

A preliminary assessment of the Diversity of the genus 'Ficus' in the Vazhachal forests, Western Ghats, India

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This preliminary study on the diversity of the genus 'Ficus' brings out 17 taxa including two endemic and two threatened species. Details morphological description with note on ecology along with taxonomic keys

Keywords: Ficus, Phenology, Ecology.

The 'banyan' trees are known to the Indian literature from the time immemorial as sacred trees. The common species 'Ficus religiosa' has a position in temples all over India and most of the ancient religions consider them as sacred. The 'Ficus benghalensis' apart from its sacred value, is common shading tree for the villages of India. The people of India also people from most of the Asian countries are worshippers of the 'Banyans' or has strong relationship with the plant. One particular tree of species (F. benghalensis) in India is listed in Guinness Book of World Records (1985) as the world's largest tree with 10,000 prop root and covers the area of 4 acres.

First comprehensive studies on the diversity of 'Ficus' were given by E.J.H Corner during 1965 in the Garden's Bulletin. He studied 474 species with certainty and detailed infrageneric classification supported with concrete keys was given. About 58 uncertain species were also listed at that time. Current estimate for the genera is now more than 1000 species. However revisions of many parts of the world are not completed still today.

The tropical region must have a high diversity of 'Ficus' species and for many parts including Malaysia and Africa detailed works on the genera are completed. For the Indian region such attempts were not done so far. Ficus genera had been given little importance in the classical works including that of J.D. Hooker (1872), Gamble and Fisher (1935) Cooke(1958). Later works are also not different Being a mega diversity country with two biodiversity hot spots, India should have a great diversity of figs in its territory. From Kerala, a state including the Southern Western Ghats only 32 species of 'Ficus' have been listed so far (Sasidharan, 2004).

This may be due to difficulty in the identification of specimens provided with the reduced and condensed state of the inflorescence and fruits (figs) and the very similarity in the vegetation structure between different species. The fruits of Ficus (Figs) are very important food for many birds and insect

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species of the world. As keystone element it is not been studied well from the region. The figs are the important diet for the hornbill species of south India and the Great Indian Hornbills found to feed on more than 20 species of figs (A. Bachan, 2006).

The study and methods adopted

This study is an attempt to reveal the potential diversity of the Ficus species from an important forest region of Kerala part of southern Western Ghats within a short period of six months. The Vazhachal forests fall within the central forest circle of the Kerala forest department. This is area continuous with the tropical evergreen forests of Nelliampathies, Sholayar and Valparais of the Anamalai part of Western Ghats.

The plants were collected in fruiting conditions and herbariums were prepared using standard methods. Plant names were indexed following D.J. Mabberley (1997) and the abbreviations for the author names were followed by Brummitt and Powel (1992). The identification of the taxa has been done using the keys and descriptions provided by Corner (1965)

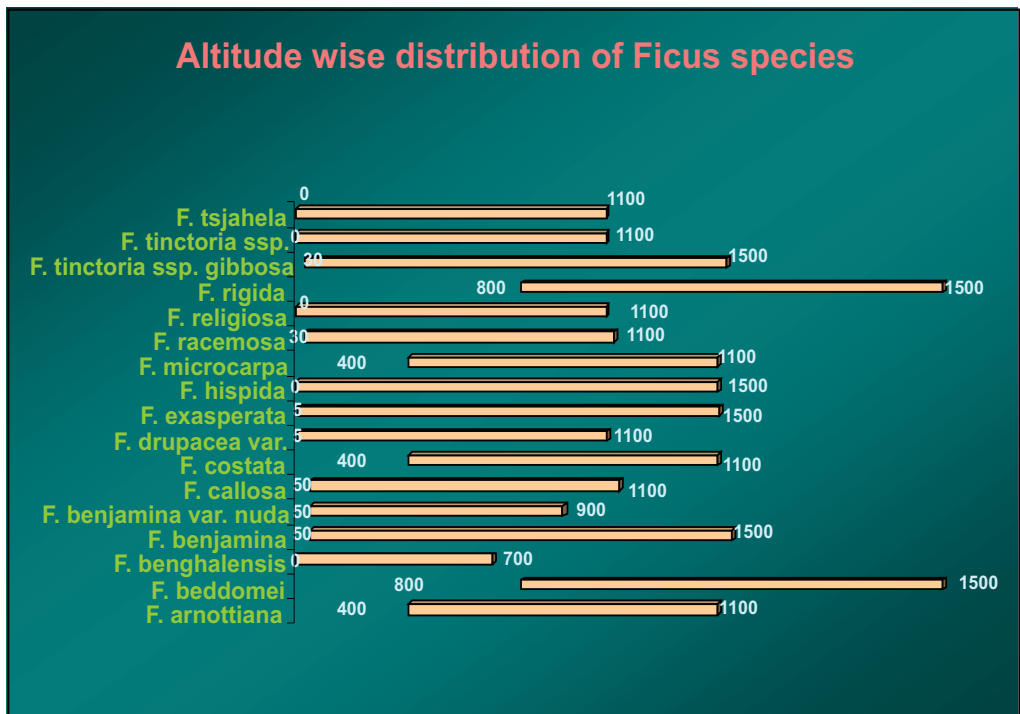
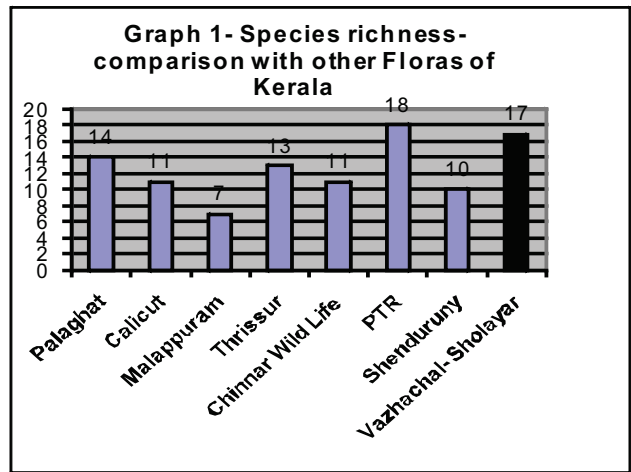
Result & Discussion

