Original Article

Systematic Studies on Ornamental Plants of the Apocynaceae Family in Kanyakumari District, Tamil Nadu, India

REJITHA. S[1], UMA DEVI. S[2] AND JOHNSI CHRISTOBEL. G[3]

[1]Ph. D Research Scholar, Reg. No. 19213112262049, Department of Botany, Nesamony Memorial Christian College, Marthandam, Affiliated to Manonmanium Sundaranar University Abishekapatti, Tirunelveli- 627012, Tamil Nadu, India

[2]Asst. Prof. Department of Botany, Sree Ayyappa College for Women, Nagercoil, Affiliated to Manonmanium Sundaranar University Abishekapatti, Tirunelveli- 627012, Tamil Nadu, India. E-mail:

[3]Asst. Prof and Head, Department of Botany, Nesamony Memorial Christian College, Marthandam, Affiliated to Manonmanium Sundaranar University Abishekapatti, Tirunelveli- 627012, Tamil Nadu, India.

DOI: 10.47750/pnr.2022.13.S08.148

Abstract

A systematic investigation was done on the Apocynaceae family that is found growing all around the Kanyakumari District in Tamil Nadu, India. We gathered and identified a total of 17 species from the 12 genera in the family Apocynaceae. A complete taxonomic account of each species has been given along with their current name, common name, brief description and phenology. Based on morphological and floral characteristics, a classification of the Apocynaceae family has been proposed.

Keywords: Apocynaceae, Kanyakumari District, Ornamental Plants, Systematic Study

INTRODUCTION

Apocynaceae is a family of angiosperms, which is known as dogbane family or oleander family. This family, which is a member of the Gentianales order, historically consists of about 155 genera and 2000 species, most of which are found in the tropics and subtropics and are only very infrequently found in temperate climates (Cronquist, 1981). The Order Gentianales, which also includes the four other families Gelseminaceae, Gentianaceae, Loganiaceae and Rubiaceae (APG IV, 2016). The Apocynaceae family is organised into five subfamilies, 25 tribes, and 49 subtribes according to APG IV classification. Apocynoideae, Asclepiadoideae, Periplocoideae, Rauvolfioideae and Secamonoideae are the subfamilies. The largest subfamily is Asclepiadoideae, which has five tribes, fifteen subtribes and 164 genera. Rauvolfioideae is second, with eleven tribes, seventeen subtribes and 83 genera. Apocynoideae has nine tribes, seventeen subtribes and 82 genera. There are 33 genera in the Periplocoideae and 8 in the Secamonoideae (Endress *et al*., 2014; APG IV, 2016).

The current investigation was carried out in Tamil Nadu, Kanyakumari District, India. The southernmost point of the Indian Peninsula is the Kanyakumari District. The Kanyakumari District is located between latitudes $8^{o}05^{l}$ and $8^{o}35^{l}$ in the north and longitudes $77^{o}05^{l}$ and $77^{o}35^{l}$ in the east. The Kanyakumari district experiences a warm and humid environment. The average monthly temperature ranged from 32.6°C at its highest point in May to 22.5°C at its lowest point in December. Elevation ranges from sea level to 1829 m above sea level, and rainfall ranges from 103 cm to 310 cm. The soil is red, varying in the quantity of ferruginous element. The purpose of the current study was to catalogue the Apocynaceae family's ornamental plant flora in Kanyakumari District.

MATERIALS AND METHODS

Systematic investigation on the family Apocynaceae growing throughout the Kanyakumari District, Tamil Nadu, India was carried out during 2019–2021. A survey on the determination of the location of different species was made and a list was prepared to be acquainted with the Apocynaceae available in the selected area. All the species were noted and from periodically the areas were visited to see when they flowered. For the morphological study, different types of species were examined five to six sampling were carried out in order to

see if there was any variation or not. Samples of several plants were gathered and morphology, habitat and location details were noted. Photographs of plant samples were used to obtain and illustrate floral and vegetative characters which are necessary for more accurate identification. It was dealt with and thoroughly investigated how the differences and similarities between the actual plants in the field and the dried specimens in the herbarium.

