1-5m), understory layer (5-10m) and canopy layer (>10m) [1]. In this survey, it is noted that the HGs were commonly consisting three layers, but sometimes with four layers. The upper most layers consist of trees and therefore were a perennial layer. The species commonly found here were *Cocous nucifera, Musa paradisiacal, Mangifera indica, Psidium guajava, Moringa oleifera, Azadirachta indica, Tamarindus indica* and *Areca catechu*. Immediately below this layer, occur both annual and perennial (fruit yielding and ornamental) plants such as *Ixora coccinea, Hibiscus rosa-sinensis, Rosa sps., Jasminum grandiflorum, Murraya koenigii, Jasminum sambac, Carica papaya, Annona squamosa, Tecoma stans,* and *Mirabilis jalapa*. The third layer consists of *Polianthus tuberosus, Portulaca oleracea, Vinca rosea, Phyllanthus niruri, Aloe vera, Ocimum tenuiflorum, Chrysanthemum coronarium, Amaranthus gangetics, Celosia argentea,* and *Curcuma longa*. Next to this layer the climbers form as fourth one in the study area with *Epipremnum auream, Momordica charantia,* and *Piper nigrum*. The lowest layer consists of creeper species that were below 20cm which includes *Dioscorea esculenta, Cucurbita moschata, Argyreia nervosa, Lagenariasiceraria* and *Centella asiatica* (Annexure Table-1).

The wide range of species found in HGs in different heights and life forms add their ecological efficiency in terms of use of physical and chemical resources such as water, sunlight and nutrients [17, 18]. In this study, table -3 indicates the pattern of species distribution in HGs of rural and urban areas with reference to life forms (climbers, creepers, herbs, shrubs, trees), maintenance (earthed, potted, earthen/potted), growing condition (wild, cultivated), useful parts (flower, fruit, leaf, pod, rhizome, tuber, whole plant) and uses (edible, medicine, multipurpose, ornamental, vegetable). Herbs found more in number both in rural (30.12%), urban (34.21%) and in overall it was 31.14% as compared to other life forms. But in Karnataka HGs, trees constitute a major component in village ecosystem [19]. The availability of herbs (28 species) was an advantage over trees (24 species) and shrubs (22 species) species in HGs of overall study area. In HGs, most of the plant species (78.31% in rural; 69.74% in urban; 74.16% in overall area) were maintained in soil (earthen). Most of the plant species (85%) in HGs of the study area were cultivated. Various parts of the plant species recorded in the HGs were used by the local people. In the study area, more than 60% of the plants were comes under whole plant use category. Similarly most of the plants were used as ornamental purpose (38.20%) in HGs as compared to other uses – multipurpose (21.35%), Vegetables (16.8%), medicine (12.36%) and food/edible (11.24%). Earlier reports [17, 20] indicate that the high diversity of plant species in the HGs and mixture of annuals and perennials of different heights results in a complex horizontal and vertical structure. Such multilayered plant canopy proves to be beneficial in the utilization of sun light and in water and soil conservations. It was also noted that there is no specific planting pattern in HGs studied.

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ANNEXURE

Table-I: Plant species surveyed in the villages of rural (RA) and urban (UA) area home gardens surveyed around Nagercoil in Kanyakumari District.