From this study total 17 species of ficus have been collected and identified. Comprehensive keys were provided for correct identification along with descriptions. Of the collected species two are endemic i.e. *F. beddomei* (Western Ghats) *F. rigida var.bracteata* (S. India) and *F. costata* is a threatened species (IUCN, 1997). When comparing with other regional flora works in Kerala, this short term assessment comes second after the 18 species reported

from the Periyar Tiger Reserve.

The study area ranges from an elevation of 100 m - 1050 m. Seven species were obtained from Vazhachal (252m - 450m); 5 species from Sholayar (700m - 900m); 2 species from Orukombankooty (400m - 600 m), 2 species from Athirappilly (100m-200m); and one species from Malakkappara (900m - 1000m).

Species like *F. religiosa*, *F. benghalensis*, *F. hispida*, *F. exasperata* are mostly found in the human inhabited areas. *F. hispida*, *F. exasperata* *F. tsjahela* and *Ficus drupacea var. pubescens* shows maximum distribution in all sorts of habitats and vegetation, and are found usually in the well



Fruiting phenology												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>F. arnottiana</i>												
<i>F. beddomei</i>												
<i>F. benghalensis</i>												
<i>F. benjamina</i>												
<i>F. benjamina var. nuda</i>												
<i>F. callosa</i>												
<i>F. costata</i>												
<i>F. drupacea var. pubescens</i>												
<i>F. exasperata</i>												
<i>F. hispida</i>												
<i>F. microcarpa</i>												
<i>F. racemosa</i>												
<i>F. religiosa</i>												
<i>F. rigida var. bracteata</i>												
<i>F. tinctoria ssp. gibbosa</i>												
<i>F. tinctoria ssp. parasitica</i>												
<i>F. tsjahela</i>					1	1						

exposed open areas. The species which shows great affinity towards the riparian forests found to associate with many riparian plant species like *Syzygium occidentale*, *Olea dioca*, *Leea sps*, *Litsea sps*, *Homoniria riparia*

The fruits of *Ficus* have high nutritional properties and they give nourishment to animals and birds. It supports many birds and animals especially primates. According to our investigations

on some selected *Ficus* species, which supports birds and animals, the fig of *F. benghalensis* is eaten by crow and green barbet. *F. tsjahela* is eaten by the green barbet, orieol etc, and green barbet takes the fig of *F. hispida* as food. *F. exasperata* is another staple food of many birds especially Great Indian Hornbill, grey pied hornbill etc. Other studies also agrees that the Fig is the favourite and staple food of Sloth bear (Bargali et al. 2002) and Nilgiri langur

(Gigi, 1998). In Vazhachal forest, out of 48 fruit of different species of dominant plants used as food by hornbill among these 20 are, Ficus species comes around up to 20 species (Bachan, 2005). Fig has a symbiotic relation with its own species of tiny pollinator wasp Agaoninae sp. (Benders- Hyde, 2002). In *F. hispida* such a relation is noticed. Seed dispersal is through the birds excreta. The fruiting phenology reveals a non synchronized fruiting behavior for most of the species which ensures the availability of Ficus fruits all over the season.

Conclusion

The data obtained from the present study reveals that the study area has rich species diversity of Ficus(17 species). From all over the world about more than 1000 species of Ficus reported (Biotropica, 2005)in the tropical region. Detailed investigation has been conducted in the African region and the other tropical regions. In Kerala no such attempt, were made so far. Only 32 species have been reported from Kerala (Sasidharan, 2004). Comparing with other forest areas, the study area (Vazhachal forest) come second in Ficus species diversity. This work on a small forest area, for a shorter duration reveals 17 species which indicates that forests of Kerala would definitely have greater number of species diversity of Ficus. The reduced state of flowers and inflorescence, lacking of detailed keys and informations are the major problems for the exploration of the species. In this study we have given specific and detailed keys based on infra generic classification provided by Corner (1965). A detailed study or the revision work for this important genus is needed for the Indian region.

