

EXPLORATION OF ORNAMENTAL FLORAS IN THE CAMPUS OF S.T. HINDU COLLEGE, NAGERCOIL, KANYAKIMARI DISTRICT, TAMILNADU, INDIA

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ABSTRACT

Most of the present day flowers have come from the wild progenitors, a few of which still exist in natural habitat. Ornamental flowers are highly promising and unutilized resources having tremendous and prover economic importance. Ornamental plants accompany people, since their birth to death and they co-exist with almost all happy events in life such birthday celebrations, weddings, carrier progress etc. In addition, they form our best partners in our everyday life in our flats, offices, different public spaces, parks, gardens and elsewhere. An extensive floristic survey was conducted during the year 2015. Taxonomic identification, photographic documentation and ornamental characterization of each species with potential for use on floral art were recorded. The methodology used is based on observation method for the determination of flora. All the specimens collected were identified with the help of recent literature. The field expeditions of study area gave interesting results concerning floristic diversity.

Keywords: Ornamental flowers, domestication, floristic diversity and methodology.

1. INTRODUCTION

Ornamental flowers are highly promising and unutilized resources having tremendous and prover economic importance (Jenomics, 2014). Ornamental plants accompany people, since their birth to death and they co-exist with almost all happy events in life such birthday celebrations, weddings, carrier progress etc. In addition, they form our best partners in our everyday life in our flats, offices, different public spaces, parks, gardens and elsewhere (Arora, 2013). They are an inseparable part of the culture of all nations and nationalities. This is the reason, why people since time immemorial have tried to improve or change flowers and other ornamental plants according to their imagination, dreams and practical aspects of planting.

2. MATERIALS AND METHODS

2.1. Floristic Survey

An extensive floristic survey was conducted during June - November 2015. Taxonomic identification, photographic documentation and ornamental characterization of each species with potential for use on floral art were recorded. The methodology used is based on observation method for the determination of flora. All the specimens collected were identified with the help of recent

literature by local floras authored by Hooker, (1972-1987), Gamble and Fischer, (1915-1935) and Henry *et al.*, 1989.

3. RESULTS AND DISCUSSION

The field expeditions of study area gave interesting results concerning floristic diversity. A total of 108 plant species are present in this study area (Table -I). Among the species, dicots were distributed in 36 families with 74 species, monocots in 13 families with 28 species; pteridophytes are in 4 families with 4 species and gymnosperms in 2 families with 2 species, 22 plant species are wild, 72 species are significantly ornamental and 14 plant species are wild or cultivated. When the percentage distributions are calculated it is found that 68.5% of dicots, 25.09% of monocots, 3.7% of pteridophytes, 1.8% of gymnosperms are present. This profiling indicated that the maximum ornamentals are dicots following monocots gymnosperms, pteridophytes and cacti. Among the total identified plants, Acanthaceae is dominant family 14.28. When the percentage distribution is calculated it is found that 68.5% of dicots, 25.09% of monocots, 3.7% of pteridophytes, 1.8% of gymnosperms are present.

The classification of the ornamental flora based on the diversity of its utilization indicating that the maximum 4 of the plant can be used as aquatic ornamentals followed by 22 species as

ornamentals trees, 24 species as ornamental shrubs, 27 species as ornamental herbs, 16 species as ornamental hedges and fencing, 4 species as ornamental succulents and cacti, 11 species as ornamental climbers 2. Regarding the habit wise distribution of identified plants, 22 species as trees, 48 species as herbs, 26 species as shrubs, 4 species as climbers and 8 species as succulents, 2 species can be used as ornamental foliage followed by 1 species

as carpet bedding, 7 species as mixed borders, 6 species as bushy and upright foliage, 3 species used in topiary formations and also, 3 species are used as ornamental palms, 2 species ornamental ferns, 15 species are recommended for railway lines 18 species are recommended for town roads, 2 species as dry wall, 3 species as topiary and 3 species as a roof gardening (Table 2-4).