Name of the species	Common Name	Family	Life form	Habitat	Nat. Gr	Useful part	Uses	Source
1. Acalypa hispida Burm.	Kuranguval	Euphorbiaceae	Herb	E	Culti.	WP	Orn	UA
2. Acalypa indica Linn.	Kuppameni	Euphorbiaceae	Herb	E	Wild	Leaf	Med	RA / UA
3. Achras zapota (L.) P. Royan	Sapota	Sapotaceae	Tree	E	Culti.	Fruit	Food	RA / UA
4. Adenium obesum (Forssk) Roem & Schult.	Sabi star	Apocynaceae	Herb	P	Culti.	WP	Orn	RA / UA
5. Allamanda cathartica L.	Goden trumpet	Apocynaceae	Cl.	E	Culti.	WP	Orn	RA / UA
6. Aloe vera (L.) Burm.F.	Katrrazhai	Liliaceae	Herb	E/P	Culti.	WP	Med	RA / UA
7. Amaranthus gangetics L.	Keerai	Amaranthaceae	Herb	P	Culti	WP	Veg	RA / UA
8. Amaranthus viridis Linn.	Kuppakerrai	Amaranthaceae	Herb	E	Wild	WP	Veg	RA / UA
9. Ananas comosus (L.) Merr.	Puruthi chakka	Moraceae	Tree	E	Culti.	Fruit	Food	RA
10. Annona squamosa L.	Seethapazham	Anonaceae	Shrub	E	Culti.	Fruit	Food	RA / UA
11. Anthurium andreanum Schott.	Anthurium	Araceae	Herb	P	Culti.	WP	Orn	RA / UA
12. Araucaria columnaris Jus.	Christhuma tree	Auracariaceae	Tree	E/P	Culti.	WP	Orn	UA
13. Areca catechu L.	Kamuku	Araceae	Tree	E	Culti.	WP	MP	RA
14. Argyreia nervosa (Burm.f.) Bojer.	Anaikodi	Convolvulaceae	Cr.	E	Culti	Tuber	Veg	RA / UA
15. Artobotrys hexapetalus (L.f.) Bhandari.	Manoranjitham	Annonaceae	Cl.	E	Wild	Flower	Med	RA
16. Artocarpus communis Frost.	Cheema	Moraceae	Tree	E	Culti.	Fruit	Food	RA
17. Artocarpus heterophyllus Lam.	Pala maram	Moraceae	Tree	E	Culti.	Fruit	Food	RA / UA
18. Artocarpus hirsutus Lam.	Ayeni	Moraceae	Tree	E	Culti.	Fruit	Food	RA
19. Azadirachta indica A. Juss.	Vembu	Meliaceae	Tree	E	Wild	WP	MP	RA / UA
20. Bambusa arundinaceae (Retz.) Roxb.	Mungil	Poaceae	Tree	E	Culti.	WP	MP	RA / UA
21. Basella alba L.	Kodibasalai	Basellaceae	Cl.	E	Culti.	WP	Veg	RA / UA
22. Bougainvillaea spectabilis (Wild)	Paper plant	Nyctaginaceae	Shrub	E	Culti.	WP	Orn	RA / UA
23. Caladium bicolour Vent.	Croton	Araceae	Herb	P	Culti.	WP	Orn	RA / UA
*24. Caladium sps.*Vent.	Croton	Araceae	Herb	P	Culti.	WP	Orn	UA
25. Callicarpa tomentosa (L.) Muss.	Vetrili	Verbinaceae	Cl.	E	Culti.	Leaf	MP	RA
26. Canavalia gladiata (Jacq.) DC.	Beans	Fabaceae	Cl.	E	Culti.	Fruit	Veg	RA / UA
27. Capsicum frutescens L.	Milakai	Solanaceae	Herb	E	Culti.	Fruit	Veg	RA / UA
28. Carica papaya L.	Papali	Caricaceae	Shrub	E	Culti.	Fruit	Food	RA / UA
29. Celosia argentea L.	Kozhipoo	Amaranthaceae	Herb	E	Culti.	WP	Orn	RA / UA
30. Centella asiatica L. Urban.	Vallarai	Apiaceae	Cr.	E	Wild	WP	Med	RA