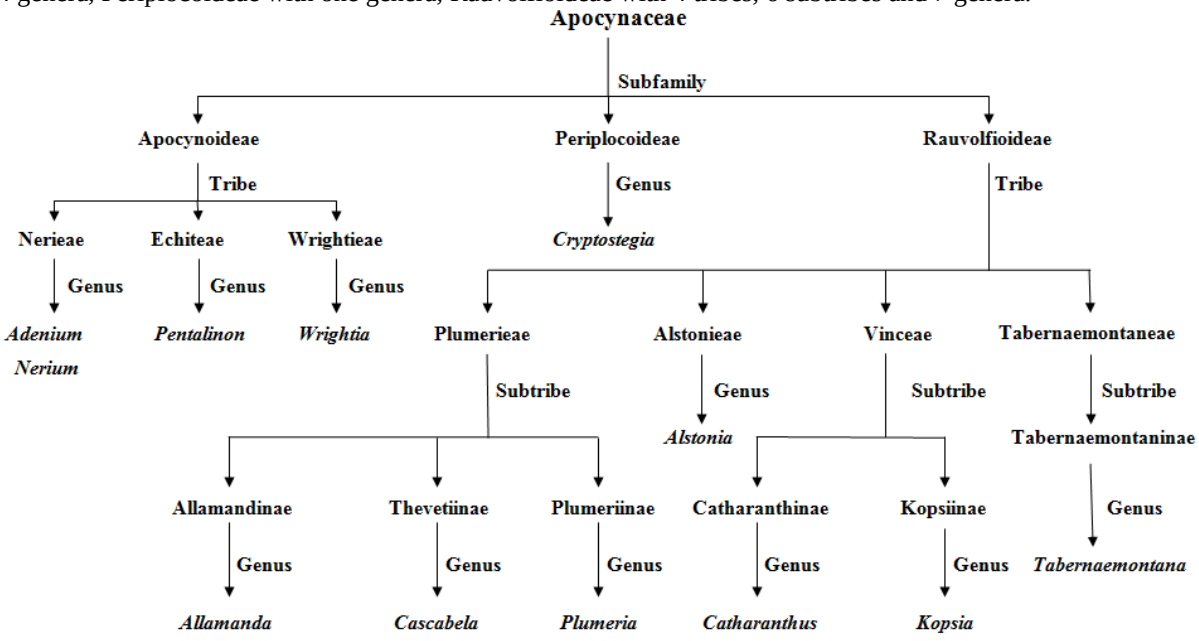
Apocynaceae family have been reviewed based on the various informative web sites, using herbarium library materials in addition to accurate examination of the samples by dissecting microscope to get more detail properties of any parts of plant needed to be taken in consideration. The literature and herbarium material that was accessible were used to review the characteristics of each individual species. All of the collected plant specimens were stored in the herbarium at the Nesamony Memorial Christian College Marthandam. In order to identify the gathered specimens, the relevant taxonomic books and pamphlets were consulted. With the aid of **[19], [20], [36], [37]**, the majority of the obtained items were recognised and characterised upto species.

RESULTS

Systematic investigation was done on the Apocynaceae family that is found growing all around the Kanyakumari District in Tamil Nadu, India. A total of 17 species under 12 genera of the family Apocynaceae were collected and identified. A complete taxonomic account of each species has been given along with their current name, common name, brief description and phenology. The majority of the species, including *Adenium obesum*, *Allamanda cathartica*, *Catharanthus roseus*, *Nerium oleander*, *Plumeria rubra* and *Tabernaemontana divaricata* were dispersed throughout the research region.

The classification of the Apocynaceae family has been suggested based on the current study:

In the present study, the selected 17 species belongs to 3 subfamilies, 7 tribes, 3 subtribes and 12 genera. Apocynoideae, Periplocoideae and Rauvolfioideae are the subfamilies. Apocynoideae with 3 tribes and 4 genera, Periplocoideae with one genera, Rauvolfioideae with 4 tribes, 6 subtribes and 7 genera.



The Apocynaceae Family: A Key

1a- The leaf arrangement was whorled type with 5 leaves …... *Allamanda schottii*
1b- The leaf arrangement was whorled type with 7 leaves …... *Alstonia scholaris*
2a- The leaf has revolute and undulate margin ……..…… *Allamanda cathartica*
2b- The leaf has entire and undulate margin ……..… *Tabernaemontana divaricata*
3a- The inflorescence type is corymb ……..….. *Adenium obesum*
3b- The inflorescence type is solitary or dichasial cyme ……... *Catharanthus roseus*
4a- The bract was truncate shape and black color ……..… *Plumeria obtusa*
4b- The bract was acute shape and brown color ……. *Plumeria pudica*

5a- The flowers are trumpet shape and calyx apex is acute to subacute ……..... *Allamanda blanchetii*
5b- The flowers are salverform and calyx apex is rounded ….. *Kopsia fruticosa*
6a- The corolla lobe was truncate to obtuse and overlapping to the left side ……..... *Cascabela thevetia*
6b- The corolla lobe was obtuse to rounded and overlapping to the right side …… (10)
7a- The outer of the cylindrical corolla tube is violet color ….. *Cryptostegia grandiflora*
7b- The outer of the cylindrical corolla tube is white color ….. *Wrightia antidysenterica*
8a- The appendages are glabrous and twirled together ….....… *Pentalinon luteum*
8b- The appendages are pubescent and twirled together …….. *Nerium oleander*
9a- The fruit was linear to ellipsoid shape ……..…… *Plumeria rubra*
9b- The fruit was boat shape ……..…....…… *Tabernaemontana alternifolia*

By examining the plant materials collected from the study area using the identification methods, systematic information was accumulated and described below.

1. *Adenium obesum* (Forssk.) Roem. & Schult. Common Name: Desert Rose, Impala Lily, Sabi Star.

Deciduous succulent shrub with golden color latex; alternate type of leaf arrangement. Leaves are subsessile, green to dark green, pubescent or glabrous; linear, obovate, oblong or obcordate shape, pinnate venation. Inflorescence was corymb; flowers funnel or trumpet shape, white, pink and red color, 6.4–10.7 × 3.8–9.8 cm. The bracteole present and bract absent. Calyx 5, polysepalous and quincuncial aestivation. Corolla twisted aestivation, 1–4 whorls of petal lobes. Androecium placed at the base of the swollen corolla tube; anther 1–10, sagittate with apical appendage; stigma dumb-bell shape, superior ovary; follicle fruits and cylindrical seeds. Phenology: Throughout the year.