Key to the species

(General Key based on Vegetative Character)

- 1a. Leaves alternate (2)
- 1b. Leaves opposite*F. hispida*
- 2a. Leaves glabrous (3)
- 2b. Leaves scabrid(15)
- 3a. Leaves neither hispid nor tomentose on both surface.....(4)
- 3b. Leaves either hispid or tomentose on both surface.....(14)

- 4a. Leaves 3-7 ribbed & primary nerves more than 13 pairs.....(5)
- 4b. Leaves 3-7 ribbed & primary nerves not more than 13 pairs of nerves.....(10)
- 5a. Petiole 0.5-2.5 cm(6)
- 5b. Petiole 4-7.5 cm.....(9)
- 6a. Leaves long and large (12x4-18.5x5 cm), elliptic oblong.....*F. rigida* var. *bracteata*
- 6b. Leaves small (5x2.5-11x3.7) , ovate oblong.....(7)
- 7a. Leaves ovate- elliptic, some what rounded base acute only midrib prominent.....(8)
- 7b. Leaves ovate- oblong elliptic, base sub cordate midrib & nerves equally prominent on lower surface.....*F. costata*
- 8a. Petiole more than 1.5 cm, usually wild.....*F. benjamina*
- 8b. Petiole not more than 1.5 cm, usually cultivate.....*F. benjamina* var. *nuda*
- 9a. Base acute, leaves 23x8 cm gland dotted on the lower surface of leaves*F. tsjahela*
- 9b. Base truncate, leaves 32x10 cm not gland dotted on the lower surface of leaves.....*F. beddomei*
- 10a. Petiole less than 2.5 cm.....*F. microcarpa*
- 10b. Petiole more than 2.5 cm..... (11)
- 11a. Petiole 3.5 cm long.....(12)
- 11b. Petiole 5-10 cm long..... (13)
- 12a. Leaves thick, 4- ribbed and 11 pairs of primary nerves.....*F. callosa*
- 12b. Leaves thin, 3-ribbed, and 6 pairs of primary nerves.....*F. racemosa*
- 13a. Leaves thick, base round, size 22x9 cm long 8- pairs of primary nerves.....*F. religiosa*
- 13b. Leaves thin, base deeply cordate, size 14x5.2 cm long, 10 pairs of primary nerves.....*F. arnottiana*
- 14a. Base round, acute apex, 7- ribbed, 8 pairs of primary nerved , petiole 3.5cm.....*F. benghalensis*
- 14b. Base acute, apex acuminate, 3-5 ribbed, 13 pairs of primary nerved, petiole 2.5 cm long.....*F. drupacea* var. *pubescens*
- 15a. Leaves sagittate.....(16) *F. tinctoria*
- 15b. Leaves not sagittate.....*F. exasperata*
- 16a. Leaves 6.5x2 to 4x2 cm long, primary nerves 5 pairs*F. tinctoria*. ssp *gibbosa*
- 16b. Leaves 10x4 cm, primary nerves 6 pairs.....*F. tinctoria*. ssp. *parasitica*

FLORISTIC DESCRIPTION

Ficus arnottiana (Miq.) Miq., Ann. Mus. Lugd.- Bat. 3: 287. 1867; Mohnan & Henry, Fl. Thiruvananthapuram 432. 1884; Hook. f., Fl. Brit. India 5:513. 1888; Gamble, Fl. Pres. Madras 1363 (953). 1928; Sasidh. & Sivar. Flow. Plan. Thrissur. 428. 1996; Sasi., Fl. Stud. Parambikulam wild. Sanct. 310. 2002; Mohan. & Sivad; Fl. Agasthyamala. 629. 2002. Urostigma arnottiana Miq. in Hook's London J. Bot. 6: 564. 1847.

Local names: Amakanniyan, Kallal, Kallaroyal.

Small trees or large shrubs. Aerial root absent. Bark smooth pale. Leaves broadly ovate, alternate, petiole 4.5cm in long, leaf deeply cordate at base, and apex caudately acuminate, glabrous and size range from 14.5x5.3 cm to 9x3.2cm. 5- ribbed. Primary nerves 6-7 pairs. Receptacles are sessile or slightly pedunculate, small seen in clusters on the axils of fallen leaf.

Common along the evergreen, semi evergreen and moist deciduous forest.

Fl. & Fr: October- February.

Distribution: India and Sri Lanka.

Ecology: *Ficus arnottiana* is distributed 400 m above from sea level to 1050 m altitude. It is seen along the river bank, rocky places in hills, etc. It is distributed to evergreen, semi evergreen and moist deciduous forest. It is a large shrub without aerial root. It is associated with *Macranga peltata* and *Syzygium* species etc.