Table 1. Number of plants and its family, habits in the study area.

S.No.	Plant Names	Family	Habits	Wild/ Cultivated
1*	<i>Adathoda vasica</i> Nees.	Acanthaceae	S	W
2.*	<i>Allamanda cathartica</i> L.	Apocynaceae	S	C
3.*	<i>Albizzi ajulibrissin</i> L.	Mimosaceae	T	C
4.**	<i>Aloe sps</i>	Liliaceae	Su	C
5.*	<i>Albizzi alebbeck</i> L.	Mimosaceae	T	C
6.**	<i>Alocasi amacrorhiza</i> L.	Araceae	H	C
7.**	<i>Anthurium sps</i>	Araceae	H	C
8.	<i>Araucaria sps</i>	Araucariaceae	T	C
9.*	<i>Aristolochia indica</i> L.	Aristolocaceae	H	W
10.**	<i>Asparagus racemosus</i> Willd.	Liliaceae	CL	C
11.*	<i>Azadirachta indica</i> A.Juss	Meliaceae	T	C
12.*	<i>Balsam impatiens</i> Royle.	Balsamnaceae	H	C
13.*	<i>Barleria prionitis</i> L.	Acanthaceae	H	W
14.**	<i>Beaureare curvata</i> Lem.	Agavaceae	S	C
15.*	<i>Begonia floccifera</i> L.	Bignoniaceae	H	C
16.*	<i>Bougainvillea spectabis</i> Wild.	Nyctaginaceae	CL	C
17.*	<i>Caesalpinia pulcherrima</i> L.	Caesalpinaceae	S	C
18.**	<i>Caladium bicolor</i> Vent.	Araceae	H	C
19.*	<i>Callistemon citrinus</i> L.	Myrtaceae	T	C
20.*	<i>Calotropis gigantean</i> L.	Asclepiadaceae	S	W
21.**	<i>Caryota urens</i> L.	Areaceae	T	W
22.*	<i>Cassia biflora</i> L.	Caesalpinaceae	S	W
23.*	<i>Cassia fistula</i> L.	Caesalpinaceae	T	C
24.**	<i>Casuarina equisetifolia</i> L.	Casurinaceae	T	C
25.*	<i>Catharanthus roseus</i> L.	Apocynaceae	S	C
26.**	<i>Chlorophytum cosmosum</i> Thumb.	Liliaceae	H	C
27.**	<i>Cissus quadrangularis</i> L.	Vitaceae	Su	C
28.*	<i>Clerodendrum speciosum</i> L.	Verbenaceae	H	C
29.*	<i>Clitoria ternatea</i> L.	Fabaceae	CL	C
30.*	<i>Codiaeum variegatum</i> L.	Euphorbiaceae	S	C
31.*	<i>Coleus amboinicus</i> Lour.	Lamiaceae	H	C
32.*	<i>Coleus blumei</i> Benth.	Lamiaceae	H	C/W
33.**	<i>Commelina benghalensis</i> L.	Commelinaceae	H	W
34.**	<i>Cordyline sps</i>	Liliaceae	S	C
35.*	<i>Crescentia cujete</i> L.	Bignoniaceae	T	C
36.**	<i>Crinum amboinensis</i> L.	Amaryllidaceae	H	C/W
37.**	<i>Crinum powellii</i> Baker.	Amaryllidaceae	H	C/W
38.*	<i>Crossandra nilotica</i> Oliv.	Acanthaceae	H	C/W
39.*	<i>Cryptostegia grandiflora</i> Roxb.	Asclepiadaceae	S	C/W
40.	<i>Cycas revolute</i> L.	Cycadaceae	T	C
41.*	<i>Delonix regia</i> Hook.	Caesalpinaceae	T	C/W