2. *Allamanda blanchetii* A.DC. Common Name: Cherry Allamanda, Purple Allamanda

Climber with milky latex; stem violet to green color and pubescent; leaf arrangement was whorled type with 3–4 leaves; green to dark green, pubescent, ovate or lanceolate shape, entire margin, pinnate venation. Inflorescence was terminal cyme; flowers trumpet shaped, light pink to red color, 8.1–13.8 × 5–12.6 cm. Bract present and bracteole absent. Calyx 5, polysepalous and quincuncial aestivation; corolla 5 obtuse petal lobes with corolla tube, twisted aestivation. Androecium placed at the base of the swollen corolla tube; anthers 5, sagittate; stigma drum shape, superior ovary with nectary disc. Phenology: Throughout the year.

3. *Allamanda cathartica* L. Mant. pl. 214. 1771; Gamble, Fl. Madras 2: 821 (577). 1923; Bor & Raiz. Beautif. Ind. climbers shrubs 196. 1954; Huber in Abeyw. Rev. Handb. Fl. Ceylon 1 (1): 2. 1973; Matthew, Fl. Tamilnadu Carnatic 257. 1981–1983; *Allamanda cathartica* L. var. nobilis Bailey, Stand. Cyclop. Hort. 1: 246. 1914. Common Name: Brown Bud Allamanda, Golden Allamanda, Golden Trumpet, Yellow Allamanda.

Climbing shrub, green to violet color stem with milky latex; whorled or opposite type of leaf arrangement; leaves glabrous or pubescent, dark green, elliptic or lanceolate shape, revolute, entire or undulate margin, pinnate venation. Inflorescence terminal cyme or dichasial cyme, peduncle with bracts. Flower trumpet shape, yellow color, 9.1–14.5 × 4.7–12.1 cm; calyx 5, polysepalous and quincuncial aestivation; corolla 1–3 whorls of petal lobes, rounded or obtuse lobes and twisted aestivation. Androecium placed at the base of the swollen corolla tube; anther 1–5, sagittate; stigma drum shape; superior ovary with nectary disc. Phenology: Throughout the year.

Adenium obesum	***Allamanda blanchetii***	***Allamanda cathartica***	***Allamanda schottii***
			

4. *Allamanda schottii* Pohl. Common Name: Bush Allamanda, Oleander–Leaved Allamanda.

Shrub, brownish green stem with milky latex; whorled type of leaf arrangement; leaves are dark green, pubescent, elliptic to obovate shape, entire margin, pinnate venation. Inflorescence cymose panicle, peduncle with bracts; flower trumpet shape, yellow color, 6.2–7.8 × 2.8–4.4 cm; calyx 5, polysepalous and quincuncial aestivation; corolla single whorl, 5 orbicular shaped petal lobes and twisted aestivation. Androecium placed at the base of the swollen corolla tube; anthers 5, sagittate; stigma drum shape; superior ovary with nectary disc; capsule fruits, globose shape and spherical shaped seeds. Phenology: Throughout the year.

5. *Alstonia scholaris* (L.) R. Br., Mem. Wern. Nat. Hist. Soc. 1: 76. 1811; Wight, Icon. pl. Ind. orient. 422. 1841; Beddome, Fl. sylv. S. India. t. 242. 1872; Hook. f. Fl. Brit. India 3: 642. 1882; Gamble, Fl. Pres. Madras 2: 810 (569). 1923; Huber in Abeyw. Rev. Handb. Fl. Ceylon 1 (1): 12. 1973; Markgraf, Blumea 22: 23. 1974; Matthew, Fl. Tamilnadu Carnatic 3: 257. 1981–1983; Matthew Fl. Tamilnadu t. 427. 1982; Mani. & Sivar. Fl. Calicut 164, 1982; Ramch. & Nair, Fl. Cannanore 274. 1988; Sasi. & Sivar. Fl. Pl. Thrissur For. 277. 1996; *Echites scholaris* L., Mant. Pl. 53. 1767. Common Name: Blackboard Tree, Devil's Tree, Dita Bark Tree, Dita Tree, Indian Devil tree, Indian Pulai, Milky Pine, Milk wood Pine, Saptaparna, Saptaparni, Shaitan wood, White Cheese Wood.

Tree, greenish black with milky latex; whorled type of leaf arrangement; leaves are dark green, glabrous, elliptic to oblanceolate shape, entire margin, pinnate venation. Inflorescence umbellate cyme, peduncle with bracts; flowers numerous, salverform, single whorl, pubescent, light green, 1.4–1.7 × 0.8–1.2 cm; calyx 5, synsepalous and quincuncial aestivation; corolla has 5 rounded lobes and twisted aestivation. Androecium placed near the corolla tube throat; anthers 5, ovate shape; stigma conical shape; superior ovary; fruit pairs of follicles; seeds cylindrical with coma at both ends. Phenology: November–December; Fruiting: December–February.

6. *Cascabela thevetia* (L.) Lippold, Feddes Repert 91: 52. 1980; *Cerbera peruviana* Pers. Syn. pl. 1: 267. 1809; *Cerbera thevetia* L. Sp. pl. 209. 1753; *Thevetia neriifolia* Juss. ex Steudel, Nom. Bot. (ed. 2) 2: 680. 1841 (nereifolia); Gamble, Fl. Madras 2: 821 (577). 1923; Bor & Raize Beautif. Ind. climbers shrubs 193. 1954; Matthew, Fl. Tamilnadu Carnatic 259. 1981–1983; *Thevetia peruviana* (Pers.) Merr. Philip. J. Sci. 9: 130. 1914; Huber in Abeyw. Rev. Hanb. Fl. Ceylon 1 (1): 3. 1973. Common Name: Be-Still Tree, Captain Cook Tree, Dicky Plant, Lucky Nut, Mexican Oleander and Yellow Oleander.