31. *Chrysanthemum coronarium* L.	Sevanthipoo	Asteraceae	Herb	E	Culti.	WP	Orn	RA / UA
32. *Citrus aurantium* L.	Northangai	Rutaceae	Tree	E	Culti.	Fruit	MP	RA / UA
33. *Citrus limon* L.Burm.f.	Elumichi	Rutaceae	Shrub	E	Culti.	Fruit	MP	RA / UA
34. *Cocous nucifera* L.	Thangai	Arecaceae	Tree	E	Culti.	WP	MP	RA / UA
35. *Codiaeum variegatum* (L.) A. Juss.	Croton	Euphorbiaceae	Shrub	E	Culti.	WP	Orn	RA / UA
36. *Coleus amboinicus* (Lour) Spreng.	Navarapachilai	Lamiaceae	Herb	P	Culti.	WP	Med	RA / UA
37. *Crossandra infundibuliformis* (L.) Nees.	Kanagambaram	Acanthaceae	Herb	E/P	Culti.	WP	Orn	RA / UA
38. *Cucurbita moschata* Duchesne ex Peir.	Poosani	Cucurbitaceae	Cr.	E	Culti.	Fruit	Veg	RA / UA
39. *Cupressus lusitanica* (L.)	Cupressus	Cupresaceae	Tree	E/P	Culti.	WP	Orn	UA
40. *Curcuma longa* L.	Manjal	Zingiberaceae	Herb	E	Culti.	Rhizome	MP	RA / UA
41. *Dieffenbachieae bowmannii*	Croton	Araceae	Shrub	E	Culti.	WP	Orn	RA / UA
42. *Dioscorea esculenta* (L.)	Sirukizhangu	Dioscoreaceae	Cr.	E	Culti.	Tuber	Veg	RA / UA
43. *Dracaena sps.* Vand. Ex L.	Dracaena	Asparagaceae	Shrub	E/P	Culti.	WP	Orn	UA
44. *Epipremnum auream* (L.) Engl.	Money plant	Araceae	Cl.	E	Culti.	WP	Orn	RA / UA
45. *Ervatamia coronaria*	Kattu pichi	Apocynaceae	Shrub	E	Wild	WP	Orn	RA / UA
46. *Euphorbia milii* Des Moul.	Jesus thorn	Euphorbiaceae	Herb	P	Culti.	WP	Orn	RA / UA
47. *Ficus religiosa* Linn.	Arasu	Moraceae	Tree	E	Wild	WP	MP	RA / UA
48. *Helianthus annuus* L.	Suriyagandhi	Asteraceae	Herb	P	Culti.	WP	MP	RA / UA
49. *Hibiscus rosa-sinensis* Lin.	Sembaruthi	Malvaceae	Shrub	E	Culti.	WP	Orn	RA / UA
50. *Ixora coccinea* L.	Thetti	Rubiaceae	Shrub	E	Culti.	WP	Orn	RA / UA
51. *Jasminum grandiflorum* L.	Pichi	Oleaceae	Shrub	E/P	Culti.	WP	Orn	RA / UA
52. *Jasminum sambac* Linn.	Malligai	Oleaceae	Shrub	E/P	Culti.	WP	Orn	RA / UA
53. *Lagenaria siceraria* (Molina.) Standl.	Suraikai	Cucurbitaceae	Cr.	E	Culti.	Fruit	Veg	RA
54. *Lucas aspera* Spreng.	Thumbai	Lamiaceae	Herb	E	Wild	WP	Med	RA / UA
55. *Luffa cylindrica* M.Roam.	Peerkangai	Cucurbitaceae	Cl.	E	Culti.	Fruit	Veg	RA / UA
56. *Mangifera indica* L.	Mamaram	Anacardiaceae	Tree	E	Culti.	WP	MP	RA / UA
57. *Manihot esculenta* Crantz.	Maravalli	Euphorbiaceae	Shrub	E	Culti.	Tuber	Food	RA / UA
58. *Michelia champaca* Linn.	Golden chamba	Magnoliaceae	Shrub	E	Culti.	WP	Orn	RA / UA
59. *Mirabilis jalapa* L.	Anthimantharai	Nictaginaceae	Shurb	E	Culti.	WP	Orn	RA / UA
60. *Momordica charantia* L.	Pagarkai	Cucurbitaceae	Cl.	E	Culti.	Fruit	Veg	RA / UA
61. *Moringa oleifera* Lam.	Murungai	Moringaceae	Tree	E	Culti.	WP	MP	RA / UA
62. *Murraya koenigii* (L.) Spreng.	Curryvepillai	Rutaceae	Shrub	E	Culti.	Leaf	MP	RA / UA
63. *Musa paradisiaca* L.	Vazhai	Mucaceae	Tree	E	Culti.	WP	MP	RA / UA