42.**	<i>Dieffenbachia picta</i> Schott.	Araceae	S	C/W
43.**	<i>Dracaena</i> sps	Liliaceae	S	C
44.△	<i>Dryopteris</i> sps	Dryopteridaceae	H	C
45.*	<i>Duranta plumeri</i> Jacq.	Verbenaceae	S	C
46.**	<i>Eichhornia crassipes</i> Solms.	Pontederiaceae	H	W
47.*	<i>Eranthemum tricolor</i> W.Bull	Acanthaceae	S	C
48.*	<i>Euphorbia antiquorum</i> L.	Euphorbiaceae	Su	C
49.*	<i>Euphorbia heterophylla</i> L.	Euphorbiaceae	H	W
50.*	<i>Euphorbia milli</i> Moul.	Euphorbiaceae	H	C
51.*	<i>Galphimia glauca</i> Bartl.	Malphiginaceae	CL	C
52.**	<i>Gompherena globosa</i> L.	Amaranthaceae	H	W
53.*	<i>Heliotropium indicum</i> L.	Boraginaceae	H	W
54.*	<i>Hemigraphis alternate</i> Burm .(f)	Acanthaceae	H	C
55.*	<i>Hibiscus rosinensis</i> L.	Malvaceae	S	C/W
56.*	<i>Hibiscus schizopetalous</i> L.	Malvaceae	S	C
57.*	<i>Hippestrum hybridum</i> L.	Acanthaceae	H	C
58.*	<i>Ixora coccinea</i> L.	Rubiaceae	H	C
59.*	<i>Jacaranda mimosifolia</i> D.Don	Mimosaceae	T	W
60.*	<i>Jasminum sambac</i> L.	Oleaceae	H	C
61.*	<i>Jatropha hastate</i> Jacq.	Acanthaceae	S	C
62.**	<i>Kalanchoebioss feldiana</i> L.	Crassulaceae	H	C/W
63.*	<i>Kleinia grandiflora</i> L.	Asteraceae	H	C
64.*	<i>Lantana camera</i> L.	Verbenaceae	H	C/W
65.*	<i>Lawso niainermis</i> L.	Lythraceae	S	C/W
66.△	<i>Microsorium pustulatum</i> Coper.	Polypodiaceae	H	C
67.*	<i>Mirabillis jalaba</i> L.	Nyctaginaceae	H	C
68.**	<i>Mamilaria baumii</i> L.	Cactaceae	Su	C
69.*	<i>Morinda coriea</i> L.	Rubiaceae	T	W
70.*	<i>Muntingia calabura</i> L.	Tiliaceae	T	C
71.*	<i>Mussaenda frondosa</i> L.	Rubiaceae	S	C
72.*	<i>Nymphae</i> sps	Nymphaeaceae	H	C
73.*	<i>Opuntia dillenii</i> L.	Opuntiaceae	Su	C
74.*	<i>Opuntia rhodantha</i> Mill.	Opuntiaceae	Su	C
75.*	<i>Orthosiphon spiralis</i> Lour.	Lamiaceae	H	C
76.*	<i>Oxalis corniculata</i> L.	Oxalidaceae	H	W
77.*	<i>Passiflora foetida</i> L.	Passifloraceae	CL	W
78.*	<i>Peltophorum pterocarpum</i> Roxb.	Fabaceae	T	W
79.**	<i>Phoenix</i> sps	Palmae	T	C
80.**	<i>Pistia stratiotes</i> L.	Araceae	S	C
81.*	<i>Plumeriarubra</i> L.	Apocynaceae	S	C
82.*	<i>Podranea brycei</i> L.	Bignoniaceae	H	C
83.*	<i>Polyalthia longifolia</i> L.	Annonaceae	T	C
84.**	<i>Polyscias bulfourana</i> Andre.	Araliaceae	H	C
85.*	<i>Quiqualis indica</i> L.	Combretaceae	S	C
86.*	<i>Pongamia pinnata</i> L.	Fabaceae	T	W
87.**	<i>Rhoeo spathacea</i> (sw)	Commelinaceae	H	C
88.*	<i>Ruelia tuberosa</i> L.	Acanthaceae	H	W
89.*	<i>Rueliat weediana</i> Griseb.	Acanthaceae	H	C
90.*	<i>Russeli aequisetiformis</i> L.	Scrophulariaceae	H	C
91.△	<i>Salvinia molesta</i> L.	Salvinaceae	H	C
92.**	<i>Sanseveria trifurcate</i> L.	Convolvulaceae	H	C
93.**	<i>Sanseveria roxburgiana</i> Schult.	Convolvulaceae	Su	C
94.*	<i>Saraca asoka</i> Roxb.	Fabaceae	T	C/W
95.△	<i>Selaginella</i> sps	Selaginellaceae	H	C