Shrub or tree, green stem with milky latex; alternate type of leaf arrangement; leaves are dark green, glabrous, linear shape, entire margin, pinnate venation. Inflorescence terminal cyme, peduncle with bracts; flower funnel shape, yellow color, 9.1–10.4 × 5.1–5.6 cm; calyx 5 polysepalous and quincuncial aestivation; corolla 5 petal lobes, twisted aestivation, truncate to obtuse lobes. Androecium placed at the base of the swollen corolla tube; anthers 5, ovoid shape; stigma conical shape; superior ovary with nectary disc; fruit drupe, subglobose to pear shaped and spherical shaped seeds. Phenology: Throughout the year.

7. *Catharanthus roseus* (L.) G. Don., Gen. Hist. 4: 95. 1837; Markgraf, Blumea 19: 150. 1971; Huber in Abeyw. Rev. Handb. Fl. Ceylon 1 (1): 13. 1973; Mani. & Sivar, Fl. Calicut 165. 1982; Ramach. & Nair, Fl. Cannanore 276. 1988; Vajravelu, Fl. Palghat Dist. 280. 1990; Stearn, Diction. Pl. Na. 29: 196. 1996; *Vinca rosea* L. Syst. Nat. ed. 10: 944. 1759; Hook. f. Fl. Brit. India 3: 640. 1882; Bor & Raiz. Beautif. Ind. climbers shrubs 200. 1954; *Lochnera rosea* (L.) Reichenb. Consp. Regni. veg. 134. 1828; Gamble, Fl. Pres. Madras 2 (5): 809. 1923; Alston in Trimen, Handb. Fl. ceylon 6: 191. 1931; Matthew, Fl. Tamilnadu Carnatic 259. 1981–1983. Common Name: Annual Vinca, Baramasi, Bright Eyes Flower, Cape Periwinkle, Graveyard Plant, Madagascar Periwinkle, Old Maid Flower, Periwinkle, Pink Periwinkle, Rose Periwinkle, Rosy Periwinkle, Sadabahar.

Herbaceous plant, light green or pink color stem; leaf arrangement opposite decussate; leaves are petiolate, dark green, glabrous, oval to obovate shape, entire margin, pinnate venation. Inflorescence solitary or dichasial cyme; flower salverform, ebracteate, ebracteolate; lavender, light pink and white color, 4.5–5.9 × 3.7–5.5 cm; calyx 5, polysepalous quincuncial aestivation; corolla 5 cuspidate petal lobes with cylindrical corolla tube and twisted aestivation. Androecium placed just below the corolla tube throat; anthers 5, sagittate; stigma drum shape; superior ovary with scaly nectary; fruit are paired follicle with oblong seeds. Phenology: Throughout the year.

Alstonia scholaris	*Cascabela thevetia*	*Catharanthus roseus*	*Cryptostegia grandiflora*

8. *Cryptostegia grandiflora* Roxb. ex R.Br. Common Name: Indian Rubber Vine, Palay Rubber Vine, Rubber Vine.

Climber, green color stem with milky Latex; Leaf arrangement opposite decussate; leaves are elliptic to ovate shape, dark green color, entire margin, glabrous, pinnate venation. Inflorescence terminal cyme, peduncle with bracts; Flowers salverform, violet color, 5.9–6.7 × 6.1–6.7 cm; calyx 5, quincuncial aestivation; corolla twisted aestivation, 5 obtuse petal lobes; androecium placed at the base of the swollen corolla tube, anthers 5, ovoid shape; stigma conical shape; superior ovary. Phenology: Throughout the year, but mainly June to August.

9. *Kopsia fruticosa* (Roxb.) A.DC. Prodr. 8: 352. 1844; Hook. f. Fl. Brit. India 3: 639. 1882; Gamble, Fl. Pres. Madras 2: 577. 1957; *Cerbera fruticosa* Ker. Gawl. in Bot. Reg. t. 5: 391. 1819. Common Name: Copsia, Kopsia Merah, Pink Gardenia, Pink Kopsia, Shrub-Vinca, Vinca-Arbustiva.

Shrub, green and glabrous with milky latex; leaf arrangement opposite decussate; leaves are green, glabrous, elliptic shape, entire margin, pinnate venation; inflorescence terminal cyme, with bract and bracteole. Flowers salverform, single whorl, light pink color, 5.1–6.7 × 3.8–5.8 cm; calyx 5, synsepalous and quincuncial aestivation; corolla 5 rounded petal lobes with cylindrical corolla tube and twisted aestivation. Androecium placed near the corolla tube throat; anthers 5, ovate shape; stigma drum shape; superior ovary. Phenology: Throughout the year.