64. Mussaenda forndosa Linn.	Mussanda	Rubiaceae	Tree	E/P	Culti.	WP	Orn	RA / UA
65. Nerium oleander Linn.	Neriuam	Apocynaceae	Shrub	E	Wild	WP	Orn	RA / UA
66. Ocimum tenuiflorum L.	Thulasi	Lamiaceae	Herb	E/P	Culti.	WP	Med	RA / UA
67. Phyllanthus niruri Linn.	Keezhanelli	Euphorbiaceae	Herb	E	Wild	WP	Med	RA / UA
68. Phyllanthus officinalis Linn.	Nelli	Euphorbiaceae	Tree	E	Culti.	Fruit	Med	RA / UA
69. Piper nigrum L.	Nalla milagu	Piparaceae	Cl.	E	Culti.	Fruit	MP	RA
70. Podocarpus sps Persoon..	Podocarpus	Podocarpaceae	Tree	E/P	Culti.	WP	Orn	RA / UA
71. Polianthus tuberosa L.	Sambangipoo	Asparagaceae	Herb	E	Culti.	WP	Orn	RA / UA
72. Portulaca oleracea L.	Pasalikeeri	Portulaceae	Herb	E/P	Culti.	Leaf	Veg	RA / UA
73. Psidium guajava L.	Koyya	Myrtaceae	Tree	E	Culti.	Fruit	Food	RA / UA
74. Punica granatum Linn.	Madulai	Lythraceae	Shrub	E	Culti.	Fruit	Food	RA / UA
75. Rosa sps. Linn.	Roja	Rosaceae	Shrub	E/P	Culti.	WP	Orn	RA / UA
76. Russelia equisetifolia Schlecht & Champ.	Coral blows	Scrophulariaceae	Herb	P	Culti.	WP	Orn	RA / UA
77. Sansevieria hyacinthoides (L) Druce.	Pambupachilai	Asaparagaceae	Herb	E/P	Culti.	WP	Orn	RA / UA
78. Solanum torvum Swarta.	Sundaikkai	Solanaceae	Shrub	E	Wild	Fruit	Veg	RA / UA
79. Tabernaemontana divaricata (Linn.) R.Br. ex. Roems.	Adukkunandhiavattai	Apocynaceae	Shrub	E	Culti.	WP	Orn	RA / UA
80. Tamarindus indica Linn.	Puliamaram	Caesalpinaceae	Tree	E	Wild	Fruit	MP	RA / UA
81. Tecoma stans (L.) Kunth.	Thanga arali	Bignoniaceae	Shrub	E	Culti.	WP	Orn	RA / UA
82. Tectona grandis Linn.	Thekku	Verbinaceae	Tree	E	Culti.	Wood	Fur.	RA / UA
83. Thespesia populnea (L.) Soland	Poovarasu	Malvaceae	Tree	E	Culti.	Wood	Fur.	RA
84. Trichosanthus anguina L.	Pudalangai	Cucurbitaceae	Cl.	E	Culti.	Fruit	Veg	RA / UA
85. Vigna unguiculata (Linn.) Walp.	Cowpea	Fabaceae	Herb	E	Culti.	Pod	Veg	RA
86. Vinca rosea (L.) G. Don.	Nithyakalyani	Apocynaceae	Herb	E	Wild	WP	Med	RA / UA
87. Vitex negundo L.	Nochi	Lamiaceae	Tree	E	Culti.	WP	Med	RA / UA
88. Zingiber officinale Roscoe.	Ginger	Zingiberaceae	Herb	E	Culti.	Rhizome	MP	RA
89. Zinnia peruviana (L.) L.	Zinnia	Asteraceae	Herb	E/P	Culti.	WP	Orn	UA

Main –Maintenance; Gr Con –Growing condition; Cr –Creeper; Cl –Climber; E –Earthen; P –Potted; Culti –Cultivated; WP –Whole plant; Orn –Ornamental; Med –Medicinal; Veg –Vegetable; MP –Multipurpose; Fru –Fruits;

Table II: Family-Genus-Species distribution pattern in the home gardens of overall (rural and urban) study areas.