96.*	<i>Stylosanthe shamata</i> L.	Fabaceae	T	W
97.**	<i>Setcreasea purpurea</i> Boom.	Commelinaceae	H	C
98.*	<i>Swienteni amahagoni</i> L.	Meliaceae	T	W
99.*	<i>Santalum album</i> L.	Santalaceae	T	C
100.*	<i>Tectona grandis</i> L.F	Verbenaceae	S	C/W
101.*	<i>Tecoma stans</i> L.	Bignoniaceae	S	C
102.*	<i>Tecomaria capensis</i> Thumb.	Bignoniaceae	S	C
103.*	<i>Terminalia catappa</i> L.	Combretaceae	T	C
104.*	<i>Thespesia populnea</i> L.	Malvaceae	T	W
105.*	<i>Thunber giaerecta</i> Benth.	Acanthaceae	H	C
106.*	<i>Tabernaemontana coronaria</i> Schut.	Apocynaceae	S	C
107.*	<i>Trapanatans</i> L.	Trapaceae	H	W
108.*	<i>Tridax procumbens</i> L.	Asteraceae	H	W

H = Herb; * Dicot; S = Shrub; **Monocot; T = Tree; Δ Pteridophytes; Cl = Climber; \square Gymnosperms; W = Wild; C = Cultivated; Su= Succulent

Table 2. Cotyledons wise distribution

Sl. No	Nature of the plant	No. of Plants	%
1.	Monocots	28	25.9
2.	Dicots	74	68.5
3.	Pteridophytes	4	3.7
4.	Gymnosperms	2	1.8

Table 3. Characterization of the recorded flora according to the ornamental utilization

S.No	Ornamental Utility	Name of the plants
1.	Aquatic ornamentals	<i>Trapanatans, Salviniamolesta, Nymphaea</i> sps, <i>Pistia stratiotes, Eichhornia crassipes</i> . (4)
2.	Ornamental trees	<i>Azadirachta indica, Caryota urens, Araucaria</i> sps, <i>Cassia fistula, Cycas revoluta, Casuarina equisetifolia, Callistemon citrinus, Crescentiacujete, Delonix regia, Jacaranda mimosifolia, Thespesia populnea, Morinda coriea, Polyalthia longifolia, Pongamia pinnata, Peltophorum pterocarpum, Plumeria rubra, Muntingia calabura, Albizzia julibrissin, Albizzia lebbeck, Terminala catappa, Santalum album, Swietenia mahagoni</i> (22)
3.	Ornamental shrubs	<i>Tectona grandis, Tecomaria capensis, Tecomastans, Russeliae quisetiformis, Phoenix</i> sps, <i>Polyscias bulfourana, Mussaenda frondosa, Lantana camera, Lawsonia inermis, Jatropaha stata, Ixora coccinea, Hibiscus schizopetalous, Hibiscus rosasinesis, Hippestrum hybridum, Hemigraphis alternate, Eranthemum tricolor, Dracaena</i> sps, <i>Duranta plumerie, Dieffenbachia pictata, Calotropis gigantea, Chlolrophytum cosmosum, Cordylinesps, Cassia biflora, Adathoda vasica</i> (24).
4.	Ornamental herbs	<i>Alocasia macrorhiza, Aristalochaia indica, Barleria prionitis, Balsam impatiens, Begonia fiocifera, Caladium bicolorur, Cathranthus roseus, Commelinea benghalensis, Crinum powellii, Crinum amboinensis, Coleus blumei, Coleus amboinicus, Euphorbia heterophylla, Clerodendrum speciosum, Gompherena globosa, Hippestrum hybridum, Keleinia grandiflora, Mirabilis jalapa, Oxalis corniculata, Stylosanthus hamatus, Rhoospa thacea, Ruelia tweediana, Ruelia tuberosa, Orthosiphon spiralis, Tridax procumbens, Setrea seapurpurea, Sanseveria roxburghiana, Sanseveria trifuscata.</i> (27)
5.	Ornamental Hedge	<i>Polyalthia longifolia, Casuarina equisetifolia, Albizzia lebbeck, Bougainvillea spectabilis, Delonixregia, Callistemon citrinus, Azadiracta indica, Jacaranda mimosifolia, Plumeria rubra, Pongamia pinnata, Muntingia calabura, Santalam album, Thespesia populnea, Hibiscus rosasinensis, Tecomastans, Tecomaria capensis.</i> (16)
6.	Ornamental	<i>Euphorbia antiquorum, Mamillaria baumii, Opuntia dilleni, Opuntia</i>