10. *Nerium oleander* L. Sp. Pl. 209. 1753; Huber in Abeyw. Rev. Handb. Fl. Ceylon 1 (1): 2. 1973; Grant, Smithsonian Contr. Bot. 17: 53. 1974; Matthew, Fl. Tamilnadu. t. 432. 1982; *Nerium indicum* Mill, Gard. dict. (ed. 8) 1768; Matthew, Exot. Fl. Kodaikanal 20: 153. 1969; *Nerium odorum* Sol. In Aiton, Hort. Kew, 1: 297. 1789; Roxb. Fl, India. 2: 2. 1832; Hook. f. Fl. Britt. India 3: 655. 1882; Gamble, Fl. Madras 2: 821 (577). 1923; Bor & Raiz. Beautif. Ind. climbers shrubs 199. 1954; Matthew, Fl. Tamilnadu Carnatic 259. 1981–1983. Common Name: Oleander.

Shrub or tree, green and glabrous stem with colorless latex; whorled type of leaf arrangement; leaves are dark green, glabrous, linear shape, entire margin, pinnate venation. Inflorescence terminal cyme, peduncle with bracts; flowers funnel and salverform, pink, white and yellow color, 3.8–5.8 × 3.6–7.6 cm; calyx 5, polysepalous and quincuncial aestivation; corolla 1–3 whorls, twisted aestivation, lobe rounded, obtuse or emarginate shape, corolla with corolline corona. Androecium placed at the base of the swollen corolla tube; anther 1–5, sagittate with apical appendage; stigma shape: dumb-bell; superior ovary; follicle fruits, cylindrical seeds with coma. Phenology: Throughout the year.

11. *Pentalinon luteum* (L.) B.F.Hansen & Wunderlin. Common Name: Catesby's Vine, Hammock Viper´s-Tail, Lice Bush, Wild Allamanda, Wild unction, Willd Wist, Yellow Dipladenia, Yellow Mandevilla.

Climber, green and glabrous stem with milky latex; leaf arrangement opposite decussate; leaves are green, glabrous, oval shape, entire margin, pinnate venation. Inflorescence terminal cyme, peduncle with bracts; flower funnel shape, yellow, 6.1–7.1 × 3.9–4.6 cm. Calyx 5, synsepalous and quincuncial aestivation; corolla 5 obtuse petal lobes, corolla tube with nectar guides and twisted aestivation. Androecium placed at the base of the swollen corolla tube; anthers 5, sagittate with apical appendage; stigma round cap shape; superior ovary with nectary disc. Phenology: Throughout the year.

12. *Plumeria obtusa* L. Common Name: Dwarf Plumeria, Singapore Frangipani, Singapore Graveyard Flower, White Champa, White Frangipani.

Tree, green to dark green stem with milky latex; alternate type of leaf arrangement; leaves are dark green, glabrous, obovate to oblong shape, entire margin, pinnate venation. Inflorescence terminal cyme, peduncle with bracts; flower salverform, light pink and white color, 5.1–9.2 × 4.6–8.9 cm; calyx 5, synsepalous

and quincuncial aestivation; corolla twisted aestivation, single whorl, 5 obtuse petal lobes with twisted corolla tube. Androecium placed at the base of the corolla tube; anther 5, ovate shape; stigma bottle shaped and half inferior ovary. Phenology: July to September.

Kopsia fruticosa	*Nerium oleander*	*Pentalinon luteum*	*Plumeria obtusa*
			

13. *Plumeria pudica* Jacq. Common Name: Bridal Bouquet Tree, Everlasting Love, Fiddle Leaf Plumeria, Gilded Spoon, Golden Arrow, Wild Plumeria.

Shrub, dark green and glabrous stem with milky latex; alternate type of leaf arrangement; leaves are dark green, glabrous, spoon shape, undulate margin, pinnate venation. Inflorescence terminal cyme, peduncle with bracts; flower salverform, white color, 7.8–10.2 × 6.9–9.9 cm; calyx 5, synsepalous and quincuncial aestivation; corolla twisted aestivation, 5 rounded petal lobes with twisted corolla tube. Androecium placed at the base of the corolla tube; anthers 5, ovate shape; stigma bottle shaped; half inferior ovary. Phenology: Throughout the year.

14. *Plumeria rubra* L., Sp. Pl. 209. 1753; Blatter *et al*. Beautif. Ind. Trees (ed. 2) 112. 1954; Matthew, Exot. Fl. Kodaikanal 20: 154. 1969; Huber in Abeyw. Rev. Handb. Fl. Ceylon 1 (1): 3. 1973; Mani. & Sivar. Fl. Calicut, 164. 1982; Vajravelu, Fl. Palgahat Dist. 284. 1990. *Plumeria acuminata* Ait., Hort. Kew. 2: 70. 1789; Roxb. Fl. Ind. 2: 20. 1832; Hook. In Curtis, Bot. Mag. 3952. 1843; *Plumeria acutifolia* Poir.in Lam., Encycl. (Suppl. 2): 667. 1812; Wight, Icon. pl. Ind. orient. 471. 1841; Hook. f. Fl. Brit. India 3: 641. 1882; Gamble, Fl. Pres. Madras 2: 821. 1923; Matthew, Fl. Tamilnadu Carnatic 259. 1981–1983. Common Name: Common Frangipani, Jasmine Mango Flower, Red Frangipani, Red Nosegay Tree, Red Paucipan, Temple Flower, True Frangipani.