Sl. No.	Family	Name of the species	Rural study area			Urban study area			Overall study area		
			NIPS*	% total /species	% total /family	NIPS*	% total /species	% total /family	NIPS*	% total /species	% total /family
1	Acanthaceae	*Crossandra infundibuliformis*	27	1.21	1.21	6	0.49	0.49	33	0.96	0.96
2	Amaranthaceae	*Amaranthus gangetics*	70	3.14	5.25	53	4.32	5.21	123	3.56	5.24
		Amaranthus viridis	14	0.63		8	0.65		22	0.64	
		Celosia argentea	33	1.48		3	0.24		36	1.04	
3	Anacardiaceae	*Mangifera indica*	60	2.69	2.69	26	2.12	2.12	86	2.49	2.49
4	Annonaceae	*Annona squamosa*	40	1.80	1.89	12	0.98	0.98	52	1.51	1.57
		Artobotrys hexapetalus	2	0.09		0	0.00	0	2	0.06	
5	Apiaceae	*Centella asiatica*	45	2.02	2.02	0	0.00	0	45	1.30	1.30
6	Apocynaceae	*Adenium obesum*	14	0.63	4.45	4	0.33	3.92	18	0.52	4.25
		Allamanda cathartica	7	0.31		4	0.33		11	0.32	
		Ervatamia coronaria	7	0.31		6	0.49		13	0.38	
		Nerium oleander	31	1.39		6	0.49		37	1.07	
		Tabernaemontana divaricata	8	0.36		6	0.49		14	0.41	
		Vinca rosea	32	1.44		22	1.79		54	1.56	
7	Araceae	*Anthurium andreanum*	18	0.81	4.89	17	1.38	4.48	35	1.01	4.75
		Areca catechu	52	2.33		0	0.00		52	1.51	
		Caladium bicolour	1	0.04		9	0.73		10	0.29	
		Caladium sps.	0	0.00		3	0.24		3	0.09	
		Dieffenbachieae bowmannii	16	0.72		9	0.73		25	0.72	
		Epipremnum auream	22	0.99		17	1.38		39	1.13	
8	Arecaceae	*Cocous nucifera*	186	8.35	8.35	126	10.26	10.26	312	9.03	9.03
9	Asparagaceae	*Dracaena sps.*	0	0.00	0.00	17	1.38	2.44	17	0.49	2.17
		Polianthus tuberosa	32	1.44	2.02	5	0.41		37	1.07	
		Sansevieria hyacinthoides	13	0.58		8	0.65		21	0.61	
10	Asteraceae	*Chrysanthemum coronarium*	22	0.99	1.12	19	1.55	2.52	41	1.19	1.62
		Helianthus annuus	3	0.13		3	0.24		6	0.17	
		Zinnia peruviana	0	0.00	0.00	9	0.73		9	0.26	
11	Auracariaceae	*Auracaria columnaris*	0	0.00	0.00	5	0.41	0.41	5	0.14	0.14
12	Basellaceae	*Basella alba*	12	0.54	0.54	7	0.57	0.57	19	0.55	0.55
13	Bignoniaceae	*Tecoma stans*	36	1.62	1.62	27	2.20	2.2	63	1.82	1.82

14	Caesalpinaceae	*Tamarindus indica*	30	1.35	1.35	15	1.22	1.22	45	1.30	1.30
15	Caricaceae	*Carica papaya*	30	1.35	1.35	37	3.01	3.01	67	1.94	1.94
16	Convolvulaceae	*Argyreia nervosa*	13	0.58	0.58	6	0.49	0.49	19	0.55	0.55
17	Cucurbitaceae	*Cucurbita moschata*	11	0.49	2.37	0	0.00	0	11	0.32	2.49
		Lagenaria siceraria	18	0.81		0	0.00	0	18	0.52	
		Luffa cylindrica	10	0.45		2	0.16	2.69	12	0.35	
		Momordica charantia	9	0.40		20	1.63		29	0.84	
		Trichosanthus anguina	5	0.22		11	0.90		16	0.46	
18	Cupresaceae	*Cupressus lusitanica*	0	0.00	0.00	2	0.16	0.16	2	0.06	0.06
19	Dioscoreaceae	*Dioscorea esculenta*	2	0.09	0.09	3	0.24	0.24	5	0.14	0.14
20	Euphorbiaceae	*Acalypa hispida*	0	0.00	0.00	2	0.16	4.4	2	0.06	5.09
		Acalypa indica	17	0.76	5.48	8	0.65		25	0.72	
		Codiaeum variegatum	20	0.90		9	0.73		29	0.84	
		Euphorbia milii	2	0.09		13	1.06		15	0.43	
		Manihot esculenta	26	1.17		2	0.16		28	0.81	
		Phyllanthus niruri	34	1.53		15	1.22		49	1.42	
		Phyllanthus officinalis	23	1.03		5	0.41		28	0.81	
21	Fabaceae	*Canavalia gladiata*	6	0.27	0.58	2	0.16	0.16	8	0.23	0.43
		Vigna unguiculata	7	0.31		0	0.00	0	7	0.20	
22	Lamiaceae	*Coleus amboinicus*	19	0.85	4.27	15	1.22	2.69	34	0.98	3.70
		Lucas aspera	24	1.08		10	0.81		34	0.98	
		Ocimum tenuiflorum	40	1.80		7	0.57		47	1.36	
		Vitex negundo	12	0.54		1	0.08		13	0.38	
23	Liliaceae	*Aloe vera*	31	1.39	1.39	26	2.12	2.12	57	1.65	1.65
24	Lythraceae	*Punica granatum*	12	0.54	0.54	8	0.65	0.65	20	0.58	0.58
25	Magnoliaceae	*Michelia champaca*	27	1.21	1.21	27	2.20	2.2	54	1.56	1.56
26	Malvaceae	*Hibiscus rosa-sinensis*	61	2.74	3.95	7	0.57	0.57	68	1.97	2.75
		Thespesia populnea	27	1.21		0	0.00		27	0.78	
27	Meliaceae	*Azadirachta indica*	43	1.93	1.93	11	0.90	0.9	54	1.56	1.56
28	Moraceae	*Ananas comosus*	30	1.35	3.91	0	0.00	0.65	30	0.87	2.75
		Artocarpus communis	12	0.54		0	0.00		12	0.35	
		Artocarpus heterophyllus	27	1.21		7	0.57		34	0.98	
		Artocarpus hirsutus	15	0.67		0	0.00		15	0.43	
		Ficus religiosa	3	0.13		1	0.08		4	0.12	
29	Moringaceae	*Moringa oleifera*	37	1.66	1.66	33	2.69	2.69	70	2.03	2.03
30	Mucaceae	*Musa paradisiaca*	87	3.91	3.91	106	8.63	8.63	193	5.59	5.59
31	Myrtaceae	*Psidium guajava*	36	1.62	1.62	28	2.28	2.28	64	1.85	1.85
32	Nyctaginaceae	*Bougainvillaea spectabilis*	12	0.54	2.07	5	0.41	3.26	17	0.49	2.49