	succulent & cacti	<i>rhodantha</i> .(4)
7.	Ornamental climber	<i>Allamanda carthartica</i> , <i>Asparagus race mosus</i> , <i>Cryptostegia grandiflora</i> , <i>Bougainvillea spectabilis</i> , <i>Clitoriaternatea</i> , <i>Cissus quadrangularis</i> , <i>Galphimia glauca</i> , <i>Jasminum sambac</i> , <i>Passiflora foetida</i> , <i>Quiqualis indica</i> , <i>Thunber giaerecta</i> .(11)
8.	Ornamental foliage	<i>Alocasia macrorhiza</i> , <i>Coleus blumei</i> , <i>Cordyline sps</i> , <i>Codiaeum variegatum</i> , <i>Caladium bicolour</i> , <i>Dieffenbachia picta</i> , <i>Dracenasps</i> , <i>Dryopteris sps</i> , <i>Chlorophytum cosmosum</i> , <i>Kleinia grandiflora</i> , <i>Phoenix sps</i> , <i>Micorosorum pustulatum</i> , <i>Sanseveria trifuscata</i> , <i>Sanseveria roxburgiana</i> , <i>Begonia flocifera</i> , <i>Asparagus racemosus</i> , <i>Cycasrevoluta</i> , <i>Setreasea purpurea</i> , <i>Commelina benghalensis</i> , <i>Anthurium sps</i> . (20)
9.	Carpet bedding	<i>Coleus blumei</i> .(1)
10.	Mixed Border	<i>Euphorbia heterophylla</i> , <i>Tecomastans</i> , <i>Thunber giaerecta</i> , <i>Catharathus roseous</i> , <i>Crossandra nilotica</i> , <i>Caesalpinia pulcherrima</i> , <i>Tecomaria capensis</i> . (7)
11.	Trailers	<i>Setcrea seapurpurea</i> , <i>Chlorophytum comosum</i> .(2)
12.	Bushy & upright foliage	<i>Aracucaria sps</i> , <i>Begonia flocifera</i> , <i>Cordyline sps</i> , <i>Dieffenbachia picta</i> , <i>Dracena sps</i> , <i>Setcreasea purpurea</i> .(6)
13.	Topiary	<i>Bougainvillea spectabilis</i> , <i>Clerodendrum speciosum</i> , <i>Durantaplumerri</i> .(3)
14.	Ornamental palms	<i>Cycasrevoluta</i> , <i>Phoenix</i> , <i>Caryotaurens</i> .(3)
15.	Ornamental ferns	<i>Microsorium pustutatum</i> , <i>Selaginella sps</i> .(2)
16.	Ornamental trees recommended for town roads	<i>Polyalthia longifolia</i> , <i>Saracaasoca</i> , <i>Delonix regia</i> , <i>Tecoma stans</i> , <i>Azodirachta indica</i> , <i>Muntingia calabura</i> , <i>Albizzi ajulibrissin</i> , <i>Cassia fistula</i> , <i>Callistemon citrinus</i> , <i>Thespesia populnea</i> , <i>Pongamia pinnata</i> , <i>Jacaranda mimosifolia</i> , <i>Cresentia cujete</i> , <i>Albizzia lebbeck</i> , <i>Peltophoruminerne</i> , <i>Terminalia catappa</i> , <i>Santalum album</i> , <i>Swietenia mahagoni</i> .(18)
17.	Ornamental trees recommended for Railway line.	<i>Albizzia lebbeck</i> , <i>Peltophorump terocarpum</i> , <i>Terminalia catappa</i> , <i>Santalum alum</i> , <i>Swietenia mahagoni</i> , <i>Delonix regia</i> , <i>Cassia fistula</i> , <i>Pongamia pinnata</i> , <i>Thespesia populnea</i> , <i>Albizzia julibrissin</i> , <i>Saracaasoca</i> , <i>Azadiracta indica</i> , <i>Polyalthia longifolia</i> , <i>Jacaranda mimosifolia</i> , <i>Cresentiacujete</i> .(15)
18.	Dry wall	<i>Oxalis corniculata</i> , <i>Selaginella sps</i> .(2)
19.	Hanging baketes	<i>Alocasia macrorhiza</i> , <i>Anthurium sps</i> , <i>Mamillaria baumii</i> , <i>Caladium bicolour</i> , <i>Chlorophytum comosum</i> , <i>Cissus qudrangularis</i> , <i>Commelina benghalensis</i> , <i>Dryopteris sps</i> , <i>Microsorium pustalatum</i> (9)
20.	Roof gardening	<i>Bougainvillea spectabilis</i> , <i>Plumeriarubra</i> , <i>Passiflora foetida</i> .(3)