Tree, green to grey and glabrous stem with milky latex; alternate type of leaf arrangement; leaves are green to dark green, glabrous, obovate, elliptic or lanceolate shape, entire margin, pinnate venation. Inflorescence terminal cyme, peduncle with bracts; flowers salverform, pink, red, white or yellow color, 5.8–8.6 × 3.8–8.4 cm; calyx 5, synsepalous and quincuncial aestivation; corolla twisted aestivation, 5 rounded or cuspidate petal lobes with twisted corolla tube. Androecium placed at the base of the corolla tube; anthers 5, ovate shape; stigma bottle shaped, half inferior ovary; follicle fruits with winged seeds. Phenology: January to June.

15. *Tabernaemontana alternifolia* L., Sp. pl. 211. 1753; Nicols *et al*. An Interpr. Hort. Malab. 57: 1988; Sivar. & Matthew, Fl. Nilambur 418. 1996; *Tabernaemontana heyneana* Wall., Lindley *et al*. Edward's Bot. Reg. t. 15: 1273. 1829; Hook. f. Fl. Brit. India 3: 646. 1882; Vajravelu, Fl. Palghat Dist. 283. 1990; *Ervatamia heyneana* (Wall) Cooke. Fl. Pres. Bombay 2: 134. 1904; Gamble, Fl. Pres. Madras 2 (5): 813. 1923; Mani. & Sivar., Fl. Calicut, 166. 1982; Ramach. & Nair, Fl. Cannanore 277. 1988. Common Name: Alternate-Leaved Crape Jasmine, Nag Kuda.

Tree, grayish brown and glabrous stem with milky latex; leaf arrangement opposite decussate; leaves are dark green, glabrous, elliptic shape, entire margin, pinnate venation; inflorescence terminal cyme with bract and bracteole. Flowers fan shape, white color, 5.2–6 × 2.7–3.8 cm; calyx 5, synsepalous and quincuncial aestivation; corolla 5 rounded petal lobes with slender corolla tube, twisted aestivation. Androecium position just below the corolla tube throat; anthers 5, linear shape; stigma capitate shape; superior ovary; fruit follicle and boat shape; seed elliptical shape. Phenology: Flowering March to June and fruiting May to September.

16. *Tabernaemontana divaricata* (L.) R.Br. ex Roem. & Schult., Syst. Veg. 4: 427. 1819; Merr. in Contr. Arnold Arbor. 8: 140. 1934; Mani. & Sivar. Fl. Calicut 166. 1982; Mohanan & Henry, Fl. of Thiruvanthapuram Dist. 405. 1994. *Nerium divaricatum* L. Sp. pl. 209. 1753; *Tabernaemontana coronaria* (Jacq.) Willd. Enum. Hort. Berol. 275. 1809; Roxb. Fl. Ind. 2. 2: 23. 1832; Wight, Icon. pl. Ind. orient. 477. 1841; Beddome, Fl. sylv.

S. India 159. 1871; Hook. F. Fl. Brit. India 3: 646. 1882; Bor & Raiz Beautif. Ind. climbers shrubs 205. 1954; *Nerium coronarium* Jacq. Coll. Bot. 1: 138. 1786; *Ervatamia coronaria* (Jacq.) Dyer. Fl. Trop. Africa 4: 127. 1902; Gamble, Fl. Pres. Madras 813.1923; *Ervatamia divaricata* (L.) Burkill, Rec. Bot. Surv. Ind. 10: 320. 1925; Huber in Abeyw. Rev. Handb. Fl. Ceylon 1 (1): 2. 1973. Common Name: Butterfly Gardenia, Ceylon Jasmine, Crepe Gardenia, Crepe Jasmine, East India Rosebay, Nero's Crown, Pinwheel Flower.

Shrub or tree, green to brownish grey and glabrous stem with milky latex; leaf arrangement opposite decussate; leaves are dark green or whitish green, glabrous, ovate, elliptic or lanceolate shape, entire or undulate margin; pinnate venation. Inflorescence terminal cyme or solitary, peduncle with bracts. Flowers fan or salverform shape, white color, 3.8–7.6 × 1.9–6.3 cm, pedicel with bracteoles; calyx 5, synsepalous and quincuncial aestivation; corolla 1–3 whorls of petal lobes with slender corolla tube, twisted aestivation, lobes rounded, emarginate or aristate shape. Androecium placed center of the corolla tube; anthers 4–5, linear shape; stigma beaked, capitate, dome or conical shape; superior ovary. Phenology: Throughout the year.

17. *Wrightia antidysenterica* (L.) R.Br. on Asclepias. 762. 1810; Mem. Wern. Mat. Hist. Soc. 1: 73. 1811; *Echites antidysentericus* (L.) Roxb. ex Fleming, Asiat. Res. 2: 166. 1810; Roth, Nov. pl. Spec. 138. 1821; *Nerium antidysentericum* L. Sp. pl. Nom. ambig. 209. 1753; *Holarrhena antidysenterica* (L.) Wall. ex DC., Prodr. 8: 413. 1844; Beddome, Fl. Sylv. S. India, 159. 1871; Hook. f. Fl. Brit. India 3: 644. 1882; Gamble, Fl. Pres. Madras 2: 811. 1923; Matthew, Fl. Tamilnadu Carnatic 3: 258. 1981–1983; Matthew Fl. Tamilnadu t. 430. 1982. Common Name: Arctic Snow, Coral Swirl, Indrajav, Milky Way, Snowflake, Tellicherry Bark, White Angel and Winter Cherry Tree.