Ficus beddomei King, Ann. Roy. Bot. Gard. Calcutta. 1:26. tt. 24 & 81 M. 1887; Hook. f., Fl. Brit. India. 5: 513. 1888; Gamble, Fl. Pres. Madras. 1364 (954). 1928; Vajravelu, Fl. Palaghat. 446. 1990; Sasidh. & Sivar, Flow. Plan. Thrissur. 428. 1996; Sivar. & Math; Fl. Nilambur 663. 1997; Sasidh., Fl. Stud. Parambikulam Wild. Sanct. 310. 2002; Mohan. & Sivad., Fl. Agasthyamala 630. 2002.

Local name: Chela, Thavittaal.

Large trees, branchlets with prominent stipular scars. Leaves alternate, petiolate 5-6cm long, leaf ovate and abruptly acuminate, base rounded and broad size ranges from 33x11cm to 25x 9cm. 3- ribbed and primary nerves are 13-15 pairs, margin sinuate or entire. Rare in semi evergreen forest.

Fl. & Fr: February-July

Distribution: Peninsular India

Endemic to: Western Ghats

Ecology: *Ficus beddomei* is distributed 894m above from sea level to higher altitude. It is seen along roadside, and it is distributed in the semi evergreen forests, and in the evergreen forests of Western Ghats. It has an association with *Ficus exasperata*, *Macranga peltata* etc.

Ficus benghalensis L., Sp. Pl. 1059. 1753; Hook. f., Fl. Brit. India. 5: 499. 1888; Gamble, Fl. Pres. Madras 361 (952). 1928; Mani. & Sivar., Fl. Calicut 277. 1982; Babu, Fl. Malappuram Dist. Exclu. Nilambur Forest. 748. 1990; Vajravelu, Fl. Palaghat 450. 1990; Sivar. & Math., Fl. Nilambur 663, 1997; Mohan. & Sivad., Fl. Agasthyamala 630. 2002. Urostigma benghalense (L.) Gasp., Nov. Gen. Fici. 7. 1844.

Local name: Per-al.

Large trees. Spreading crown. Grows as epiphyte as first. Aerial root present, bark light colour and red inside. Leaves obovate and pubescent on both side. Petiole (1.7 cm) also pubescent. Leaf apex shortly acute, base rounded. Lateral nerves 8 pairs, 5-ribbed. Fig sessile, globose, axillary basal bract 3, slightly rounded, pubescent and red when ripe.

Commonly seen in moist deciduous forest and also in all plains.

Fl. & Fr: April-August.

Distribution: Planted in all plains of India, wild only in the sub- Himalayan forest and on the lower slope of Deccan hills.

Ecology: *Ficus benghalensis* is distributed from sea level to 700 m altitude. It is less or very rare in our study area. It is seen along the dry and moist deciduous forest. It is associate with *Macranga peltata*, *Anacardium occidentale*, *Ailanthus malabaricus*, *Tectona grandis* and *Calycopteris floribunda* etc.

Ficus benjamina L., Mant. Pl. 1:129. 1767; Hook. f, Fl. Brit. India 5:508. 1888; Gamble Fl. Pres. Madras 1367 (956). 1928.

Large trees, spreading crown and no aerial root, leaves alternate, stipulate, petiolate (2cm long), slightly coriaceous, base acute, apex cuspidate, 3-

ribbed, 16 pairs of primary nerves, 0.2 cm long stalked, 1.5 cm in size, yellowish when ripen. It is planted as an ornamental tree.

Fl. & Fr.: April-May.

Distribution: Malaya peninsula, Archipelago, Eastern hills of Indian peninsula, the vallies of Eastern Himalayas, hills of Assam, Chitta gonghu, Berma.

Ecology: *Ficus benjamina* is distributed 25m above from sea level to 1500m altitude. It is seen along the evergreen, moist deciduous forests and mid plains. *Ficus benjamina* has an association with *Macranga peltata* and *Mallotus auro punctatus*.

Ficus benjamina L. var. *nuda* (Miq.) Barrett. 91951; Corn, Gard. Bull. Singapore, 1965; *Urostigama nudum* Miq. 91847)- *U. Benjamineum* Miq. V. nudum Miq. (1851)- *Ficus nuda* Miq. (1867)- *Ficus comosa* Roxb. (1798)- *Ficus papyrifera* Griff. (1854)- *Ficus benjamina* L. V. *comosa* (Roxb.) kurz (1877)- *Ficus xaveiri* Merr. (1922); Gamble, Fl. Pres. Madras 508, 1928.

Trees, aerial root present. Leaves alternate, petiole 1cm long, stipule 0.5-0.7 cm long, ovate-elliptic, coriaceous, size ranges from 8x4 cm to 6x2.3 cm. Base acute, bluntly acuminate apex. 3-ribbed, entire margin.