Table 4. Habitat wise distribution of identified plants

Sl. No	Habitat	No. of Plants
1.	Climber	4
2.	Succulent	8
3.	Shrub	26
4.	Herb	48
5.	Tree	22

Landscape gardening and bio-aesthetic planning is a recent trend to establish eco-friendly human habitats. Exploration of collection and conservation of wild and cultivated ornamental species is also one of the cultural methods to maintain the diversity of the species and conserve to endemic and endangered species of ornamental interest. There is a lot of significance in recent year for the ornamental species in the utilization of various kinds and is the income generation among

poor also in the export market of India. Wild ornamental species are also the sources for the medicinal significance (Asati and Yadav, 2010) so the ornamental germplasm relatives are to be conserved. In the development for new hybrids, polyploidy mutation of ornamental interest it is essential to know ornamental species. The dynamic floriculture industry is constantly looking for new products, technology and market riches.

Over-exploitation by humans, both for direct consumption and also for botanical and horticulture value, also threatens wild ornamentals. Grassland reclamation programmes and overgrazing by cattle have had a debilitating effect on these wild species. Fragmentation of extensive habitats into small isolated patches can mean that they become too limited to maintain their plant populations. Fragmentation seems to reduce genetic variation and seedling vigour. Natural disasters have also played a role in species extinction. Even protected areas cannot be expected to safeguard plants from the effects of disasters such as volcanoes, fires, airborne pollutants, droughts and landslide.

This process is largely based on research and development and requires strong collaboration between many links of the production chain most modern scientific research in the field of new ornamental crops deals with the adaptability of new species to the environmental and the regulation of their life cycle or propagation systems. New ornamental products can be developed by researches and breeders only in collaboration with efficient producers and satisfied consumers, linked together in mutually beneficial ways. It is very easy for the propagation of wild species by traditional propagation methods. The cost of domestication and

maintenance of ornamental species is also very less in comparison. We hope this work will help the researches and people who are interested in ornamental plants.

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