Shrub, green and glabrous stem with milky latex; leaf arrangement opposite decussate; leaves are green, glabrous, ovate shape, entire margin, pinnate venation. Inflorescence terminal cyme, peduncle with bracts; flower star shape, white color, 3.4–4 × 1.9–2.8 cm; calyx 5, synsepalous and quincuncial aestivation; corolla twisted aestivation, 5 rounded petal lobes with corolline corona. Androecium placed at the throat of the corolla tube; anthers 5, sagittate shape; stigma conical shape; superior ovary with scaly nectaries. Phenology: Throughout the year.

Plumeria pudica	***Plumeria rubra***	***Tabernaemontana alternifolia***	***Tabernaemontana divaricata***	***Wrightia antidysenterica***
				

DISCUSSION

Apocynaceae family generally has lots of ornamental plants. In the current study, the distribution of plants from the Apocynaceae family in the Kanyakumari District was examined. The distribution and taxonomy of Apocynaceae species have been documented by several authors **[19], [20], [36], [37]**. There were a total of 17 species recorded in the current study, of which 6 were new. None of the floras in the study area had previously been documented. However, it is a quite widespread species in Kanyakumari District. It was recorded almost throughout the Kanyakumari District.

After a proposed key has been established, a focused, detailed and accurate study of the Apocynaceae specimens has been conducted in order to be used for the identification of the various Apocynaceae species, notably in Kanyakumari District, Tamil Nadu, India. This work will focus on the Apocynaceae family, which has not yet been taken into account in the region. The provided species identification key should prompt additional research on other broad Apocynaceae genera and other plant families. This will help to establish the district's new flora, which does not yet exist. As a result, this research and future works will surely fill in some of the gaps in the taxonomic and systemic studies of the flora in this region of the world.

CONCLUSION

Systematic investigation was done on the Apocynaceae family that is found growing all around the Kanyakumari District in Tamil Nadu, India. We gathered and identified a total of 17 species from 12 genera in the family Apocynaceae. On the basis of the morphological and floral characteristics of the current study, a classification of the Apocynaceae family has been suggested.

ACKNOWLEDGEMENT

The authors wish to thank Manonmanium Sundaranar University, Abishekapatti, Tirunelveli 627 012, Tamil Nadu, India.

REFERENCES

1. Abeywickrama, BA 1973, 'A Revised Handbook to the Flora of Ceylon', University of Ceylon, vol. 1, pp. 2.
2. Aiton 1789, 'Hortus Kewensis or A Catalogure of the Plants Cultivated in the Royal Botanic Gargen at Kew', London, Printed for George Nicol, Bookseller to his Majesty, vol. 1, pp. 297.
3. Alston, AGH & Trimen 1931, 'Handbook to the Flora of Ceylon, Containing Descriptions of all the Species of Flowering Plants Indigenous to the Island and Notes on their History, Distribution and Uses, London', vol. 6, pp. 191.
4. Angiosperm Phylogeny Group IV 2016, 'An Update of the Angiosperm Phylogeny Group Classification for the Orders and Families of Flowering Plants: APG IV', Bot. J. Linn. Soc, vol. 181, pp. 1-20.
5. Arbour, A 1934, 'Contributions from the Arnold Arboretum of Harvard University', vol. 8, pp. 140.
6. Bailey, LH 1914, 'Standard Cyclopedia of Horticulture', The Macimillan Company, Macimillan, vol. 1, pp. 246.
7. Beddome, RH 1869-1874, 'The Flora of Sylvatica for Southern India', Gantze Brothers, Madras, pp. 242 (569).
8. Beddome, RH 1871, 'The Flora of Sylvatica for Southern India', Madras: Printed by Gantz Brothers, vol. 1, pp. 159.
9. Blatter, E & Milard, WS 1954, 'Some Beautiful Indian Trees', Bombay Natural Society, Edition 2, pp. 112.
10. Bor, NL & Raizada, MB 1954, 'Some Beautiful Indian Climbers and Shrubs', Bombay Natural History Society, pp. 196.
11. Brown, R 1810, 'On the Asclepiadeae, A Natural Order of Plants Separated from the Apocineae of Jussieu', Preprint of Mem. Wern. Nat. Hist. Soc, vol. 1, pp. 12-78.
12. Burkill, IH 1925, 'Records of the Botanical Survey of India', vol. 10, pp. 320.
13. Candolle, AD 1844, 'Prodromus Systematis Naturalis Regni Vegetabilis: Sive Enumeratio Contracta', Sumptibus Fortin, Masson et Sociorum, pp. 352.
14. Don, G 1837, 'A General History of Dichlamydeous Plants', pp. 95.
15. Cooke, T 1904, 'The Flora of the Presidency of Bombay', London: Taylor and Francis, vol. 2, pp. 134.
16. Cronquist, A 1981, 'An Integrated System of Classification of Flowering Plants', Columbia University Press, New York, pp. 1-1262.
17. Endress, ME & Bruyns, PV 2000, 'A revised classification of Apcynaceae s. l', The Botanical Review, vol. 66, pp. 1-56.
18. Gamble, JS & Fischer, CE 1915-1935, 'Flora of the Presidency of Madras London', pp. 1-3.
19. Gamble, JS & Fischer, CE 1957, 'Flora of the Presidency of Madras', (Reprint Edition), vol. I– III. Calcutta: Botanical Survey of India, pp. 2017.
20. Grant, 1974, 'Smithsonian Contributions to Botany', Washington, Smithsonian Institution Press, pp. 53.
21. Hooker, JD 1882, 'Flora of British India', The Secretary of State for India in Counsil, vol. 3, pp. 642.
22. Hooker, WJ & Curtis, O 1843, 'Botanical Magazines', Botanical Magazine Warehouse, Glazenwood, vol. XVI, pp. 3952.
23. Jacquin, NJ 1786, 'Coll. Bot', vol. 1, pp. 138.