Ornamental tree.

Distribution: Northeast India, South China, Indochina, Thailand, Philippines, New Guinea.

Ecology: It is distributed 25 m above from sea level to 900 m altitude. It is an ornamental tree. It is seen in Evergreen & moist deciduous forests and plains. It is associated with *Macranga peltata*.

Ficus callosa. Wild., Mem. Acad. Roy. Sci. Hist. (Berlin) 102. 1798; Hook. f. Fl. Brit. India 5: 516. 1888; Gamble, Fl. Pres. Madras 1364 (954). 1928; Mani. & Sivar., Fl. Calicut 276. 1982; Mohan. & Sivad., Fl. Agasthyamala. 631. 2002; Corner. Gard. Bull. S. S. 21:29. 1965 & in Dassan. & Fosb., Rev. Handb. Fl. Ceylon 3:263. 1981.

Large trees. Aerial roots absent. Bark grey colour. Leaves large, oblong base rounded, apex acute, glabrous, size ranges from 22x13 to 15x7.5 cm, 3-4 ribbed. Primary veins 11 pairs. Fig axillary, solitary, sub globose 2.5cm across, Puberulous, greenish in colour. Petiole 3cm long.

Commonly distributed in moist deciduous forest.

Local name: Kadaplavu.

Fl. & Fr.: March - May.

Distribution: Indo - Malesia.

Ecology: *Ficus callosa* is distributed 50m. above from sea level to 1054 m altitude. It is seen along the open areas in dry regions, evergreen, semi evergreen and moist deciduous forest. It has an association with *Macranga peltata*, *Syzygium* species etc.

Ficus costata Ait., Hort. Kew. (ed. 1) 3: 452. 1789; Sasidh., Fl. Stud. Parambikulam wild. Sanct. 311. 2002. *Ficus caudiculata* Trimen, J. Bot. 23: 243. 1885; Hook. f., Fl. Briot. India 5: 510. 1888. *Ficus mooniana* king in Hook. f., Fl. Brit. India 5: 514. 1888.

Trees, branchlets slender, glabrous, leaves alternate, petiolate 1-2cm long, ovate- oblong, ranges from 11x 4cm to 8x2cm. Base subcordate and apex sharply and abruptly acuminate. 3-ribbed and 12-14 pairs of primary nerves, entire margin.

Rare in evergreen forests at low elevation.

Fr. & Fl.: November- December

Distribution: South India & Sri Lanka

Ecology: *Ficus costata* is rare and distributed 400m above from sea level to 1050m altitude. It is seen along the ridges of rocks and as epiphytes. It is seen in the evergreen forests. It is a rare species in low elevation of evergreen forest. It is associate with *F. tsjahela*

Ficus drupacea Thunb. var. *pubescens* (Roth) Corner, Gard. Bull. Singapore 17:381. 1960 & 21: 13. 1965; Mani. & Sivar., Fl. Calicut 276. 1982; Babu, Fl. Malappuram Dist. Exclu. Nilambur Forest. 750. 1990; Vajravelu, Fl. Palaghat 446. 1990; Sasidh. & Sivar. Flow. Plan. Thrissur 428. 1996; Sivar. & Math; Fl. Nilambur 665. 1997; Mohan. & Sivad., Fl. Agasthyamala 631. 2002. *Ficus mysorensis* Heyne ex Roth in Roem. & Schult., Syst. Veg. 1:508. 1817; King in Hook. f., Fl. Brit. India. 5: 500. 1888; Fischer in Gamble, Fl. Madras 1361 (952) 1928. *Ficus mysorensis* Heyne ex Roth var. *pubescens* Roth in Roem. & Schult., Syst. Veg. 1:508.1817; Hook. f., Fl. Brit. India. 5:500. 1888; Gamble, Fl. Pres. Madras. 1361 (952) 1928.

Large trees. Spreading crown, young shoots are

hairy or pubescent. Aerial root absent. Leaves elliptic- oblong, base cordate or rounded, apex acuminate. Lower surface of the leaf is brown pubescent and dorsal surface become glabrous when mature. Fruits are orange yellow when ripe.

Common in evergreen, semi evergreen, moist deciduous forests, coastal regions and plains etc.

Fl. & Fr.: March- May.

Ecology: *F. drupacea* var. *pubescens* is distributed from sea level to 1025m altitude. It is mainly seen along the ridges of rock, roadside and also in dry plains. It is associated with *Macranga peltata*, *Trema orientalis*, *Mallotus species*, *Garcinia gummi-gutta*, and *Syzygium lanceolatum* etc.