		Mirabilis jalapa	34	1.53		35	2.85		69	2.00	
33	Oleaceae	*Jasminum grandiflorum*	52	2.33	4.49	15	1.22	2.36	67	1.94	3.73
		Jasminum sambac	48	2.16		14	1.14		62	1.79	
34	Piparaceae	*Piper nigrum*	30	1.35	1.35	0	0.00	0	30	0.87	0.87
35	Poaceae	*Bambusa arundinaceae*	11	0.49	0.49	6	0.49	0.49	17	0.49	0.49
36	Podocarpaceae	*Podocarpus sps*	4	0.18	0.18	6	0.49	0.49	10	0.29	0.29
37	Portulaceae	*Portulaca oleracea*	25	1.12	1.12	33	2.69	2.69	58	1.68	1.68
38	Rosaceae	*Rosa sps.*	37	1.66	1.66	155	12.62	12.62	192	5.56	5.56
39	Rubiaceae	*Ixora coccinea*	58	2.60	3.09	20	1.63	1.96	78	2.26	2.69
		Mussaenda forndosa	11	0.49		4	0.33		15	0.43	
40	Rutaceae	*Citrus aurantium*	30	1.35	4.18	3	0.24	2.77	33	0.96	3.68
		Citrus limon	21	0.94		5	0.41		26	0.75	
		Murraya koenigii	42	1.89		26	2.12		68	1.97	
41	Sapotaceae	*Achras zapota*	17	0.76	0.76	3	0.24	0.24	20	0.58	0.58
42	Scrophulariaceae	*Russelia equisetifolia*	24	1.08	1.08	2	0.16	0.16	26	0.75	0.75
43	Solanaceae	*Capsicum frutescens*	40	1.80	2.74	5	0.41	0.65	45	1.30	1.99
		Solanum torvum	21	0.94		3	0.24		24	0.69	
44	Verbinaceae	*Callicarpa tomentosa*	7	0.31	1.61	0	0.00		7	0.20	1.36
		Tectona grandis	29	1.30		11	0.90	0.9	40	1.16	
45	Zingiberaceae	*Curcuma longa*	30	1.35	2.92	1	0.08	0.08	31	0.90	1.91
		Zingiber officinale	35	1.57		0	0.00		35	1.01	
* - Number of individuals per species			2227	100.00		1228	100.00		3455	100.00	