24. Ker. Gawl 1819, 'The Botanical Register: Consists of Coloured Figures of Exotic Plants, Cultivated in British Gardens with their History and Mode of Treatment', London: Printed for James Ridgway, Piccadilly, vol. 5, pp. 391.
25. Lindley, John, Ridgway & James 1829, 'Edwarde's Botanical Register', London: James Ridgway, vol. 15, pp. 1273.
26. Linnaei, C 1759, 'Systema Nature', Holmiae, Impensis Direct, Laurenti Salvii, pp. 944.
27. Linnaeus, C 1753, 'Species Plantarum', pp. 209.
28. Linnaeus, C 1767, 'Mantissa Plantarum: Gennervm Editionis VI et Speciervm Editionis II', Biodiversity Heritage Library, pp. 53.
29. Linnaeus, C 1771, 'Mantissa Plantarum', Holmiae: Impensis Laurentii Salvii, Stockholm, vol. 2, pp. 576.
30. Lippold, H 1980, 'Feddes Repertorium', vol. 91, no. 7-8, pp. 52.
31. Manilal, KS & Sivarajan, VV 1982, 'Flora of Calicut', Bishen Singh Mahendra Pal Singh, pp. 427.
32. Markgraf 1971, 'Blumea Supplement', Rijksherbarium, pp. 150
33. Markgraf, F 1974, 'Florae Malesianae Praecursores LIV. Apocynaceae III', Blumea, vol. 22, pp. 23.
34. Matthew, KM 1969, 'The Exotic Flora of Kodaikanal Palni Hills', Delhi, Manager of Publications, vol. 20, pp. 153.
35. Matthew, KM 1982, 'The Flora of the Tamilnadu Carnatic: Illustration on the Flora of the Tamilnadu Carnatic', Rapinat Herbarium, St. Joseph's College, Tiruchirapalli, pp. 427.
36. Matthew, KM 1881-1883, 'The Flora of the Tamilnadu Carnatic, Tiruchirapalli, India', Rapinat Herbarium, St. Joseph's College, pp. 257.
37. Miller & Philip 1768, 'Gardeners Dictionary', Edition 8. London.
38. Mohanan, M & Henry, AN 1944, 'Flora of Thiruvananthapuram', Botanical Survey of India, pp. 405.
39. Nicolson, DH, Suresh, CR & Manilal, KS 1988, 'An Interpretation of Van Rheede's Hortus Malabaricus', Koeltz Scientific Books, pp. 57.
40. Persoon 1809, 'Species Plantarum', vol. 1, pp. 267.
41. Poir. In. Lame 1812, 'Synomic Checklist of the Vascular Plants of the World', Encycl. Suppl. 2, pp. 667.
42. Ramachandran, VS & Nair, VJ 1988, 'Flora of Cannanore', Botanical Survey of India, pp. 274.
43. Reichenbach, H 1828, 'Conspectus Regni Vegetabilis', Carolum Cnobloch, pp. 134.
44. Roemer & Schultes 1819, 'Systema Vegetabilium', vol. 4, pp. 427.
45. Roth, AW 1821, 'Novae Plantarum Species Praesertim Indiae Orientalis', Halberstadii: Sumptibus H. Vogleri, pp. 138.
46. Roxb. ex Fleming 1810, 'Asiatic Researches, or Transactions of the Society', Culcutta, vol. 2, pp. 166.
47. Roxburg, W 1832, 'Descriptions of Indian Plants', Serampore, Printed for W. Thacker, Co. Culcutta, Parbury, Allen and Co. London, vol. 2, pp. 2.
48. Sasidharan, N & Sivarajan, V 1996, 'Flowering Plants of Thrissure Forests', Scientific Publishers, pp. 277.
49. Sivarajan & Mathew 1996, 'Flora of Nilambur (Western Ghats, Kerala)', Bishen Singh Mahendra Pal Singh, pp. 418.
50. Stapf, O 1902, 'Apocynaceae. in WT. Thiselton-Dyer (editor)', Flora of Tropical Africa 4. L. Reeve, London, pp. 24-233.
51. Stearn, WT 1996, 'Stearns Dictionary of Plant Names for Gardenes', Distributed in the U.S by Sterling Pub. Co, pp. 196.
52. Steudel 1841, 'Nomenclator Botanicus. Edition Secunda', vol. 2, pp. 680.
53. Merr 1914, 'The Philippine Journal of Science', vol. 9, pp. 130.
54. Vajravelu, E 1990, 'Flora of Palghat District, Including Silent Valley National Park, Kerala', Botanical Survey of India, pp. 280.
55. Wight, R 1840, 'Icons Plantarum Indiae Orientalis', vol. 1, pp. 422.
56. Wild 1809, 'Enumerating Plantarum Horti Regii Botanical Berolinensis: Continens Descriptions Omnium Vegetabilium in Horto Dicto Cultorum', pp. 275.