Ficus exasperata Vahl, Enum. Pl. 2: 197. 1805; Mohanan & Henry, Fl. Thiruvananthapuram 432, 1884; Corner, Gard. Bull. S. S. 21: 74. 1965 & in Dassan. & Fosb; Rev. Hand b. Fl. Ceylon 3: 274. 1981; Mani & Sivar, Fl. Calicut 275, 1982; Mani, Fl. Silent Valley Trop. Rain. Fors. India. 259. 1988; Babu, Fl. Malappuram Dist. Exclu. Nilambur Forest. 751. 1990; Vajravelu, Fl. Palaghat. 447. 1990; Mohan. & Sivad, Fl. Agasthyamala 632, 2002; Sasidh. Bio. docu. Kerala. Part VI Flow. Plants. 439. 2003. *Ficus asperrima*- Roxb., Fl. India 3:554. 1832; Wt. Ic. t. 633. 1840; Hook. f., Fl. Brit. India 51: 522. 1888; Gamble, Fl. Pres. Madras 1366 (955). 1928.

Local name: Parakam, Therakam.

Small trees, greyish bark, and smooth. Aerial roots are absent, leaves obovate, apex is acuminate and base acute, or rounded, highly scabrous, fig is axillary, solitary, scabrid, globose and when ripe it becomes yellowish colour, 1cm long peduncle., size of leaf ranges from 11.5x4.5cm to 5.5x2.5cm. Common in moist deciduous forest.

Flowering & Fruiting: February- April.

Distribution: India, Sri Lanka, East Africa and Arabia.

Ecology: *Ficus exasperata* is distributed from sea level to 1500m altitude. It is mainly seen along road sides, in open areas and also in river margin etc. It is more found in the moist deciduous, riparian forest and also in fringe areas of evergreen forest.

It is associated with *Macranga peltata*, *Olea dioica*, and *Ficus hispida*. It is more associated with *Macranga peltata*.

Ficus hispida L. f. Suppl. Pl. 442. 1781; Mohanan. & Henry, Fl. Thiruvananthapuram. 433. 1884; King in Hook. f., Fl. Brit. India 522. 1888; Fischer in Gamble, Fl. Madras 1367. 1928; Corner. Gard. Bull. S. S. 21:89. 1965 & in Dassan. & Fosb., Rev. Handb. Fl. Ceylon. 3: 277. 1981; Mani. & Sivar. Fl. Calicut 275. 1982; Mani, Fl. Silent Valley. Trop. Rain Fors. India. 259. 1988; Babu., Fl. Malappuram Dist. Exclu. Nilambur. Forest. 830. 1990; Vajravelu; Fl. Palaghat. 447. 1990; Sasi. & Sivar. Flow. Plan. Thrissur. 429. 1996; Sivar. & Math., Fl. Nilambur 667. 1997; Mohan. & Sivad., Fl. Agasthyamala 633. 2002. *Ficus oppositifolia* Roxb., Pl. Corom. t. 124. 1799; Wt. Ic. t. 638. 1843. *Ficus daemona* Koen. ex Vahl, Enum. Pl. 2:198. 1805; wt., Ic. t. 641. 1843.

Local name: Erumanakku, Thonditherakam.

Small trees. Leaves opposite. Milky exudates which are sticky. Leaf size ranges from 20x9 cm to 39x14 cm in length, 3- ribbed. Base acute and apex acuminate, on both dorsal and ventral surface of leaf the hairs are present, margin serrate. Petiole 1.5-4 cm. Bracts lanceolate and turned to yellow or brown coloured when mature (0.5 cm). Fruits pedicellate, hairy in clusters and cup shaped.

Common in all plains.

Fl. & Fr: March- November

Distribution: Indo- Malesia to Australia and S. China.

Ecology: *Ficus hispida* is distributed from sea level to 1500m altitude. It is seen along road side, open areas, ridges of rock, river basin, river margin etc. It is mainly found in the evergreen, semi evergreen, moist deciduous, riparian forests. It has an association with *Macranga peltata*, *Mallotus auro-punctatus*, *Leea species*, *Litsea species*, *Polyalthia fragrans*, *Bombax ceiba* etc. Along the river margin, it is associated mainly with *Aprusa lindleyana*, *F. tsjahela* and *F.exasperata*.

Ficus microcarpa L. f., Suppl. Pl. 442. 1781; Corner. Gard. Bull. S. S. 21:22. 1965 & in Dassan & Fosb., Rev. Handb, Fl. Ceylon 3:258. 1981; Mani. & Sivar., Fl. Calicut 276. 1982; Sasidh. & Sivar. Flow. Plan. Thrissur 429. 1996; Mohan. & Sivad., Fl. Agasthyamala 634. 2002. *Ficus retusa* King. Ann. Roy. Bot. Gard (Culcutta) 1:50. tt. 61 & 84 P. 1887, non L.1767; Hook. f., Fl. Brit. India 5:511, 1888; Gamble, Fl. Pres. Madras 1362 (952). 1928. *Ficus*

retusa var. nitida Sensu Hook. f., Fl. Brit. India 5:511, 1888, non- Thunb. 1781-1801; Gamble; Fl. Pres. Madras 1362 (952). 1928.

Trees, leaves alternate, petiolate, 0.7cm long, base acute and apex acuminate entire, glabrous, 3 ribbed, 8-13 pairs of primary nerves, midrib and first primary ribs are prominent on the lower surface Occasional in semi evergreen and riparian forest.

Fl. & Fr.: March.- April

Ecology: *Ficus microcarpa* is distributed in all district, from 400m to 1050m altitude. It is seen along the river basin. It is found in the evergreen and riparian forests, associated with *Ficus hispida*.

Ficus racemosa L. Sp. Pl. 922. 1753; Corner. Gard. Bull. s.s. 21:34. 1965 & in Dassan. & Fosh; Rev. Handb. Fl. Ceylon 3:266. 1981; Mani & Sivar. Fl. Calicut 275. 1982; Babu, Fl. Malappuram Dist. Exclu. Nilambur. Forest. 753. 1990; Vajravelu, Fl. Palaghat 448. 1990; Sivar. & Math. Fl. Nilambur 668. 1997; Mohan. & Sivad. Fl. Agasthyamala. 635. 2002; Sasidh. Bio. docu. Kerala. Part VI. Flow. Plants. 441. 2003. *Ficus glomerata* Roxb. Pl. Corom. t. 123. 1799; Wt. Ic. t. 667. 1840; Hook. f., Fl. Brit. India. 5:535. 1888; Gamble, Fl. Pres. Madras. 1364 (954) 1928.

Local name: Atthi

Medium sized trees. Spreading crown, dark colour bark. Milky exudates which are not sticky. Leaves alternate, size ranges from 12"x 4" to 4.5"x2". Aerial root absent. Petiole size ranges from 1.8" to 0.5". Entire margin, apex as well as base are acute, exstipulate. Lateral nerves 9 pairs, basal pairs opposite and remains are alternate. Fruit pyriform, pedicel 0.2" long, fruit yellow or orange colour when ripen.

Common in semi- evergreen and riparian forest.

Fl. & Fr.: March- April.

Distribution: Indo- Malesia to Australia and S. China.

Ecology: *Ficus racemosa* is distributed 30m above from sea level to 1054m altitude. It is mainly seen along river basin. It is more found in the evergreen forest, riparian forest etc. It is associated with *Homonium riparia*, *Syzygium occidentale*, *Ochlandra travancorica* etc.

Ficus religiosa L., Sp. Pl. 1059. 1753; Mohanan. & Henry, Fl. Thiruvananthapuram 433. 1884; Hook.f., Fl. Brt. India 5: 513. 1888; Gamble, Fl. Pres. Madras 1363 (953). 1928; Mani. & Sivar; Fl. Calicut 277. 1982; Babu, Fl. Malappuram Dist. Exclu. Nilambur. Forest. 754. 1990. *Urostigma religiosum* (L.) Gasp., Ric. Caprifico 82. t. 7. ff. 1-5. 1845.

Local name: Arei- al, Arasu.

Large trees, grow epiphytes at first. No aerial root. Leaves alternate, petiolate, base rounded and apex cuspidate, 3-5 ribbed and 8 pairs of primary nerves, glabrous. Fruits are axillary, bracteate, sessile, in pairs, blood red colour when ripen.

Occasional in the moist deciduous forest.

Fl. & Fr.: June- July

Distribution: Wild in sub Himalayan forest, Bengal & Central India. Planted in India & Ceylon. Frequently in Burma and rarely in Malayan region.

Ecology: *Ficus religiosa* is distributed from sea level to 1054m altitude. It is seen in all plains, coastal area, riparian & moist deciduous forests. It is associated with *Albizia*, *Ficus benghalensis*, *Ficus gibbosa*, *Syzygium species* etc.

Ficus rigida Jack, Malay. Misc. 2:72. 1822, var. bracteata (corner) Bennet, Indian J. For. 5; 326. 1982; Vajaravelu, Fl. Palaghat 449. 1990; Sasidh., Fl. Stud. Parambikulam wild. Sanct. 313. 2002; Mohan. & Sivad; Fl. Agasthyamala 636. 2002. *Ficus glaberrima* Blume var. bracteata Corner, Gard. Bull. Singapore 17; 388. 1959 (1960). *Ficus travancorica* King, Ann. Roy. Bot. Gard. (Calcutta) 1: 28. tt. 26 & 820. 1887; Hook. f., Fl. Brit. India 5: 503. 1888; Gamble, Fl. Pres. Madras 1365 (955). 1928.

Scandent epiphytic shrub, branchlets glabrous, leaves alternate oblong- lanceolate, acute at base, apex acuminate, reddish when dry, 3- ribbed, primary nerves are 12-17 pairs, petiole 2cm, size of the leaf ranges from 18.5x5.5cm to 12x4cm. Glabrous.

Common along the river banks and semi evergreen forest.

Fl. & Fr.: August- December.

Endemic to: South India

Ficus rigida var. *bracteata* is distributed from 894m. to high altitude. It is seen in the evergreen forest. It is distributed along the riverbank and also

the ridges of rocks in the evergreen forest. It is associated with *Ludwigia parviflora*.

Ficus tinctoria G. Forst. ssp gibbosa (Blume) Corner var. *cuspidifera* (Miq.) Chitra in Henry et al; Mohanan. & Henry, Fl. Thiruvananthapuram 433. 1884; Sasidh., Fl. Stud. Parambikula wild. Sanct. 313. 2002. *Ficus cuspidifera* Miq. in Hook's London J. Bot. 7:434. 1848; Hook. f., Fl. Brit. India 5:497. 1888. *Ficus gibbosa* Blume var. *cuspidifera* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1:6, t. 2A. 1887; Gamble, Fl. Pres. Madras 1366 (955). 1928.

Local name: Ithimottu

Small trees, often epiphytic with aerial roots, Leaves elliptic, small, base narrow to acute and apex acuminate. Leaves alternate, petiolate (0.4 cm long). Size ranges from

6.5x 2 cm to 3.3 x1.7 cm; coriaceous, stipule small 0.5cm long., leaves gibbous to one side.

Occasional in semi & evergreen forest

Fl. & Fr.: October-December.

Distribution: India, China & Sri Lanka.

Ecology : It is distributed 25 m above sea level to 1500 m altitude. It is seen along the roadside, and also as an epiphyte or lithophyte. It is distributed along the evergreen, semi evergreen and also in plain areas. It has an association with *Macranga peltata*, *Ficus religiosa* etc.

Ficus tinctoria G. Forst. ssp. parasitica (Koen. ex Willd.) Corner, Gard. Bull. Singapore 17:476. 1960; Mani. & Sivar., Fl. Calicut 276. 1982; Ramach. & Nair, Fl. Cannanore 433. 1988; Vajravelu, Fl. Palaghat 449. 1990; Sasidh. & Sivar. Flow. Plan. Thrissur 430. 1996; Sivar. & Math; Fl. Nilambur 669. 1997; Sasidh., Fl. Stud. Parambikulam wild. Sanct. 314. 2002; Mohan. & Sivad., Fl. Agasthyamala 636. 2002. *Ficus parasitica* Koenig ex Willd.) King, Ann. Roy. Bot. Gard. (Calcutta) 1:t. 2, 16. 1887; Hook. f., Fl. Brit. India 5:497. 1888; Gamble, Fl. Pres. Madras 1365 (955). 1928.

Local names: Itthi, Kallithi.

Small to medium sized trees, often epiphytic

with interlacing aerial roots. Leaves elliptic – ovate or oblanceolate, base acute or cuspidate and unequal, one side gibbous and other side cuneate. Sparsely hispid, size 19x9cm long, petiole 1cm long, 3-ribbed and 6-7 pairs of primary nerves.

Occasionally in semi evergreen, moist deciduous and also in plain areas.

Fl. & Fr: March- April.

Distribution: Indo- Malesia.

Ecology : It is distributed from sea level to 1054 m altitude. It is seen along the roadside, rock side and also as an epiphytes. It is distributed along moist deciduous and semi evergreen forests.

Ficus tsjahela Burm. f., India. 227. 1768; Mohanan & Henry. Fl. Thiruvananthapuram 434. 1884; Hook. f., Fl. Brit. India 5:514. 1888, "tjakela"; Gamble, Fl. Pres. Madras 1362 (953). 1928 Corner. Gard. Bull. s. s. 21:7. 1965 & in Dassan. & Fosb., Rev. Handb. Fl. Ceylon. 3:237. 1981; Mani & Sivar; Fl. Calicut 277. 1982; Mani, Fl. Silent valley Trop. Rain. Fors. India. 260. 1988.; Babu, Fl. Malappuram Dist. Exclu. Nilambur. Forest. 756. 1990; Vajravelu, Fl. Palaghat 450. 1990; Sivar. & Math. Fl. Nilambur 671. 1997; Mohan. & Sivad. o Fl. Agasthyamala 637. 2002.

Medium sized trees; spreading crown, milk exudates are sticky. Aerial root absent. Leaves alternate, petiolate which is 7.5 cm long, base acute and apex cuspidate, margin entire, sizes of leaves 23.5x8 cm, 3- ribbed and 15 pairs of primary nerves. Figs axillary, sessile, small, bracteate which are lobed and rounded. The small white dots are seen on both stem tip and fruits. Stipule small, red coloured and slightly lanceolate.

Common in moist deciduous forest.

Fl. & Fr.: April- May and August – September.

Distribution: Peninsular India, Ceylon, Sri Lanka, Deccan Peninsula.

Ecology: *Ficus tsjahela* is distributed from sea level to 1054m altitude. It is mainly found along the open areas and dry region It is seen evergreen, semi evergreen, riparian, moist deciduous etc. It has an association with *Ailanthus malabaricus*, *Macranga peltata*, *Syzygium species*, *Olea dioica*.

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